



## Recovery of Tungsten, Niobium and Tantalum occurring as by-products in mining and processing waste streams

### TARANTULA CLUSTERING EVENT

Social License to Operate (SLO) in mining sector and LCA methodologies for (re)processing of low-grade primary and secondary resources 19th April 2023

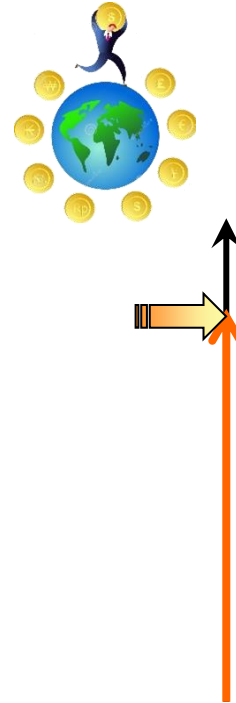
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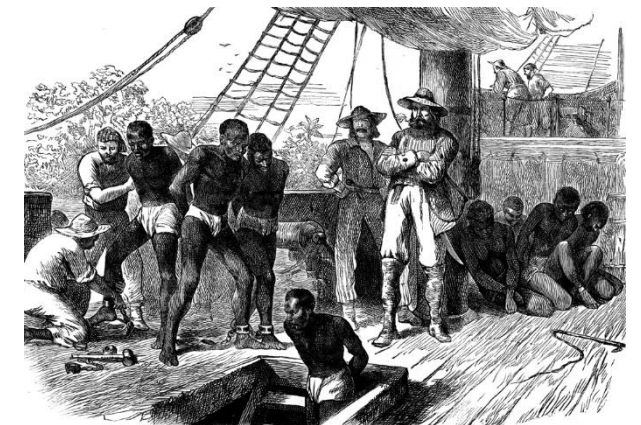
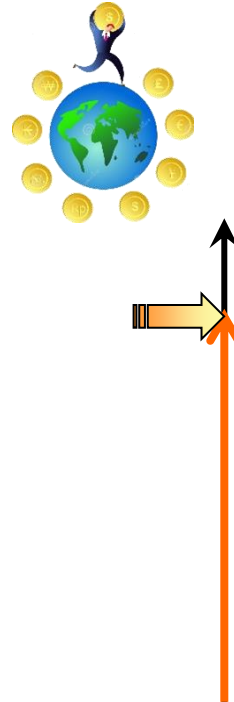
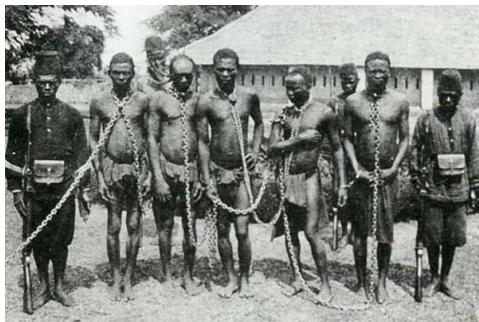
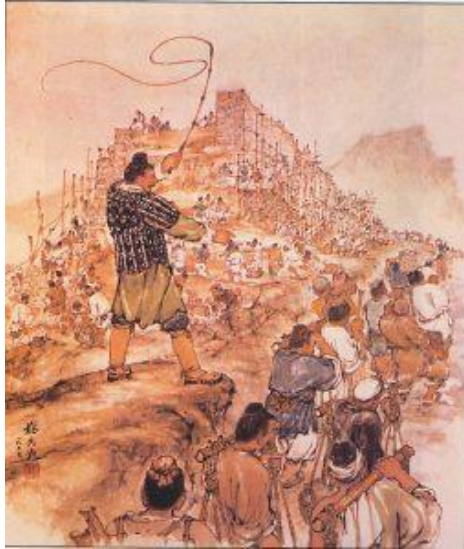
# SLO and the raw materials social paradox



