

Zambezi Watercourse Commission



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RULES AND PROCEDURES

FOR SHARING OF DATA AND INFORMATION
RELATED TO THE MANAGEMENT AND
DEVELOPMENT OF THE ZAMBEZI
WATERCOURSE

Adopted by the ZAMCOM Council on

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PREAMBLE

The Member States of the Zambezi Watercourse Commission, being the Republic of Angola, the Republic of Botswana, the Republic of Malawi, the Republic of Mozambique, the Republic of Namibia, the United Republic of Tanzania, the Republic of Zambia and Republic of Zimbabwe;

INSPIRED by the establishment of the Zambezi Watercourse Commission (ZAMCOM) through the Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM-Agreement), which entered into force on 19 June 2011

ACKNOWLEDGING that ZAMCOM, through the ZAMCOM-Agreement, was established within the framework of the Southern African Development Community Revised Protocol on Shared Watercourses, which was adopted on 07 August 2000 and entered into force in 2003;

CONSCIOUS of the benefits of regional cooperation with regard to water related data and information exchange;

AFFIRMING the importance for an effective, sustainable, reliable and accessible water resources information system for the Zambezi watercourse;

COMMITTED to the sharing of data and information in accordance with Article 15 of the ZAMCOM-Agreement and Article 3 (6) of the SADC Revised Protocol on Shared Watercourses;

ACKNOWLEDGING the cooperative spirit among Member States for the development of the ZAMWIS database, which being hosted at the ZAMCOM Secretariat (ZAMSEC) and also installed at a key institution at each of the eight Member States, will be a solid common reference for all the Member States when discussing the future development and management of the basin

HEREBY AGREE AS FOLLOWS:

PART I: RULES FOR SHARING DATA AND INFORMATION

Article 1: Definitions and Acronyms

For the purpose of these Rules and Procedures the following terms shall mean, unless otherwise stated:

Term	Definition
Environment Data	Data related to the conditions and functioning of natural and physical resources, e.g. ecosystems and their constituent parts
Government Institutions	Institutions mandated by statutory law as part of a Member State's government structure, e.g. ministries, departments, parastatals
Hydrological Data	This concerns the water cycle including surface water and groundwater
Internally shared data	Data that will only be shared among: <ul style="list-style-type: none">• The National Focal Institutions of the respective Member States.• Other Government Institutions within the Member States upon official request for access to the ZAMWIS data and information through the National Focal Institutions.
Knowledge products	This concerns documents, reports, photos and other information not being time-series or spatial data.
Member States	Countries having ratified the ZAMCOM Agreement
Meteorological Data	Data which describes the atmosphere, including temperature, pressure, wind and air density
Multinational Organisations	Organisations collecting information relevant for ZAMWIS <u>and</u> not controlled/managed by a single Member State
National Focal Institution	Government Institution designated by a Member State as focal point for that country to engage with ZAMCOM on all matters related to data and information sharing in terms of these Rules and Procedures
Planning instruments	Government instruments relevant for water resources management planning, such as policies, legal instruments, strategies, master plans etc.
Publicly shared data	Data that will be made publicly available via the ZAMWIS web page
Readily available data	Data that are collected as part of the normal national monitoring programs
Spatial data	Information about the locations and shapes of geographic features and the relationships between them, usually stored as coordinates and topology, basically any data that can be mapped. It includes both traditional GIS data as well as remote sensing data
Socio-economic data	Data related to the social and economic conditions and activities
Source institution	The organisation originally collecting and/ or producing the data
Time series data	A sequence of numerical data points in successive order, usually occurring in uniform intervals. Common type of time series data to be shared between the Member States will e.g. include discharge and rainfall time series data.
Water Quality data	Data which describes the physical, chemical and biological properties of the water
Zambezi Watercourse	Means the system of surface and groundwater of the Zambezi constituting by virtue of their physical relationship a unitary whole flowing into the Indian Ocean as a common terminus
ZAMCOM Agreement	Agreement on the Establishment of the Zambezi Watercourse Commission (ZAMCOM)

Acronyms	
DSS	Decision Support System
GIS	Geographic Information System
IT	Information Technology
MoU	Memorandum of Understanding
NFI	National Focal Institution
RS	Remote sensing
SADC	Southern African Development Community
WRIS	Water Resources Information System
ZAMWIS	Zambezi Water Information System (housed within ZAMSEC and NFI)
ZAMSEC	Secretariat of the Zambezi Watercourse Commission
ZAMCOM	Zambezi Watercourse Commission

Article 2: Scope and Structure of the Rules and Procedures

1. These Rules and Procedures shall apply to the sharing of data and information relevant to the equitable and reasonable utilisation, management and sustainable development of the Zambezi Watercourse. These Rules and Procedures shall not apply to information exchange in emergency situations as defined in Article 17 of the ZAMCOM-Agreement.
2. These Rules and Procedures consist of two parts, namely
 - a) ‘Part I: Rules for Sharing Data and Information, which sets out the agreed rules for data sharing, cost sharing¹, roles of institutions²; and
 - b) ‘Part II: Technical Procedures and Specifications’, specifying the data to be shared, technical standards and procedures of data and information exchange.
3. Part I and Part II form inter-related components of these Rules and Procedures. Whereas each part is valid only in conjunction with the respective other part, the amendment of each part is subject to different rules, each defined in Article 11 of these Rules and Procedures.

Article 3: Objectives of the Rules and Procedures

1. The overall objective of these Rules and Procedures is to give effect to the provisions on data sharing in the ZAMCOM Agreement and the SADC Protocol on Shared Watercourses in order *“to ensure that relevant and quality assured data and information are shared timely between the Member States in order to facilitate that the Member States - through ZAMCOM - will be able to take informed decisions in relation to the planning and management of the shared water resources in the Zambezi watercourse ”*.
2. The specific objectives of these Rules and Procedures are to specify:
 - a) The type of data and information to be shared as well as source, frequency, format, standards, quality assurance, and the method of transfer
 - b) Roles and responsibilities of involved institutions
 - c) Time frames for supplying the agreed data and information
 - d) Ownership and access rights to shared data and information

Article 4: Legal Framework

1. These Rules and Procedures are based on, and facilitate the implementation of, the relevant provisions on data sharing and information exchange of the ZAMCOM Agreement and the SADC Revised Protocol on Shared Watercourses, these being

¹ Reference is made to Article 10: Costs Implications

² Reference is made to Article 9: Roles and Responsibilities

a) in terms of the ZAMCOM-Agreement:

Article 5 (a) stating that *one of the functions of ZAMCOM is to “collect, evaluate and disseminate all data and information on the Zambezi Water course as may be necessary for the implementation of this (ZAMCOM) Agreement”;*

Article 10 (2) (e) stating that the powers of the Technical Committee shall be to *“make recommendations to the Council on the standardised methodology to be adapted by Member States for collecting, processing and disseminating data and information with regard to all aspects of the Zambezi Watercourse”;*

Article 11 (6) (c) stating that the Secretariat shall *“collect, obtain, collate and evaluate data and information with regard to all relevant aspects of the Zambezi Watercourse as well as disseminate all such data and information to the Member States”;* and

Article 15 stipulating that

1. *Member States shall, on a regular basis, provide the Secretariat as well as all the other Member States with readily available or obtainable data and information with regards to all aspects of the Zambezi Watercourse.*
2. *If a Member State should be requested by the Secretariat or another Member State to provide data or information which is not readily available or obtainable, it shall employ its best efforts to comply with the request but may condition its compliance upon the payment by the requesting Member State or the Secretariat of the reasonable costs of collecting and, where appropriate, processing such data and information.*
3. *Member States shall, on a regular basis, provide the Secretariat as well as all the other Member States with readily available or obtainable data and information with regards to all aspects of the Zambezi Watercourse.*
4. *A Member State shall not be obliged to supply data or information to the Secretariat or any other Member State if it would be prejudicial to its defence or national security. A Member State shall however co-operate in good faith with the Secretariat or other Member States and provide as much data and information especially on hydrology matters and matters potentially harmful to people and the environment as circumstances permit.*

b) in terms of the Revised SADC Protocol on Shared Watercourses:

Article 3 (6) stipulating that ‘State Parties shall exchange available data and information regarding the hydrological, hydro geological, water quality, meteorological and environmental condition of shared watercourses’; and

Article 5: Data and Information Categories

1. The Member States agree to share all data and information relevant for the planning, management and sustainable development of the Zambezi Watercourse, including but not limited to the following data and information categories:

- a) Hydrology
- b) Meteorology
- c) Water quality
- d) Socio-economy
- e) Environment
- f) Planning instruments (e.g. policies, legal instruments, strategies, master plans, etc.)

