

AFP Business Plan: Deliverable 2: Date: 15th July 2017
The concept to integrate the AFP into the Regional Certification Mechanism

Terms of reference indicated the following deliverables for the second output.

- 4.4 Produce SWOT (Strengths, Weakness, Opportunities, and Threats) analysis on AFP implementation based on input and findings under 4.1 and 4.2 (Which was deliverable one)
- 4.5 Present report on SWOT analysis including detailed proposals on structure of AFP Business Plan (with explanations) by **15.07.2017**.

Approach and scope of the second deliverable:

The first deliverable under 4.1 and 4.2 of the terms of reference explored the applicability of AFP into certification mechanism and beyond, further stakeholder consultation document was prepared as part of this deliverable. This deliverable uses the input from first deliverable to produce SWOT (Strength, Weakness, Opportunity and Threats) analysis on AFP implementation. Based on the SWOT analysis proposed structure of business plan is also reported. BGR assisted in providing key figure and relevant numbers that were used in this deliverable.

SWOT Analysis

This section lists and explains the Strengths and weaknesses of AFP. S1, S2 etc. represents respective strength, while W1, W2 etc. represents respective weakness.

Strengths:

S1: Sound theoretical foundation:

Mineral liberation analysis and laser ablation inductively coupled plasma-mass spectrometry are used to obtain the data used for the analytical fingerprint of 3T mineral concentrates. The AFP data base generated from ore concentrates of the ICGLR region combined with relevant statistical techniques of data evaluation have the potential to recognise samples originating from a common mine site.

Both analysis and data evaluation are based on advanced scientific techniques that utilise well established principles of mineralogy, laser ablation mass spectrometry and statistics.

The AFP project has so far produced at least 5 academic articles in the international journals of high repute, while another one is accepted. This is the evidence that AFP concept is technically sound. The acceptance of findings by the BGR team has been accepted by highly reputed journals like Journal of Forensic Sciences, J.Anal. At. Spectrom etc. and it is evidence of acceptance of applicability of AFP concept to 3 T minerals in the region.

The AFP method has been presented in various scientific publications and hence is based on a very sound and established scientific theoretical base.

S2: Investment

A significant investment has been made by BGR in this project. At the end of 2016, about €5 million were spent on the project for AFP of which about €3 million have been spent in the ICGLR region. This investment is made in setting up AFP preparation labs in Kigali (Rwanda), Bukavu (DRC) and Bujumbura (Burundi). Further, an AFP analytical lab is set up in Dar-e Salaam. This AFP analytical lab is equipped with a scanning electron microscope (SEM) and a Laser ablation- inductively coupled mass spectrometer (LA-ICP-MS) for analysis of the samples. In addition, an AFP management unit (AMU) is set up in Bujumbura. The highlight of this unit is that it contains a data base which captures all the analytical results of mineral samples that have been collected and tested so far. This data base is continuously updated with new sample analysis results. This unit is the ultimate unit to finalise all reports on AFP testing results, while it also coordinates with other stakeholders in the region.

For the current project phase which is supposed to ends in 2019, €4.6 million have been approved of which about 2-3 million euros will be spent in the region. This is mainly to assist the ICGLR member states to operationalise the AFP concept and take control of the process when BGR would leave the scene.

The amount of investment shows the confidence of scientist and researchers on the applicability of AFP for 3 T minerals in the region.

S3: Highly Skilled team of scientists and trained staff:

A team of about 16 highly skilled and trained staff on AFP are working to further the applicability to export samples. More than 50% of this manpower is locally sourced from ICGLR region and trained to carry out the job. More than 1000 (one thousand) hours have been spent on training of personnel in the ICGLR region.

S4: Availability of targeted minerals: Applicability

At this stage, it is difficult to identify the exact volumes of 3 T minerals to which AFP method could be applied. However, from a conceptual point of view, all the 3 T minerals in the ICGLR region can be covered under the scope of AFP technique.

Weaknesses:

W1: Applicability of AFP in identifying the source of origin:

There are documents, scholarly publications and handouts, all produced by BGR, that claim that the AFP method can theoretically identify the source of specified minerals based on the scientific development of the AFP method since 2011. However, the detailed analysis and discussions with BGR team during the preparation of the first deliverable indicated that the capabilities of the current AFP are only applicable to the verification of existing documents indicating the origin of a sample in question. Furthermore, the method is highly restricted to unmixed ore concentrates, i.e. (pre-) concentrates from mutual mine sites. However, usually ore concentrates from multiple mine sites of a concession are blended and/or upgraded on site before they leave the mining company/concession. This aspect then limits the application of AFP. As the developed technique on AFP cannot be applied to mixed ore concentrates, there seems to be no application of the present AFP technique to a practical situation based on the detailed discussion with BGR team. However stakeholder consultations may provide some additional input into this aspect.

W2: Cost and delivery time to client:

Previous concepts of AFP application were mainly focused on (i) application within certification schemes (e.g. RCM, request by IMCA) or (ii) requests of AFP by processors and traders to proactively demonstrate conformity with the respective due diligence guidelines. In either case, a fast and cost-effective realization is needed to allow sustainable application by ICGLR or member states and convince stakeholders of the private sector of AFP application.

