
TRANSFER OF GEO-DATA AND KNOWLEDGE IN SUPPORT OF A GEO-IMS AT RMB"
A joint RMB/SDMR - RMCA project in the frame of
the Sustainable Development of Mining in Rwanda (SDMR) programme (2017-2020)

Executive Summary

1. Objectives and results of the collaboration between RMCA and RMB

The **objectives** of the RMCA collaboration to the SDMR project are 1) to recover historic geological and mining data for inclusion in a digital national archive for the Rwandan mining sector and 2) to strengthen and increase geological and mining (academic) research in the country (at RMB).

As explained in the ToR signed between RMB/SDMR and RMCA, determining the activities and role of all actors involved in the SDMR programme, the **expected results (R) / deliverables** of RMCA's involvement are (in chronological order):

- R1. Geo-IMS ToR approved
- R2. Geo-IMS fully operational at RMB
- R3. Selected data from 2008 archive (pre-)processed and ready for transfer to Geo-IMS
- R4. Supplemental data from RMCA archive data (pre-)processed and ready for transfer to Geo-IMS
- R5. All data successfully uploaded into fully operational Geo-IMS
- R6. National-level standardized terminology and national geologic map streamlined
- R7. Report on the geological mapping target area (GMTA)¹ produced incl. a new regional geologic map
- R8. Junior RMB Geologists trained in national geologic topics and techniques

2. Planned activities

The activities and scheduling of the SDMR programme covers 9 quarters (27 months) and started in 2017. The Geo-Information management system (Geo-IMS) line of activities within the SDMR programme can be broken down into a series of 9 Work Packages – (WP0 to 8).

RMCA programmed in line with the overall calendar of SDMR, a sequence of activities covering a total of 6 quarters (18 months), starting on March 15, 2018². These activities fall within 4WP's of the SDMR programme:

- WP0 Coordination and Management
- WP1. Drafting ToR for Geo-IMS
- WP3. Data export
- WP5. Support in geological interpretation of geo-data

Specifically for WP3 and WP5 input and collaboration of RMB senior geological staff is required.

¹ in the ToR signed between RMB and RMCA, there is mention to "Potential Target Area (PTA)". To prevent confusion in the final purpose of this deliverable, it was decided during the Kick-off technical meeting between RMB, SDMR and RMCE to use the term "geological mapping target area – GMTA"

² see overall schematic chronogramme at end of exec summary

3. WP3 - Data export

RMCA hosts an important historical collection of field data, mining archives, geological maps, rock and mineral samples from Rwanda. The field data contain a unique set of original observations, boreholes, and exploration and exploitation data. RMB requests access to this information so it can be valorised and incorporated in the to-be established Geo-IMS of Rwanda. All selected data will be made electronically available only.

Activities:

The 2008 digital datasets will be recovered from long term storage and (re)processed by the RMCA (technical) staff.

Additional Data items pertinent to Rwanda geology and mineral resources will be identified by RMB senior staff in RMCA archives under supervision of RMCA staff, then if necessary (re)processed by RMCA (technical) staff.

All digital data will be geo-processed by RMCA staff if necessary and delivered to RMB / SDMR "ready to transfer" into the new Geo-IMS.

Tasks breakdown:

- Task 6 Identify data items pertinent for Rwanda at RMCA to be transferred into new Geo-IMS.
- Task 7 Prepare data from existing system (2008) for export.
- Task 8 Select supplemental data from RMCA hardcopy archive and prepare for export.
- Task 9 Carry out geo-referencing and data harmonizing, e.g. co-ordinates, projection systems.
- Task 10 Transfer all re-processed data into operational Geo-IMS.

Works Schedule and organisation

Start of activities March 15, 2018; end of activities September 15, 2019

- Task 6 start March 15, 2018, to be completed before June 15, 2018
- Task 7 start at completion Task 6, to be completed before September 15, 2018; **R3 achieved**
- Task 8 builds on Task 6, to be completed before March 15, 2019
- Task 9 builds on Task 7&8, to be completed before June 15, 2019. **R4 achieved**
- Task 10 builds on Task 9, to be completed before September 15, 2019, **R5 achieved**

4. WP5 - Support in geological interpretation of geo-data

RMB planned to start re-mapping the subsurface of the country with the aim to produce geological maps at the scale of 1:50,000. In addition to the usual geological and mineralisation features, these maps will include available new information, such as recently discovered mining sites.

