www.foramproject.net N° 4 - June 2018

FORAM
TOWARDS A WORLD FORUM ON RAW MATERIALS

NEWSLETTER

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 730127

Meet FORAM Stakeholders

Interview with Mr. Mathis Wackernagel, Ph.D.
Founder and CEO Global Footprint Network, USA

During the first stakeholders videoconference, you mentioned that "it would be very valuable to provide a stronger narrative on the circular economy's butterfly diagram to help place the various resource stories into a more consistent context. We need to explain how the biological and non-biological world relate to each other, how renewables and non-renewables interlink." Could you elaborate?

Mr. Wackernagel: I would frame the story as follows: Start from the recognition that the most limiting factor for the human economy, and life in general, is the planet's regenerative capacity. Metals are not as limiting, since we can dig deeper holes to find more (which takes energy, and might compromise ecosystems). Fossil fuel underground is not most limiting – rather, it is how much of it we can burn, because of the limits of the planet's regenerative capacity to absorb the CO_2 waste. The butterfly diagram shows a technical circle (right wing) and a biological circle (left wing). The right wing (tech) must be kept totally closed for toxic materials, and reasonably closed for others so we recover their embodied energy. The left wing (bio) powers the right circle. Also it feeds many other processes, including the food system etc. There the main point is that the thickness of the left circle (the flow of biomaterials) should not get bigger than what the planet can renew (we are now at least in 70% overshoot, according to our conservative estimates).

When it comes to resource efficiency and circularity, what can business do within current market conditions? What is the role of novel, circular PSS (product service system) businesses?

Mr. Wackernagel: We work with Schneider Electric. They realized that their business model is aligned with moving humanity out of ecological overshoot. That's what their strategy is now fully focusing on. This is also interesting for investors to know because companies that offer services that are needed more and more will be having more opportunities and will do better, on average. Some companies span across various domains where some domains align with moving out of overshoot, others don't. For example, Siemens has a wind turbine division (aligns) and a coal power plant division (does NOT align). Regarding PSS: circularity is not a goal, but a strategy. So you need to measure – how do these strategies reduce humanity's demand on the planet. If they don't, they are not serving their purpose.

Is there a need for a new organization such as a World Forum on Raw Materials? Why? Could this type of organization help in solving above mentioned issues and how?

Mr. Wackernagel: I cannot judge that. But what we really need are new business and economics professors. We need to start recognize that investments in infrastructure and assets that increase our resource dependence are likely to become stranded and hence useless. That's bad for the investor, and therefore also bad for society. But what is worse is that the value of these assets might be lost when we need this 'cushion' most – when the economy is frail. Double loss, double whammy.

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Interview with Mr. Nelson Cristo, Director, International Relations, ASSIMAGRA - RECURSOS MINERAIS DE PORTUGAL (PORTUGAL MINERAL RESOURCES), Évora, Portugal.

Before answering the questions, I begin by saying that I am currently working at ASSIMAGRA - Mineral Resources of Portugal and by that, although perfectly aligned with the strategy that the National Association has defined for the sector, in some particularities of each of the dimensions that will be dealt with during the questions that have been addressed to me, I cannot distance myself from what is my particular opinion as a professional working in the sector for almost 20 years.

To answer these questions, I will always be as comprehensive as possible, in sectoral terms, trying to embrace the different subsectoral perspectives and making also it inclusive from the perspective of those who develop solutions (also must be read "resources", in here - from all kind) and technology for the sector, since the answers to the challenges that we face nowadays should be addressed from an overall perspective.

Is there a need for a new organization such as a World Forum on Raw Materials? Why?

The answer to this question is seemingly simple and apparently quite obvious since raw materials are now on the centre of attention worldwide. However, the dynamics around these subjects did not always had a constant, attentive and informed focus not only from those who had the political decision-making power on these matters but also from the part of the interface entities that were created with the aim of better to articulate the economic interests of companies as well as to harmonize social and environmental interests. As part of this list interface entities we can refer the national business associations and international federations/associations (worldwide), professional associations and technology or innovation centres as well some sectoral agencies. These ones have always been proactive in finding solutions and in trying to sensitize the governments to the concerns about raw materials access (territory) and supply, but with some frequency, particularly in the more developed countries/regions of the globe, there was a clear disinvestment in the search for adequate responses to the concerns manifested by these entities.

For many years what has been observed and in some countries is still in force is the relocation of mining areas to third countries where social and environmental concerns did not gain relative importance when compared with the ones that were applied in Europe, for example, where these dimensions gain a huge value when compared with the raw material supply needs. In the same way, but for different reasons we had and continue to have the USA with the same type of strategic position. In this case the policy is to continue to have its reserves as strategic, while it is «cheaper» buy from third countries. As a quick and simple conclusion: both in Europe and the USA, no one wants a mine in their backyard.