The exact data and information to be shared are specified in Part II

2. The data and information to be shared between the Member States includes data formats such as:
 - a) Time series
 - b) Spatial data
 - c) Knowledge products
3. The data and information to be shared between the Member States shall consist of all relevant past and present data and information needed to describe and understand the actual situation of the watercourse, as well as causes for possible changes.
4. The exact relevant data and information to be shared within the above categories shall be reviewed and determined by ZAMTEC on an annual basis, in accordance with Article 11 of these Rules and Procedures, and listed in Part II: Technical Specifications. Part II also describes the access level, frequency, format, source, quality assurance and method of transfer.
5. The Member States agree that in addition to the above-mentioned data and information to be provided from the respective Member States, already publicly available data and information related to the Zambezi watercourse will also regularly be integrated into ZAMWIS to serve the ZAMCOM objectives.

Article 6: Ownership and Access to Shared Data and Information

Ownership:

1. The ownership of the originally supplied data and information remains with the source institution.
2. The ownership of data and information generated through processing by ZAMCOM shall be with the Member States collectively. ZAMSEC will acknowledge the original source(s) institution when producing processed information. Such acknowledgement shall be visible along with the processed product(s).

Level of access:

3. In agreement with the respective Member State their provided data and information will be categorised in one of the following two categories :
 - a) Data and information to be shared publicly
 - b) Data and information only to be shared internally

4. Data and information categorised as ‘to be shared publicly’ can at any time be shared publicly through the ZAMCOM website.
5. Data and information categorised as ‘not to be shared publicly’ meaning “only to be shared internally” shall only be made available to:
 - a) The National Focal Institutions of the respective Member States.
 - b) Other Government Institutions within the Member States upon official request for access to the ZAMWIS data and information through the National Focal Institutions and upon conclusion of the non-disclosure agreement (provided in Part II of these Rules and Procedures) with ZAMCOM.
6. Where the National Focal Institutions or other government institutions employ a consultant for technical studies, ‘data only to be shared internally’ may be temporarily provided to the consultant for the purposes of such study, provided that such data is
 - a) essential for carrying out the study, and
 - b) subject to conclusion of a non-disclosure agreement in accordance with the ZAMCOM standards (provided in Part II of these Rules and Procedures) with the consultant.

Article 7: Data Security

1. Once the data have been provided to ZAMSEC and incorporated into ZAMWIS it is the responsibility of ZAMSEC to make sure that the data and information “*only to be shared internally*” will only be shared with the intended institutions/organisations in accordance with Article 6 (5). . To serve this purpose ZAMSEC will ensure that ZAMWIS is constructed in a way that only users with permission to access internal data will be able to do so.
2. Organizations and institutions other than Government Institutions in the Member States who want to make use of data and information categorised as “*only to be shared internally*”, for national or transboundary purposes, are requested to contact the source institution in the respective Member State to get permission to use the data. ZAMCOM may facilitate such a process, if it is for transboundary purposes.
3. In case that a consultant will be assisting ZAMCOM in carrying out services that require the consultant to have access to data and information “*only to be shared internally*”, the consultant shall sign an agreement with ZAMCOM stating that they will only use these data and information for this specific purpose and that they will delete/destroy the received data and information upon completion of the service carried out for ZAMCOM.
4. While every effort has been made by the ZAMCOM through its Member States and ZAMSEC to share accurate, quality-controlled data and information through the ZAMWIS in accordance with the provisions of the ZAMCOM Agreement and these rules and procedures, the ZAMCOM and its Member States cannot guarantee in any way whatsoever the correctness nor accuracy of the data and information provided. Use and application of the ZAMWIS data and information is therefore fully at the responsibility and discretion of any user and neither ZAMCOM nor the Member States shall bear any liability for incorrect or inaccurate data and information.

Article 8: Operational Procedures for Data and Information Sharing

1. The data and information to be provided by the respective Member States are listed in Part II, Section 1. Part II, Section 2 also specifies the source institution, monitoring frequency, data formats, transfer frequency and transfer method.
2. Prior to submission of data and information to ZAMCOM, the National Focal Institutions ensure that all data and information provided to ZAMCOM has been quality assured by the relevant source institution.
3. The Member States agree that harmonised quality standards will be developed if and when required. ZAMCOM will facilitate such harmonisation as stated in the ZAMCOM Agreement.
4. Unless otherwise agreed, the method of transferring data and information will be as direct upload of electronic files to the ZAMWIS where all received data will be stored. Regular backup procedures will ensure that received data are not lost in case of IT breakdown.

Article 9: Roles and Responsibilities

National Focal Institutions

1. Each Member State shall appoint a National Focal Institution, responsible for carrying out the Member State's duties with respect to all data and information sharing described in these Rules and Procedures. The role of the National Focal Institutions is to ensure that all agreed data and information are provided to ZAMSEC in a timely manner. In case a national source institution is not providing the agreed data to the designated National Focal Institution within the agreed time frame, the National Focal Institution will make contact with the respective provider in order to facilitate a prompt delivery of data. The National Focal Institutions will appoint a national contact person(s), who will facilitate the data exchange between the Member State and ZAMSEC.
2. The National Focal Institution will deal with the Government Institutions in the respective Member State when such Institutions are requesting data and information available in ZAMWIS. When data and information "only to be shared internally" are requested to be shared with a Government Institution the National Focal Institution shall ensure that data is only transferred after the Government Institution concludes the non-disclosure agreement with ZAMCOM in accordance with Article 6 (5) (b).
3. The appointment of and/or change of any National Focal Institution shall be communicated to ZAMSEC in writing by the respective Member State in a timely manner.

ZAMCOM Technical Committee (ZAMTEC)

4. The role of the ZAMTEC is to review the relevance of the data and information sharing requirements as specified in Part II. This is in order to propose and agree on changes to the types of data and information to be shared when necessary, in order to ensure the continued relevance of the data and information. The individual ZAMTEC Members will also support the appointed

National Focal Institutions in their task of making sure that agreed data and information is shared in a timely manner with ZAMSEC, in accordance with these Rules and Procedures.

5. ZAMCOM may enter into MoU with relevant multi-national organisations in order to facilitate direct data and information transfer between these organisations and ZAMCOM.

ZAMCOM Secretariat (ZAMSEC):

6. ZAMSEC shall at all times maintain an updated record of the National Focal Institutions.
7. ZAMSEC is responsible for the operation of the ZAMWIS and will as such monitor the actual uploading/receipt of data and information from the Member States.
8. Further, ZAMSEC shall:
 - a) Implement and maintain an appropriate data security system of ZAMWIS in accordance with Article 7.
 - b) Prepare bulletins of information derived from data including updating various thematic reports and maps
 - c) Advise the Member States through ZAMTEC on the continuous review of data and information sharing requirements of each Member State.
 - d) Facilitate the harmonisation of data and information quality standards if needed
9. In relation to the National Focal Institutions, ZAMSEC shall:
 - a) Confirm to the National Focal Institutions when data and information is well received
 - b) Inform the National Focal Institutions when their received data and information are visible on the windows version of ZAMWIS
 - c) Remind respective National Focal Institutions when receipt of data and information is delayed
 - d) Assist the National Focal Institutions in the Member States with technical backstopping and training, and capacity building, when needed.
 - e) Prepare and share a short annual report on the status of received data and information, as well as how the data and information has or will be used.

Article 10: Costs Implications

1. The Member States shall provide readily available data and information to ZAMCOM without financial compensation.
2. In the case that ZAMCOM or another Member State is requesting data or information that is not readily available or obtainable, the Member State requested to provide such data or information may request a reasonable financial compensation for providing such data or information, as stipulated in Article 15 (2) of the ZAMCOM-Agreement,

Article 11: Amendment of the Rules and Procedures

1. All proposed amendments to Part I of these Rules and Procedures, as defined in Article 2 (2) of these Rules and Procedures, shall be in writing to ZAMCOM and require mutual agreement by all Member States. Such agreement shall be expressed through a decision by the Council of Ministers in accordance with Article 7 (4) of the ZAMCOM-Agreement and Section 2.4 of the ZAMCOM Governance Guidelines.
2. Part II of these Rules and Procedures shall be reviewed and, when necessary, updated on an annual basis. By adopting these Rules and Procedures the Council of Ministers delegates the authority and responsibility for the annual review and update to the ZAMTEC, to be carried out in accordance with Chapter 3 of the ZAMCOM Governance Guidelines on the rules for ZAMTEC.

