

INFACT

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ACCEPTABLE EXPLORATION TECHNOLOGIES

INFACT DELIVERABLE D2.4

ONLINE-SURVEY OF PUBLIC OPINION IN FINLAND, GERMANY AND SPAIN FINAL VERSION

Summary:

This document outlines and summarises the results of the ONLINE-SURVEY OF PUBLIC OPINION IN FINLAND, GERMANY AND SPAIN.

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Title:	ONLINE-SURVEY OF PUBLIC OPINION IN SPAIN, GERMANY AND FINLAND		
Lead beneficiary:	Ludger Benighaus, DIA		
Other beneficiaries:	UEF, SYKE, ATC		
Due date:	30. April 2018		
Nature:	Public		
Diffusion:	all Partners, WP-partners		
Status:	Final version		
Document code:	INF_DIA_D_2.4_Survey_Public-Opinion		
Revision history	Author	Delivery date	Summary of changes and comments
Version 01	NN	30. April	Review by authors
Version 02	NN	3 rd May 2018	Review by internal reviewer
Final version	NN	18 th May 2018	Final version

Approval status				
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Executive summary

In March 2018, a representative citizens' survey on mining and mineral exploration was carried out in each of the countries Finland, Germany and Spain. The aim of the survey was to collect and analyse the public attitude towards mining activities and mineral exploration.

It was structured in the following four sections:

1. Introduction
2. General attitudes towards mining
3. General attitude towards mineral exploration and their activities (helicopter, drones)
4. Attitude towards mining industry and public authorities

The raw data was collected by an online panel, exposing the respondents to a set of 21 questions, closed standardized and open-ended. App. 1000 respondents in each of the three countries Finland, Germany and Spain (total 3.000) of all ages and regions are involved, bringing insights about the public attitude towards mining, mineral exploration and the mining industry.

INFACT-Partners DIALOGIK, ATCLAVE, University of Eastern Finland and SYKE carried out the survey and analysed the data. Norstat in Germany, with branches in Spain and Finland, simultaneously collected the data with an online panel and their respondents' data base.

The results show that citizens in Finland, Germany and Spain have a positive attitude towards mining concerning the importance of the sector for the whole economy, the chances for employment and being independent by mining resources in the own country. People see a benefit for the local infrastructure and facilities when it comes to mining.

In general terms, Indifferent among the citizens' opinion is the trust and acceptance towards mining industry and how public authorities handle mining issues. Impact on environment caused by mining is seen as a huge issue. The citizens are unsure and indifferent whether mining is usually accepted by the local community or not.

Relating to exploration with non-invasive methods, like helicopters and drones, participants are generally not bothered. Some show an interest to learn more about the technology of non-invasive methods. Public might be concerned about the noise caused by the field research and about a drone which could observe the ground, violating privacy. A stable 10 to 15% of all participants show a very critical (very negative) attitude in general towards mining and mineral exploration.

The results give an overview of the general attitude towards mining and mineral exploration in the three countries and will support designing the stakeholder engagement process in each of the reference sites in Finland, Germany and Spain for 2018 and 2019.

1 Introduction

The level of knowledge about the attitude of the public towards mining in a broader sense differs significantly from country to country. As part of the INFACT-Project, an in-depth literature search examined the public opinion towards mining and exploration and factors that drive opinion forming (INFACT 2018). Here, all available studies and scientific articles on reputation of mining, with a focus on Europe and the reference site countries Finland, Germany and Spain, as well as Australia, Latin American countries and global perspectives from decision makers are taken into consideration.

While the knowledge base for Finland, due to intensive research activities in recent years, is very high, it looks limited for Spain and Germany. Based on the literature analysis (INFACT 2018), reputation is slightly positive in the reference site countries Finland, Germany and Spain. Driving factors that shape the reputation of mining are economic dependence on raw material, environment and health impacts, level public participation, and avoiding new mining into other areas.

The mining background plays a critical role for local reputation and is needed to understand the local perceptions and attitudes. With a good local identity towards mining, it could form a positive attitude, while with bad experiences and “scandals” with a local mine, it can negatively form the opinion of a whole nation. The work being done concluded that mining exploration reputation is not to be separated from mining sector. Not much is known about how and what people think about mining in general and mineral exploration, how they perceive mining industry and the relation to public authorities, and how it is linked to mining activities.

At this point, and the identified lack of knowledge about peoples’ attitude, the survey and the research questions are designed. The concept of a citizens’ survey – completely tailored to the needs of the INFACT-project – tries to examine and to get a deeper understanding of what people in selected countries really think and wish to get when it comes to mining and to the previous stage of mineral exploration. The results give an overview of the general attitude toward mining and mineral exploration in the three countries and will support designing the stakeholder engagement process in each of the reference sites in Finland, Germany and Spain for 2018 and 2019.

The team at INFACT sets up the following research question, each for countries Finland, Germany and Spain:

1. What do people think about mining in general?
2. What do they think and believe about mineral exploration?
3. What is peoples’ attitude towards the mining industry and public authorities?

For this, full representative samples of adults from Finland, Germany and Spain are involved in this study.

1.1 Objectives of this document

The main objective of this report, as outlined in the proposal for INFACT, consists of a broad and yet in-depth analysis of the perception and opinion-forming processes related to exploration in general and exploration platforms. To conduct this, the project partners, in close cooperation with an external contractor, examined attitudes via an online-survey reaching in Finland, Germany and Spain. 1,000 people in each country were asked to complete an online-questionnaire covering the topics of exploration. In the case of the northern test site preparatory engagement was completed prior to the online survey, to mitigate the risk that even its very topic was to provoke a negative reaction, via meetings with the local community.

An overview of the citizens' survey is given below.

Table 1: Overview of the citizens' survey.

	Description
Title of study	Citizens' survey on reputation of mining and exploration in Finland, Germany and Spain
Research questions	What do people think about mining in general? What do they think and believe about the mineral exploration? What is peoples' attitude towards the mining industry?
Target group	Citizens older 18 years in Finland, Germany and Spain, each country >1000, total 3000
Method, approach	Online panel in cooperation with NORSTAT questionnaires via internet, nationwide in Finland, Germany and Spain Representative quantitative study, duration each: 15 to 20 minutes, app. 20 standardized questions, few open answer questions
Structure of questionnaire	<ul style="list-style-type: none"> - Intro and demographic background - General attitude towards mining - Attitude towards exploration: helicopter and drone - Mining industry and public authorities

Product	Presentation with an overview of results in each of the countries (slide show) Report and deliverable for WP2 In-depth analysis of open-ended questions Part of the context analyse for designing the engagement process
Management of study	Coordination, concept and lead: DIA Case study Germany: DIA Case study Finland: UEF and SYKE Case study Spain: AT-Clave Advice from EFG, HZDR, SRK and advisory board

1.2 Method of online-Survey

Introduction

This survey aimed at answering various questions related to the public’s perception of and attitudes towards mining activities and mineral exploration in Finland, Germany and Spain.

Overview – Citizens’ survey in three countries

Number of participants in each country

- Finland (N=1.025)
- Germany (N=1.015)
- Spain (N=1.023)

Total: 3.063 people interviewed



Figure 1: Overview - Citizens’ survey in three countries.

The target group of this research were citizens older 18 years, located in Finland, Germany and Spain, around 1.000 participants per country, equalling a total of 3.000 participants.

1.3 Methodological Approach

This online panel was conducted in cooperation with NORSTAT. It comprised 1000 successfully completed questionnaires via Internet, nationwide in Finland, Germany and Spain.

Norstat handles huge datasets of persons who have registered for taking part of regular surveys. These datasets vary from country to country but can get up to 80.000 to 130.000 citizens of all ages and background, from all regions. As a standard process, the company Norstat sends a link that directs participants to the survey page, inviting them to take part in the survey. The participants complete the questionnaire. This allowed participants to answer the questions online, in a convenient manner that saved them the effort and costs of physical travelling.

Participants are being reimbursed for their time and effort. Personal data are kept completely anonymous and meet all national and international standards of data protection. This representative study took participants on average 15 to 20 minutes to complete, containing 21 standardised questions as well as open-ended questions.

The survey was conducted both in a quantitative and qualitative manner, using different types of questions i.e. closed and open questions, questions featuring statements allowing the participants to select the extent to which they agreed with a given statement in order to be able to represent the complexity of the issues in question in the best way possible. For organizational reasons, partners worked with a master-version of the questionnaire in English and translated this respectively into the language of the target country (Finnish, German and Spanish).

1.4 Structure of Questionnaire

The questionnaire was structured into four sections.

1. Introduction
2. General attitudes towards mining
3. General attitude towards mining exploration and their activities (helicopter, drones)
4. Attitude towards industry and public authorities

1. Introduction

Section one was the introduction that set the tone for the interview and gave participants some basic information about the project INFACT and data protection and asked about their demographic background such as age, gender and place of living.

2. General attitudes towards mining

The second section enquired about the participants' general attitude towards mining and asked about

- Mining activities at the place of residence
- Framing of the term mining
- Importance of mining industry in the country (employment, own resources)
- Benefit and critical effects for infrastructure, facilities, environment in community
- Social acceptance in a community.

3. General attitude towards mining exploration and their activities (helicopter, drones)

The third section was designed to find out about the participants attitudes towards mineral exploration, i.e. exploration activities with helicopter or drones.

4. Attitude towards industry and public authorities

The last part focused on attitude towards mining industry, their responsibilities and public authorities and the handling of mining.

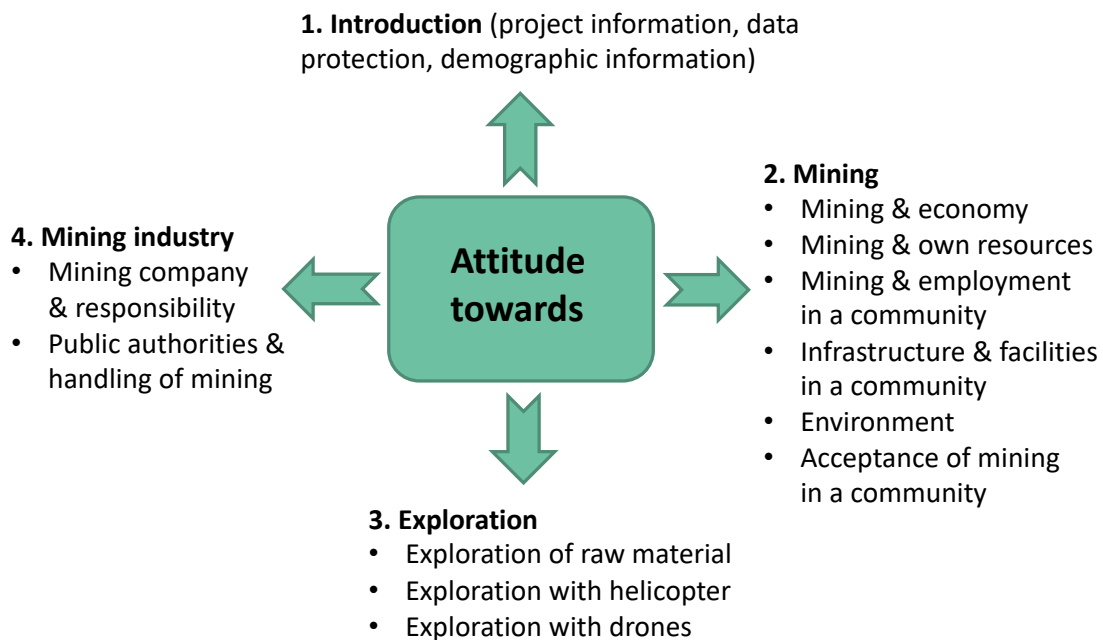


Figure 2: Four main topics of the citizens' survey conducted in Finland, Germany and Spain.

This figure gives a detailed overview of the four different section of the questionnaire as well.

1.5 Parties Involved

The concept of the survey was worked out by DIALOGIK in close cooperation with the Finish partners UEF and SYKE and the Spanish partner AT-Clave with helpful advice from EFG, HZDR, SRK and advisory board. The whole coordination with Norstat and the partners was realised by DIALOGIK.

