



Deliverable D7.2

# Social Risk Analysis



## Deliverable report

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## Table of contents

Deliverable report	2
Document Contributors	2
Document History	3
Disclaimer	3
Table of contents	4
List of Abbreviations	6
1 Executive Summary	7
2 Introduction and scope	8
2.1 Relation to other activities and deliverables	8
2.2 Structure of the deliverable	8
2.3 Note on the methodology.	9
3 Mechanisms for social acceptance	10
4 Social Risk Analysis	10
4.1 Potential risks in the European RM sector	10
4.2 Social Risk Matrix	12
4.3 Social Risk Matrix in the 5 pilot sites	14
4.3.1 Pilot #1. VICAT (Fenouillet, France)	14
4.3.2 Pilot #2. HANSON (Valdilecha, Spain)	14
4.3.3 Pilot #3. HOLCIM (Milano, Italy)	15
4.3.4 Pilot #4. CSI (Mammendorf, Germany)	16
4.3.5 Pilot #5. CIMPOR (Alenquer, Portugal)	16
5 Conclusions	17
6 References	19
7 Annexes	20
7.1 VICAT - Social Risk Analysis	20
7.2 HANSON - Social Risk Analysis	24
7.3 HOLCIM - Social Risk Analysis	28
7.4 CSI - Social Risk Analysis	32
7.5 CIMPOR - Social Risk Analysis	34
List of Figures	37



## List of Abbreviations

ABBREVIATION	DESCRIPTION
CA	Consortium Agreement
CES	Community Engagement Strategy
CSO	Civil Social Organisations
CSR	Corporate Social Responsibility
EC	European Commission
GA	Grant Agreement
IQS	Intelligent Quarrying System
RM	Raw Materials
SDGs	Sustainable Development Goals
SLO	Social Licence to Operate
WP	Work Package
VICAT	Granulats Vicat
HANSON	Hanson Hispania
CIMPOR	AGREPOR AGREGADOS - EXTRACÇÃO DE INERTES
HOLCIM	HOLCIM AGGREGATI CALCESTRUZZI
CSI	Cronenberger Steinindustrie Franz Triches GmbH & Co.KG

# 1 Executive Summary

This document constitutes the Deliverable D7.2 Social risk analysis of the DIGIECOQUARRY project. This deliverable corresponds to the Task 7.1 (Social Risk Analysis in the 5 pilot sites) of Work Package (WP) 7 Mechanisms for social acceptance & interaction with policymakers.

The Project INNOVATIVE DIGITAL SUSTAINABLE AGGREGATES SYSTEMS (H2020-SC5-2020-2) will exploit the aggregates industry's great potential through a coordinated approach towards construction materials management with the final goal of reducing EU external supply dependency as well as leading to an efficient use of resources. DIGIECOQUARRY will develop systems, technology and processes for integrated digitization and automation real-time process control, to be piloted in 5 EU quarries with the target of improving health and safety conditions for workers. The pilot campaigns will lead to improved efficiency of processes maximizing quarry resources and sustainable management of water, energy emissions, minimized environmental impact and expanding the EU aggregates and construction business. Coupling Artificial Intelligence approaches with cyber-physical systems and the Internet of Things concept, make Industry 4.0 approach possible and the smart sustainable extractive site a reality. All phases of the process, from extraction to the end user are covered by DIGIECOQUARRY, ensuring communication with policy makers, social acceptance activities and international cooperation with the Colombia and South Africa partners to share knowledge and best practices. The development of an innovative Intelligent Quarrying System (IQS) will increase the sustainable supply of minerals for the construction sector as well as enabling the sustainable extraction of EU's mineral resources in existing and new quarries.

This Project includes 25 partners and will last for 48 months, starting on 1<sup>st</sup> June 2021. It is divided into 11 Work Packages. One of them is Work Package 7 (WP7), named Mechanisms for social acceptance & interaction with policymakers, which will cover the complete duration of the Project.

The main objective of WP7 is to establish mechanisms, tools and methodologies to build long-term and mutually benefitting relationships between quarries and local stakeholders, ensuring the **obtention of the Social Licence to Operate (SLO) in the 5 pilot quarries**.

WP7 will work very close to the pilots in WP6 (and in line with WP9) to: (1) Obtain the social license to operate (SLO); (2) Generate community support and deliver positive and effective outcomes for Raw Materials (RM) projects; (3) Integrate the 5 pilot sites involved with the local identity and values; (4) Include community participation in RM projects decision-making and design; (5) Build trust, relationships, feelings of ownership, and a sense of collaboration through the provision of meaningful and ongoing community engagement with local stakeholders and other policy makers; (6) Establish and develop dialogue and participation processes with local communities; (7) Provide transparent and responsiveness access to project information and activities; (8) Define and implement one-way and two-way communication actions with policy makers.

This deliverable, elaborated under task 7.1, offers an identification of the main social risks identified in each of the pilot sites, containing also the categorisation or prioritisation of the risks. This document will be the basis for the elaboration of the Community Engagement Strategy (D7.3), identifying the focus issues for the interaction with local stakeholders.

At a later stage, once local stakeholders are engaged with the project activities, the risk matrix will be validated by external stakeholders in each pilot site.

## 2 Introduction and scope

The D7.2 deliverable is the second output of the task 7.1, Social Risk Analysis in the 5 pilot sites, run in the frame of WP7, Mechanisms for social acceptance & interaction with policy makers, led by ZABALA and involving the following other partners: ANEFA, VICAT, HANSON, HOLCIM, CSI, CIMPOR.

The **main objective of task 7.1** is to foster social acceptance of the quarrying sector by introducing novel participatory processes and engagement actions with local communities and policy makers to achieve the **Social License to Operate (SLO)** and improve public acceptance and trust of the new quarrying technologies.

In deliverable D7.1 **ZABALA** built a **context narrative** for each pilot site, including their key attributes and values and key aspects of local demographics, culture and history relevant to every quarry and the European Raw Materials (RM) sector. Furthermore, **ZABALA** identified the **relevant stakeholders** of each pilot site, focusing on the local community and those with an interest in or influence on the project or developer. In parallel, **ZABALA** identified the main **potential risks in the extractive industry** at global level that could affect the DIGIECOQUARRY project development directly or indirectly.

Based on the general risk identification developed, in **deliverable D7.2**, **ZABALA** has identified the key social risks in each pilot site through a consultation and validation process with pilot representatives (internal local stakeholders). This identification of risks will enable to establish priorities when designing the Community Engagement Strategy (CES) to be developed in deliverable D7.3 in month 20.

### 2.1 Relation to other activities and deliverables

WP7 is devoted to social acceptance and interaction with policy makers to obtain the SLO and promote best quarrying practices. This WP will get the local communities and the general public involved to define the future of the non-energy extractive sector under this new approach.

Thus, WP7 will work very close to **WP8** and **WP9**. WP7 will establish mechanisms, tools and methodologies to obtain the SLO in the 5 pilot quarries (Fig. 1). WP8 will establish a powerful, solid network of stakeholders and WP9 will ensure dissemination and communication, including exploitation and business plan definition.

Social acceptance, market uptake and management, will aim at developing and implementing the appropriate mechanisms for social acceptance (WP7) joining forces and finding synergies with related projects and initiatives through tailored networking activities with key stakeholders at EU/world level (WP8), defining and undertaking communication and dissemination actions to maximise the project impact (WP9).