Outside of this context there are some other developed countries or regions that, where it's economy largely depends on raw materials that continued to have a proactive position in this sector and facing constant challenges, such as the South Africa, Australia and Canada cases, for example. As a result, these countries, contrary to what happens in Europe, nowadays hold most of the scientific, methodological and technological know-how for the sector. Of course, there are exceptions in Europe and the USA, but it should be noted that, for example, South Africa, along with a very sector-oriented financial, research and innovation systems and services, also as a direct result of the geological conditions, their continuous investment along decades on raw materials sector make them one of the great specialists on deep mining. We can easily find other examples of these king of sectoral successes that is the result of the continuous investment on raw materials such as the Australian one with their METS Sector (Mining Equipment, Technology and Services), almost exclusive worldwide, at least as far as its excellence is concerned.

More recently, a "new kind" of international entity was created, the INTRAW - International Observatory for Raw Materials. This International Observatory was born from the work developed through an H2020 project, in partnership with third countries. As a permanent international body, the Observatory aim the establishment and maintenance of strong long-term relationships with the world's key players in raw materials technology and scientific developments. Its core activities will be to monitor continuously cooperation possibilities and to promote these through funding schemes and incentives between the EU and other technologically advanced countries.

But let's focus on the first part of the question because the why is very clear. There are many challenges to be faced and there is no international entity with the objective and mission of gathering all the key players, discuss these issues extensively that can clearly involve and influence positively the political decision-making power of the most influent nations worldwide in the face of new sectoral paradigms worldwide. The existence of the World Forum on Raw Materials is really needed, but only if can manage to accomplish with these two main objectives.

What are the main opportunities and challenges in the global raw material sector from your perspective?

In my perspective there are two different dimensions of opportunities and challenges to be faced by the raw materials sector. The first one is clearly pointed on the previous answer and it's the need of the involvement and positive influence of the political decision-making power of the most influent nations worldwide. The other dimension

is related with the new challenges on raw materials access and supply, also worldwide.

The first dimension is already sufficiently explored in the answer to the first question that I have been asked so I will excuse myself from going deeper into the subject. The second dimension relates to key factors for the mining industry, such as access to the territory, the general shortage of qualified human resources, and aspects related to the constant need to focus on the research and innovation issues.

One of the biggest challenges we face today is access to territory. This is a sector that without access to the territory cannot exist. The companies cannot exist where there is now raw material to extract. It is a sector that without adequate access to the territory has no future sustainability and immediately puts in question the entire upstream value chain. It is urgent and fundamental that clear and structuring measures are taken with regard to access to the territory, be they at international, regional and even local level so that they can ensure the demand and sustainability not only of this industry, of its entire chain of value, but also of everything that currently depends directly on the adequate supply of raw materials.

The human resources problem is clearly related with the rapid fluctuation in the demand of specialist's skills that is not aligned with the "human resources industry providers", such as the Universities and the VET system (Vocational and Educational Training). There is a demographic gap in the sector. Today, the demographic gap is deepened by some other facts: career insecurity, essential mobility, remote locations and perceived work activity, the industry profile has led to difficulty in attracting young people to the industry. As written on the INTRAW reports "(...) Canada, Australia, South Africa and the USA host world class education facilities and programmes but suffer from similar demographic challenges, cyclical threats to financial viability and challenges in recruiting students to mining engineering programmes in particular. South Africa has unique challenges around redressing historic educational inequalities that is driving recruitment policies, combined with loss of graduates to surrounding African mining countries, and to mining countries elsewhere in the world."

From the perspective of Research & Innovation the challenges are also varied, and it is possible to point some drivers that are fundamental not only for a competitive industry, sustainable industry, but at the same time can guarantee the needs of the demand for raw materials worldwide. However, some of these drivers are also quite debatable in terms of compatibility and social and environmental sustainability, so the search for new solutions and methods should take into account all these factors and always seek the greatest possible compatibility.

The needs of the mining industry are in line with what is traditionally the drivers of other types of industries, such as the search for more environmentally friendly, more efficient, faster, safer and more reliable methods and technologies, among others. However, due to their specificities they are also conditioned by other factors, such as:

- the fact that they should take into account social aspects such because this is one of the few industries that can create jobs where no other has the capacity to create and which is related to the fact that raw materials exist where the geological conditions allowed it and not where it would be most interesting from the economic point of view

- the fact that we are working with a finite resource, on a human scale

- the fact that also by the geological conditions often the working environments of our industry are unique in terms of difficulty and with adverse conditions.