DIALOGIK was responsible for the case study in Germany, the case study in Finland was conducted by SYKE and UEF and the Spanish equivalent was worked out by AT-Clave.

1.6 Example for a Question Page

This graph (Figure 3) illustrates an example of one question of the online panel to illustrate the overall set-up and layout of the survey design.

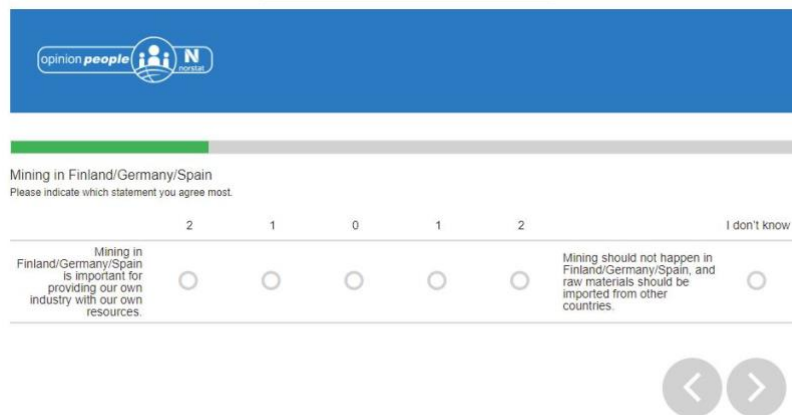


Figure 3: Example of question page at online panel (Screenshot Survey).

1.7 Representative Sample

The sample of all the interviewed participants was comparatively large, ensuring scientific research conditions with a total of 3.063 people who were interviewed in all three countries with the same questions. The sample sizes were nearly identical, so that the results are comparable: Finland (N=1.025), Germany (N=1.015) and Spain (N=1.023).

The samples in all three countries were rather large which clearly allows for a scientifically adequate results that represent the overall tendencies of a country very well. Also, a good dispersion of different ages, genders and locations considering the participants was ensured. The table below listed the representative distribution of gender and age of Finland, Spain and Germany. Compared to national distribution there is nearly a similar one in the different online-surveys which allows to applicate the result as for population representative surveys. Still it has to be said that people without the skillset to use this form of participation might be underrepresented (e.g. elderly technology-averse cohorts).

The high similarities between all countries imply that the survey has successfully been conducted in a coherent manner throughout all three countries.

Table 2: Population representative of age and gender in Finland, Germany and Spain compared with survey distribution in each country (analysis of raw data provide by Norstat).

Final distribution Finland			Final distribution Spain			Final distribution Germany		
total:	n	n	total:	n	n	total:	n	n
	1025			1022			1015	
	male	female		male	female		male	female
18-29	98	94	18-29	87	88	18-29	81	86
30-39	79	76	30-39	112	104	30-39	74	71
40-49	88	85	40-49	103	101	40-49	102	100
50-59	91	92	50-59	81	82	50-59	87	90
60-69	80	85	60-69	74	83	60-69	72	69
70-85	72	85	70-85	64	44	70-85	91	92
in %:			in %:			in %:		
	male	female		male	female		male	female
18-29	10%	9%	18-29	9%	9%	18-29	8%	8%
30-39	8%	7%	30-39	11%	10%	30-39	7%	7%
40-49	9%	8%	40-49	10%	10%	40-49	10%	10%
50-59	9%	9%	50-59	8%	8%	50-59	9%	9%
60-69	8%	8%	60-69	7%	8%	60-69	7%	7%
70-85	7%	8%	70-85	6%	4%	70-85	9%	9%
population representative			population representative			population representative		
%	men	women	%	men	women	%	men	women
18-29	10%	9%	18-29	9%	9%	18-29	9%	9%
30-39	8%	8%	30-39	11%	10%	30-39	7%	7%
40-49	9%	9%	40-49	10%	10%	40-49	10%	10%
50-59	9%	9%	50-59	8%	8%	50-59	9%	9%
60-69	8%	8%	60-69	6%	6%	60-69	7%	7%
70-85	6%	8%	70-85	6%	8%	70-85	7%	9%

1.8 Conclusion

It can be said that the sample sets of citizens were very well set up in the distribution of age and gender compared to the national one for analysis of the perception and attitude of mining and exploration and allows a substantial comparison amongst the three countries.

They were similarly constituted considering sample size, gender diversity, diversity of community size and age which allows a good comparison of the results. The perceptions considering the different topics did not vary greatly.

This very balanced precondition already set the tone for the overall results of the research.

2 Results of Public survey in Finland

2.1 Demographic structure of respondents

Gender

The Finnish sample consisted of 50% female (n= 517) and 50% male (n= 508) participants. The total number of participants was 1025.

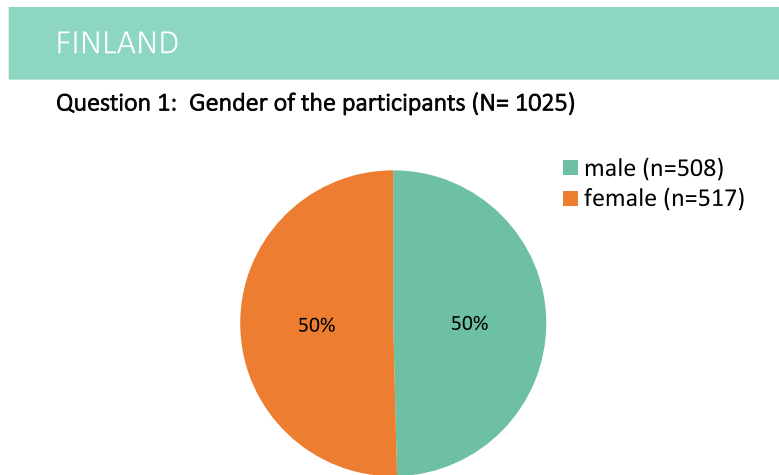


Figure 4: Finland question 1 - Gender of the participants (N= 1025).

Age

In terms of the age of the participants the Finnish survey included 19% young adults (18-29, n=192), 15% of middle-aged adults (30-39, n=155), 17% of older adults (40-49, n=173), 18% of old adults (50-59, n=183), 16% of senior adults (60-69, n=165), and 15% of the oldest age group (70-85, n=157). This means that the ages of the participants were very balanced, with a slight surplus in the youngest age group.

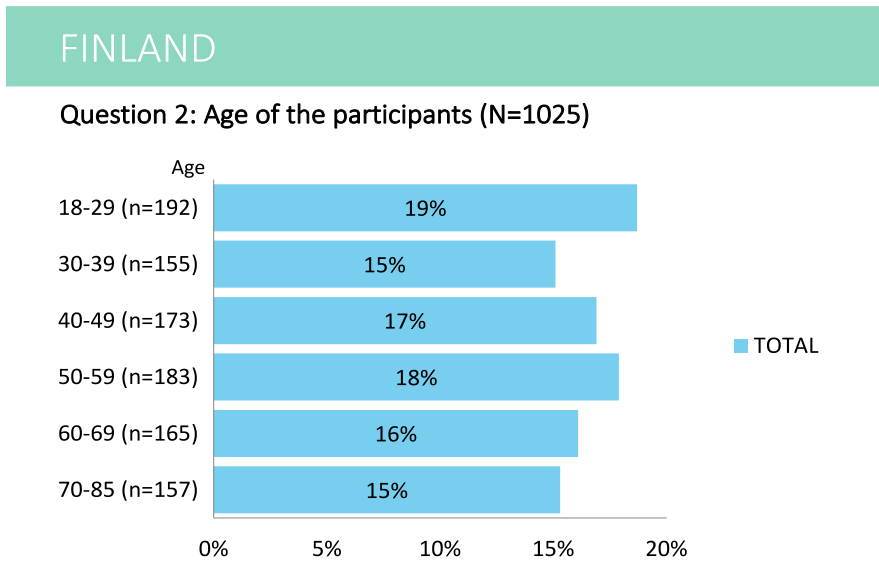


Figure 5: Finland question 2 - Age of the participants (N=1025).

Urbanity

Concerning the population sizes of the communities of the Finnish participants, the biggest group of participants (23%) came from cities with 10.000-49.999 inhabitants. The second largest group (20%) came from the largest city, Helsinki, which is the only city in Finland with more than 500.000 inhabitants. Typically, the Finnish municipalities are rather small: the mean size was 17.695 inhabitants and the median was 6.137 inhabitants in 2016. There were no participants from towns or communities with less than 500 inhabitants and only 1% of the participants were from a community with 500-999 inhabitants. 5% of the participants were from communities as big as 1.000-4.999 inhabitants and 8% from towns with a population between 5.000-9.999 inhabitants, which is the size of most municipalities that have metal mining industry in the country. 13% of the participants were from cities ranging between 50.000-99.999 inhabitants and 15% came from cities as big as 100.000-199.999 inhabitants. 17% of the survey participants live in cities with a population ranging from 200.000 to 499.999 inhabitants. There are nine cities in this size category, mostly in southern and western parts of the country. Thus, it can be said that Finnish respondents were still rather diverse, when considering that the largest group (23%) came from suburban sized communities, which balanced the second largest group (20%).

FINLAND

Question 4: "I live in a town or city with a population of around..."

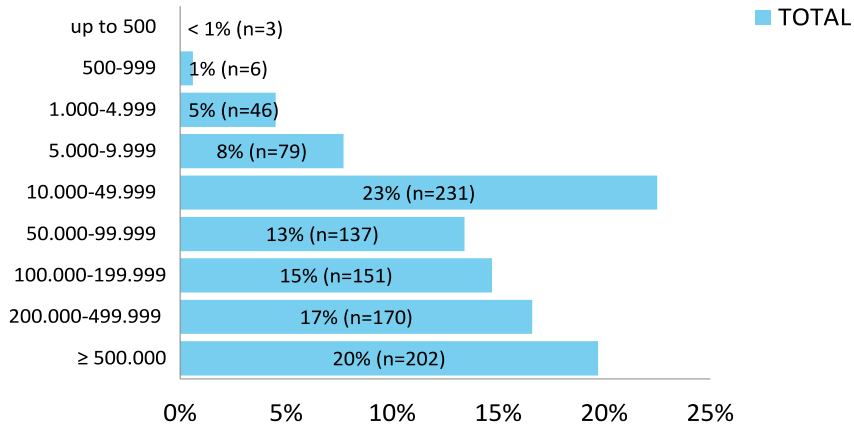


Figure 6: Finland question 4 - "I live in a town or city with a population of around..." (N=1025).

Place of Residence influenced by Mining Activities

A large proportion of the participants (68%) claimed that their place of residence is not affected by mining activities, 20% were not sure whether that is the case or not, and 12% claimed that their place of residence is indeed affected by mining activities. This result is very much in line with the previous question, since in Finland, 7 out of 9 municipalities with metal ore mining have 4500–9300 inhabitants and two mining related cities have about 10.500 inhabitants.

FINLAND

Question 5: "My place of residence is influenced by mining activities" (N=1025)

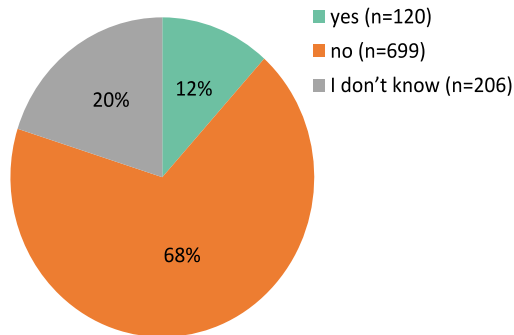


Figure 7: Finland question 5 - "My place of residence is influenced by mining activities" (N=1025).

2.2 Attitude towards mining in general

General attitude towards mining

The participants were asked to respond with as many words or sentences as they wish to the open question “What comes first to your mind when you hear the word “mining”?”