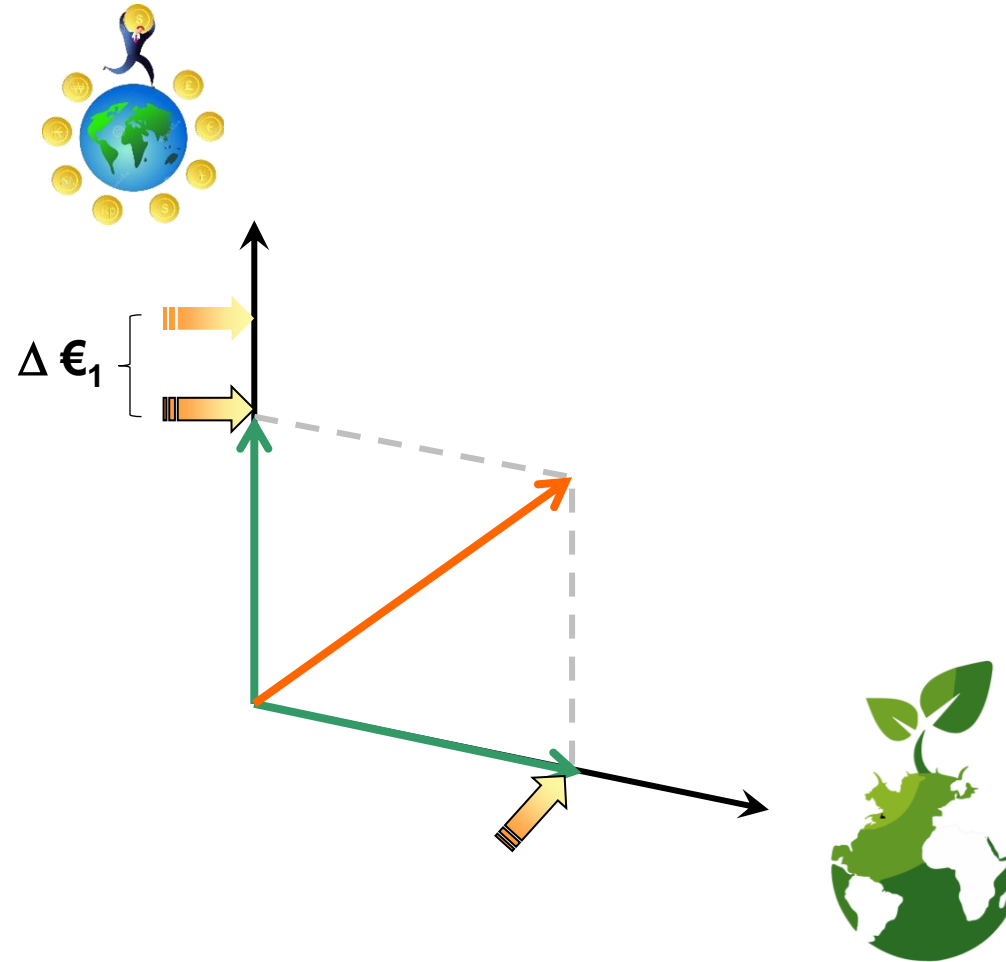
Prof. Juan M. Menéndez Aguado  
<http://www.unioviedo.es/juanm>