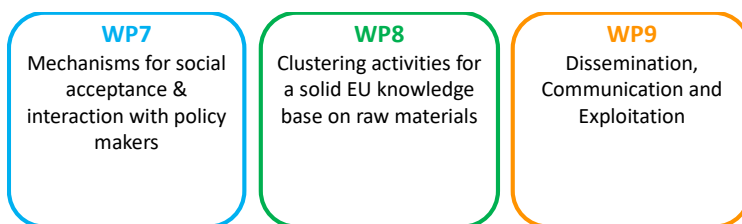


Figure 1 Relationship between WPs 7, 8 and 9

### 2.2 Structure of the deliverable

With the above in mind, the “Social risk analysis” is structured as follows:

**Section 1 - Executive summary:** Contains a brief statement of the project.



**Section 2 – Introduction and scope:** Provides introductory information with respect to the Social risk analysis and its structure as well as its scope and its relation to other tasks, activities and deliverables.

**Section 3 – Mechanisms for social acceptance:** Introduces the background and rationale behind the social acceptance activities in the project

**Section 4 – Social Risk Analysis:** Outlines the key social risks that affect the different pilot sites of the DIGIECOQUARRY project.

**Section 5 - Conclusions:** Pertains the conclusions of the Social risk analysis as well as the way forward.

## 2.3 Note on the methodology.

DIGIECOQUARRY project aims at developing tools and analysis frameworks that can be applied not only within the project scope and its pilot partners but by any organisation from the field of aggregates and quarrying. Allowing the uptake of this risk assessment framework by other actors and countries will ensure a future comparability and standardisation of the social risks related to quarries. For this reason, the “[2016 Mapping Mining to the Sustainable Development Goals](#),” (and the updated version published in 2020) produced by the Columbia Center on Sustainable Investment (CCSI), the United Nations Development Programme (UNDP), the United Nations Sustainable Development Solutions Network (SDSN) and the World Economic Forum (WEF) has been taken as the basis for the identification and prioritisation of social risks affecting to DIGIECOQUARRY pilot sites and the developments to be implemented as part of the project.

This basis, however, present some limitations which the reader should consider when analysing the results of the identification of social risks in each pilot site:

- 1) The Mapping offers an exhaustive list of risks related to Sustainable Development Goals at global level, which are not relevant for all contexts. Many of the risks identified are linked to countries in which the political and social contexts differ in many ways from the European context.
- 2) The Mapping considers mainly large-scale mining activities, which impacts differ in many cases from the impacts of the quarrying activities, and more specifically, the aggregates sector. For this reason, the list of social risks identified and priorities within the frame of the project are significantly lower than the ones proposed by the mapping.

### 3 Mechanisms for social acceptance

One of the main specific objectives of DIGIECOQUARRY will be to foster social acceptance by introducing novel participatory processes and engagement actions with local communities and policy makers by establishing a **Community Engagement Strategy (CES)** in order to achieve the **Social License to Operate (SLO)** and improve public acceptance and trust of the new quarrying technologies. As a result, the project will generate positive Environmental, Social, H&S and Economic impacts related to quarries, contributing to expand and strengthen the EU aggregates industry.

As part of the process to design the CES, deliverable D7.1 was addressed to understanding the European Raw Materials sector and its key social risks as well as the local context and particularities of each pilot site. Furthermore, an identification of the main stakeholders was carried out for each pilot site, focusing on the local community and those with an interest in or influence on the project.

In this deliverable, we have identified the key social risks in each pilot site, assessing their likelihood and impact, through a **participatory process (consultation and validation) with the pilot representatives** (internal stakeholders)

As a next step, these risks will be **co-validated with local external stakeholders** through participatory and consultation processes. The final compilation of social risks per quarry together with the identification of stakeholders conducted in D7.1 will allow us to establish priorities when designing the CES. Thus, considering the likelihood and impact of each social risk, the CES will monitor and manage these risks and establish specific mitigation actions during the project and beyond. The **CES will enable the project to mitigate the risks**, both those already existing in each of the quarries in their daily operations and the potential risks as a result of the implementation of the technology developed in the project. This public participation and stakeholder involvement processes, transparency and information disclosure, and good and open communication, will increment the existing credibility, reliability, and acceptance, allowing ultimately to achieve the **SLO of the project with the local communities and stakeholders**.

### 4 Social Risk Analysis

Environmental, Social and Governance (ESG) issues are becoming some of the biggest risks to mining and extractive industries and their operations and some of the most pressing concerns for industrial miners. Therefore, the mining industry has a significant role to play in achieving the **UN Sustainable Development Goals (SDGs)**, and mining businesses have the opportunity and responsibility to demonstrate how they are incorporating these goals into their operations. At the same time, mining operations present **potential risks to the realisation of the SDGs**. Some of these risks are intrinsic to mining (implications for other land uses and community access because of mines' physical footprint), while others are related to a lack of protection or inaction on economic, environmental, social, and governance issues. If mining businesses are to create trust, limit risk, and leave positive legacies when their mining operations end, they must identify these risks, avoid or minimize them, and mitigate them.

#### 4.1 Potential risks in the European RM sector






The mining industry has strong linkages with issues covered in all the 17 SDGs. These linkages are clearly set out in the [2016 Mapping Mining to the Sustainable Development Goals](#), an Atlas produced by the Columbia Center

on Sustainable Investment (CCSI), the United Nations Development Programme (UNDP), the United Nations Sustainable Development Solutions Network (SDSN) and the World Economic Forum (WEF).

Building on the Mapping Mining to the Sustainable Development Goals, in 2020, this group of organisations published an update report on the status of large-scale mining companies on their integration process of the SDGs into their business strategies and the potential risks (including those that are inherent or unintentional) that mining activities pose which might impede the achievement of the SDGs (Table 1).

Demonstrating meaningful action to achieve progress on the SDGs will enable companies to create confidence, limit risk (including operational, reputational, financial, and regulatory risks) and show respect for the people and countries impacted by mining activities.

*Table 1 Potential risks in the European Raw Material (RM) sector*

SDG	POTENTIAL RISKS
	1 Avoid taxes, depriving governments of budget contributions that could be invested into basic public goods
	2 Hinder land-based livelihoods through air and water pollution and footprint of mining operations
	3 Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods
	4 Compete for land resources, reducing area available for agricultural production
	5 Pollute land and water resources required for agricultural production
	6 Leave post-mining land in an unproductive state, due to inadequate rehabilitation
	7 Expose workers to risks of fatal accidents, injuries and physical and mental health problems
	8 Expose mining-affected communities to health and safety risks
	9 Expose human rights defenders to risk of attack
	10 Trigger health and safety risks for children and women due to mine-related in-migration of labour
	11 Exacerbate social conflict and local inequalities by bringing in skilled and unskilled workers from outside
	12 Resettle mining-affected communities without ensuring access to schools
	13 Discriminate against women applicants in recruitment processes
	14 Discriminate against women workers in professional development processes
	15 Marginalise women in mining-affected communities from discussions, decision-making and benefit-sharing activities
	16 Fail to address gender-based violence commonly exacerbated by presence of mining
	17 Fail to prevent acid mine drainage
	18 Exacerbate water stress by competing for water supply
	19 Pollute water sources from poor waste management and from tailings storage facilities leakages or failures
	20 Fail to provide gender-appropriate sanitation facilities for women workers
	21 Increase competition for grid-based power
	22 Increase share of non-renewable energy produced and consumed
	23 Slow down move towards renewable energy sources
	24 Fail to address risk of over-reliance on mining for economies and employment
	25 Perpetuate poor labour practices and unsafe working conditions
	26 Fail to ensure no child labour in operations or supply chain
	27 Limit local jobs to low-paying positions and fail to pay a living wage
	28 Increase local frustration due to increased automation decreasing local job creation
	29 Under-report value/quantity of raw materials extracted/exported to controlling authorities
	30 Fail to support shared infrastructure, constraining economic development of producing countries
	31 Fail to engage with in-country institutions for R&D, to increase capacity for innovation