All respondents answered to this question – one with a question mark and little bit more than 20 by answering “I do not know” or “Nothing to say”. By far the most common answer to this question was “Talvivaara”, which appeared in the answers 225 times. The mine is now owned by the state-owned company “TerraFame” – which appeared 10 times in the responses. While this was to be expected considering Talvivaara’s media presence in the recent years, perhaps its overwhelming prevalence in nearly 23% of the responses still came as a small surprise. By comparison, the second most commonly mentioned mine was Outokumpu, which came up 39 times in the responses. Outokumpu mine was a state owned mine in Eastern Finland and operated from 1910 to 1989, and it had a very important role in the economic growth of Finland in the 1900’s. Other specific mines had only few mentions.

A second clear and popular theme (about 13%) in the answers was the environment (102) and nature (91), which were almost without an exception linked to the negative environmental impacts, like dust, noise, spoiled landscape, or to the perceived high risk of negative impacts of mining. It is safe to assume these two themes are connected as Talvivaara’s negative environmental impacts have been widely discussed in media locally as well as nationally (e.g. Tiainen et al. 2014). This was shown also in many of the answers where Talvivaara and the negative environmental impacts were mentioned together.

A common and quite neutral theme was related to the common extractives and mining related activities. “Ore” (132), “gold” (81), “metal” (47), “mineral” (39), “mine/mining” (louhos/louhinta in Finnish, 147) and “digging” (38) had relatively high number of mentions.

Work or employment (92) brought by the mines was often mentioned in the responses as a positive issue. However, several responses included both the positive impacts of employment and the impacts on environment, which was also brought up in the other open questions of this survey. Money (32) was mentioned in both positive (mining as a source of incomes) and negative (greed or waste of money) contexts. Foreign mining companies were mentioned 33 times and almost completely in negative context (e.g. exploiting the nature and taking the benefits out of the country).

Perceived positive aspects from mining

The participants were asked to “Write down arguments that you believe support mining”. This was an open question with three open columns for positive arguments.

The clearly highest recognized benefit from mining was work, employment or increasing employment, which were directly mentioned 686 times. Some respondent emphasized that it is important to create

jobs for local people and contractors as well. Furthermore, it was noted that there may be some increase on the demand of (local) services. In addition to employment, mining industry was seen to benefit economically Finland as well as the mining companies. Mining industry will in some cases promote local and regional development and bring tax revenues.

122 respondents answered with variance of “I don’t know” or with a question mark, dash or some other mark. There was also a group of respondents answering there are no benefits or it is difficult to find any.

Perceived negative aspects from mining

As in the previous question, the participants were asked to “Write down arguments that you believe are against mining”. Similarly, this was an open question with three open columns for the negative arguments.

Nearly all respondents answered to this question in the first open column (about 40 empty answers, or do not know / undecided). Not surprisingly, negative environmental impacts and risks were the clearest group of arguments. With these, the respondents referred for example to the negative impacts on water systems, harmful wastewaters, increase in heavy traffic in the area, dust, noise and depletion or overuse of natural resources. Safety and health risks were also mentioned.

The other big group of answers was connected to economic issues. The respondents noted for example that the income from the mining industry is not for the local people but will mainly go abroad to global mining companies. In this sense, it was believed, that mining industry does not benefit the local or regional economy.

Mining and economy

Participants were asked on a scale from 1-5 how much or little they agree with the statement “Mining is an important industry in our country.”

In Finland 18% fully agreed with this statement, 39% partly agreed with the statement, 18% said that they neither agreed nor disagreed with the statement as such, while 13 % partly disagreed and 7% fully disagreed. 6% stated to not have an opinion concerning this statement.

The results indicate that the perception of public for this statement is largely on the positive side since almost two thirds agreed fully or partly with the importance of mining and only one fifth disagreed with the statement. The results are in line with Jartti et al. (2017), who’s data showed that mining is generally considered as central to Finland. The importance of mining was higher in mining and other regions compared to metropolitan region with higher disagreement. Interestingly, and compared to the amount and visibility of mining in media, Jartti et al. (2017) found, that mining was the least important sector to the future of Finnish economy according to the participants, when they were asked to compare it with

the other sectors (forestry, mechanical engineering industry, electro technical industry and food industry were rated as the most important). In the metropolitan region of Uusimaa it was considered as least important.

Mining has been in the public discussions in Finland since the mining boom started in the beginning of 21th century. Mining industry has enjoyed strong support from the government and has been included in governmental strategies (Programme of the prime minister Katainen’s Government 2011, Arctic strategy 2013, Prime minister Sipilä’s government proposal to amend the Mining Act 2017).

The latest topics of discussions have been related to the importance of mining when considering the aims of low carbon and circular economy. For example, the need for metals and minerals for solar panels and batteries of electric cars have been in the public discussions. The image of mining industry has been seen from a different angle – new low-carbon energy sources are possible because of mining.

FINLAND

Question 9: To what degree would you agree with this sentence: “Mining is an important industry in our country.” (N=1025)

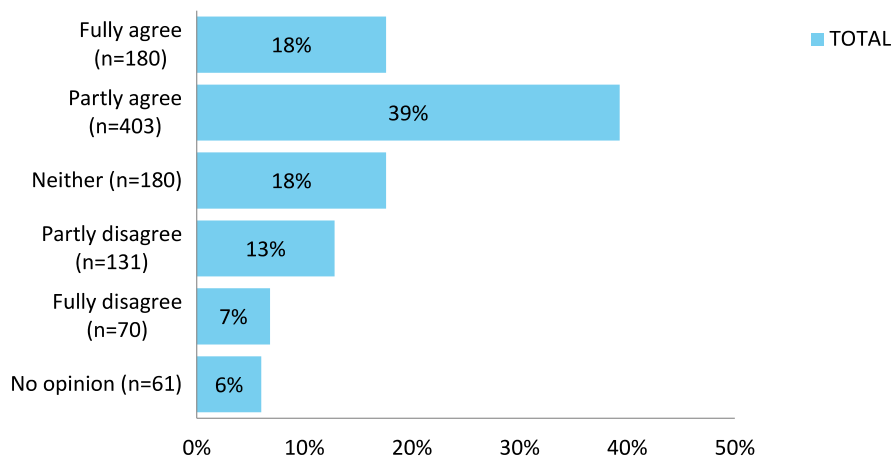


Figure 8: Finland question 9 - To what degree would you agree with this sentence: “Mining is an important industry in our country” (N=1025).

Mining and domestic resources

The participants were asked whether they tended to think mining in Finland is important for providing its own industry with resources on the one end of the scale or at the other end, whether they believed mining should not happen in Finland and raw materials should be imported from somewhere else.

30% were fully in favour of the statement that Mining in Finland is important for providing its own industry with resources. 38% agreed with this less strongly, while 15% neither agreed with the one nor

the other statement. 5% rather thought the statement “Mining should not happen in Finland, and raw materials should be imported from other countries.” to be more valid, while as low as 2% fully agreed with this statement. 11% stated that they did not know how to answer this question.

FINLAND

Question 10: Mining in Finland - Please indicate which statement you agree most. (N=1025)

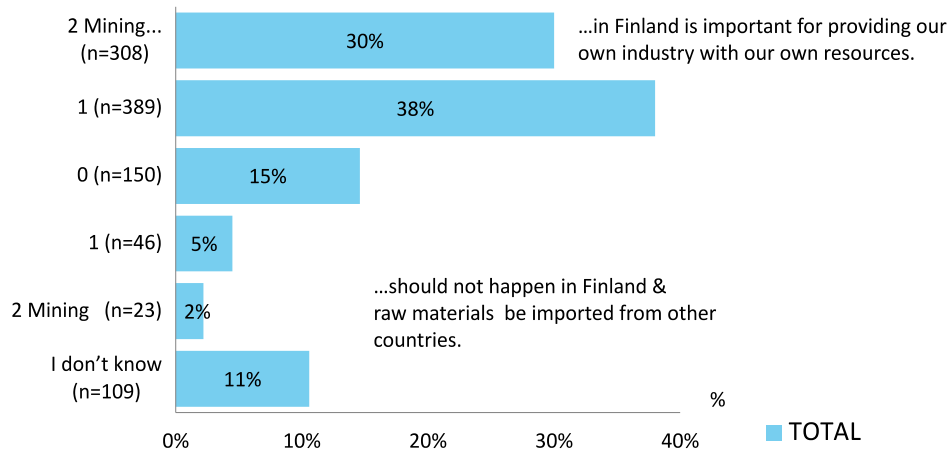


Figure 9: Finland question 10 - Mining in Finland - Please indicate which statement you agree most (N=1025).

The question of importance for providing material for our own industry is confusing because there is no way to control the free markets of the extracted ore or the metal products produced. However, this statement has been mentioned many times in the national strategies and is therefore often heard explanation why mining is needed in Finland. Quite many (11 %) felt that they do not understand or know how mining really relates to the national economy.

Mining and Employment in the Community

A mining project often leads to high economic expectations. Considering the perception of the correlation between mining and employment in a community, the Finnish participants were given two statements. One in favour of the idea that mining creates many jobs locally, leading to the whole community benefitting from it and another one stating that “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” People then could indicate on a scale with those two statements on the far ends, how much they agree with them.

31% of the Finnish participants believed “Mining creates many jobs locally and the whole community benefits from this”. 39% did not fully agree with that statement but indicated that they rather agreed

with the positive effect on employment through mining activities. This is an expected result since there have been several studies about mining industry and the increase in employment in municipalities that suffer from relatively high unemployment. At the time of the opening of Talvivaara mine, the mining industry was touted as a saviour of the people in Kainuu, an area which has experienced high unemployment (e.g. Mononen 2015; Sairinen et al. 2017). However, several studies (Törmä & Reini 2009, Laukkonen & Törmä 2014) indicated more job creation than later occurred in practice. However, the mining industry has held the impression of an industry that creates jobs. The local multiplier effect of those who work for the mining companies creates jobs in the service sector at the community and add tax revenues for the local administration. Therefore, it may be seen that it is not only a question of jobs in the mines, but also about the community benefits. However, in some cases commuting may hinder this effect, since the availability of housing near the mining site is not always sufficient or the mine-workers do not want to move near to mining site permanently. Commuters may pay taxes to another municipality and the community where the mining is taking place does not benefit from them. (e.g. Mononen 2012; Mononen & Suopajarvi 2016; Mononen 2018.) This may be reflected in the answers as about one fifth of the respondents had either neutral or negative impression on mining’s employment effects.

11% did not lean towards one or the other statement. 6% rather thought the statement “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” to be correct and only 5% fully agreed with the negative statement. 8% indicated “I don’t know” as their answer to the question.

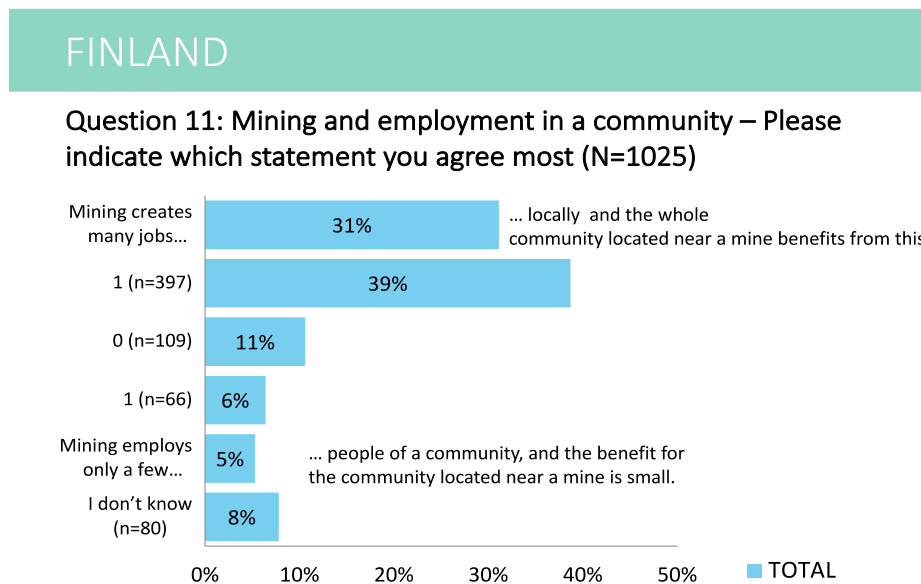


Figure 10: Finland question 11 - Mining and employment in a community – Please indicate which statement you agree most (N=1025).