Article 12: Dispute Resolution

1. In the event of a dispute with regard to the interpretation and application of these Rules and Procedures, arising among Member States, the Member States which are parties to the dispute shall expeditiously enter into consultations and negotiations, at the level of ZAMTEC, in the spirit of good faith and equity with a view to arriving at an amicable settlement.
2. ZAMTEC may, where appropriate, make recommendations to the parties to the dispute with a view to arriving at an amicable settlement thereof.
3. In case a solution is not found at the level of ZAMTEC, the dispute shall be referred to the Council of Ministers for negotiations and resolution by consensus in accordance with Article 7 (4) of the ZAMCOM-Agreement and Section 2.4 of the ZAMCOM Governance Guidelines.

Article 13: Rules and Procedures Languages

1. These Rules and Procedures exist in two original texts in the English and Portuguese languages respectively, both texts being equally authentic.

Article 14: Entry into Force

1. These Rules and Procedures shall enter into force thirty (30) days after their adoption by the ZAMCOM Council of Ministers in the minutes of the Council of Ministers' meeting.

PART II: TECHNICAL PROCEDURES AND SPECIFICATIONS FOR DATA AND INFORMATION SHARING

Section 1: Introduction

This Part II of the Rules and Procedures complements the legal rules for data and information sharing and exchange stipulated in Part I. As such this Part II forms the technical component of the Rules and Procedures and aims at providing clear technical guidance to the practitioners in ZAMSEC and the Member States in charge of data and information sharing and maintaining the ZAMWIS.

Part II describes the procedures and specifications for data sharing, such as the type of data to be shared, the frequency and procedures for transfer of data, as well as the levels of access. This part further provides detail on the institutional framework (i.e. the National Focal Institutions) for data and information exchange and the procedures for annual review and update of this Part II. Finally, it also includes a brief description of ZAMWIS, the software tool used for sharing the data.

Section 2: ZAMWIS

In technical terms, the Zambezi Water Information System (ZAMWIS) is the centre-point of data and information sharing and exchange between Member States in the Zambezi Basin. Housed within ZAMSEC, the ZAMWIS is the software tool used for the actual exchange and sharing of the data and information. ZAMWIS is a Water Resources Information System (WRIS), which later will be extended to include a Decision Support System (DSS) that will facilitate the use of the shared data and information for strategic planning and utilisation of the water resources in the basin.

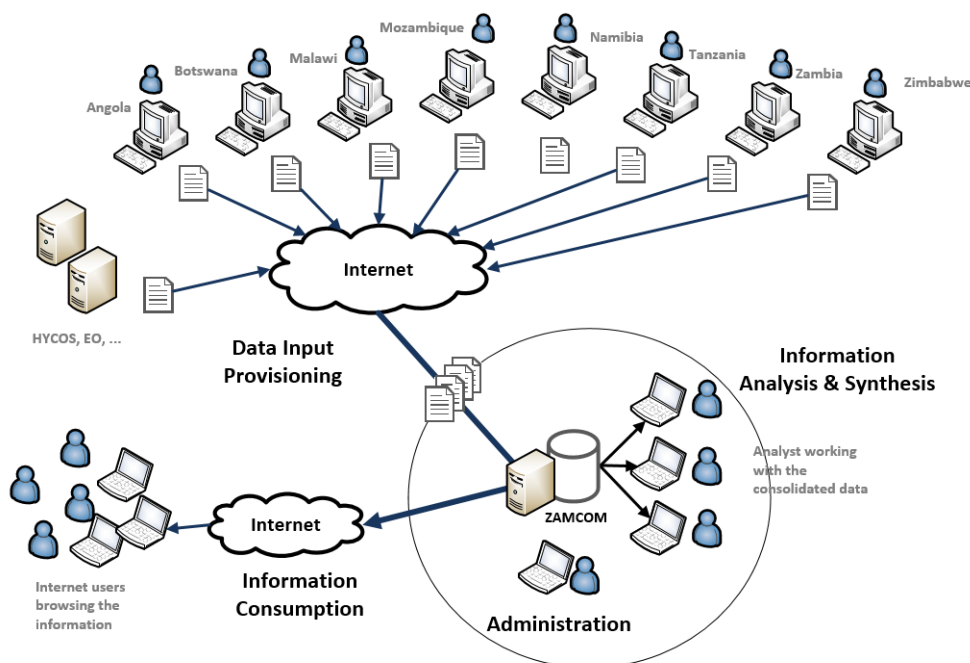


Figure 1 The ZAMWIS Water Resources Information System and its users. The Windows version of ZAMWIS is installed at ZAMWIS and the National Focal Institutions in the eight Member States. Publicly shared data will be available to any Internet user through the Web-version of ZAMWIS.

The system consists of both a Windows- and Web-version. The Windows-version is installed at the ZAMSEC as well as at the National Focal Institution in each of the eight countries, cf. Figure 1. The database is installed on the server at these locations, which can be accessed from client computers at these institutions. It is also through these Windows-versions of ZAMWIS that data is entered into the system. Most of the time series data will be entered into the system at the National Focal Institutions and transferred to ZAMSEC, while the spatial data and knowledge products will regularly be entered at ZAMSEC directly. More detail of the data exchange and sharing mechanisms is provided in Section 3 through 5. As the Windows version is only accessible for ZAMSEC and NFIs, all the ZAMWIS data will be available through this version, i.e. publicly shared data as well as internally shared data.

The Web-version of ZAMWIS (www.zamwis.zambezicommission.org) is also hosted at ZAMSEC. It is a Web-application which is publicly available through the Internet. It has basically the same functionalities for viewing and downloading data as the Windows-version. However, the Web-version does not allow uploading of data to the system and data can also not be modified.

Section 3: Sharing of time series data

This section provides information on:

- 1) The frequency of sharing and exchange of time series data;
- 2) The type of time series data to be shared;
- 3) The procedures for data exchange;
- 4) Quality assurance of data; and
- 5) A list of the stations in the individual Member States for which data will be shared.

3.1 Time-series data sharing frequency

The frequency of data and information transfer shall be as follows:

- 1) Quarterly:
 - a) For most of the time series data the Member States will, on a quarterly basis³, provide ZAMSEC with new data from the preceding quarter.
 - b) These data may for example be used for long-term planning.
- 2) Near real-time:
 - a) There will be an online transfer of data to ZAMSEC from all the SADC-HYCOS stations in all the Member States. The most recent of these data will be made available for viewing online via the Web-version of ZAMWIS. However, the full time series will only be available through the Windows-version through the quarterly updates.
 - b) This data will be useful, for example, for short-term and seasonal planning, and flood warning.
 - c) For the future, the aim is to also share data from stations other than the SADC-HYCOS stations in near real-time format, if and when the technology allows for this.

3.2 Type of time series data to be shared

The key data which eventually is aimed to be shared between the Member States, their monitoring frequency, units to be used, transfer frequency and method of transfer are listed in Table 1 below.

³ End March, June, September and December

Initially the focus is on the sharing of water levels, discharge and rainfall data, while the eventual aim is to include all the hydro-meteorological and environmental variables listed in Table 1. The actual stations for which time series data, based on the most recent review, is to be shared between the Member States through ZAMWIS are listed in the tables in Section 3.5.

Table 1 Type of time series data, which eventually is aimed to be shared between the Member States.

Type of data	Monitoring Frequency	Units	Transfer Frequency	Transfer Method
Water levels	Daily	m	Quarterly	Exchange files
Discharge	Daily	m ³ /s	Quarterly	Exchange files
Rainfall	Daily	mm/day	Quarterly	Exchange files
Evaporation ¹	Daily	mm/day	Quarterly	Exchange files
Temperature ¹	Daily	°C	Quarterly	Exchange files
Sediment concentration ¹	Depend on availability	mg/l	Quarterly	Exchange files
Water Quality ¹	Depend on availability	N/A	Quarterly	Exchange files
Water level	May vary	m	Near real-time	Telemetric
Discharge	May vary	m ³ /s	Near real-time	Telemetric
Rainfall ¹	May vary	mm	Near real-time	Telemetric

Note: 1) These data are presently not shared, but the aim is eventually to include this type of data in the data sharing between the Member States.