	32	Exclude local business and SMEs from procurement and sourcing programmes
	33	Instigate local inflation due to in-migration
	34	Engage in unequal revenue spending and distribution
	35	Exacerbate regional inequalities within and between countries
	36	Maintain wage gap between expat and local workers
	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion
	38	Fail to plan for just transition for communities after mine closure
	39	Destroy or compromise cultural and natural heritage
	40	Fail to manage settlement growth and urbanisation due to population influx, straining public infrastructure and resources, and resulting in conflict
	41	Pollute air, land and water
	42	Externalise the socio-economic and environmental costs of mining
	43	Disincentivise transition to recycling and a circular economy
	44	Inadequately address waste management, tailings management and pollution prevention
	45	Mine very low-grade ores that generate excessive waste material
	46	Contribute to production and use of coal
	47	Amplify energy- and emissions-intense economies
	48	Exacerbate climate change impacts on populations and environments
	49	Disturb ecosystems and exacerbate deforestation
	50	Exacerbate adverse impacts due to subsea shallow mining and deep-sea mining
	51	Discharge waste and tailings into rivers, lakes and marine environments
	52	Adversely impact marine resources due to port infrastructure
	53	Fail to prevent acid mine drainage
	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution
	55	Increase environmental strain due to in-migration and increased economic activity
	56	Facilitate access to illegal activities including deforestation and poaching
	57	Leave long-term environmental problems due to inadequate rehabilitation
	58	Fail to prevent acid mine drainage
	59	Fail to eradicate risk of illicit financial flows and poor governance
	60	Exacerbate risk of bribery and corruption
	61	Increase conflicts fuelled by certain minerals
	62	Fail to eliminate child labour from operations and supply chain
	63	Withhold public access to public interest information
	64	Lack of a good regulatory frameworks that may cause delays or bottlenecks in the administrative and licensing procedures for the quarries' operations
	65	Contribute to debilitating lobbying against global governance around climate change, circular economy and tax reforms
	66	Erode domestic revenue collection and undermine public financing
	67	Persist with the enclave model (lack of interaction and sharing of benefits with local communities)
	68	Fail to publicly disclose public interest data on socio-economic, environmental and governance impacts

## 4.2 Social Risk Matrix

Based on the potential risks of the European RM sector developed by the CCSI, UNDP, SDSN and WEF, DIGIECOQUARRY pilot partners have identified the key social risks in each pilot site assessed by 'Likelihood' and 'Impact' according to the following rating:

**LIKELIHOOD OF RISK RATING.** Depending on the likelihood of the occurrence of the risk, this can be classified under these five categories:

- Rare (1): These are the risks that have almost no probability of occurring.
- Unlikely (2): These are the risks that have a low probability of occurrence.
- Possible (3): Risks that have a 50/50 probability of occurrence.
- Likely (4): Risks that have a 60%-80% chance to occur.
- Almost certain (5): Risks that are almost guaranteed to show up during the execution of the project (more than 85% likely to happen).

**IMPACT OF RISK RATING.** Risks are rated on the severity of the impact, or the extent of damage caused by the risk. The impact of risk can be ranked into five categories based on how severe the damage can get.

- Negligible (1): Risks that can cause the negligible amount of damage.
- Minor (2): Risks that have a small potential for negative effects.
- Moderate (3): Risks that do not impose a great threat but are yet sizable damage.
- Major (4): Risks that have substantial negative effects and are going to impact in a serious way the success of a project.
- Catastrophic (5): A major event that can cause reputational and economic damage and will result in huge business and client base losses.

As a result of assessing likelihood and impact for each social risk, we obtained a **Social Risk Matrix** (Fig. 2) which allows organisations to manage risks effectively. The Social Risk Matrix helps to understand the relative importance and priority of each risk and determine which risks need detailed risk response plans (Table 2).

		IMPACT				
		Negligible 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
LIKELIHOOD	5 Almost certain	Moderate 5	High 10	Extreme 15	Extreme 20	Extreme 25
	4 Likely	Moderate 4	High 8	High 12	Extreme 16	Extreme 20
	3 Possible	Low 3	Moderate 6	High 9	High 12	Extreme 15
	2 Unlikely	Low 2	Moderate 4	Moderate 6	High 8	High 10
	1 Rare	Low 1	Low 2	Low 3	Moderate 4	Moderate 5

Figure 2 Social Risk Matrix considering Likelihood and Impact

## RISK CLASSIFICATION:

Table 2 Risk classification

<b>LOW RISK (1-3)</b>	The risk is acceptable. For these risks, no specific procedures are required. The risk must be monitored by the project team as part of its ongoing follow-up with project tasks
<b>MODERATE RISK (4-6)</b>	The risk is tolerable. There is a need to evaluate possible countermeasures in order to reduce the level of the risk to an acceptable level. Continuous improvement approach is required.
<b>HIGH RISK (8-12)</b>	The risk is not acceptable and must be improvable. There is a need to implement rapid countermeasures in order to reduce the level of the risk at least to a tolerable level
<b>EXTREME RISK (15-25)</b>	The risk is not acceptable and must strongly attached. There is a need to implement immediate countermeasures in order to reduce the level of the risk at least to a tolerable level.

Hence, this procedure allows to take into consideration the following:

- Is there any negative / non-intended projected impact on the local environment and populations?
- Are there any potential environmental and social risks?
- If yes, what is the significance of such risks (low, moderate, high, extreme high)?

And then, determine the following:

- How can the risk/s be monitored and mitigated?
- Who should be involved in the mitigation and monitoring plan?

## 4.3 Social Risk Matrix in the 5 pilot sites

The Social Risk Matrix outlines the key social risks that could affect the DIGIECOQUARRY project development directly or indirectly. In the following sections we provide key social risks identified in each pilot site.

### 4.3.1 Pilot #1. VICAT (Fenouillet, France)

The VICAT quarry has identified two 'High' and 66 'Low' risks. In Table 3 we provide the most relevant risks. The complete list of risks of the VICAT quarry is provided in Annex 7.

Table 3 Key social risks - VICAT quarry (RS: Risk Score)

SDG	POTENTIAL RISKS		STAKEHOLDER INVOLVED	RS
SDG 3	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees	8
SDG 11	41	Pollute air, land and water	Local community	12

### 4.3.2 Pilot #2. HANSON (Valdilecha, Spain)

The HANSON quarry has identified six 'High', 23 'Moderate', and 39 'Low' risks. In Table 4 we provide the most relevant risks. The complete list of risks of the HANSON quarry is provided in Annex 7.