Infrastructure and Facilities in the Community

In order to find out what the perceptions of the Finnish people are regarding the effects of mining on the infrastructure and facilities in the community, the participants were given two statements: one positive towards the effects of mining on the local infrastructure and facilities (“Mining creates new infrastructure and facilities to the community”) and one negative (“Mining does not much contribute to the local infrastructure and facilities”). The statements were at the different ends on a scale and the participants could select whether they fully agreed, partly agreed, neither agreed nor disagreed with either of the statements. Finally, they could also mark “I don’t know” as a possible answer - which 11% did.

In Finland 21% fully agreed with the positive statement that mining indeed creates new infrastructure and facilities locally and 37% thought this statement was partly correct. 15% did not lean towards either the positive or the negative statement. 10% of the participants thought that the negative statement was partly correct and only 7% fully agreed that mining does not contribute much to the local facilities and infrastructure of a community.

The life cycle of a mine can impact infrastructure creation. In some municipalities new mining projects can cause growth in infrastructure. Municipalities may construct new services, such as housing, health care centres, day care and schools for children. This can happen before the municipality gets any benefits by taxes from the mining. For this reason, small municipalities can sometimes find it a challenging task. However, this kind of visible growth is more typical for small municipalities with new mining projects. Mine-workers and contractors can of course invigorate the local economy whether they live permanently near the mining site or not. In Finland the municipality of Kittilä is often shown as an example where the municipality, other livelihoods and mining have supported each other and created growth to the local businesses and people.

A new mine may also cause pressure for construction of new housing for the new labour, which may cause disturbances on local housing markets. In some cases, when the mines close after functioning for 30 years, the infrastructure and housing built for the operational phase of the mine may be left underutilized.

In contrast to above, in some recent Finnish studies (e. g. Mononen 2012; 2018) it has become clear that new houses or apartments are not being built, but old ones are used and repaired if necessary. In most cases, the workers do not move permanently to the local communities affected by the mining projects, and instead renovate and rent existing apartments. In addition, the mining companies have implicated that it is not on their responsibility to build or refurbish the infra. They build the roads for their operations and not for the locals. Of course, local people can benefit from this as well. Mining companies’ task is not, at the first hand, to act as a regional or local developer.

As noted in the question regarding the benefits of mining, unlike earlier practice, miners now travel longer distances to find employment and change employers according to the opening and closing of mines. This phenomenon is known in international discussion as drive in – drive out or fly in – fly out. These terms refer to the workers commuting between their places of residence and workplaces in situations where the distance between two is so long that daily commuting is not possible or practical. The workers live part of the workweek or even several weeks near the workplace. This is well illustrated for example in case of Pampalo gold mine. (Mononen 2012.)

FINLAND

Question 12: Mining and mining regions - Please indicate which statement you agree most. (N=1025)

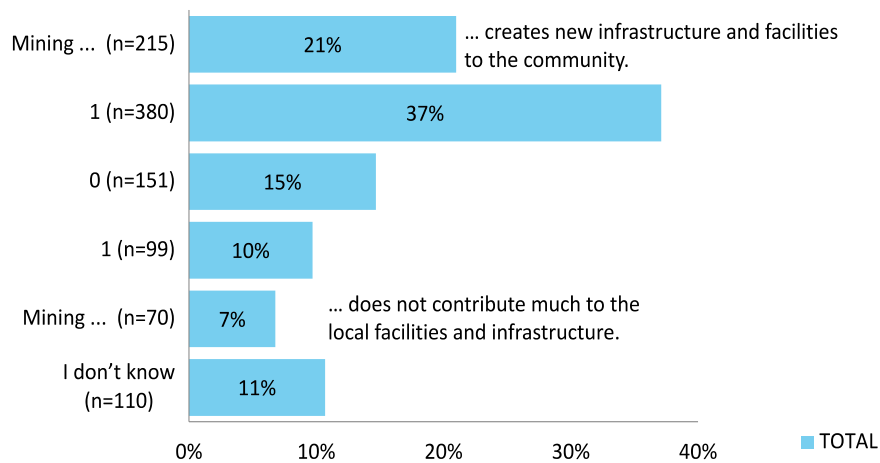


Figure 11: Finland question 12 - Mining and mining regions - Please indicate which statement you agree most (N=1025).

Besides possible local infrastructure investments, mining is in some cases important factor in regional or national level infrastructure investments. New road connections have been built and railways planned to enable the transportation of ore to the markets. For example, the Finnish government funded 5,6 million euros construction of two bridges and a road to Kevitsa mine. Such infrastructure projects bring employment and tax revenues to the region. There are two big infrastructure projects that have been discussed regionally and even nationally in the recent years. First, the Sokli railroad, which would connect the northeastern mine to Rovaniemi and second, the arctic railroad, which would be constructed to connect the mining industry to the harbours of the Arctic Ocean. The difference of what infrastructure is created by local funding (such as schools, kindergartens and health care centres)

and which is regionally or governmentally funded (such as railroads, highways) is not always clear for the public.

Finally, it should be considered that the research sample is emphasizing big cities. The people living in small mining municipalities may have different perception. This should be examined later in more detail, while taking into consideration the background of the respondents.

Environment

Environment is an important issue when discussing the possible challenges of mining with stakeholder engagement. Thus, it is important to understand the public perception of environmental impacts caused by the mining activities.

In Finland only as low as 3% of the participants stated that “The impact on the environment caused by mining is minor and can be handled well.” 9% partly agreed with this statement. 34% agreed partly with the statement “The impact of mining on the environment is huge and its consequences are not acceptable, while a total of 26% of the participants fully agreed with this statement. Only 9% decided to mark “I don’t know” as their answer.

The responses are clearly on the negative side. As discussed already in the context of the open question “What comes first to your mind when you hear the word mining”, the public perception may have been influenced by the few mining projects where environmental problems have been prominently in the media, documentaries and even in a fictional movie. The court cases have been going on for years where companies and their management have been accused of neglecting the environmental issues.

While Talvivaara is not the only mine with environmental and other problems, it is often referenced in the context of new mines. Fearing the worst-case scenario or “fear of another Talvivaara” was a theme that was brought up in the open answers of this survey as well. It could be argued that the few bad cases take all the space from the media and thus may influence the perceptions in unbalanced manner. The mining projects which are run without environmental or other problems seldom appear in media and public discussions compared to the troubled ones.

The results suggest that in Finland, it will be of special importance to inform the public of any environmental issues and if possible, alleviate the pre-existing fears, to conduct mining activities successfully. For example, public events connected to the environmental impact assessment process of certain mining projects are a good opportunity for the residents to get more information.

Question 13: Mining and environment - Please indicate which statement you agree most. (N=1025)

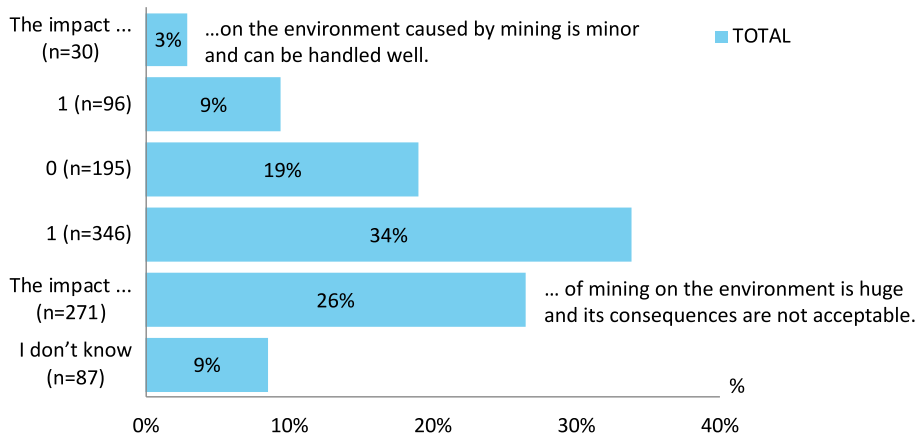


Figure 12: Finland question 13 - Mining and environment - Please indicate which statement you agree most (N=1024)

Acceptance of mining in a community

To determine the existing notion of the Finnish public regarding how socially accepted mining activities are in general, the participants were given two statements: one stating that mining is indeed well accepted by the local communities and another one stating that mining causes a lot of controversies in the mining community. The respondents also had the option to say that they did not know the answer, which 19% of them did. Furthermore, this question was accompanied by an open column where the participants were asked to comment on their answer.

The number of people indicating “I don’t know” is possibly this high because most people are not living in a community affected by mining. As for the positive statement “Mining is well accepted by most local communities – only 6% agreed fully and 20% agreed partly. This may be because the respondents have not experienced the situation first hand in their communities.

19% of the respondents were indecisive by choosing the neutral option between the two statements. 20% of participants partly agreed with the negative statement “Mining causes a lot of controversies in the community in which mining is conducted” and 16% fully agreed with the negative statement. This could be explained once again by the previous results which have shown that people previously unaffected by mining tend to judge mining more negatively than people who come from areas affected by mining.

FINLAND

Question 14: Mining and social acceptance - Please indicate which statement you agree most (N=1025).

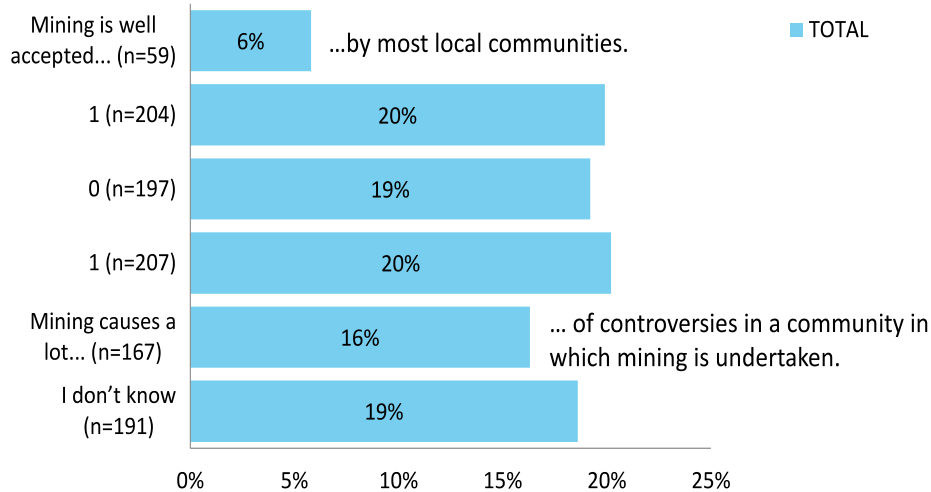


Figure 13: Finland question 14 - Mining and social acceptance - Please indicate which statement you agree most (N=1025).

People may have different reasons for their negative attitudes towards mining. Some may have negative perception because of negative environmental impacts or because of other disturbances. It is also a recognized phenomenon that local community residents may sometimes feel that newcomers are dispersing the community socially and culturally. On the other hand, newcomers can be welcomed as they bring new life and activity to the area (Kuisma & Suopajarvi 2017). In her recent study, Suopajarvi (2017) found that many of the mine-workers (exploration and actual mining) were not keen on staying in Sodankylä. “The real personal life” seemed to be somewhere else, as their families and homes were still in the former place of residence. Furthermore, their families often did not want to move to a small place like Sodankylä.

In several places tourism entrepreneurs oppose mining as the key attraction for tourism in Lapland is the untouched wilderness and there is a fear that establishing a mine would break that image.