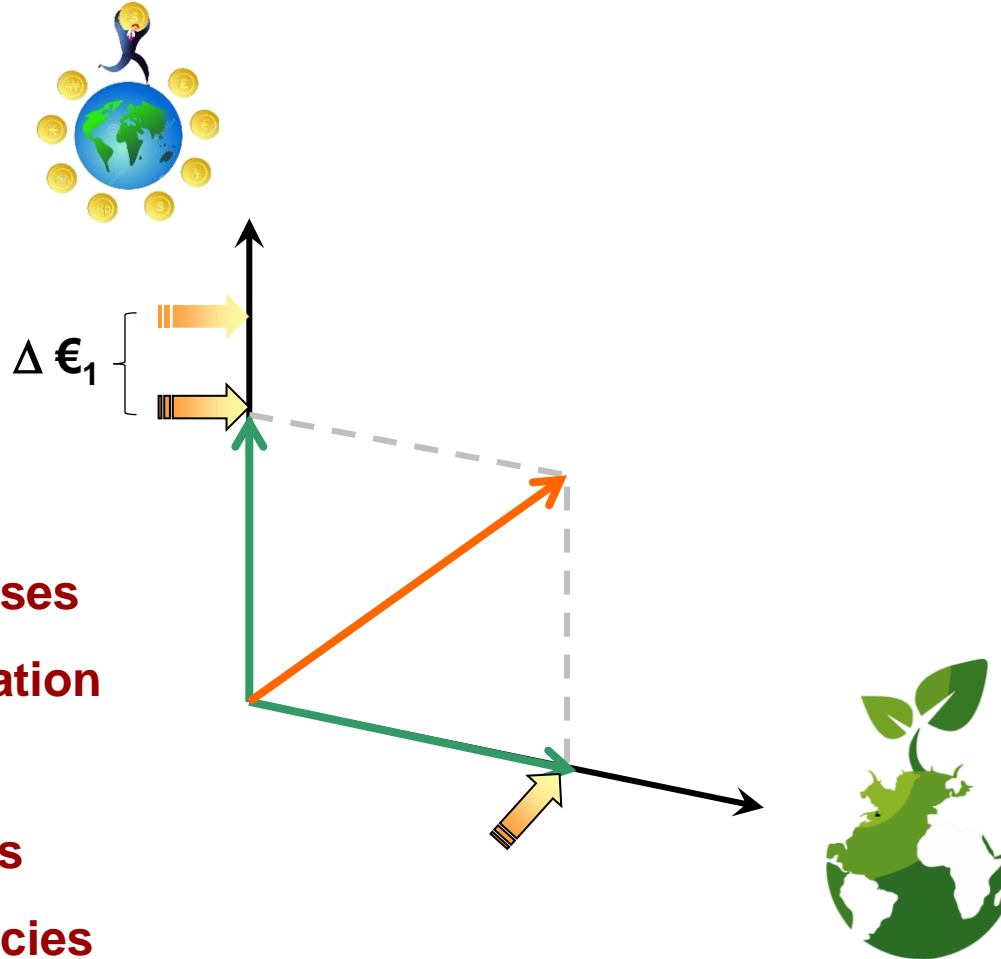
**1D development model**



**1D development model**  
*-lasted for centuries-*



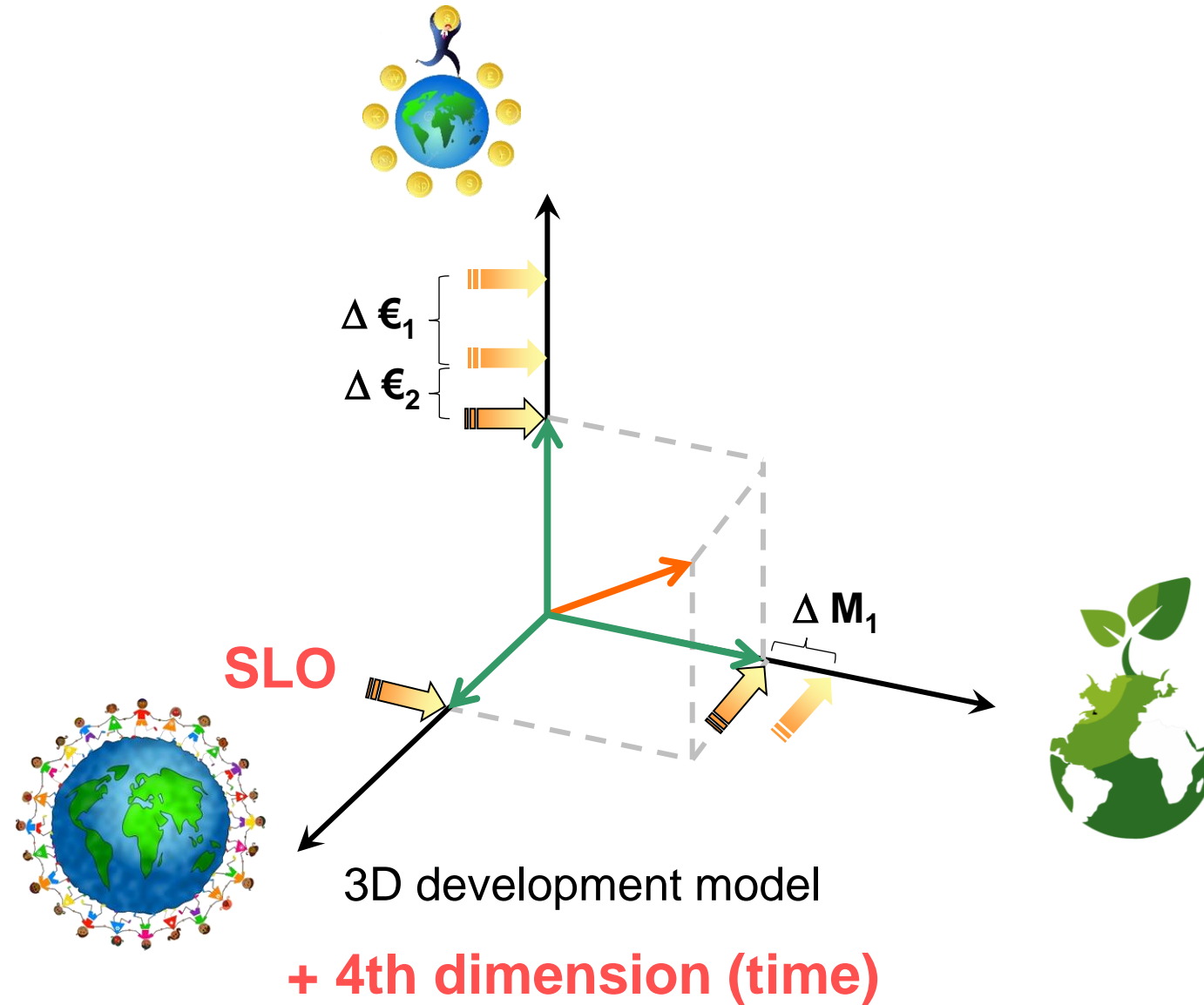
2D development model

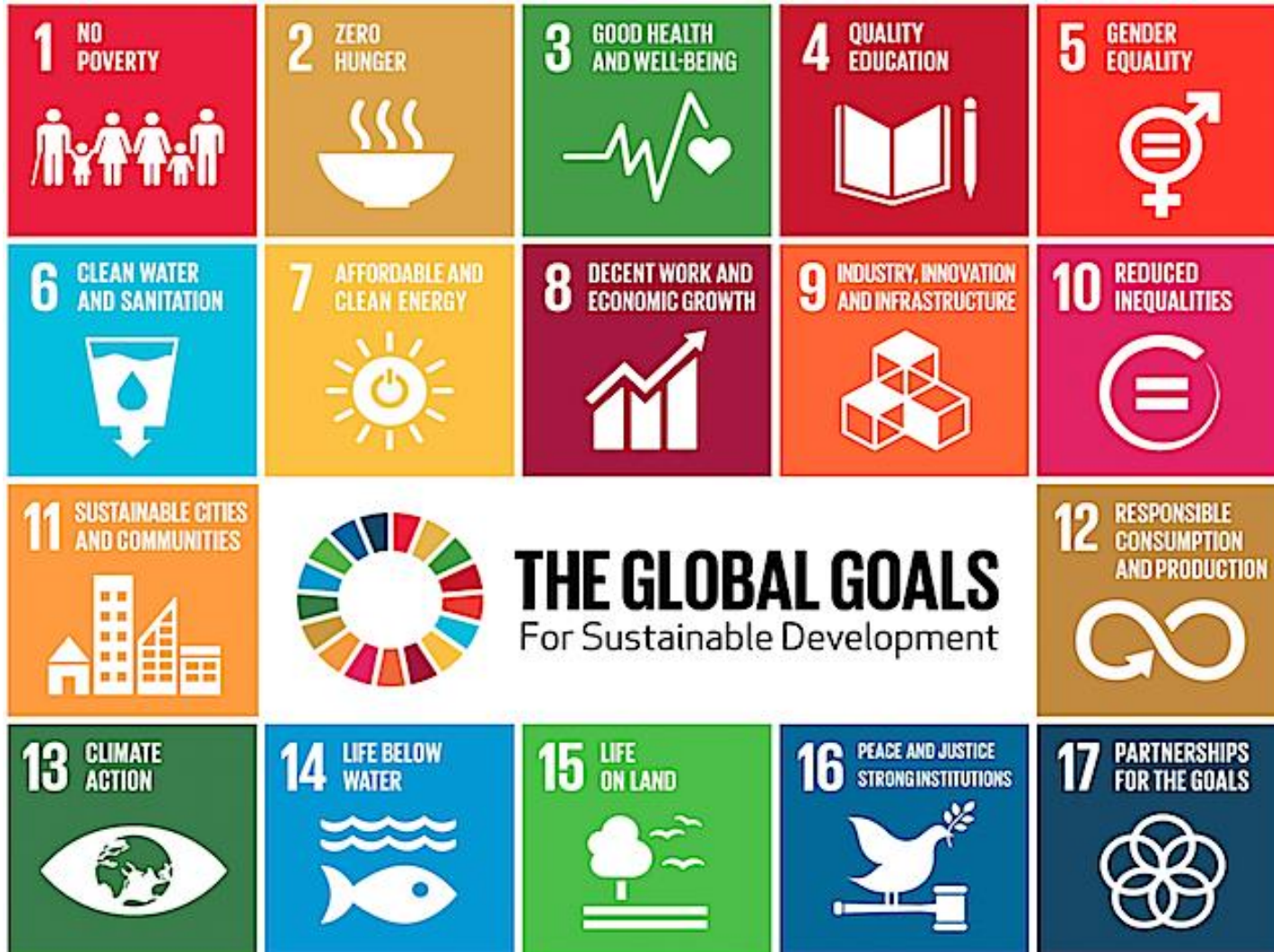


### Collateral damages to “developed countries”:

- Slow and complex administrative processes
- Raw materials production relocation  
(👉 opportunity for third countries 👈)
- Extinction of traditional productive sectors
- Lack of long-term reindustrialization policies
- ...

**2D development model**  
-lasted a few decades-



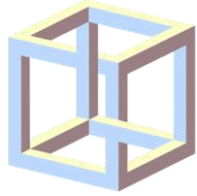