Table 4 Key social risks - HANSON quarry (RS: Risk Score)

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	RS
SDG 3	7 Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees	12
SDG 5	13 Discriminate against women applicants in recruitment processes	Employees, Local community	9
	14 Discriminate against women workers in professional development processes	Employees, Local community	9
SDG 13	49 Disturb ecosystems and exacerbate deforestation	Local community	9
SDG 2	6 Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community	8
SDG 3	8 Expose mining-affected communities to health and safety risks	Local community	8
SDG 6	20 Fail to provide appropriate sanitation facilities for workers	Employees	6
SDG 7	21 Increase competition for grid-based power	Local community	6
SDG 11	39 Destroy or compromise cultural and natural heritage	Local community	6
	41 Pollute air, land and water	Local community	6
SDG 12	43 Disincentivise transition to recycling and a circular economy	Local community	6
	44 Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities	6
SDG 13	48 Exacerbate climate change impacts on populations and environments	Local community	6
SDG 15	54 Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community	6
	56 Facilitate access to illegal activities including deforestation and poaching	Local community	6
	57 Leave long-term environmental problems due to inadequate rehabilitation	Local community	6
SDG 16	60 Exacerbate risk of bribery and corruption	Local community, Public Authorities	6

#### 4.3.3 Pilot #3. HOLCIM (Milano, Italy)

The HOLCIM quarry has identified one 'Extreme', two 'High', one 'Moderate', and 65 'Low' risks. In Table 5 we provide the most relevant risks. The complete list of risks of the HOLCIM quarry is provided in Annex 7.

Table 5 Key social risks - HOLCIM quarry (RS: Risk Score)

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	RS
SDG 11	Heavy traffic in / out of the quarry *	Local community	16
SDG 3	7 Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees	12

	8	Expose mining-affected communities to health and safety risks	Local community	6
SDG 16	64	Lack of a good regulatory frameworks that may cause delays or bottlenecks in the administrative and licensing procedures for the quarries' operations	Public Authorities	12

\*additional risk included by the HOLCIM quarry

#### 4.3.4 Pilot #4. CSI (Mammendorf, Germany)

The CSI quarry has identified six 'Moderate' and 19 'Low' risks. In Table 6 we provide the most relevant risks. The complete list of risks of the CSI quarry is provided in Annex 7.

Table 6 Key social risks - CSI quarry (RS: Risk Score)

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	RS*
SDG 2 No hunger	4 Compete for land resources, reducing area available for agricultural production	Local community	5
	5 Pollute land and water resources required for agricultural production	Local community	5
	6 Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community	4
SDG 3 Good health and well being	8 Expose mining-affected communities to health and safety risks	Local community	6
SDG 7 Affordable and clean energy	23 Slow down move towards renewable energy sources	Local community	6
SDG 12 Responsible consumption and production	44 Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities	6

#### 4.3.5 Pilot #5. CIMPOR (Alenquer, Portugal)

The CIMPOR quarry has identified one 'Extreme', two 'High', five 'Moderate' and 61 'Low' risks. In Table 7 we provide the most relevant risks. The complete list of risks of the CIMPOR quarry is provided in Annex 7.

Table 7 Key social risks - CIMPOR quarry (RS: Risk Score)

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	RS
SDG 8	Unemployment due to operation ending*	Local community	16
SDG 3	7 Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees	12
SDG 6	18 Exacerbate water stress by competing for water supply	Local community	9

\*additional risk included by the CIMPOR quarry



## 5 Conclusions

Concerning the risk assessment conducted together with pilots' representatives, we can conclude that the environmental, social and economic framework deeply conditions the social risks related to the extractive activity. Hence, the need of conducting site specific risks assessment is key to avoid any potential harm to local communities and avoid conflicts. **Beyond generic risk identifications, which are useful to set the frameworks but are too generic, it is highly advisable that each site completes the general risks assessments and Corporate Social Responsibility (CSR) measures of the companies.**

However, there are risks that are commonly identified, at least in the five different contexts included in DIGIECOQUARRY project which are mainly **related to the exposing of workers to risks of fatal accidents, injuries and physical and mental health problems as well as expose mining-affected communities to health and safety risks (Risk 7 and 8, SDG3)**. Furthermore, although the environmental risks are also commonly mentioned by all quarries, we will not focus on them in detail since there are specific sections of the project that address the environmental dimension and these specific risks and issues.

It should be noted that, although automatization and digitalization of process may result in a **negative impact in employment, this risk has not been identified as relevant in none of the quarries in relation to the DIGIECOQUARRY project**. This is because negative impact in employment depends also on the current level of automation and production efficiency (i.e. To/ Working hour). The workforce number depends on that but also on the level of refinement/processing depth (and thus production effort). Hence, in the case of the 2 pilots with a higher number of workers in absolute numbers, (CSI and HANSON) it may be that with its relatively high output, efficiency and high level of refinement/processing has lower workforce in relative numbers, and the digitalisation of quarries will not derive in a loss of jobs but the adaptation of them. To ensure a smooth upskilling and/or reskilling of sector workers, DIGIECOQUARRY will engage them to integrate their perception in the project development (Task 7.2) and define a capacity building programme to ensure the acquire the needed skills to adapt to the sector's sustainable transformation.

In this regards, **delays in approving permits at administrative level** have been identified as main cause for potential job destruction due to the end of operations, especially highlighted by the Portuguese pilot partner, CIMPOR. This reality goes beyond the scope of the project and seems to be a generalised barrier for quarries to ensure their long term sustainability and capacity to maintain jobs. These delays, however, will not be affecting the proper implementation of the DIGIECOQUARRY project as they have been already foreseen and tackled through the quarries, and also by the project's activities related to interaction with policy makers.

This preliminary risk identification, together with the context analysis conducted in deliverable 7.1, will be the starting point to develop a Community Engagement Strategy: the social risk analysis allows us to prioritise especially sensitive topics that needs to be carefully considered when approaching external stakeholders.

Once external local stakeholders are approached, ZABALA, together with pilot partners, will conduct a second consultation of social risks in order to identify the main concerns of local communities and compare them with the ones identified by quarries representatives. Through this second validation, ZABALA will elaborate a social risks framework better adapted to the characteristics of the European aggregates sector. Social aspects have only recently been incorporated into project risk assessments in the mining industry. Hence, there are still not adequate resources neither specific people responsible for implementing the

sustainability approach designed at high level into the specific local context of each quarry. As a result, the fact that social risk identification is not being conducted in the daily operations of the quarries poses a potential risk itself.

In order to address this issue, training sessions and practical guidelines on social impact assessment and awareness will be conducted during the execution of the project to the managers of each pilot quarry.