Answers to the open question concerning the acceptance of mining in a community

While the respondents were asked to comment freely on their answer, there were only 379 responses altogether and again, most of the answers were connected to the negative impacts of the mining industry. If mining industry is handled well as a whole, it is acceptable, as products of mining industry

are needed in society. It seems that the respondents are trying to balance themselves between the negative environmental impacts and the positive economic impacts. There are always some actors getting the benefits while others suffer from the negative impacts. In the comments, it was noted that the mining industry is needed but monitoring and controlling of mining must be strict.

2.3 Attitude towards mineral exploration

General attitude towards mineral exploration

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important need in the eyes of the public.

In the first question of this section, the participants were asked to describe “What is the first thing that comes to your mind when you hear the word “exploration”?” The answers could be divided into distinct groups here. One group was connected to the technique and the technical performance of exploration. Respondents for example mentioned holes, stones, drills and drilling, finding new ore and deposits, using Geiger counter, and mapping. Some other minor groups of responses were connected to professions, like geologist and miner, but also to a hobby and everyman’s right.

There were also some (mental) images connected to mining and especially old-fashioned techniques and tools were mentioned. These covered answers like hammer and hoe and a man with a hoe. Furthermore, gold and gold panning were mentioned in some answers. Rest of the answers covered wide variation of images of exploration, themes and comments, such as big machines, mysterious, secretive, uncontrollable and slow. Exploring was, however, considered in many answers to be interesting. Some of the respondents did not know or were undecided. This may reflect the fact that exploration is invisible to the majority of the public and thus, an unknown part of the mining life cycle. About 100 respondents answered “Do not know” or “Undecided”.

Exploration of raw material

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important activity in the eyes of the public.

FINLAND

Question 16: Exploration in Finland - Please indicate which statement you agree most (N=1025).

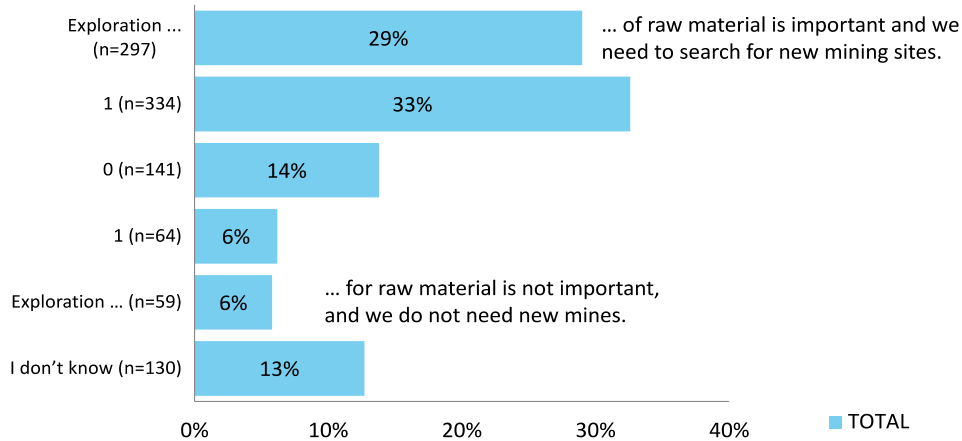


Figure 14: Finland question 16 - Exploration in Finland - Please indicate which statement you agree most (N=1025).

The participants were again given two statements – a positive one “Exploration of raw materials is important, and we need to search for new mining sites” and a negative one “Exploration of raw materials is not important, and we do not need new mining sites.” Here again the participants could mark whether they fully agree with either statement, partly agree, agree with neither or that they did not know the answer.

In Finland 29% fully agreed with the positive statement and 33% partly agreed with the positive statement considering the need for more mining activity.

14% were neither for one nor against the two statements. As for the negative responses, a total of 6% agreed partly with the critical statement and 6% fully agreed with the negative statement. 13% stated that they did not know the answer to the question.

Exploration seems to be acceptable, but it must be noted, that it is often invisible. Furthermore, it is not well known or understood in public what exploration means in practise. This was also suggested by the widely varying answers in the previous question.

Exploration with drones

One important aspect in this research concerns the public acceptance of the different flying devices that will be used to assist in assessing the ground conditions for mining activities. Thus, the respondents were asked to imagine seeing a drone flying about 100 metres distance from them when they are having

a walk – what do you think? Before the question, there was an explanation for the usage of drones and some information about the speed.

The participants had the options of agreeing fully or partly with the positive statement that they would not be bothered by drones or agreeing fully or partly with the negative statement that this indeed would bother them. They could also state that neither would be the case or that they did not know how to answer. Furthermore, the question was accompanied by an open column where the participants were asked to explain their answer.

In Finland 34% responded that they would remain entirely unaffected in the occurrence of such an event, fully agreeing with the positive statement that they would not be bothered by it. 25% partly agreed with this statement.

12% agreed with neither of the statements and 5% claimed to not know the answer.

As for the negative statement, a total of 9% said that this indeed would be a problem for them and they would feel bothered by a drone flying in their visual periphery, while 15% said this could potentially be a problem for them and that they might be bothered by a drone in their proximity.

Even though this suggest a slightly more positive attitude towards the technology, it would make sense to try providing the affected groups with more information so that their potential worries could be decreased and even eliminated.

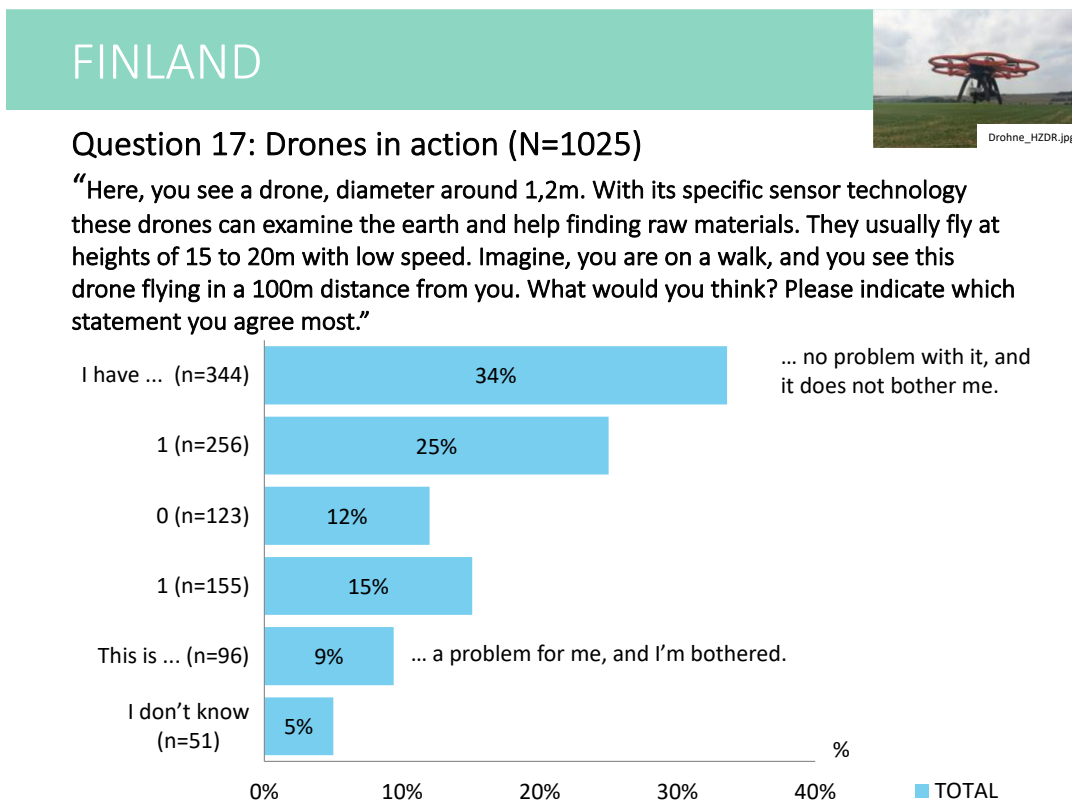


Figure 15: Finland question 17 - Drones in action (N=1025).

The positive results may suggest that people trust that the drones are used in a proper way for useful purposes. Media has been reporting many uses for them, such as the police searching for lost people in the wilderness, the authorities using drones in flood protection, discovering oil spills from vessels, detecting power lines, assessing wind turbines and roofs, border guards monitoring the borders, post delivering mail to remote areas (islands) and even farmers mapping crop damages. After some incidents of smuggling at the east border of Finland, the legislation is under change and the police will be granted a permission to shoot down drones which are used for illegal purposes. The positive news generates trust that drones are used for good purposes and not only for war and spying.

Answers to the open question concerning exploration with drones

In the open comments, the lack of information about using drones was clear. Drones seem to be something new to respondents as only less than 500 respondents commented their answer. Many wrote that they have no experiences with them, but in the answers, drones were also described to be scary, funny, and some mentioned UFOs and antennas. Many answered that they may find it scary at first. Some answered that there may be the feeling that someone is watching them or keeping an eye on them. It was very clear that the respondents wanted more information before any possible exploration in a specific area to prevent fears and suspicions.

Finally, the respondents also wrote that drones are part of the future and the contemporary technology, and perhaps even more ecological compared to the other methods of exploration.

Exploration with helicopters

The question about exploration with helicopters had identical format with the previous one, including the possibility to explain the answer in an open column. When asked about helicopters with the sensor equipment conducting test flights, 35% of the Finnish participants were fully accepting this technology and 25% were positive towards it. 14% were neither for nor against either of the statements, while 4% chose "I don't know" as an answer.

Only 9% were opposed of the idea of helicopters flying in their proximity and 13% were critical towards it but did not entirely dismiss the idea of having helicopters flying in their proximity and conducting research.

The helicopters are perceived in mainly positive manner as they are used for several good purposes. They are used in emergencies by rescue teams and Mediheli and Aslak (privately sponsored rescue helicopter) bring doctors to sparsely populated areas or evacuate patients from accident sites in urgent need. Furthermore, the border guard uses them, rescue teams use them in marine accidents, and power companies use them to clear the power lines. Finally, the defence forces use them for national security.

Private helicopters are not that common and leisure use is rare. In Lapland some companies fly tourists to the wilderness, but as it is part of important business for the local people, the attitude may be tolerant. Finally, reindeer herders use helicopters in their work when they are gathering the reindeer together.

Answers to the open question concerning exploration with helicopters

In the open comments, just as with the drones, helicopter exploration seems to be a new issue to the respondents: there were lots of empty answers. Some respondents supposed using helicopters to be noisy and thus, tranquillity would be lost. Some wrote this kind of activity does not belong to the Finnish nature. On the other hand, some answered that this would not disturb them. Others said that this method is interesting, and unlike drones, identifiable. Information was said to be important, as it will diminish the fears and suspicions. Without good communications the activity could cause some confusion and suspicion.