RMCA is willing to collaborate to this major task as it has been in charge of the two previous geological mapping programmes of Rwanda during the -'60s and -'80s of last century, and because RMCA has continuously, since almost a century, carried out fundamental geological research on the subsurface of Rwanda that was published in a wide variety of scientific media. These activities result in the fact that the RMCA is internationally recognized for its expertise on the geology and mineral resources of Rwanda. RMCA can deliver its expertise within the Rwanda national mapping programme.

Activities:

Streamlining national stratigraphy and terminology

Since the end of last century, new concepts and standards on stratigraphy, metallogeny and geological terminology have been introduced by the International Union of Geological Sciences (IUGS) and other international organisations. The most recent geological map covering the entire country dates from 1992, and was compiled using information and data collected mainly during the 1970-1990 period. These datasets do not always comply with the present-day geo-standards and terminology.

Geological Mapping Target Area with senior RMB staff

A joint RMB / RMCA mapping activity **on a selected target area** with the aim to produce an updated geological map at 1/50.000 scale.

In an initial GIS desktop study, available pre-2008 data present in RMCA for the target area will be combined with available data acquired by RMB since that time and provided by RMB to RMCA. This will result in a first tentative updated map. This work will be followed by a field proofing campaign that will corroborate and/or amend the tentative geological interpretations. In a second phase, the cycle – GIS desktop study + field proofing – will be repeated for further fine-tuning and to bring ancillary geo-datasets into the final GIS product (eg. metallogenic classification of known mineral deposits, known and new identified mineral deposits and mine activities, ...). Finally, an updated geological map at 1/50.000 will be produced up to the pre-press stage (pdf format).

Training of junior RMB staff

A series of seminars and short courses for the junior RMB earth scientists to provide them with the necessary scientific insights in the present-day concepts and approaches in global geodynamics, stratigraphy and metallogeny; in the geological build-up and history of Rwanda set within these concepts, and in their relationship with the formation of mineral deposits.

New and/or the required field mapping and sampling techniques will be illustrated, together with GIS-based digital map production.

Task breakdown

- Task 11 Work on geologic formation names, stratigraphy, streamlining sub-divisions on national level with senior RMB geologists
- Task 12 Elaborate regional level desktop study on Geological Mapping Target Area including fieldwork and map production
- Task 13 On the job training of RMB junior geologists

Works Schedule

Start of activities March 15, 2018; end of activities September 15, 2019

- Task 11 start at completion of Task 6, to be completed before July 15, 2018, **R6 achieved**
- Task 12 start at completion of Task 6, to be completed before September 15, 2019, **R7 achieved**
- Task 13 start September 15, 2018, to be completed before March 15, 2019, **R8 achieved**

WP3 workload and personnel mobilisation

WP3	Data exportation	F. Kervyn WP coordinator	profile	effective total weeks staff	# missions	weeks in Terv	weeks in Rwanda
T6	Select data items at RMCA and RMB to be transfer into new Geo-IMS <i>start March 15, 2018, to be completed before June 15, 2018</i>	<i>RMB staff 1</i>	<i>senior geologist</i>	3	1	3	
		<i>RMB staff 2</i>	<i>senior geologist</i>	3	1	3	
		M. Fernandez	regional geology	1		1	
T7	Prepare data from existing system (2007) for export <i>start at completion Task 6, to be completed before September 15, 2018; R3 achieved</i>	P. Lahogue	geo-databases	4		4	
T8	extract new data from RMCA hardcopy archive and prepare for export <i>builds on Task 6, to be completed before March 15, 2019</i>	D. Baudet	regional geology	10		10	
		S. Dewaele	mineral resources	2		2	
T9	Carry out Geo-referencing and data harmonising, e.g. co-ordinates, projection systems <i>builds on Task 7&8, to be completed before June 15, 2019. R4 achieved</i>	M. Laghmouch	geo-GIS	11		11	
T10	Transfer all re-processed data into operational Geo-IMS <i>builds on Task 9, to be completed before September 15, 2019, R5 achieved</i>	P. Lahogue	geo-databases	5	1	4	1