## 6 References

Responsible Mining Foundation (RMF) and Columbia Center on Sustainable Investment (CCSI). 2020. Mining and the SDGs: a 2020 status update. <https://www.responsibleminingfoundation.org/mining-and-the-sdgs/>

## 7 Annexes

### 7.1 VICAT - Social Risk Analysis

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
			1	2	3	4	5	1	2	3	4	5	
SDG 1 No poverty	1	Avoid taxes, depriving governments of budget contributions that could be invested into basic public goods	Local community, Public Authorities	x					x				1
	2	Hinder land-based livelihoods through air and water pollution and footprint of mining operations	Local community	x					x				1
	3	Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods	Local community	x					x				1
SDG 2 No hunger	4	Compete for land resources, reducing area available for agricultural production	Local community	x					x				1
	5	Pollute land and water resources required for agricultural production	Local community	x					x				1
	6	Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community	x					x				1
SDG 3 Good health and well being	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees		x						x		8
	8	Expose mining-affected communities to health and safety risks	Local community	x					x				1
	9	Expose human rights defenders to risk of attack	Local community, CSOs	x					x				1
SDG 4 Quality education	10	Trigger health and safety risks for children and women due to mine-related in-migration of labour	Local community	x					x				1
	11	Exacerbate social conflict and local inequalities by bringing in skilled and unskilled workers from outside	Employees, Local community	x					x				1
	12	Resettle mining-affected communities without ensuring access to schools	Local community	x					x				1
SDG 5 Gender equality	13	Discriminate against women applicants in recruitment processes	Employees, Local community	x					x				1
	14	Discriminate against women workers in professional development processes	Employees, Local community	x					x				1
	15	Marginalise women in mining-affected communities from discussions, decision-making and benefit-sharing activities	Employees, Local community	x					x				1
	16	Fail to address gender-based violence commonly exacerbated by presence of mining	Employees, Local community	x					x				1

SDG 6 Clean water and sanitation	17	Fail to prevent acid mine drainage	Local community	X						X						1
	18	Exacerbate water stress by competing for water supply	Local community	X						X						1
	19	Pollute water sources from poor waste management and from tailings storage facilities leakages or failures	Local community	X						X						1
	20	Fail to provide appropriate sanitation facilities for workers	Employees	X						X						1
SDG 7 Affordable and clean energy	21	Increase competition for grid-based power	Local community	X						X						1
	22	Increase share of non-renewable energy produced and consumed	Local community	X						X						1
	23	Slow down move towards renewable energy sources	Local community	X						X						1
SDG 8 Decent work and economic growth	24	Fail to address risk of over-reliance on mining for economies and employment	Local community	X						X						1
	25	Perpetuate poor labour practices and unsafe working conditions	Employees	X						X						1
	26	Fail to ensure no child labour in operations or supply chain	Employees, Local community	X						X						1
	27	Limit local jobs to low-paying positions and fail to pay a living wage	Employees, Local community	X						X						1
	28	Increase local frustration due to increased automation decreasing local job creation	Employees, Local community	X						X						1
	29	Under-report value/quantity of raw materials extracted/exported to controlling authorities	Public Authorities, Local community	X						X						1
SDG 9 Industry Innovation and infrastructure	30	Fail to support shared infrastructure, constraining economic development of producing countries	Local community	X						X						1
	31	Fail to engage with in-country institutions for R&D, to increase capacity for innovation	Public Authorities	X						X						1
	32	Exclude local business and SMEs from procurement and sourcing programmes	Local community	X						X						1
SDG 10 Reduced inequalities	33	Instigate local inflation due to in-migration	Local community	X						X						1
	34	Engage in unequal revenue spending and distribution	Employees, Local community	X						X						1
	35	Exacerbate regional inequalities within and between countries	Local community	X						X						1
	36	Maintain wage gap between expat and local workers	Employees	X						X						1
SDG 11 Sustainable	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion	Local community	X						X						1

cities and communities	38	Fail to plan for just transition for communities after mine closure	Local community	x					x					1
	39	Destroy or compromise cultural and natural heritage	Local community	x					x					1
	40	Fail to manage settlement growth and urbanisation due to population influx, straining public infrastructure and resources, and resulting in conflict	Local community, Public Authorities	x					x					1
	41	Pollute air, land and water	Local community				x				x			12
SDG 12 Responsible consumption and production	42	Externalise the socio-economic and environmental costs of mining	Local community, Public Authorities	x					x					1
	43	Disincentivise transition to recycling and a circular economy	Local community	x					x					1
	44	Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities	x					x					1
	45	Mine very low-grade ores that generate excessive waste material	Local community	x					x					1
SDG 13 Climate action	46	Contribute to production and use of coal	Local community	x					x					1
	47	Amplify energy- and emissions-intense economies	Local community	x					x					1
	48	Exacerbate climate change impacts on populations and environments	Local community	x					x					1
	49	Disturb ecosystems and exacerbate deforestation	Local community	x					x					1
SDG 14 Life below water	50	Exacerbate adverse impacts due to subsea shallow mining and deep-sea mining	Local community	x					x					1
	51	Discharge waste and tailings into rivers, lakes and marine environments	Local community	x					x					1
	52	Adversely impact marine resources due to port infrastructure	Local community	x					x					1
	53	Fail to prevent acid mine drainage	Local community	x					x					1
SDG 15 Life on land	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community	x					x					1
	55	Increase environmental strain due to in-migration and increased economic activity	Local community	x					x					1
	56	Facilitate access to illegal activities including deforestation and poaching	Local community	x					x					1
	57	Leave long-term environmental problems due to inadequate rehabilitation	Local community	x					x					1
	58	Fail to prevent acid mine drainage	Local community	x					x					1
SDG 16 Peace, justice	59	Fail to eradicate risk of illicit financial flows and poor governance	Local community,	x					x					1

and strong institutions		Public Authorities																	
	60	Exacerbate risk of bribery and corruption	Local community, Public Authorities	X						X									1
	61	Increase conflicts fuelled by certain minerals	Local community	X						X									1
	62	Fail to eliminate child labour from operations and supply chain	Local community, Employees	X						X									1
	63	Withhold public access to public interest information	Local community, Public Authorities	X						X									1
	64	Lack of a good regulatory frameworks that may cause delays or bottlenecks in the administrative and licensing procedures for the quarries' operations	Public Authorities	X						X									1
SDG 17 Partnerships for the goals	65	Contribute to debilitating lobbying against global governance around climate change, circular economy and tax reforms	Local community, Public Authorities	X						X									1
	66	Erode domestic revenue collection and undermine public financing	Local community, Public Authorities	X						X									1
	67	Persist with the enclave model (lack of interaction and sharing of benefits with local communities)	Local community, Public Authorities	X						X									1
	68	Fail to publicly disclose public interest data on socio-economic, environmental and governance impacts	Local community, Public Authorities	X						X									1