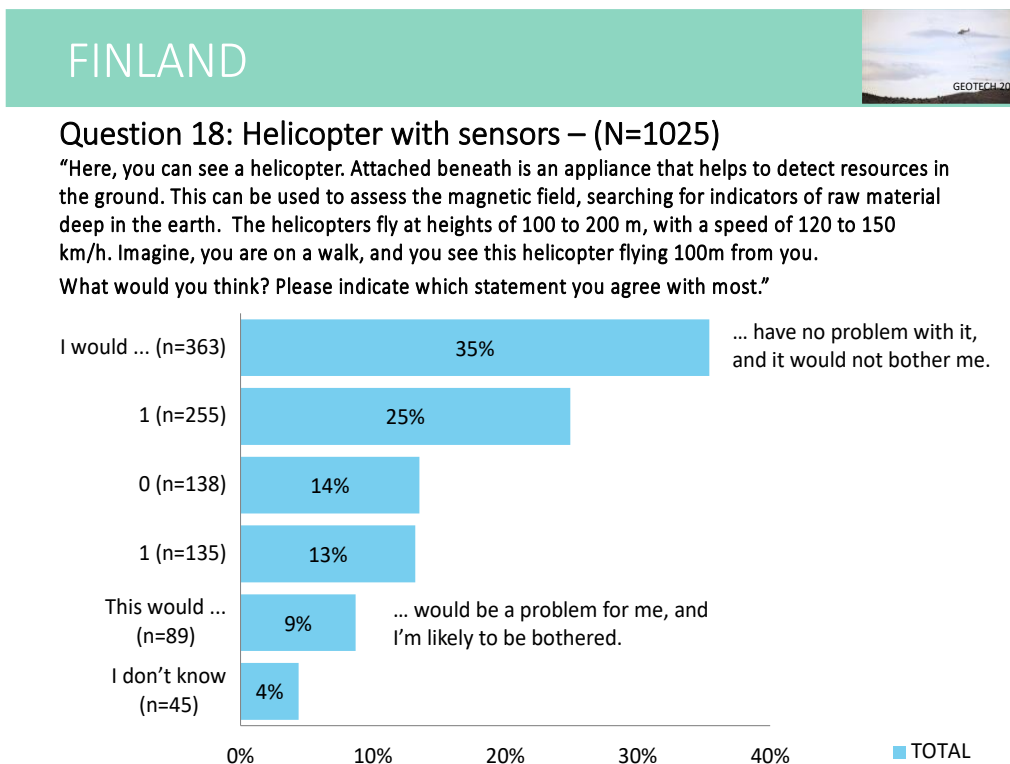


Figure 16: Finland question 18 - Helicopter with sensors (N=1025).

2.4 Attitude towards mining industry and public authorities

Mining companies and responsibility

To ensure that people accept mining activities in their communities it is important for them to trust that the involved operators manage their activities in a responsible manner. This question asked the participants whether they trusted that the mining industry in their country was handling matters either in a fair and responsible manner or whether they did not trust the mining industry to do so. They could fully agree with either of the statements, partly agree or not to agree with either of the statements. They could also pick the “I don’t know” option, which 5% did.

13% of the Finnish participants were fully positive and 28% were partly positive towards the way the mining industry acts. 19% neither trusted nor distrusted the way the mining industry acts in Finland.

Complete distrust was indicated by 16% of the participants and lower amount of distrust was indicated by as much as 18% of participants.

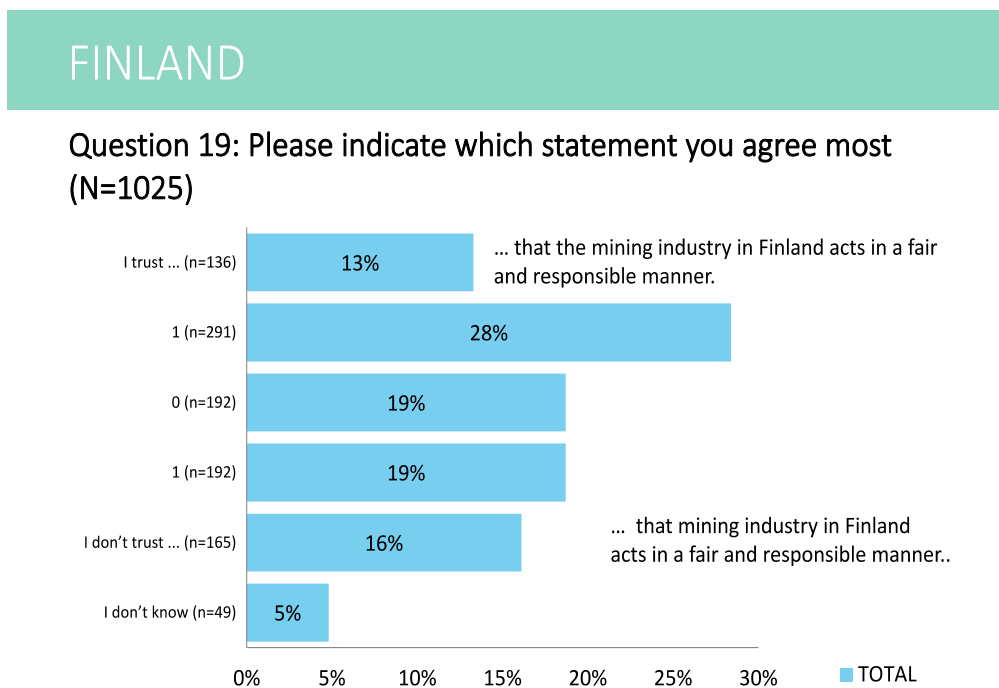


Figure 17: Finland question 19 - Please indicate which statement you agree most (N=1025).

Trust in mining companies is surprisingly high, taking into consideration the wide discussions in media about environmental negligence of mining companies and international companies extracting Finnish natural resources for “free”. Indeed, in contrast to the image you might get from these discussions, Mononen (2012) found that the residents near Pampalo gold mine had high trust in the mining company. The interviewees knew that the requisites for the environmental permits are strict. Furthermore, many of the interviewees also trusted the authorities. Since the environmental impact

assessment had been already made and the mine had an environmental permit, the interviewees thought they could trust the operators. If they suspected that the mining operation would cause environmental problems, they would at the same time suspect the experts, meaning the management of the mining company and the environmental authorities.

Public authorities and their handling of mining

In this question the participants were asked if they trusted the public authorities by giving them the statement “Public authorities in Finland handle all the issues on mining well.” They were asked to indicate their approval of this statement by marking whether they fully agree, partly agree, neither, partly disagree or fully disagree. They could also state that they did not have an opinion, which 8% of the participants did. Only 4% of the Finnish participants stated that they fully agreed with the statement and 24% partly agreed.

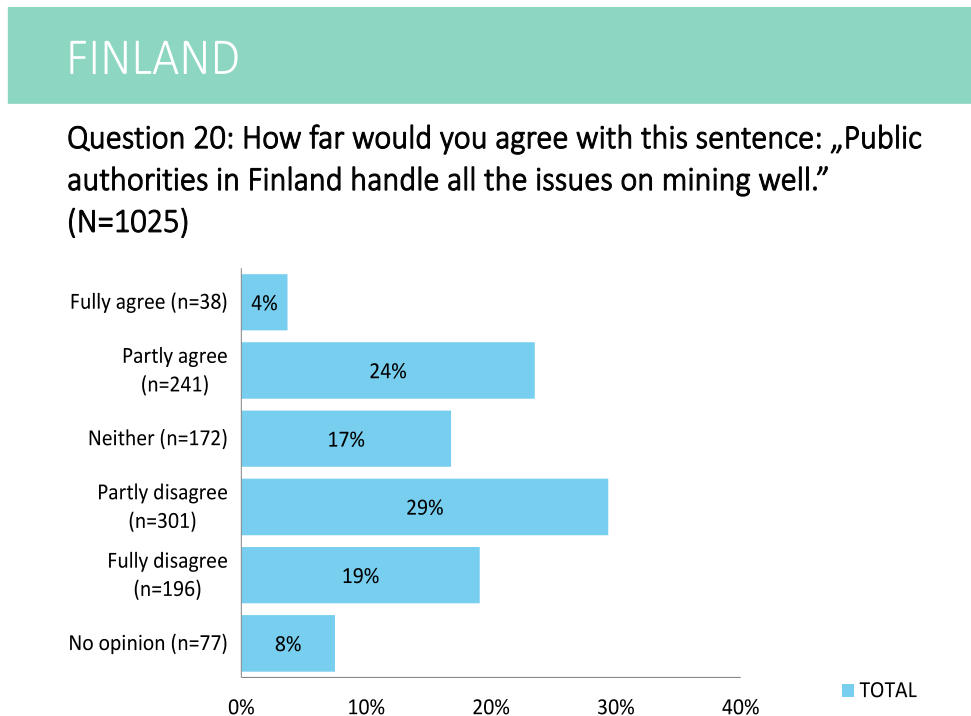


Figure 18: Finland question 20 - Please indicate which statement you agree most (N=1025).

17% of the participants did not agree with either statement. 29% stated that they partly disagreed with the given statement and 19% answered that they fully disagreed with the statement in question. Generally Finnish people have a high trust in authorities. However, the mining authorities are an exception as has been illustrated in several studies (e.g. Tiainen et al 2014; Sairinen et al. 2017). One of the recent environmental negligence cases, Talvivaara, highlighted that the authorities were lacking resources for monitoring the mining activity. This was brought up strongly by the media and even

though the responsible authorities have been provided with additional resources since, it is difficult to restore the trust that has been lost. One reason for this specific image of mining authorities is the long lasting juridical processes of Talvivaara mine.

Last question and additional comments from the Finnish respondents

In the final question, the participants were asked if they have anything to add or comment regarding mining and exploration in Finland. 518 answers were given, and they indicate that respondents do not have much knowledge about exploring as they mainly concentrated on commenting actual mining. It should be also noted that out of these answers about 170 respondents stated that they have nothing to add or they know nothing about the mining industry. It was also written that it is difficult to answer as the respondents felt they do not have enough information and they are not familiar with the industry. This is not surprising since only 120 of respondents live near mining activities.

As a comment, it can be said that information about mining industry and exploration is important for the local people but for the wider public as well. Its importance should be considered in the future. Furthermore, as the results illustrate, the nature and the environment are valued highly by the Finnish society and those must be taken care to achieve any kind of acceptability for mining activities. However, the mining industry is good and worth supporting if it is responsible and well controlled by the authorities. In these answers there were also many comments, again, about Talvivaara. Interestingly, it was mentioned that in the media, there could also be some good examples instead of always Talvivaara.

2.5 Conclusion for the Finnish part

Regarding the research sample of Finland, a rather big number of the respondents live in the southern Finland in big cities and thus, are not affected by the mining industry. Indeed, only a minority of the respondents are affected by the various activities of the mining industry. This was also seen in the open answers where people often linked mining with romantic or outdated (mental) images of mining, which is quite contrast from the modern technologically driven operations that are practiced today. On the other hand, images that came up in the other countries answers, such as dirty faces or child labour, had barely any mentions in the Finnish context.

Another big factor that may have affected the answers regarding acceptability is the heavy publicity of Talvivaara and its negative environmental impacts in the media. The vast number of references to Talvivaara and its impacts in the open questions of the survey support this assumption. While the case revealed some wider issues regarding the whole mining sector, it also led to overgeneralizations and in the end, it casted a shadow over the whole industry for many years to come. Traditionally Finns have had relatively high trust in authorities but as the results from this study and Jartti et al. (2017) indicate,

mining authorities are an exception in this sense. The authorities received their share of blame from the public in the Talvivaara case as it was felt they were slow in their actions and unable to control the company (Kotilainen 2015).

There are several mining projects in Finland with no negative impacts, but these cases have not been in the public. Critical voices could be based on some practices of certain mining companies which have shown disparaging attitude towards the worries of local people. As the research by Mononen (2015) indicates, although the local people are critical to the environmental impacts of mining, they do not oppose mining at the general level. However, it is clear that the mining operations should not pollute the environment. A common theme in the responses of this survey was that the environmental impacts and the mining companies should be controlled better. Furthermore, when the people were asked what is the first thing that comes to their mind when they hear the word “mining”, the environmental impacts came up clearly more than for example the benefits, such as employment. It remains an important issue in Finland, which is a country that often prides itself on being environmentally progressive.

One of the more practical findings that this survey has highlighted for the INFACT project, are the attitudes towards drones and helicopters as tools for exploration. In Finland, the respondents showed great interest in the new technologies and approval as long as they are informed about them beforehand. Indeed, there were numerous responses which pointed out that if the person would not know why the drone or helicopter is circling somewhere close by, they would find it disturbing or perhaps even scary. Thus, good communications regarding the use of new technologies should be emphasized. Finally, the high number of empty answers in these contexts may indicate that people do not have much knowledge about them. This was also seen in the last question, where the responses were mainly connected to mining and not exploration.