**Social:** 1, 2, 3, 4, 5, 6, 10, 11, 16, 17  
**Environment:** 7, 13, 14, 15  
**Economy:** 8, 9, 12

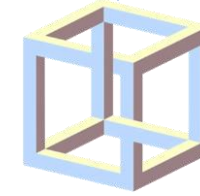


**Strong emphasis in the social dimension**





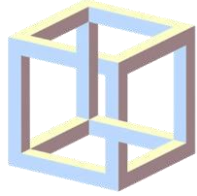
## Socio-environmental paradox of Raw Materials (RM) production



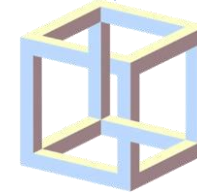
### Paradox 1.0

Society demands consumer goods which need mineral RM for their production; **but people do not want to accept environmental consequences of that production...**





## Socio-environmental paradox of Raw Materials (RM) production



### Paradox 2.0

“Developed countries” endow themselves with the toughest legislation (labor, environment) making almost impossible any RM local projects; **thus promoting the mineral production somewhere, somehow...**



## Some reasons for the paradox...

👉 *Mining black history...* and some irresponsible mining at the present



## Some reasons for the paradox...

👉 Environmental impact of mining activities (*paying the righteous for sinners*)



## Some reasons for the paradox...

➔ Developed countries “*double standard*”, enacting high-standard labor & environmental laws (responsible production), but allowing the RM supply from third countries without ensuring the same production standards (*business are business*)...