In which areas do you see a need for more innovative ideas along the value chain?

In my opinion, this question would have a very long and complex answer due to the extension of the intervention areas where this sector, due to its complexity and importance, could innovate. I will focus only on those that I consider to be more fundamental and that can be achieved in the medium term. There are three areas that must be addressed:
- The territory;
- The technology;
- Public Awareness.

The territory, because, as has already been pointed, without access to it we do not have the possibility of having a competitive, healthy and sustainable sector. Compared to what already exists for the Habitats and Agriculture, such as Ecological Reserves and Agricultural Reserves, our national association (ASSIMAGRA) claims that should be created Geological Reserves based on geo-economical potential of the areas so that the level of accessibility both for the exploration or for exploitation become more accessible. This should not only facilitate the relation with the investors but would also upgrade the speed in obtaining and maintaining licenses.

The technology, not only for the items already pointed on the previous answer, but by the others closely related to the fact that we are dealing with a unique, finite raw material and by the fact that is important not only to obtain very high concentration rates or commercial rates (in the case of the Natural Stone) but also with the ones related with the recycling processes in all its aspects (mining waste and urban recycling).

Last but not least, the sectorial Public Awareness. This Public Awareness is pointed almost exclusively because it's fundamental to improve our image the society. The sector is fundamental for all aspects related to our daily lives (our houses, our cars, our phones, our food, what we drink, what we dress and so on), however the society do not know these facts and, more importantly, it sees us as having a deep environmental impact. Change this is fundamental for us to go a step forward as an industry. This facto as a direct impact on the human resources problem of the sector and is also fundamental to the issues related with territory accessibility.

FORAM 18 PILOT EVENT
27 JUNE 2018 - NANCY, FRANCE

Workshop 2: **Policies and Strategies (WHY: SOCIETY)**

Chair: Slavko Solar (Secretary General, EuroGeoSurveys)

Keynote speaker: Peder Jensen (Head of the Secretariat of IRP, UN Environment)

Every country, region and smaller administrative unit needs strategies and policies to balance supply and demand of raw materials in a sustainable manner, also acceptable to society. These strategies and policies define the sourcing of raw materials (primary and secondary raw materials), full cost accounting of their production and processing, as well as other elements of parts of value chain (product design, manufacturing, use of product, collection, reuse, recycling, etc.). Strategies and policies must be in line with the broader societal goals laid down in other strategies and policies such as industrial policy, environmental protection, social well-being, etc. For setting strategies and policies, process and outcome are of equal importance. Process is a social interaction, stakeholder consultation with transparent sharing of related data and knowledge, with known and respected roles and timeline. Outcomes are strategies or polices that should be implementable in a way to increase social well-being. Good strategies and policies would be also easy to monitor, review and adapt if needed. Each stage of policy cycle should have coherent linkages within its cycle and with other relevant or crosscutting strategies and policies.

Workshop objective is to place policies and strategies in overall context of the FORAM project by creating few important recommendations to main stakeholders, with the special focus on: (a) strategies / policies horizontal and vertical integration, (b) balance between process (including social license to mine) and outcomes (implementable minerals strategies and policies), and (c) examples of good practice.

Main issues/questions to cover:

This workshop focuses on how to formulate, adapt and implement strategies and policies, that would have as broader consensus as possible, from global to local level, within and outside society, at the same time being concerned and compliant to other strategies and policies. Besides, workshop should provide recommendations on important elements of minerals strategies and policies, as well as the roles of relevant stakeholders (governments, expert community, industry, academia, NGOs, local community, citizens).

Furthermore, workshop should put the issue of strategies and policies in the context of potential World Forum on Raw Materials, outcome of FORAM project. Is there an existing mineral policy cycle support structure? How to shape less resource conflict future with better strategies and policies in short-, mid- or long-term perspective? Which actions would support that? Is there an example of good practice?

Workshop 3: **Mineral raw materials sourcing: from competition to cooperation**

Chair: Vitor Correia (President, European Federation of Geologists)

Keynote speaker: Julian Hilton (Economic Affairs Officer, United Nations Economic Commission for Europe, UNECE)

No country has all raw materials it needs. This explains why the trade of mineral resources has been with humankind since our ancestors started developing tools. There is evidence of the exchange of obsidian and flint during the Stone Age. Later, gold, silver, precious stones, copper, tin, iron ore and many other elements were traded in all major civilisations, including Mesopotamia, Greece, Egypt, China, India and the Roman Empire. And in modern times coal became the fuel of the industrial revolution, and the trade of coal (and later oil and natural gas) and iron had a massive impact on transport infrastructures (ports, canals and railways), facilitating the movement of goods, people and ideas.