\*Risk Score

## 7.2 HANSON - Social Risk Analysis

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
			1	2	3	4	5	1	2	3	4	5	
SDG 1 No poverty	1	Avoid taxes, depriving governments of budget contributions that could be invested into basic public goods	Local community, Public Authorities	x						x			3
	2	Hinder land-based livelihoods through air and water pollution and footprint of mining operations	Local community	x						x			3
	3	Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods	Local community	x				x					1
SDG 2 No hunger	4	Compete for land resources, reducing area available for agricultural production	Local community	x					x				2
	5	Pollute land and water resources required for agricultural production	Local community	x						x			3
	6	Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community		x						x		8
SDG 3 Good health and well being	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees			x					x		12
	8	Expose mining-affected communities to health and safety risks	Local community		x						x		8
	9	Expose human rights defenders to risk of attack	Local community, CSOs	x					x				2
SDG 4 Quality education	10	Trigger health and safety risks for children and women due to mine-related in-migration of labour	Local community	x							x		4
	11	Exacerbate social conflict and local inequalities by bringing in skilled and unskilled workers from outside	Employees, Local community	x					x				2
	12	Resettle mining-affected communities without ensuring access to schools	Local community	x				x					1
SDG 5 Gender equality	13	Discriminate against women applicants in recruitment processes	Employees, Local community			x				x			9
	14	Discriminate against women workers in professional development processes	Employees, Local community			x				x			9
	15	Marginalise women in mining-affected communities from discussions, decision-making and benefit-sharing activities	Employees, Local community		x				x				4
	16	Fail to address gender-based violence commonly exacerbated by presence of mining	Employees, Local community	x					x				2
SDG 6 Clean water and sanitation	17	Fail to prevent acid mine drainage	Local community	x					x				2
	18	Exacerbate water stress by competing for water supply	Local community	x						x			3



	19	Pollute water sources from poor waste management and from tailings storage facilities leakages or failures	Local community	X								X				3
	20	Fail to provide appropriate sanitation facilities for workers	Employees		X							X				6
SDG 7 Affordable and clean energy	21	Increase competition for grid-based power	Local community		X							X				6
	22	Increase share of non-renewable energy produced and consumed	Local community		X						X					4
	23	Slow down move towards renewable energy sources	Local community	X							X					2
SDG 8 Decent work and economic growth	24	Fail to address risk of over-reliance on mining for economies and employment	Local community	X							X					2
	25	Perpetuate poor labour practices and unsafe working conditions	Employees	X									X			4
	26	Fail to ensure no child labour in operations or supply chain	Employees, Local community	X								X				3
	27	Limit local jobs to low-paying positions and fail to pay a living wage	Employees, Local community	X								X				3
	28	Increase local frustration due to increased automation decreasing local job creation	Employees, Local community	X							X					2
	29	Under-report value/quantity of raw materials extracted/exported to controlling authorities	Public Authorities, Local community	X							X					2
SDG 9 Industry Innovation and infrastructure	30	Fail to support shared infrastructure, constraining economic development of producing countries	Local community	X								X				3
	31	Fail to engage with in-country institutions for R&D, to increase capacity for innovation	Public Authorities		X						X					4
	32	Exclude local business and SMEs from procurement and sourcing programmes	Local community		X						X					4
SDG 10 Reduced inequalities	33	Instigate local inflation due to in-migration	Local community	X						X						1
	34	Engage in unequal revenue spending and distribution	Employees, Local community	X							X					2
	35	Exacerbate regional inequalities within and between countries	Local community	X						X						1
	36	Maintain wage gap between expat and local workers	Employees	X							X					2
SDG 11 Sustainable cities and communities	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion	Local community	X							X					2
	38	Fail to plan for just transition for communities after mine closure	Local community	X							X					2
	39	Destroy or compromise cultural and natural heritage	Local community		X							X				6

	40	Fail to manage settlement growth and urbanisation due to population influx, straining public infrastructure and resources, and resulting in conflict	Local community, Public Authorities	x						x				2
	41	Pollute air, land and water	Local community		x						x			6
SDG 12 Responsible consumption and production	42	Externalise the socio-economic and environmental costs of mining	Local community, Public Authorities		x				x					2
	43	Disincentivise transition to recycling and a circular economy	Local community			x				x				6
	44	Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities		x						x			6
	45	Mine very low-grade ores that generate excessive waste material	Local community	x						x				2
	46	Contribute to production and use of coal	Local community	x					x					1
SDG 13 Climate action	47	Amplify energy- and emissions-intense economies	Local community		x					x				4
	48	Exacerbate climate change impacts on populations and environments	Local community		x						x			6
	49	Disturb ecosystems and exacerbate deforestation	Local community			x					x			9
	50	Exacerbate adverse impacts due to subsea shallow mining and deep-sea mining	Local community	x					x					1
SDG 14 Life below water	51	Discharge waste and tailings into rivers, lakes and marine environments	Local community	x					x					1
	52	Adversely impact marine resources due to port infrastructure	Local community	x					x					1
	53	Fail to prevent acid mine drainage	Local community	x					x					1
	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community		x						x			6
SDG 15 Life on land	55	Increase environmental strain due to immigration and increased economic activity	Local community	x						x				2
	56	Facilitate access to illegal activities including deforestation and poaching	Local community		x						x			6
	57	Leave long-term environmental problems due to inadequate rehabilitation	Local community		x						x			6
	58	Fail to prevent acid mine drainage	Local community		x					x				4
	59	Fail to eradicate risk of illicit financial flows and poor governance	Local community, Public Authorities	x						x				2
SDG 16 Peace, justice and strong institutions	60	Exacerbate risk of bribery and corruption	Local community,		x						x			6

[illegible]

\*Risk Score

### 7.3 HOLCIM - Social Risk Analysis

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
			1	2	3	4	5	1	2	3	4	5	
SDG 1 No poverty	1	Avoid taxes, depriving governments of budget contributions that could be invested into basic public goods	Local community, Public Authorities	x					x				1
	2	Hinder land-based livelihoods through air and water pollution and footprint of mining operations	Local community	x					x				1
	3	Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods	Local community	x					x				1
SDG 2 No hunger	4	Compete for land resources, reducing area available for agricultural production	Local community	x					x				1
	5	Pollute land and water resources required for agricultural production	Local community	x					x				1
	6	Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community	x					x				1
SDG 3 Good health and well being	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees			x					x		12
	8	Expose mining-affected communities to health and safety risks	Local community		x					x			6
	9	Expose human rights defenders to risk of attack	Local community, CSOs	x					x				1
SDG 4 Quality education	10	Trigger health and safety risks for children and women due to mine-related in-migration of labour	Local community	x					x				1
	11	Exacerbate social conflict and local inequalities by bringing in skilled and unskilled workers from outside	Employees, Local community	x					x				1
	12	Resettle mining-affected communities without ensuring access to schools	Local community	x					x				1
SDG 5 Gender equality	13	Discriminate against women applicants in recruitment processes	Employees, Local community	x					x				1
	14	Discriminate against women workers in professional development processes	Employees, Local community	x					x				1
	15	Marginalise women in mining-affected communities from discussions, decision-making and benefit-sharing activities	Employees, Local community	x					x				1
	16	Fail to address gender-based violence commonly exacerbated by presence of mining	Employees, Local community	x					x				1
SDG 6 Clean water	17	Fail to prevent acid mine drainage	Local community	x					x				1