## Some reasons for the paradox...

☞ “Production” seems to be old-fashioned in the consumer societies, while the “production-based” societies are, in general, low-profile markets



## Solving the paradox



real SLO

Some key ingredients of the *magic recipe*:



**communication**

**Ecosystem service approach**

**traceability**

**policies**

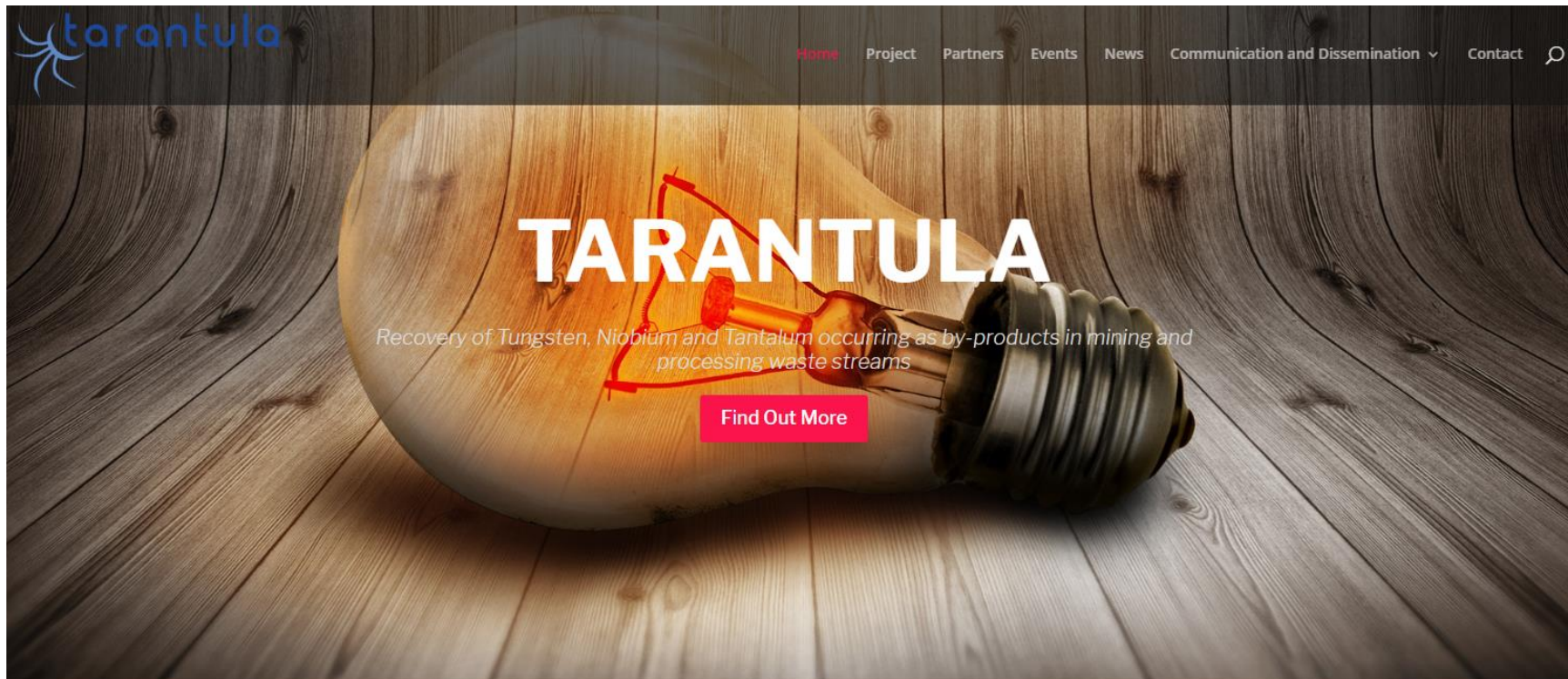
**b.a.t**

**public awareness**

**responsible production & consumption**

...

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