WP5 workload and personnel mobilisation

WP5	Support in geological interpretation of geo-data	M. Fernandez WP coordinator	Profile	effective total weeks per staff	# missions	weeks in Terv	weeks in Rwanda
T11	Work on geologic formation names, stratigraphy, streamlining sub-divisions on national level with senior RMB geologists <i>start at completion of Task 6, to be completed before July 15, 2018, R6 achieved</i>	<i>RMB staff 1</i>	<i>senior geologist</i>	3	1	3	
		<i>RMB staff 2</i>	<i>senior geologist</i>	3	1	3	
		D. Baudet	stratigraphy; (meta)sedimentary geology	3		3	
		M. Fernandez	precambrian geodynamics	3		3	
		G. Nimpagaritse	regional geology	3		3	
T12	Elaborate regional Geological Mapping Target Area desktop study, inclusive fieldwork <i>start at completion of Task 6, to be completed before September 15, 2019, R7 achieved</i>	<i>RMB staff 1</i>	<i>senior geologist</i>	12			12
		<i>RMB staff 2</i>	<i>senior geologist</i>	12			12
		D. Baudet	stratigraphy; (meta)sedimentary geology	6	2		6
		M. Fernandez	precambrian geodynamics	6	2		6
		S. Dewaele	mineral resources, metallogeny	4	1		4
		G. Nimpagaritse	regional geology	6	2		6
T13	On the job training of RMB junior geologists <i>start September 15, 2018, to be completed before March 15, 2019, R8 achieved</i>	G. Nimpagaritse	basic fieldwork initiation	3	1		3
		<i>RMB staff</i>	<i>junior geoscientist</i>	3			3

Schematic overall chronogramme

Work package	Tasks	Outputs	RMB man power	Year 1				Year 2				Year 3		
				Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1		
1	Drafting ToR	5 Collaborating on defining technical requirements of Geo-IMS	Technical requirements for the national Geo-IMS are defined											
		Defining requirements for the Geo-IMS												
2	Procurement	Writing ToR	ToR approved											
		Procurement the Geo-IMS, incl. internet access for external user / promoting the mining sector	Geo-IMS fully operational at RMB											
3	Data exportation	6 Selecting data items at RMCA and RMB to be transfer into new Geo-IMS		RMB are going to mandate 2 technical experts, profile tbd.										
		7 Preparing data from existing system (2008) for export	All selected data processed and ready for transfer											
		8 Adding new selected data from RMCA hardcopy archive												
		Adding new selected data from RMB hardcopy archive		RMB are going to mandate 2 IT specialists + 2 GIS-Experts (senior / junior level), profile tbd.										
		9 Geo-referencing and harmonising data framework, e.g. co-ordinates												
10 Transferring all re-processed data into operational Geo-IMS	Data successfully uploaded into Geo-IMS													
4	New digital data acquisition	Scanning of RMB documents incl. geo-referencing and geo-coding	Relevant data processed											
		Transferring all re-processed data into operational Geo-IMS	Data successfully uploaded into Geo-IMS	Number and profiles tbd.										
5	Support in geological interpretation of geo-data (incl. capacity building)	11 Working on geologic formation names, stratigraphy, streamlining sub-devisions on national level	National-level standardized terminology and national geologic map	RMB are going to mandate 2+2 geologists / mining engineer (senior / junior level), profile tbd.										
		12 Elaborating regional level (PTA) study	Report on PTA produced incl. regional geologic map											
		13 On the job training of RMB junior geologists	2 junior geologists trained in national geologic topics											
6	Improving user friendliness	Enriching the Geo-IMS with keywords, hyperlinks, etc.	Improved user interface	RMB are going to mandate 2 IT specialists + 2 GIS-Experts (senior / junior level), profile tbd.										
7	Capacity Building	Carrying out GIS training to RMB staff	RMB staff trained in day-to-day usage	Number and profiles tbd.										
		Carrying out Geo-IMS training to RMB staff												
		Carrying out Geo-IMS training for system maintenance and administration	Geo-IMS system managers trained	RMB are going to mandate 2 IT specialists + 2 GIS-Experts (senior / junior level), profile tbd.										
8	System post production	Pre-defined catalogue of data layers for public use and provision of additional information to be shared online.	Public documentation produced	Number and profiles tbd.										
		System description and documentation for in-house use	System documentation produced											