Associated are the time and costs currently spent on AFP services. For example, a set of 7 samples taken from a shipment of exports (to which AFP may apply) and which is representing an analysis set can have estimated costs of US \$ 1065. This assumption is including sampling by BGR trained samplers, sample preparation, transport of samples to the analytical lab, analysis of samples and evaluation report generated by AMU unit. Thus an individual, single

sample assessment, measured within an analysis set, will cost around 152 USD. A shipment may require more than one set of such samples.

The time to generate the required report includes time for sampling (say 1 day), sample preparation (say 3 days), transport to lab (say 2 days in extreme situations), analysis of samples (2 days in Dar e Salaam), data evaluation and final report preparation electronically (say 1 day). This totals at least 9 days.

Based on the estimates of cost (in the range of US \$ 2000 or more per shipment) and time to get the report (say up to 2 weeks), any business client is likely to reject the proposal on purely business grounds. It does not make any business case.

W3: Understanding by different stakeholders/BGR:

There are various stakeholders in the process. These include BGR internal staff members, Governments of the member states, large exporters, small exporters, miners of all sizes.

The interaction of consultant suggest that the understanding on the applicability of AFP method differs amongst BGR staff members. Some have strong theoretical background, while some have good understanding of the ground realities. However common understanding on the applicability of AFP on ground, differs. This is an inherent weakness that has potential to hamper AFP implementation at this stage and going forward.

As far as business/mining community is concerned, stake holder consultation would provide the answers but it is anticipated that they would not have any detailed knowledge of the AFP method. One of the reasons for this gap is that, BGR never communicated to the mine site owners after collecting AFP samples. The owners would keep on guessing the purpose of such sampling by BGR.

The ICGLR and two member states namely Rwanda and DRC officials are expected to be at a better understanding platform compared to industry on AFP.

W4: Support by ICGLR Member states and their willingness to support the AFP efforts

The ICGLR and two Member States (namely Rwanda and DRC) have been part of the AFP process from the beginning. However the recent interaction with Rwandan Government suggests practically no support for AFP at this stage. Rwandan Ministry has undergone structural changes during 2016-2017. As a result the new people have occupied the senior positions. It seems they are taking time to settle and still understand the AFP and other processes.

The status in DRC is unique which is marked with no clarity of structures and confusing processes. This makes implementation of AFP very challenging in DRC.

The ICGLR secretariat has always been slow in responding to such initiatives like AFP, marked with strong bureaucracy and recent political situation in Burundi makes the situation worse from implementation point of AFP.

Opportunities and Threats:

Opportunities arises from the Strengths while Threats arises from the weakness of the system. Opportunities and threats and their corresponding strengths and weaknesses are discussed below.

O1/T1: Sound theoretical foundation has potential to attract interest from various stake holders for its applicability in order to determine the source of origin of concentrate and get benefit to the businesses. This opportunity arises from the S1, S3 and S4. However the weaknesses identified under W1, W2, W3 and W4 are likely to erode away any such opportunities and this is the greatest threat (identified as T1) of not getting any returns out of the investments made by BGP on AFP project so far.

O2/T2: The investment made by BGR concerning three laboratories and one analytical laboratory in the ICGLR region has the potential to sustainably provide jobs and train local employees. It can further help to boost the economy of local districts. This opportunity arises from the strengths S2 and S3. However the weakness identified namely W4, along with W1, W2 and W3 are likely to wash out this advantage. This is identified as the second biggest threat (T2).

O3/T3: There is an adequate availability of 3T minerals in the ICGLR region for experimentation purposes. This coupled with good number of high quality academic publications made so far has the potential to attract more interest by other researchers to collaborate and provide new directions. This can assist developing areas of AFP application that do not seem feasible at this stage, i.e. mixed origin of samples. The only threat in this opportunity arises from the current status of AFP application (W1). The publications made by BGR so far does not mention the limitation on the applicability of present AFP system and if this is made known to the researchers, it could derail any further interest.

Proposed structure of AFP business plan:

Based on the SWOT analysis, at this stage there seems to be no business case that can be taken as such to the clients. However the proposed stakeholder consultation in Rwanda and DRC might provide some feedback that may result in some business case for the AFP implementation. As a result, the business report will present possible suggestions to close the weaknesses based on this SWOT report.

At best and at this stage and based on the current findings, the only possible business plan is to move from present sample and data collection for AFP data base to **trial runs**. These trial runs will test various types of exports concentrates against the established AFP data base to examine the applicability of AFP system for real export shipments.

Accordingly 3 sites are suggested in Rwanda and similar sites can be taken up in DRC. The cost implication etc. for such trail project is outside the scope of TOR of this study. The existing structure of BGR is sufficient to deal with these trial runs for the next 3 years.

More details as above can be expected in the business plan which is the next deliverable.

Signed on 15th July 2017



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