3.3 The procedures for data exchange

Quarterly exchange of time series data

The administration part of ZAMWIS provides functionality for keeping the databases at the National Focal Institutions and ZAMSEC synchronized to ensure that ZAMSEC receives the most recent time series data to be shared from each Member State and that the compiled data subsequently are shared with each of the Member States. The organisational workflow related to keep the databases synchronized is the following:

- 1) After the end of each quarter, the National Focal Institutions will ensure that their ZAMWIS database is updated with the times series to be shared and which are readily available.
- 2) The National Focal institutions will then after the end of each quarter generate an exchange file with changes that have occurred in their database and avail that file to ZAMSEC
- 3) ZAMSEC will load the received exchange files from the eight Member States into their database
- 4) ZAMSEC will based on a schedule generate an exchange file with changes that have occurred in the database and disseminate that exchange file to the National Focal Institutions in the eight Member States for loading

This procedure will ensure that changes in a database at any National Focal Institution will be propagated to ZAMSEC and from there further to all the other National Focal Institutions.

The ZAMWIS System Administration Manual, which will be provided to each Member State, explains the detail related to uploading and downloading of exchange files between the National Focal Institutions and ZAMSEC.

Exchange and sharing of near real-time data

The ZAMWIS installation at ZAMSEC will be configured to download the latest recordings from the SADC-HYCOS network and have the data imported to the ZAMWIS database at ZAMSEC. It is the responsibility of ZAMSEC to ensure that the downloading process is working, while it is the

responsibility of the National Focal Institutions that the stations are working and are transmitting the data to the receiver.

3.4 Quality assurance

The time series data to be provided by the Member States shall be the officially processed and quality assured data. It should be the aim that the data collection procedures follow WMO standards, and that the data also have been through quality check and quality assurance procedures according to WMO guidelines and standards, as described in e.g. 1) Guide to Hydrological Practices, Vol I: Hydrology – From Measurement to Hydrological Information, WMO No. 168, 6th Edition, 2008, and 2) Manual on Stream Gauging, Vol I (Fieldwork) & Vol II (Computation of Discharge), WMO No. 1044 (2010).

The quality assurance is to be carried out by the source institution, which will either be the National Focal Institution or another source institution. When ZAMSEC receives the data, they may carry out an additional quality check. However, if any possible errors are detected, ZAMSEC cannot change/correct the data itself, but will have to refer back to the source institutions and request for the data to be corrected (as needed) and re-submitted.

3.5 List of time series data to be exchanged and shared

The monitoring stations for which time series shall be provided by Member States and shared are listed in the following tables. The relevant stations have been identified through a consultative process with the Member States. During the annual review of the lists, these might be adjusted as new stations may be added and stations no longer found relevant or which may have been closed down may be deleted.

The tables are grouped into two types of tables: 1) Tables showing stations for which data will be exchanged on a quarterly basis (Tables 3-5), and 2) Tables listing stations for which exchange of near real-time data will take place (Tables 6-7). Table 2 provides an overview of the tables listing the different types of time series data to be shared.

Table 2 List of tables indicating the stations for which data should be exchanged and shared

Table	Type of station	Frequency of Exchange	Type of Exchange
Table 3	River gauging stations	Quarterly	Exchange files
Table 4	Lake stations	Quarterly	Exchange files
Table 5	Rainfall stations	Quarterly	Exchange files
Table 6	River gauging station	Near real time	Data acquisition
Table 7	Lake stations	Near real time	Data acquisition

It is very important to note that the lists include the stations for which data should be shared, i.e. historical data as well as quarterly updates. Once this document has entered into force (cf. Article 14), the Member States shall provide the historical data from the listed stations. Regarding the quarterly updates or near real time acquisition, it should be noted that some of the stations are presently not operational, which is indicated in the status column. Thus, the quarterly sharing of time series data will obviously only be for the stations indicated as operational. As soon as a station becomes operational the Member States will start sharing the data from the station. The status of the stations should be reviewed and updated, if necessary, as part of the annual review.

Table 3 List of River gauging stations in the Zambezi Basin, for which mean daily discharge (m³/s) shall be shared between the eight Member States on a quarterly basis. Note that this is the total list of station intended to be shared. However, some of the stations were not operational at the time of the latest review (reflected in the list) as they need either rehabilitation (if it is existing stations) or need to be constructed, and data could therefore not be shared at the time the review. As soon as they become operational, the respective Member States should start sharing the data and the status should be updated during the next review.

No	Country	Sub-basin	River	Station ID	Station Name	Status (Operational / Rehabilitation needed / To be constructed)	To be publicly shared (Yes/No)
101	Angola	Upper Zambezi	Luena	627403	Luena	Rehabilitation needed	No
102	Angola	Upper Zambezi	Luena	627402	Chafinda	Rehabilitation needed	No
103	Angola	Upper Zambezi	Lumege	627401	Canhange	Rehabilitation needed	No
104	Angola	Upper Zambezi	Zambeze	627412	Lóvua	To be constructed	No
105	Angola	Upper Zambezi	Zambeze	627404	Cazombo	To be constructed	No
106	Angola	Upper Zambezi	Zambeze	627406	Lumbala Caquengue	To be constructed	No
107	Angola	Upper Zambezi	Luisavo	627405	Luisavo	To be constructed	No
108	Angola	Luanginga	Luanguinga	627407	Luanguinga	To be constructed	No
109	Angola	Lungue Bungo	Lungué Bungo	627408	Lungué Bungo	To be constructed	No
110	Angola	Cuando/Chobe	Lombo	627409	Ponte Mavinga	To be constructed	No
111	Angola	Cuando/Chobe	Cuando	627410	Somil	To be constructed	No
112	Angola	Cuando/Chobe	Cuando	627411	Cangombe	To be constructed	No
201	Botswana	Cuando/Chobe	Chobe	6614	Ngoma Bridge	Operational	No
202	Botswana	Cuando/Chobe	Chobe	6624	Kasane	Operational	No
203	Botswana	Cuando/Chobe	Chobe	6634	Mowana	Operational	No
204	Botswana	Cuando/Chobe	Linyanti	6414	Sajawa	Operational	No
205	Botswana	Cuando/Chobe	Kwando	6125	Bates Camp	Operational	No
301	Malawi	Shire Basin/Lake Malawi	Shire	1B1	Shire at Liwonde	Rehabilitation needed	No
302	Malawi	Shire Basin/Lake Malawi	Shire	1G3	Shire at Tengani	Rehabilitation needed	No
303	Malawi	Shire Basin/Lake Malawi	Shire	1P2	Shire at Matope	Rehabilitation needed	No
304	Malawi	Shire Basin/Lake Malawi	Shire	1L12	Shire at Chikwawa	Rehabilitation needed	No
305	Malawi	Shire Basin/Lake Malawi	Shire	1G1	Shire at Chiromo	Rehabilitation needed	No
306	Malawi	Shire Basin/Lake Malawi	Ruo	14D3	Ruo at Sandama	Rehabilitation needed	No
307	Malawi	Shire Basin/Lake Malawi	Songwe	9B7	Songwe at Mwandenga	Rehabilitation needed	No
308	Malawi	Shire Basin/Lake Malawi	Rukuru	7G18	South Rukuru at Mlowe	Rehabilitation needed	No
309	Malawi	Shire Basin/Lake Malawi	Luweya	16F2	Luweya at Zayuka	Rehabilitation needed	No
310	Malawi	Shire Basin/Lake Malawi	Bua	5C1	Bua at S53 Road Brigde	Rehabilitation needed	No