and sanitation	18	Exacerbate water stress by competing for water supply	Local community	X						X							1
	19	Pollute water sources from poor waste management and from tailings storage facilities leakages or failures	Local community	X						X							1
	20	Fail to provide appropriate sanitation facilities for workers	Employees	X						X							1
SDG 7 Affordable and clean energy	21	Increase competition for grid-based power	Local community	X						X							1
	22	Increase share of non-renewable energy produced and consumed	Local community	X						X							1
	23	Slow down move towards renewable energy sources	Local community	X						X							1
SDG 8 Decent work and economic growth	24	Fail to address risk of over-reliance on mining for economies and employment	Local community	X						X							1
	25	Perpetuate poor labour practices and unsafe working conditions	Employees	X						X							1
	26	Fail to ensure no child labour in operations or supply chain	Employees, Local community	X						X							1
	27	Limit local jobs to low-paying positions and fail to pay a living wage	Employees, Local community	X						X							1
	28	Increase local frustration due to increased automation decreasing local job creation	Employees, Local community	X						X							1
	29	Under-report value/quantity of raw materials extracted/exported to controlling authorities	Public Authorities, Local community	X						X							1
SDG 9 Industry Innovation and infrastructure	30	Fail to support shared infrastructure, constraining economic development of producing countries	Local community	X						X							1
	31	Fail to engage with in-country institutions for R&D, to increase capacity for innovation	Public Authorities	X						X							1
	32	Exclude local business and SMEs from procurement and sourcing programmes	Local community	X						X							1
SDG 10 Reduced inequalities	33	Instigate local inflation due to in-migration	Local community	X						X							1
	34	Engage in unequal revenue spending and distribution	Employees, Local community	X						X							1
	35	Exacerbate regional inequalities within and between countries	Local community	X						X							1
	36	Maintain wage gap between expat and local workers	Employees	X						X							1
SDG 11 Sustainable cities and communities	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion	Local community	X						X							1
	38	Fail to plan for just transition for communities after mine closure	Local community	X						X							1

	39	Destroy or compromise cultural and natural heritage	Local community	x						x								1
	40	Fail to manage settlement growth and urbanisation due to population influx, straining public infrastructure and resources, and resulting in conflict	Local community, Public Authorities	x						x								1
	41	Pollute air, land and water	Local community	x						x								1
SDG 12 Responsible consumption and production	42	Externalise the socio-economic and environmental costs of mining	Local community, Public Authorities	x						x								1
	43	Disincentivise transition to recycling and a circular economy	Local community	x						x								1
	44	Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities	x						x								1
	45	Mine very low-grade ores that generate excessive waste material	Local community	x						x								1
SDG 13 Climate action	46	Contribute to production and use of coal	Local community	x						x								1
	47	Amplify energy- and emissions-intense economies	Local community	x						x								1
	48	Exacerbate climate change impacts on populations and environments	Local community	x						x								1
	49	Disturb ecosystems and exacerbate deforestation	Local community	x						x								1
SDG 14 Life below water	50	Exacerbate adverse impacts due to subsea shallow mining and deep-sea mining	Local community	x						x								1
	51	Discharge waste and tailings into rivers, lakes and marine environments	Local community	x						x								1
	52	Adversely impact marine resources due to port infrastructure	Local community	x						x								1
	53	Fail to prevent acid mine drainage	Local community	x						x								1
SDG 15 Life on land	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community	x						x								1
	55	Increase environmental strain due to in-migration and increased economic activity	Local community	x						x								1
	56	Facilitate access to illegal activities including deforestation and poaching	Local community	x						x								1
	57	Leave long-term environmental problems due to inadequate rehabilitation	Local community	x						x								1
	58	Fail to prevent acid mine drainage	Local community	x						x								1
SDG 16 Peace, justice and strong institutions	59	Fail to eradicate risk of illicit financial flows and poor governance	Local community, Public Authorities	x						x								1

	60	Exacerbate risk of bribery and corruption	Local community, Public Authorities	x					x						1
	61	Increase conflicts fuelled by certain minerals	Local community	x					x						1
	62	Fail to eliminate child labour from operations and supply chain	Local community, Employees	x					x						1
	63	Withhold public access to public interest information	Local community, Public Authorities	x					x						1
	64	Lack of a good regulatory frameworks that may cause delays or bottlenecks in the administrative and licensing procedures for the quarries' operations	Public Authorities			x							x		12
SDG 17 Partnerships for the goals	65	Contribute to debilitating lobbying against global governance around climate change, circular economy and tax reforms	Local community, Public Authorities	x					x						1
	66	Erode domestic revenue collection and undermine public financing	Local community, Public Authorities	x					x						1
	67	Persist with the enclave model (lack of interaction and sharing of benefits with local communities)	Local community, Public Authorities	x					x						1
	68	Fail to publicly disclose public interest data on socio-economic, environmental and governance impacts	Local community, Public Authorities	x					x						1

ADDITIONAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
		1	2	3	4	5	1	2	3	4	5	
heavy traffic in / out of the quarry	Local community				x					x		16

\*Risk Score

## 7.4 CSI - Social Risk Analysis

SDG	POTENTIAL RISKS		STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
				1	2	3	4	5	1	2	3	4	5	
SDG 1 No poverty	3	Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods	Local community	x					x					1
SDG 2 No hunger	4	Compete for land resources, reducing area available for agricultural production	Local community					x	x					5
	5	Pollute land and water resources required for agricultural production	Local community					x	x					5
	6	Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community				x		x					4
SDG 3 Good health and well being	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees		x				x					2
	8	Expose mining-affected communities to health and safety risks	Local community			x				x				6
SDG 5 Gender equality	13	Discriminate against women applicants in recruitment processes	Employees, Local community	x					x					1
	14	Discriminate against women workers in professional development processes	Employees, Local community	x					x					1
SDG 6 Clean water and sanitation	18	Exacerbate water stress by competing for water supply	Local community		x				x					2
	19	Pollute water sources from poor waste management and from tailings storage facilities leakages or failures	Local community	x					x					1
	20	Fail to provide appropriate sanitation facilities for workers	Employees	x					x					1
SDG 7 Affordable and clean energy	23	Slow down move towards renewable energy sources	Local community			x				x				6
SDG 8 Decent work and economic growth	25	Perpetuate poor labour practices and unsafe working conditions	Employees	x					x					1
	29	Under-report value/quantity of raw materials extracted/exported to controlling authorities	Public Authorities, Local community	x					x					1
SDG 9 Industry Innovation and infrastructure	31	Fail to engage with in-country institutions for R&D, to increase capacity for innovation	Public Authorities	x					x					1
	32	Exclude local business and SMEs from procurement and sourcing programmes	Local community	x					x					1
SDG 10 Reduced inequalities	34	Engage in unequal revenue spending and distribution	Employees, Local community			x			x					3



SDG 11 Sustainable cities and communities	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion	Local community	x						x					1
	39	Destroy or compromise cultural and natural heritage	Local community	x						x					1
	41	Pollute air, land and water	Local community		x					x					2
SDG 12 Responsible consumption and production	42	Externalise the socio-economic and environmental costs of mining	Local community, Public Authorities	x						x					1
	43	Disincentivise transition to recycling and a circular economy	Local community	x						x					1
	44	Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities			x					x				6
SDG 13 Climate action	49	Disturb ecosystems and exacerbate deforestation	Local community		x					x					2
SDG 15 Life on land	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community		x					x					2