It is clear that generally the communities near mining projects want to have new residents, services and for example tax revenues. In many locations mining workers and the mine have brightened up the atmosphere. However, in many cases the mine workers are commuting from elsewhere as they are not willing to move to the location permanently. This means that the municipality where the mine exists do not necessarily benefit from increased tax income as much as it would prefer and instead it has the burden of offering services such as health care. The municipality may also have to deal with the possible environmental impacts of mining. Finally, it is not the aim of the mining companies to be regional or local developers or to promote local economy. The perceived unbalanced sharing of the benefits and negatives also came up in the survey responses. Especially the image of foreign mining companies coming to Finland, taking all the benefits abroad and leaving the negative impacts for locals to bear was a present in the answers as it has been in the national discussions.

Finally, while people tended to have stronger opinions and perceptions about mining, it seems that exploration did not receive as many responses or cause as big reactions in Finland. Alternatively, it was not seen as something separate from the mining itself. This was seen in the responses where the people arguing against mining tended to also be against mining exploration, often using the same arguments. Thus, the reputation of exploration is most likely strongly linked to the reputation of mining in general.

3 Results of Public survey in Germany

3.1 Demographic structure of respondents

Gender

The German sample consisted of 50% female (n= 508) and 50% male (n= 507) participants. The base were 1015 participants. Thus, the sample can be considered evenly balanced in terms of gender dispersion.

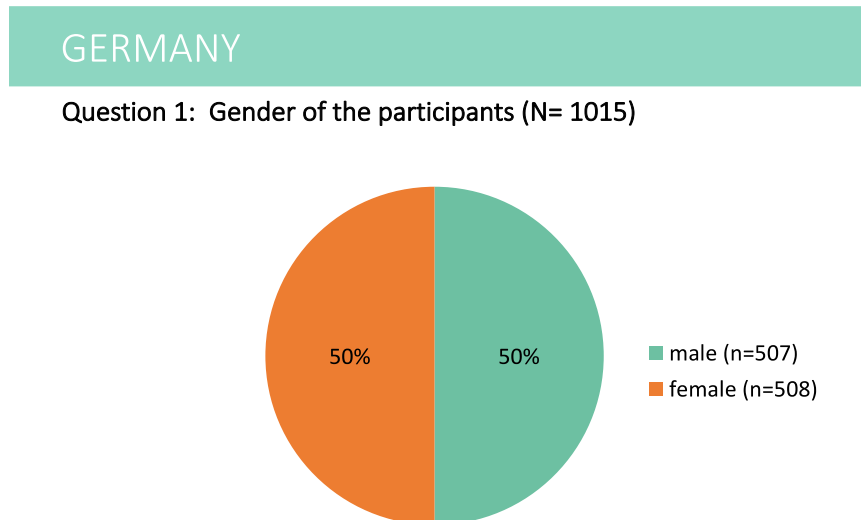


Figure 19: Germany question 1 - Gender of the participants (N= 1015)

Age

In terms of the age of the participants the German survey was conducted with around 17% young adults (18-29, n=167), 14% of middle-aged adults (30-39, n=145), 20% of older adults (40-49, n=202), 17% of old adults (50-59, n=177), 14% of senior adults (60-69, n=141), 18% of the oldest age group (70-85, n=183). This means that the ages of the participants were very balanced, with a slight surplus in the older adult age group (40-49).

Dividing the participants into different age groups is necessary in order to identify age effects and/or cohort effects in the way participants chose to answer to the survey questions. Younger cohorts/groups are more likely to focus on long-term effects of certain activities on the environment and/or economy, because they see their long-term future affected by them. Very old cohorts tend to not care as much about negative implications as these effects perhaps won't affect them during their lifetime. However even the older cohorts tend to include moral considerations into their reasoning (e.g. preserving the world for future generations), which will still lead to responsible answers.

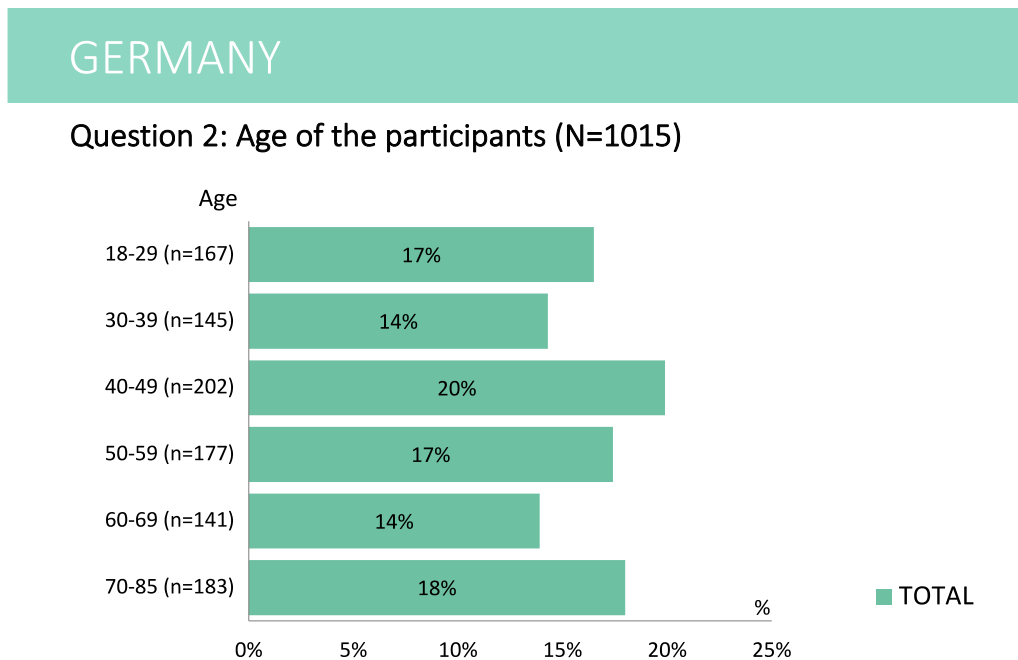


Figure 20: Germany Question 2 Age of the participants (N=1015)

Cohorts that have been actively working during the time of the German “Wirtschaftswunder” might be more positive towards mining than cohorts growing up in the 70s, 80s or 90s. These effects need to be taken into consideration for an effective way of dealing with the different attitudes and perceptions towards mining.

Urbanity

Concerning the population sizes of the communities of the German participants, with 25% most participants came from cities with 10.000-49.999 inhabitants, the second largest group (18%) came from the biggest cities with 500.000 or more inhabitants.

GERMANY

Question 4: "I live in a town or city with a population of around..."

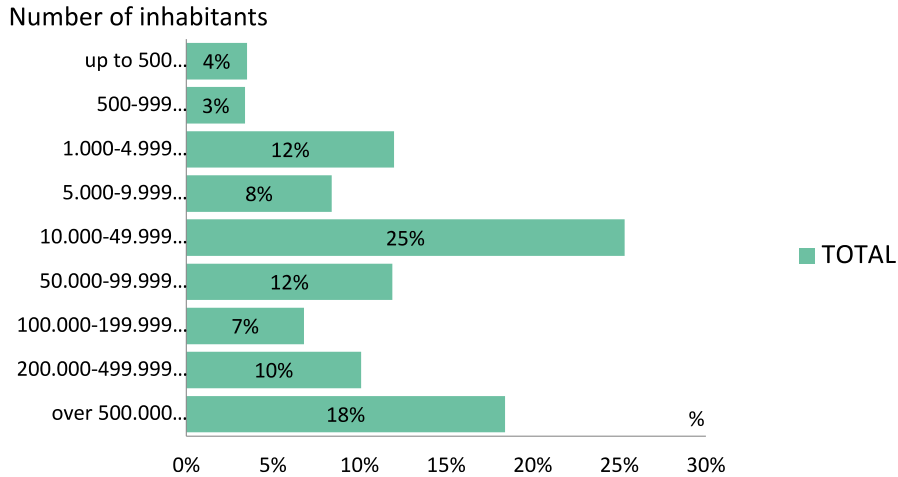


Figure 21: Germany Question 4: "I live in a town or city with a population of around..." (N=1015)

There were only 4% participants from towns or communities with less than 500 inhabitants and only 3% of the participants were from a community with 500-999 inhabitants. 12% of the participants were from communities as big as 1.000-4.999 inhabitants and 8% from towns with a population reaching from 5.000-9.999 inhabitants. 12% of the people interviewed were from cities ranging between 50.000-99.999 inhabitants. 7% came from cities as big as 100.000-199.999 inhabitants. 10% of the survey participants live in cities with a population ranging from 200.000 to 499.999 inhabitants. Also, for Germany it can be said that the population groups of people interviewed were still rather varied, considering that the largest group (25%) was from suburban sized communities, which also balanced the second largest group (18%) coming from Germany's biggest cities with more than 500.000 inhabitants. Though the participants from the smaller scaled communities were scarce (4% and 3 %), these statistics represent the German demographics rather accurately with people generally living in larger cities or larger suburban communities.

Place of Residence influenced by Mining Activities

GERMANY

Question 5: “My place of residence is influenced by mining activities” (N=1015)

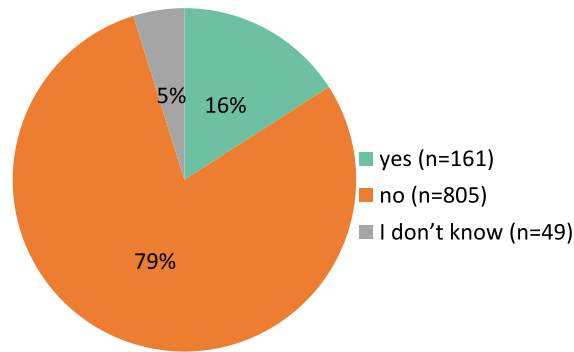


Figure 22: Germany Question 5: “My place of residence is influenced by mining activities” (N=1015)

In Germany the largest proportion of the interviewed participants (79%) state that their place of residence is not affected by mining activities, only 5% are not sure whether that is the case or not and 16% know their place of residence to be affected by mining activities. This is important in order to determine whether negative attitudes towards mining come from a real experience with mining activities, e.g. through experiences with a mining site nearby or whether they are actually part of a negative attitude that is not based on factual experiences, rather than media information and personal opinion with no further backing. If the negative attitudes of people living in mining areas are high, the chances are very high that people in the future will oppose to mining activities. If however, the attitudes outside mining regions are more negative than within them, one can draw the conclusion that the reality of living nearby mining is not as bad, as people may think. Partly, a more positive attitude from people actually confronted by mining activities in their own proximity could also be attributed to a social phenomenon, where people that can currently not change their situation (or do not want to), will overlook negative aspects of their life circumstances in order to justify, why they are still in this specific region.

3.2 Attitude towards mining in general

General attitude towards mining

In order to allow a deeper understanding of what people really think, the following open question “What comes first to your mind when you hear the word „Mining“?” extracts opinions and attitudes without

guiding with predefined answers. The participants were asked to answer as many word or sentences as they like. All 1015 respondents answered the question, most of them between 1 to 3 single word, but some respondents explained it in longer statements of more than 20 words.

It is immediately obvious that people associate mining primarily with “coal” (139) and “Ruhrgebiet or Ruhrpott” (60), the region with the dominating picture of mining for centuries in Germany with more than 3000 mines (Günter 2000, Tenfelde et al. 2015, Tenfelde and Pierrenkemper 2016). This industrialised area was to be known for the coal mines and its industries in German population. Some still specify more and mention coal or lignite. These are the most common keywords mentioned by the respondents. The “Ruhr area” is numerically probably the most frequently mentioned and the most popular area in Germany of coal mining (Weber 2000). Some of the respondents also have a direct relationship to this area or mining and answered, for example “my family, my father, my grandfather, my old home town”. If individual raw materials are mentioned, then, in addition to coal or lignite, the ore and salt is often mentioned, more seldom copper, gold and silver.

However, when it comes to production, ore also plays a role in the answers of the participants, and people mentioned “Erzgebirge” (9) and “Freiberg” (2) occasionally. It appears that this mining region is still in some peoples’ mind, although the mining closed down mostly, and is very small compare to lignite and coal areas in Germany.