No	Country	Sub-basin	River	Station ID	Station Name	Status (Operational / Rehabilitation needed / To be constructed)	To be publicly shared (Yes/No)
401	Mozambique	Tete	Luangwa	343	Arruangwa	Operational (only WL)	No
402	Mozambique	Tete	Zambeze	310	Zumbo	Operational	No
403	Mozambique	Tete	Zambeze	320	Tete	Operational	No
404	Mozambique	Tete	Zambeze	293	Mutarara	Operational (only WL)	No
405	Mozambique	Zambezi Delta	Zambeze	291	Caia	Operational	No
406	Mozambique	Zambezi Delta	Zambeze	285	Marromeu	Operational (only WL)	No
407	Mozambique	Tete	Luia	645	Luia	Operational	No
408	Mozambique	Tete	Revubue	302	Revubue	Operational	No
409	Mozambique	Shire Basin/Lake Malawi	Chire	289	Megaza	Operational	No
410	Mozambique	Tete	Luenha	348	Luenha-I	Operational	No
501	Namibia	Cuando/Chobe	Kwando	68022	Kongola (HYCOS)	Operational	No
502	Namibia	Barotse	Zambezi	68017	Katima Mulilo (HYCOS)	Operational	No
503	Namibia	Cuando/Chobe	Ngoma	68021	Ngoma	Operational	No
601	Tanzania	Shire Basin/Lake Nyasa	Songwe	1RD1A	Songwe at Kasumulu	Operational	No
602	Tanzania	Shire Basin/Lake Nyasa	Kiwira	1RC8A	Kiwira at Natural Bridge	Operational	No
603	Tanzania	Shire Basin/Lake Nyasa	Kiwira	1RC2A	Kiwira at Ipyana	Operational	No
604	Tanzania	Shire Basin/Lake Nyasa	Ruhuhu	1RB2	Ruhuhu at Masigira	Operational	No
605	Tanzania	Shire Basin/Lake Nyasa	Ruhuhu	1RB3	Ruhuhu at Kikonge	Operational	No
606	Tanzania	Shire Basin/Lake Nyasa	Mbaka	1RC3A	Mbaka at Mwaya	Operational	No
607	Tanzania	Shire Basin/Lake Nyasa	Luhekei	1RA1	Luhekei at Nangombo	Operational	No
608	Tanzania	Shire Basin/Lake Nyasa	Chiwindi	1RA2	Chiwindi at Mtupale	Operational	No
609	Tanzania	Shire Basin/Lake Nyasa	Lufilyo	1RC1A	Lufilyo at Ipinda	Rehabilitation needed	No
701	Zambia	Upper Zambezi	Zambezi	1-105	Chavuma	Operational	
702	Zambia	Kabompo	Kabompo	1-950	Watopa	Operational	
703	Zambia	Barotse	Zambezi	2-030	Lukulu	Operational	No
704	Zambia	Barotse	Little Zambezi	2-330	Matongo Platform	Operational	No
705	Zambia	Barotse	Zambezi	2-400	Senaga	Operational	No
706	Zambia	Barotse	Zambezi	2-410	Ngonye Falls	Operational	No
707	Zambia	Barotse	Zambezi	2-700	Sesheke Boma	Operational	No

No	Country	Sub-basin	River	Station ID	Station Name	Status (Operational / Rehabilitation needed / To be constructed)	To be publicly shared (Yes/No)
708	Zambia	Kariba	Zambezi	3-045	Nanas Fam	Operational	No
709	Zambia	Mupata	Zambezi	3-980	Chirundu	Operational	No
710	Zambia	Kafue	Kafue	4-130	Smith Bridge	Operational	No
711	Zambia	Kafue	Kafue	4-435	Mswebi	Rehabilitation needed	No
712	Zambia	Kafue	Lunga	4-560	Chifumpa	Operational	No
713	Zambia	Kafue	Kafue	4-669	Hook Bridge	Operational	No
714	Zambia	Kafue	Kafue	4-760	Namwala Pontoon	Operational	No
715	Zambia	Kafue	Kafue	4-977	Kasaka	Operational	No
716	Zambia	Mupata	Zambezi	5-005	Chiawa	Rehabilitation needed	No
717	Zambia	Tete	Zambezi	5-098	Kavalamanja	Rehabilitation needed	No
718	Zambia	Luangwa	Lunsemfwa	5-765	Great North Road	Operational	No
719	Zambia	Luangwa	Luangwa	5-800	Ndevu Camp	Rehabilitation needed	No
720	Zambia	Luangwa	Luangwa	5-940	Great East Road Bridge	Operational	No
721	Zambia	Luanginga	Luanginga	2-250	Kalabo	Operational	No
801	Zimbabwe	Kariba	Shangani	A36	Gwayi Confluence Flumes	Operational	No
802	Zimbabwe	Kariba	Gwayi	A38	Dahlia Control Section	Operational	No
803	Zimbabwe	Kariba	Gwayi	A72	Binga Road Bridge	Operational	No
804	Zimbabwe	Kariba	Gwayi	A22	Kamativi	Rehabilitation needed	No
805	Zimbabwe	Kariba	Mupfure	C12	Twyford Weir	Operational	No
806	Zimbabwe	Kariba	Sebakwe	C36	Lower Ziwegwe Dam D/S	Operational	No
807	Zimbabwe	Kariba	Muzvezwe	C48	Claw Dam D/S	Rehabilitation needed	No
808	Zimbabwe	Kariba	Sanyati	C59	Copper Queen C/S	Operational	No
809	Zimbabwe	Kariba	Sanyati	C109	Sanyati	Operational	No
810	Zimbabwe	Kariba	Ume		Ume	Operational	No
811	Zimbabwe	Tete	Manyame	C61	Chinhoyi Old Road Bridge	Operational	No
812	Zimbabwe	Tete	Manyame	C64	Nyakapupu G/W	Operational	No
813	Zimbabwe	Tete	Musengezi	C68	Aurelia Flumes	Operational	No
814	Zimbabwe	Kariba	Zambezi	ZGP25	Victoria Falls Big Tree	Operational	No
815	Zimbabwe	Tete	Mazowe	D75	Mazowe Bridge	Operational	No

Table 4 List of Lake stations in the Zambezi Basin, for which daily WL (m) shall be shared between the eight Member States on a quarterly basis. Note that this is the total list of station intended to be shared. However, some of the stations were not operational at the time of the latest review (reflected in the list) as they need either rehabilitation (if it is existing stations) or need to be constructed, and data could therefore not be shared at the time a review. As soon as they become operational, the respective Member States should start sharing the data and the status should be updated during the next review.

No	Country	Lake / Reservoir	Station ID	Station Name	Status (1. Operational / To Be Rehabilitated / To be constructed)	To be publicly shared (Yes/No)
200	Namibia	Lake Liambezi		Lake Liambezi at Muyako	To be constructed	No
301	Malawi	Lake Malawi	17C1	Lake Malawi at Chilumba	Rehabilitation needed	No
302	Malawi	Lake Malawi	16G1	Lake Malawi at Nkhata-Bay	Rehabilitation needed	No
303	Malawi	Lake Malawi	3A2	Lake Malawi at Monkey-Bay	Rehabilitation needed	No
401	Mozambique	Cahora Bassa	No ID	Cahora Bassa Dam	Operational	No
601	Tanzania	Lake Nyasa	1R1A	L.Nyasa at Itungiport	Operational	No
602	Tanzania	Lake Nyasa	1R2	L.Nyasa at Mbambabay	Operational	No
801	Zimbabwe	Kariba		Kariba Dam	Operational	No

Table 5 List of rainfall stations (presently mainly SADC-HYCOS stations) in the Zambezi Basin, for which daily rainfall (mm/day) shall be shared between the Member States on a quarterly basis. Note that this is the total list of station intended to be shared. However, some of the stations were not operational at the time of the latest review (reflected in the list) as they need either rehabilitation (if it is existing stations) or need to be constructed, and data could therefore not be shared at the time a review. As soon as they become operational, the respective Member States should start sharing the data and the status should be updated during the next review.