Technology has enlarged the range of raw materials used in industrial applications. Nowadays, the list of raw materials used in industry encompasses a more significant share of the elements in the periodic table, and undoubtedly, international cooperation and free trade of raw materials are paramount to tackle the expectations of a growing world population.

This workshop aims to discuss how to advance international cooperation in the raw materials domain, at times where free-trade seems to be weakening, nationalism is rising, and population growth and climate change are posing new challenges to society.

Main issues/questions to cover:

Which format should the World Forum on Raw Materials take? Should it be led by an international intergovernmental body? Or by a business association, a research institute or an existing independent multi-stakeholder organisation?

And which type of actions should it develop? Diplomacy? Public outreach? Conflict resolution? Voluntary certification schemes? Regulatory/best-practice watchdog?

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PROGRAM

8.00 – 9.00	Registration
9.00 – 10.30	**Plenary Session - Setting the Scene** Opening Bas de Leeuw (Managing Director, World Resources Forum) Jonas Hedberg (Senior Project Adviser, European Commission EASME) Keynote external speaker Gerben-Jan Gerbrandy (Member of European Parliament) Introducing the FORAM Project Mathias Schluep (Programme Director, World Resources Forum) Introducing Workshop Topics Outcomes of Stakeholder Videoconferences: Jelena Vidovic (Scientific Officer, EuroGeoSurveys) Interactive session to receive comments and inputs from the participants
10.30 – 11.00	Coffee Break
11.00 – 13.00	**Workshops WS 1, WS 2, WS 3 (Parallel Sessions)** WS1: Knowledge Management (WHAT: SCIENCE) Chair: Federico Magalini (Project Manager, United Nations University) Keynote speaker: Barbara Reck (Senior Research Scientist, Yale University) WS2: Policies and Strategies (WHY: SOCIETY) Chair: Slavko Solar (Secretary General, EuroGeoSurveys) Keynote speaker: Peder Jensen (Head of the Secretariat of IRP, UN Environment) WS3: International Cooperation - Mineral Raw Materials Sourcing: from Competition to Cooperation (HOW: ROADMAP) Chair: Vitor Correia (President, The European Federation of Geologists) Keynote speaker: Julian Hilton (Chair, UNECE/EGRC Sustainable Development Goals Delivery Working Group)
13:00 – 14.00	Lunch
14.00 – 16.00	**Plenary Session: Outcomes of the Workshops** Keynote speaker Stefan Bringezu (Professor and Director at Center for Environmental Systems Research Sustainable Resource Futures Group, University of Kassel) Panel Discussion with Workshop Chairs & Speakers Open Discussion with the Audience
16.00 – 16.30	Coffee Break
16.30 – 17.30	**Closing Session** Keynote speaker Malwina Nowakowska (Policy Officer, European Commission) (tbc) Closing Words Victoire de Margerie (Vice Chairman of World Materials Forum) Greg Mulholland (CEO, Citrine Informatics) Summary Next Steps
17.30 – 18.30	Aperitif

Workshop 1: **Knowledge Management (WHAT: SCIENCE)**

Chair: Federico Magalini (Project Manager, United Nations University)

Keynote speaker: Barbara Reck (Senior Research Scientist, Yale University)

This workshop focuses on knowledge management, in other words: what knowledge exist, in what format, what are the gaps, and priority topics; those might include data on primary versus secondary raw materials, analysis of flows, prices and stocks for commodities, technological as well socio-economic aspects. Generated knowledge on raw materials is important for research, education and capacity building: a growing number of stakeholders globally (academia, NGOs, industries, IOs) gather data on raw materials. To be able to share this data, efficient infrastructures are needed. The workshop will be the occasion to discuss which platforms can be used or developed to share data.

At the same time, in the field of education and capacity building there are different approaches to centralize and share materials; those include curricula for students and online education programs, such as massive open online courses (MOOCS), but also dedicated material and trainings for practitioners like face-to-face or online trainings.

During the workshop we will discuss and identify major knowledge gaps that hinder progress in improving global raw materials management; we will discuss how to improve the effectiveness of relevant initiatives; and we will finally define a roadmap to engage worldwide network of stakeholders to manage knowledge management in an efficient and effective way.

Tags: WHAT - SCIENCE

Main issues/questions to cover:

- What knowledge exist, in what format, what are the gaps, and priority topics?
- Which infrastructures are needed to centralize and share existing knowledge?
- How can we define a roadmap to increase effectiveness of knowledge sharing?

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