\*Risk Score

## 7.5 CIMPOR - Social Risk Analysis

SDG	POTENTIAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
			1	2	3	4	5	1	2	3	4	5	
SDG 1 No poverty	1	Avoid taxes, depriving governments of budget contributions that could be invested into basic public goods	Local community, Public Authorities	X					X				1
	2	Hinder land-based livelihoods through air and water pollution and footprint of mining operations	Local community	X						X			2
	3	Displace and resettle mining-affected communities without adequate provisions for sustained livelihoods	Local community	X						X			2
SDG 2 No hunger	4	Compete for land resources, reducing area available for agricultural production	Local community	X						X			2
	5	Pollute land and water resources required for agricultural production	Local community	X					X				1
	6	Leave post-mining land in an unproductive state, due to inadequate rehabilitation	Local community	X							X		3
SDG 3 Good health and well being	7	Expose workers to risks of fatal accidents, injuries and physical and mental health problems	Employees		X							X	12
	8	Expose mining-affected communities to health and safety risks	Local community	X						X			2
	9	Expose human rights defenders to risk of attack	Local community, CSOs	X					X				1
SDG 4 Quality education	10	Trigger health and safety risks for children and women due to mine-related in-migration of labour	Local community	X					X				1
	11	Exacerbate social conflict and local inequalities by bringing in skilled and unskilled workers from outside	Employees, Local community	X					X				1
	12	Resettle mining-affected communities without ensuring access to schools	Local community	X					X				1
SDG 5 Gender equality	13	Discriminate against women applicants in recruitment processes	Employees, Local community	X					X				1
	14	Discriminate against women workers in professional development processes	Employees, Local community	X					X				1
	15	Marginalise women in mining-affected communities from discussions, decision-making and benefit-sharing activities	Employees, Local community	X					X				1
	16	Fail to address gender-based violence commonly exacerbated by presence of mining	Employees, Local community	X					X				1
SDG 6 Clean water	17	Fail to prevent acid mine drainage	Local community	X					X				1

and sanitation	18	Exacerbate water stress by competing for water supply	Local community			X					X					9
	19	Pollute water sources from poor waste management and from tailings storage facilities leakages or failures	Local community	X						X						1
	20	Fail to provide appropriate sanitation facilities for workers	Employees	X						X						1
SDG 7 Affordable and clean energy	21	Increase competition for grid-based power	Local community	X						X						1
	22	Increase share of non-renewable energy produced and consumed	Local community	X						X						1
	23	Slow down move towards renewable energy sources	Local community	X						X						1
SDG 8 Decent work and economic growth	24	Fail to address risk of over-reliance on mining for economies and employment	Local community	X						X						1
	25	Perpetuate poor labour practices and unsafe working conditions	Employees	X						X						1
	26	Fail to ensure no child labour in operations or supply chain	Employees, Local community	X						X						1
	27	Limit local jobs to low-paying positions and fail to pay a living wage	Employees, Local community	X						X						1
	28	Increase local frustration due to increased automation decreasing local job creation	Employees, Local community		X						X					4
	29	Under-report value/quantity of raw materials extracted/exported to controlling authorities	Public Authorities, Local community	X						X						1
SDG 9 Industry Innovation and infrastructure	30	Fail to support shared infrastructure, constraining economic development of producing countries	Local community	X						X						1
	31	Fail to engage with in-country institutions for R&D, to increase capacity for innovation	Public Authorities	X						X						1
	32	Exclude local business and SMEs from procurement and sourcing programmes	Local community	X						X						1
SDG 10 Reduced inequalities	33	Instigate local inflation due to in-migration	Local community	X						X						1
	34	Engage in unequal revenue spending and distribution	Employees, Local community	X						X						1
	35	Exacerbate regional inequalities within and between countries	Local community	X						X						1
	36	Maintain wage gap between expat and local workers	Employees	X						X						1
SDG 11 Sustainable cities and communities	37	Resettle mining-affected communities without adequate provisions for livelihoods and social cohesion	Local community	X						X						1
	38	Fail to plan for just transition for communities after mine closure	Local community	X						X						1

	39	Destroy or compromise cultural and natural heritage	Local community	X					X									1
	40	Fail to manage settlement growth and urbanisation due to population influx, straining public infrastructure and resources, and resulting in conflict	Local community, Public Authorities	X					X									1
	41	Pollute air, land and water	Local community		X					X								4
SDG 12 Responsible consumption and production	42	Externalise the socio-economic and environmental costs of mining	Local community, Public Authorities	X					X									1
	43	Disincentivise transition to recycling and a circular economy	Local community	X					X									1
	44	Inadequately address waste management, tailings management and pollution prevention	Local community, Public Authorities	X					X									1
	45	Mine very low-grade ores that generate excessive waste material	Local community	X					X									1
SDG 13 Climate action	46	Contribute to production and use of coal	Local community	X					X									1
	47	Amplify energy- and emissions-intense economies	Local community	X					X									1
	48	Exacerbate climate change impacts on populations and environments	Local community	X					X									1
	49	Disturb ecosystems and exacerbate deforestation	Local community		X					X								4
SDG 14 Life below water	50	Exacerbate adverse impacts due to subsea shallow mining and deep-sea mining	Local community	X					X									1
	51	Discharge waste and tailings into rivers, lakes and marine environments	Local community	X					X									1
	52	Adversely impact marine resources due to port infrastructure	Local community	X					X									1
	53	Fail to prevent acid mine drainage	Local community	X					X									1
SDG 15 Life on land	54	Degrade ecosystems and harm biodiversity due to mining operation footprints and pollution	Local community		X					X								4
	55	Increase environmental strain due to in-migration and increased economic activity	Local community	X					X									1
	56	Facilitate access to illegal activities including deforestation and poaching	Local community	X					X									1
	57	Leave long-term environmental problems due to inadequate rehabilitation	Local community		X					X								4
	58	Fail to prevent acid mine drainage	Local community	X					X									1
SDG 16 Peace, justice and strong institutions	59	Fail to eradicate risk of illicit financial flows and poor governance	Local community, Public Authorities	X					X									1

	60	Exacerbate risk of bribery and corruption	Local community, Public Authorities	X					X								1
	61	Increase conflicts fueled by certain minerals	Local community	X					X								1
	62	Fail to eliminate child labour from operations and supply chain	Local community, employees	X					X								1
	63	Withhold public access to public interest information	Local community, Public Authorities	X					X								1
	64	Lack of a good regulatory frameworks that may cause delays or bottlenecks in the administrative and licensing procedures for the quarries' operations	Public Authorities	X					X								1
SDG 17 Partnerships for the goals	65	Contribute to debilitating lobbying against global governance around climate change, circular economy and tax reforms	Local community, Public Authorities	X					X								1
	66	Erode domestic revenue collection and undermine public financing	Local community, Public Authorities	X					X								1
	67	Persist with the enclave model (lack of interaction and sharing of benefits with local communities)	Local community, Public Authorities	X					X								1
	68	Fail to publicly disclose public interest data on socio-economic, environmental and governance impacts	Local community, Public Authorities	X					X								1

ADDITIONAL RISKS	STAKEHOLDER INVOLVED	LIKELIHOOD					IMPACT					RS*
		1	2	3	4	5	1	2	3	4	5	
Unemployment due to operation ending	Local community				X					X		16

\*Risk Score

## List of Figures

Figure 1 Relationship between WPs 7, 8 and 9 ..... 8

Figure 2 Social Risk Matrix ..... 13

## List of Tables

Table 1 Potential risks in the European Raw Material (RM) sector .....	11
Table 2 Risk classification .....	14
Table 3 Key social risks - HANSON quarry .....	15
Table 4 Key social risks - HOLCIM quarry .....	15
Table 5 Key social risks - CIMPOR quarry .....	16