No	Country	Sub-basin	Station ID	Station Name	Status (1. Operational / Rehabilitation needed / To be constructed)	To be publicly shared (Yes/No)
301	Malawi	Shire Basin/Lake Malawi	1B1	Shire at Liwonde	Rehabilitation needed ¹	No
302	Malawi	Shire Basin/Lake Malawi	1G3	Shire at Tengani	Rehabilitation needed ¹	No
303	Malawi	Shire Basin/Lake Malawi	14D3	Ruo at Sandama	Rehabilitation needed ¹	No
304	Malawi	Shire Basin/Lake Malawi	9B7	Songwe at Mwandenga	Rehabilitation needed ¹	No
402	Mozambique	Zambezi Delta	291	Caia (Ex Marromau)	Operational	No
403	Mozambique	Tete	310	Zumbo	Operational	No
501	Namibia	Cuando/Chobe	68022	Kongola	Operational	No
502	Namibia	Barotse	68017	Katima Mulilo	Operational	No
503	Namibia	Cuando/Chobe	68021	Ngoma Gate	Operational	No
504	Namibia			Mapilila Island	To be constructed	No
601	Tanzania	Shire Basin/Lake Nyasa	1RB2	Masigira Rainfall Station	Operational	No
701	Zambia	Upper Zambezi	1-105	Chavuma	Operational	No
702	Zambia	Kabompo	1-950	Watopa	Operational	No
703	Zambia	Kariba	3-045	Nanas Fam	Operational	No
704	Zambia	Kafue	4-669	Hook Bridge	Operational	No
705	Zambia	Kafue	4-760	Namwala Pontoon	Operational	No
706	Zambia	Luangwa	5-800	Ndevu Camp	Rehabilitation needed	No
707	Zambia	Luangwa	5-940	Great East Road Bridge	Operational	No
801	Zimbabwe	Tete	C68	Aurelia Flumes	Operational	No
802	Zimbabwe	Tete	D75	Mazowe Bridge	Operational	No

Table 6 List of SADC-HYCOS river gauging stations in the Zambezi Basin, for which near real-time discharge data (m³/s) shall be shared between the Member States. Note that this is the total list of station intended to be shared. However, some of the stations were not operational at the time of the latest review (reflected in the list) as they need either rehabilitation (if it is existing stations) or need to be constructed, and data could therefore not be shared at the time a review. As soon as they become operational, the respective Member States should start sharing the data and the status should be updated during the next review.

No	Country	Sub-basin	River	Station ID	Station Name	Status (1. Operational / Rehabilitation needed / To be constructed)	To be publicly shared (Yes/No)
301	Malawi	Shire Basin/Lake Malawi	Shire	1B1	Shire at Liwonde	Rehabilitation needed ¹	No
302	Malawi	Shire Basin/Lake Malawi	Shire	1G3	Shire at Tengani	Rehabilitation needed ¹	No
303	Malawi	Shire Basin/Lake Malawi	Ruo	14D3	Ruo at Sandama	Rehabilitation needed ¹	No
304	Malawi	Shire Basin/Lake Malawi	Songwe	9B7	Songwe at Mwandenga	Rehabilitation needed ¹	No
401	Mozambique	Tete	Zambezi	320	Tete	Operational	No
402	Mozambique	Zambezi Delta	Zambezi	291	Caia (Ex Marromau)	Operational	No
403	Mozambique	Tete	Zambezi	310	Zumbo	Operational	No
501	Namibia	Cuando/Chobe	Kwando	68022	Kongola	Operational	No
502	Namibia	Barotse	Zambezi	68017	Katima Mulilo	Operational	No
503	Namibia	Cuando/Chobe	Chobe	68021	Ngoma Gate	Operational	No
601	Tanzania	Shire Basin/Lake Nyasa	Ruhuhu	1RB2	Ruhuhu at Masigira	Operational	No
701	Zambia	Upper Zambezi	Zambezi	1-105	Chavuma	Operational	No
702	Zambia	Kabompo	Kabompo	1-950	Watopa	Operational	No
703	Zambia	Kariba	Zambezi	3-045	Nanas Fam	Operational	No
704	Zambia	Kafue	Kafue	4-669	Hook Bridge	Operational	No
705	Zambia	Kafue	Kafue	4-760	Namwala Pontoon	Operational	No
706	Zambia	Luangwa	Luangwa	5-800	Ndevu Camp	Rehabilitation needed	No
707	Zambia	Luangwa	Luangwa	5-940	Great East Road Bridge	Operational	No
801	Zimbabwe	Kariba	Gwayi	A38	Dahlia Control Section	Operational	No
802	Zimbabwe	Kariba	Sanyati	C59	Copper Queen C/S	Operational	No
803	Zimbabwe	Tete	Manyame	C61	Chinhoyi Old Road Bridge	Operational	No
804	Zimbabwe	Tete	Musengezi	C68	Aurelia Flumes	Operational	No
805	Zimbabwe	Tete	Mazowe	D75	Mazowe Bridge	Operational	No

Note: 1) Construction not fully completed

Table 7 List of Lake stations in the Zambezi Basin, for which near real-time water level data (m) shall be shared between the Member States. Note that is the total list of station intended to be shared. However, some of the stations were not operational at the time of the latest review (reflected in the list) as they need either rehabilitation (if it is existing stations) or need to be constructed, and data could therefore not be shared at the time a review. As soon as they become operational, the respective Member States should start sharing the data and the status should be updated during the next review.

No	Country	Lake	Station ID	Station Name	Status (1. Operational / To Be Rehabilitated / To be constructed)	To be publicly shared (Yes/No)
301	Malawi	Lake Malawi	16G1	Lake Malawi at Nkhata-Bay	Need rehabilitation ¹	No

1) Rehabilitation not fully completed

Section 4: Sharing of Spatial data

Spatial data consist of traditional GIS data as well as remote sensing (RS) data. Obtaining, processing and uploading of most of the GIS and RS data will be the responsibility of ZAMSEC, while the provision of national GIS data mainly will be the responsibility of the Member States, through the National Focal Institutions. Spatial data will be shared publicly, unless there is a good reason for keeping them as only internally shared data. The projection of spatial data should be in decimal degrees (WGS84).

The roles and responsibilities of ZAMSEC and the National Focal Institutions, respectively, are briefly described below.

4.1 Sharing of spatial data through ZAMSEC

ZAMSEC will be responsible for uploading of all spatial data to ZAMWIS, including data provided by the Member States, as well as data which ZAMSEC has required from third parties, both GIS and RS data. This is done to ensure data consistency and uniformity.

ZAMSEC will be responsible for obtaining GIS and in particular remote sensing data from third parties, e.g. ESA, NASA, process the data and upload them to ZAMWIS. Routines have been established so this process to a large degree is automated to save resources, but it is the responsibility of ZAMSEC to maintain these procedures.

ZAMSEC shall ensure that relevant and available GIS and RS data generated during transboundary projects are compiled and uploaded to ZAMWIS.

ZAMSEC will during the annual review of Part II of this document request for the updated station layers from the Member States to ensure that ZAMWIS contain up-to-date station layers for all type of time series data listed in Table 1. ZAMSEC shall thereafter ensure that the basin-wide station layers in ZAMWIS are updated accordingly.

4.2 Spatial data to be provided by the Member States

The National Focal Institution, shall, following the annual review and update of Part II of this document, ensure that the station layers for all type of time series data listed in Table 1 are updated and provide the updated layers to ZAMSEC.

The Member States shall, through the National Focal Institution, assist in generating relevant national GIS data (e.g. location of planned hydropower plants, location of existing or planned major irrigation schemes) as and when needed.

Section 5: Sharing and exchange of knowledge products

Sharing of knowledge products is also an important part of the data sharing between the Member States. The sharing of knowledge products is divided into:

- 1) Sharing of national documents, which is the responsibility of the National Focal Institution
- 2) Sharing of transboundary, regional and international documents, which is the responsibility of ZAMSEC

The format of the knowledge products should be as PDF-file.

5.1 Sharing and updating ZAMWIS with national documents

It is the responsibility of the National Focal Institution (NFI) to acquire new national documents relevant for the management of the Zambezi watercourse. This will mainly, but not exclusively, include

knowledge products related to the water, and other relevant sectors, e.g. energy, agriculture, fisheries, environment, tourism and transport/navigation. Without being an exhaustive list, knowledge products in this context as a minimum includes documents such as:

- 1) Various Acts (such as Water Act, Environmental Management Act, etc.);
- 2) National Water Policy and other relevant policies;
- 3) Various strategies and plans such as Master Plans (e.g. water, irrigation, hydropower, etc.), Catchment Management Strategies and Plans; and
- 4) Documents related to major water development projects, such as major irrigation and hydropower projects.

The NFI will forward new documents to ZAMSEC by mail or other proper method available depending on the size of the documents.

ZAMSEC will review the received document and if found relevant in the transboundary context ZAMSEC will upload the document to ZAMWIS.

The knowledge products to be shared are in most cases already official and publicly available publications. Thus, unless otherwise indicated, the documents forwarded by the National Focal Institutions to ZAMSEC, are considered to be publicly shared data.

5.2 Sharing of transboundary, regional and international documents

It is the responsibility of ZAMSEC to identify and acquire new transboundary, regional and international documents relevant for the management of the Zambezi Watercourse. This will mainly include knowledge products related to the water sector, and other relevant sectors, e.g. energy, agriculture, fisheries, environment, tourism and transport/navigation. ZAMSEC will review the documents and if found relevant in the transboundary context they will be upload and shared through ZAMWIS. The Zambezi Outlook Reports, Zambezi River Basin – Atlas of the Changing Environment, Dam Synchronisation and Flood Releases in the Zambezi Basin Project reports, and the Multi-Sector Investment Opportunities Analysis reports are examples of documents which are highly relevant documents to be shared through ZAMWIS.

Section 6: National Focal Institutions in the Member States

The main roles and responsibilities of the National Focal Institution (NFI) are described in Article 9 of Part I.

Each NFI has appointed a contact person, who is the key person through whom ZAMSEC will communicate with the NFIs. A list of the NFIs, and the details of the contact persons are given in Table 8. It is the responsibility of the contact person to inform ZAMSEC in case of any changes in the table, and the table will also be reviewed as part of the annual review of Part II.

Table 8 List of National Focal Institutions in the Member States, including the responsible contact person and his/her contact details

Country	Name and Address of National Focal Institution	Name and designation of contact person	Phone of contact person	E-mail of contact person
Angola	INRH Talatona neighborhood - MAT Street Administrative Complex Classics Talatona, Block C (5 Building) RC Law Luanda	Narciso Augusto Ambrosio Chefe do Departamento de Planeamento dos Recursos Hídricos e Hidrologia	+244923 647 899	luimm_007@hotmail Narcio.ambrosio@inarh.gv.ao
Botswana	Ministry of Mines, Energy and Water Resources Department of Water Affairs Private Bag 0029, Gaborone	Ontlogetse Dikgomo Principal Hydrologist	+267 3607 100 +26772 106 960	odikgomo@gov.bw
Malawi	Ministry of Irrigation and Water Development Department of Water Resources, Tikwere House, City Centre, Private Bag 390, Capital City, Lilongwe 3, Malawi.	Susan Kumwenda Hydrologist	+265 1 770 344 +265 999 280 911	susankumwenda@yahoo.co.uk
Mozambique	ARA-Zambeze Bairro M'padue EN7-Tete CP-67 Cidade de Tete Tete	Manuel Jose Mahunguana Hydrologist	+258 827 606 601 +258 842 560707	mahunguanamanuel@gmail.com
Namibia	Ministry of Agriculture, Water and Forestry Department of Water Affairs Luther St, Windhoek P/Bag: 13184, Windhoek	Jacobine Amutenya Hydrologist	+264-61-208 7111 +264 814 082 869	jtamutenya@gmail.com
Tanzania	Ministry of Water and Irrigation Water Resources Department, Morogoro Road PO Box 9153 Dar-res-Salaam	Diana J. Kimbute Hydrologist	+255 222 450 244 +255 786 752 925	dkimbute@gmail.com mwakedi@yahoo.com
Zambia	Water Resources Management Authority, PO Box 51059 Lusaka	Rowen Jani Senior Hydrologist	+260 974 606 743 +260 972 346 481	Rowen.jani@gmail.com
Zimbabwe	Block 4 East Celestial Park Borrowdale Road Box CY617 Harare	Nyashadzashe Viriri Data and Research Manager	+263 773 578 689	nviriri@zinwa.co.zw

Table 9 List of ZAMWIS contact details at ZAMCOM Secretariat (ZAMSEC)

Country	Name and designation of contact person	Phone of contact person	E-mail of contact person
1	Hastings Chibuye Programme Manager, Data, Information, Knowledge Management and Decision Support Systems (ZAMWIS)	+263 772 25 97 93	katubwe@zambezicommission.org
2	Chipo Zimbawah ITC Officer	+263 773 58 76 34	chipo@zambezicommission.org
3	ZAMCOM Administrative Assistant (Thembe Dube)	+263 4 253361-3	zamcom@zambezicommission.org

NOTE: email communication to ZAMSEC related to ZAMWIS should be addressed to Hastings Chibuye and Chipo Zimbawah with copy to Administrative Assistant at zamcom@zambezicommission.org.

Section 7: Annual review process

The objective of the annual review of Part II, in accordance with Article 11 (2) of Part I, is to ensure that the document is a dynamic and updated document which at all times reflects the practical needs for shared data for water resources management purposes at both national and basin level. The review process also allows for the inclusion into the data sharing and exchange framework of new important and useful data types and source which have become available. It further provides for the expansion of data provision from other source institutions in the Member States if and when arrangements have been made with them to share their data.

The review and update of Part II of shall be carried out in accordance with Art. 11 (2) of Part I of these Rules and procedures in conjunction with the relevant provisions of the ZAMCOM Governance Guidelines.

The annual review (and possible update) of this Part II is to be carried out and agreed on at the annual ordinary ZAMTEC meeting, held usually in the first quarter of each year. In order for ZAMTEC to be in a position to take a decision at the ordinary meeting, the technical review and preparation process at country and ZAMSEC level needs to be initiated and carried out well in advance. The following provides an overview of key steps in the review process and applicable time lines (cf. Table 10):

Step 1: Technical review at national and ZAMSEC level

Each Member State shall carry out an internal review of the functionality and usefulness of the shared data and information. During this review, possible information gaps shall be identified, as shall potential new sources of data and information. The review shall also assess whether the data types, monitoring frequencies etc. set out in Part II are serving their intended purposes, and make proposal for amendment if found necessary.

At the same time, the technical personnel within ZAMSEC using the ZAMWIS, and being in charge of maintaining/ running it, shall carry out a review of the overall functionality of the system and propose amendments seen to be necessary from their perspective.

Step 2: Submission of review proposals to ZAMSEC

The review findings and resulting proposals for amendment of the system shall be submitted to ZAMSEC for consolidation.

Step 3: Consolidation of proposals and development of draft updated Part II; circulation to Member States

The submitted proposals shall be consolidated by ZAMSEC into a draft for an updated Part II. In consolidating the submitted proposals ZAMSEC shall take all submissions appropriately into account, while at the same time ensuring technical feasibility of the proposed amendments.

The consolidated draft of updated Part II shall be circulated to the Member States for review.

Step 4: Review of draft updated Part II and agreement on proposal to ZAMTEC

The Member States, together with ZAMSEC shall review the proposed draft with a view at agreeing on a joint draft for submission for approval to ZAMTEC. This review could be carried out electronically, but it is proposed that where possible, it is undertaken at a ZAMSCOH meeting, thereby ensuring that all Member States collectively discuss the technical implications and feasibility of the proposed amendments. The ZAMSCOH shall agree on a final draft version to be submitted to ZAMTEC.

Step 5: Circulation of proposal to ZAMTEC members

The consolidated and jointly agreed proposal shall be circulated to ZAMTEC in a timely manner, ensuring compliance with the ZAMCOM governance guidelines (sections on ZAMTEC meeting preparation).

Step 6: Review and adoption by ZAMTEC

At their ordinary meeting, ZAMTEC shall review and adopt the updated Part II, either as per submitted proposal or subject to any amendments ZAMTEC sees fit.

Step 7: Communication of agreed changes to ZAMSEC staff and NFIs

Following adoption of the updated Part II by ZAMTEC, the ES shall communicate the agreed changes to the technical staff within ZAMSEC and the NFIs, so that the necessary adjustments to the system are made in a timely manner and the system is operated as per the amended specifications.

Table 10 Overview of annual review process, and timelines

Step	Task	Responsible	Activity period/ deadline
Step 1	Technical review at national and ZAMSEC level	NFI, Nat. source institutions; ZAMSEC	September/ October
Step 2	Submission of review proposals to ZAMSEC	NFIs; ZAMSEC	Latest 31 October
Step 3	Consolidation of proposals and development of draft updated Part II; circulation to Member States	ZAMSEC	Latest 15 November
Step 4	Review of draft updated Part II and agreement on proposal to ZAMTEC	Countries (through ZAMSCOH)	Latest 15 December
Step 5	Circulation of proposal to ZAMTEC Members	ZAMSEC	January (one month prior to ZAMTEC meeting)
Step 6	Review and adoption by ZAMTEC	ZAMTEC	February
Step 7	Communication of agreed changes to ZAMSEC staff and NFIs	ZAMSEC	Immediately after the ZAMTEC meeting

Annex 1: Maps showing river gauging stations from which data should be shared between Member States

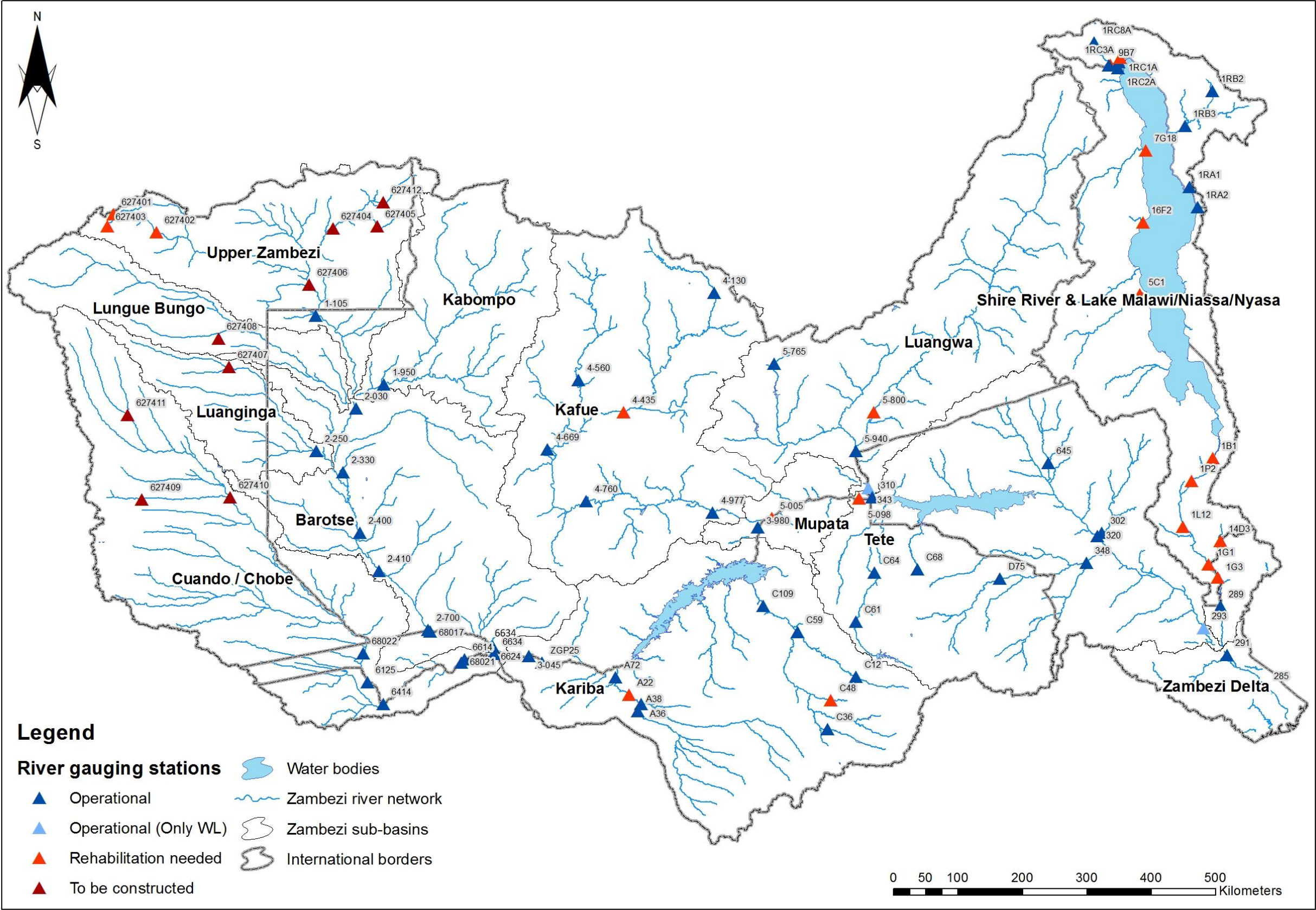


Figure 2 Map showing river gauging stations in the Zambezi Basin, for which mean daily discharge (m^3/s) should be shared between the eight Member States on a quarterly basis (corresponding to Table 3). Note: Ume from Zimbabwe is not included as the coordinates were not available.

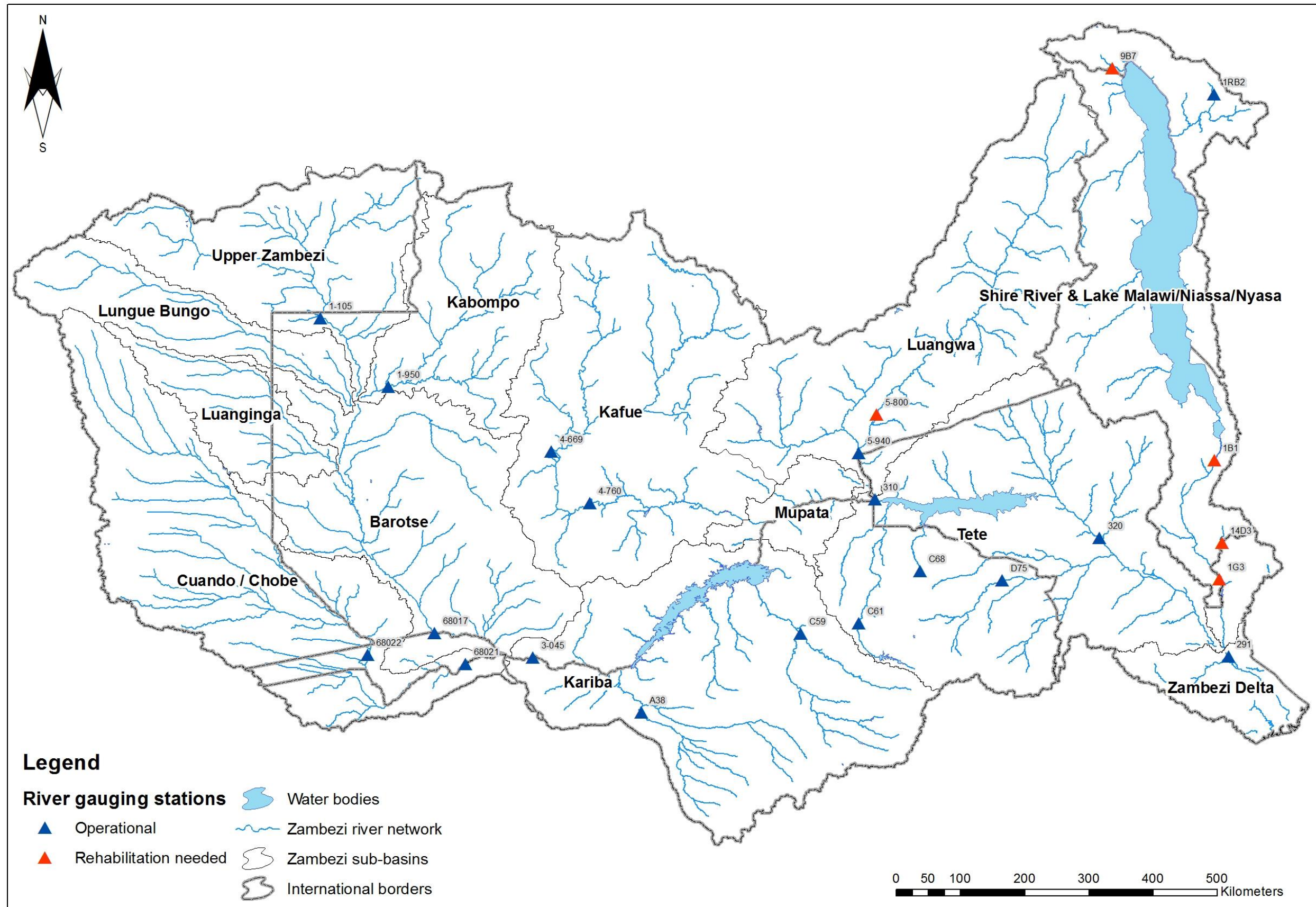


Figure 3 Map showing SADC-HYCOS river gauging stations in the Zambezi Basin, for which near real-time discharge data (m^3/s) shall be shared between the eight Member States (corresponding to Table 6).

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