It is striking that positive comments are rarely mentioned. If the comments contain a judgement, this is usually of a negative quality. As one main topic the miners themselves play a role in the thoughts of the respondents. Their work is generally very much appreciated and respected. But respondents assume the working conditions to be poor and they emphasized often the physically demanding labour in associations, such as “dust, darkness, noise, black, danger, dirty, underground, polluted air” (compare Tenfelde 1981).

The second main topic in the answers played the “environment”. Some see the “destruction of entire landscapes” as a possible negative outcome. Others think of “polluted air” or “damages at infrastructure”. In addition, some negative remarks are made considering mining as out-dated. However, there are some voices regretting the decline of mining in previous decades because it created jobs in the region.

In summary, it can be said that a negative tendency dominated, concerning the environment and the working conditions which were mostly mentioned. This is different to the quantitative or statistical data that was analysed in this survey too where this tendency isn’t obvious. The positive statement emphasized are “jobs” the mining industry created.

Perceived positive aspects from mining

With the simple open questions “Mining, this is good....” people were asked to put down as many positive arguments of mining which are coming to their mind.

The main arguments which the respondents mentioned mostly were “job creation” “employment” or “economic benefit” as a positive aspect. These results are in line with Nippa (2014), who’s data showed that mining has been considered on the positive aspects of job creation and the literature review (Tenfelde, K., Pierenkemper, T. 2016, Schanetzky, T. and D. Ziegler 2013) who showed benefits for the community with high employment rate, high development infrastructure and industrialization. In this context, the stimulation of the economy and increasing employment which promote local and regional development are sometimes emphasized as already mentioned with development of the industrialised Ruhr area (Köhlmann 1990, Hermann and Hermann 2008, Harenberg 1987). Only few remark that jobs are „underpaid“ and thus they see the employment in mining critical, contrary to some which see potential in mining for well-paid employment.

The people also like to mention the extraction of raw materials as a way to “support the local/national economy” and the “energy supply”. Another argument recognised “being more sustainable” when “not importing raw material” and “being independent from import of other countries”.

However they do not necessarily mention which commodities they mean when they think of the term „resources“. The participants all tended to stick to the general term "raw materials". If raw materials are mentioned by name, it is primarily coal.

Interestingly, despite the question of specific positive aspects, people sometimes often respond negatively, for “subsidence damages” or “harmful emission”. Many respondents had no idea what is positive in mining and answered with variance of “I don’t know” or with a question mark, dash or “nothing”.

In summary, it can be said that people recognize certain positive aspects of mining. First and foremost, increasing employment and economic benefit is seen as positive, in line with study of Nippa (2014). However, many people cannot mention anything positive at all concerning mining.

Perceived negative aspects from mining

As the previous question, respondents answered to the open question “Mining, this is bad....” and wrote down arguments that they believe are negative or critical aspects.

As the biggest concern detectable in the participants’ answers is clearly the pollution of the environment or other damages around mining site as for example “environmental pollution”, “water pollution”, “landscape damage” or “landslide”. A couple of persons even fear the collapse of infrastructure such as houses through drilling activities. These arguments are dominating the whole spectrum of answers in

the public and are dominating the negative effects of mining in literature too (Young 1992, 1993, Hiller 1997, Hildemann 1996, Grün et al. 1993, Cöster and Frühauf 1998, Schmidt 1997, Schmidt 2000).

Many respondents also point out “hard working conditions” of the labour itself with associations as “heavy work”, “unhealthy”, “constant darkness” as a negative aspect when considering the effects of mining and refer to possible health consequences as “black lung”.

The word “overexploitation” is also often mentioned. In this case, it means the excavating of raw materials with no regard for sustainable aspects or negative effects on nature.

Another issue is the economic question. It has been criticized that mining was supported by taxpayers’ money and additionally the follow-up costs caused by mining were paid by them too. Some respondents regard the work as underpaid, which is important when trying to create a positive image for mining and employment in a region. If people feel that their region will prosper and benefit from mining, it will be easier to conduct mining activities.

In general, the potential damages to the environment and concerns for the environment around a mining site remains the key issue. In this sense, follow-up costs may play an important role.

Mining and economy

The German participants were asked on a scale from 1-5 how much or little they agree with the statement “Mining is an important industry in our country.”

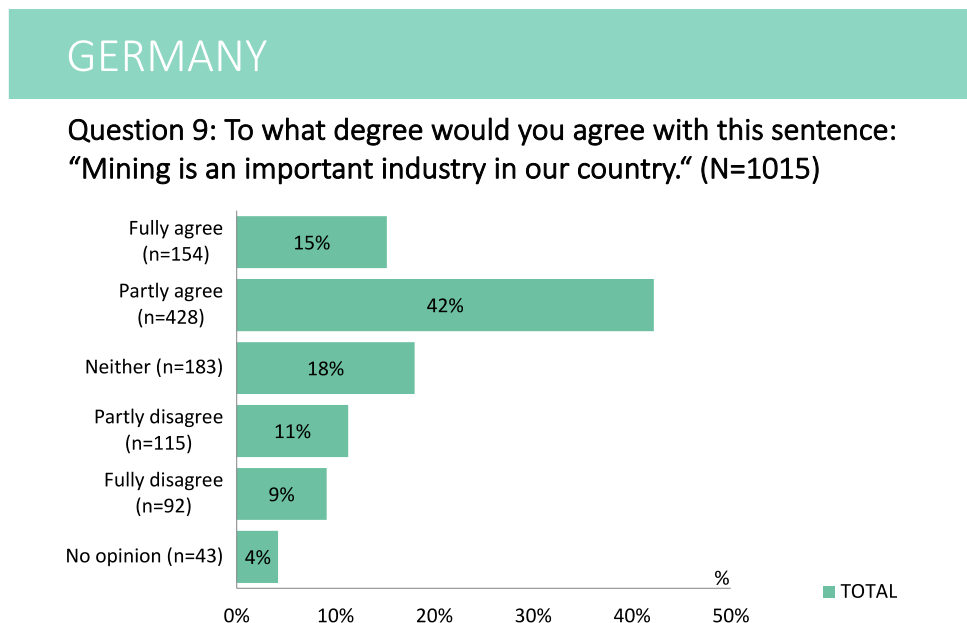


Figure 23: Germany Question 9: To what degree would you agree with this sentence: “Mining is an important industry in our country.” (N=1015)

15% fully agreed with this statement, 42% partly agreed with this statement, 18% said that they neither agreed nor disagreed with the statement as such, while 11% partly disagreed and 9% fully disagreed. 4% stated to not have an opinion concerning this statement.

Mining and own resources

In Germany the participants were asked whether they tended to think “Mining in Germany is important for providing our own industry with resources” on the one end of the scale or whether they believed “Mining shouldn’t happen in Germany and raw materials should be exported from somewhere else”.

Here 23% were fully in favour of the statement that “Mining in Germany is important for providing our own industry with resources”, while 33% agreed with this less strongly, while 23% neither agreed with the one nor the other statement. 6% rather thought the statement “Mining should not happen in Germany, and raw materials should be imported from other countries.” to be valid, while 5% fully agreed with this statement. 10% stated that they did not know what to answer considering the statements.

With a combined 56% of the participants agreeing (23% fully, 33% less strongly) with the statement there is a definite trend towards people believing mining in Germany is important for providing Germany’s industry with resources. This is in line with results from Nippa (2014) too. Data showed that 75% of people see a necessity of mining in Germany. As 23% were neither for or against either of the statements and 5% claimed to have no answer to the question, only 11% were on the negative scale, thinking “Mining shouldn’t happen in Germany and raw materials should be exported from somewhere else”. This clearly shows that (if it is reasonable), people would be willing to support mining activities as a majority sees it as relevant for the national economy in providing resources.

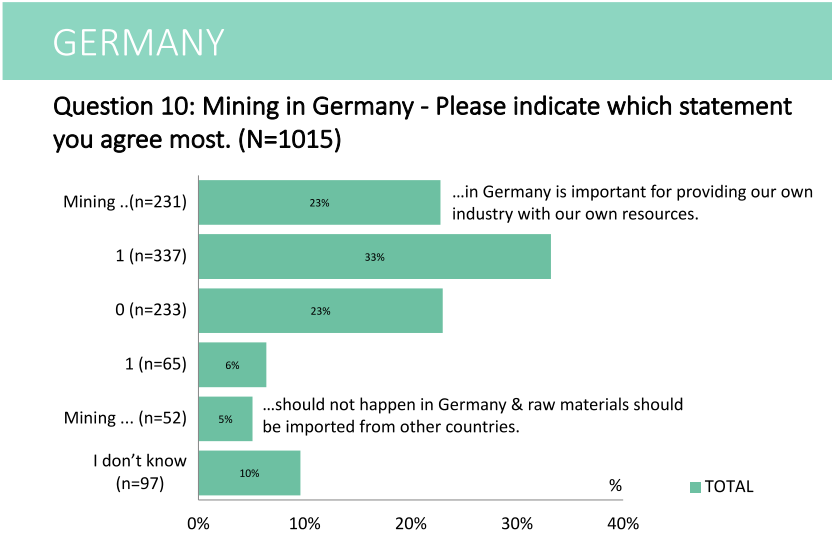


Figure 24: Germany Question 10: Mining in Germany - Please indicate which statement you agree most. (N=1015)

Mining and Employment in a Community

Considering the perception of the correlation between mining and employment in a community the German participants were given two statements, one in favour of the idea that mining creates many jobs locally, leading to the whole community benefitting from this, one stating that “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” People then could indicate on a scale with those two poles on the far ends, how much they agree with each of the statements.

In Germany 32% (2) of the participants were of the opinion that “Mining creates many jobs locally, and the whole community benefits from this”. Also 32% (1) did not fully agree with that statement but indicated that they rather agreed with the positive effect on employment through mining activities. 16% (0) neither tended towards one or the other statement. 9% (1) rather thought that “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” And 7% (2) fully agreed with the negative statement. 6% indicated “I don’t know” as their answer to the question.

With as much as a combined 64% the participants believed that mining was able to create employment, which is the majority of the people asked. Only 16% disagreed with the idea that mining creates employment. The public perception thus is that mining is very likely to create employment. This could eventually be one of the benefits that should be communicated when planning mining activities.

GERMANY

Question 11: Mining and employment in a community – Please indicate which statement you agree most (N=1015)

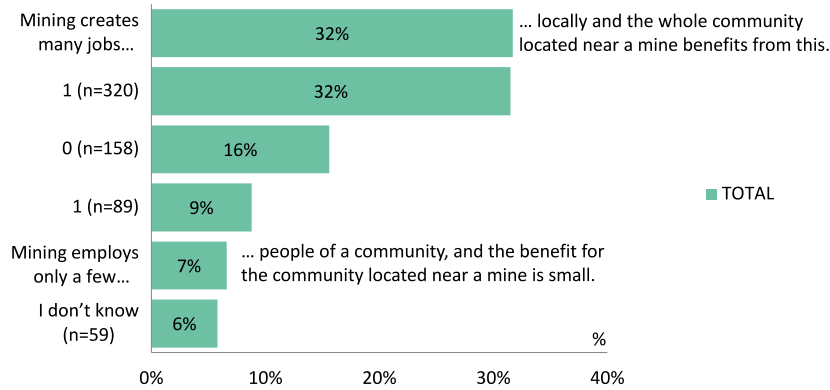


Figure 25: Germany Question 11: Mining and employment in a community – Please indicate which statement you agree most (N=1015)

Infrastructure and Facilities in a Community

In order to find out what the perception of the German people in terms of the effects of mining on the infrastructure and facilities in a community were, participants had been given two statements, one positive towards the effects of mining on the local infrastructure and facilities (“Mining creates new infrastructure and facilities to the community”) and one negative (“Mining does not much contribute to the local infrastructure and facilities”). Both statements were poles on the ends of a scale from 2-0-2, and the participants could select whether they fully agreed (2), partly agreed (1), neither agreed nor disagreed with either of the statements (0) and they also could mark “I don’t know” as a possible answer which 9% of the participants marked as their answer.

GERMANY

Question 12: Mining and mining regions - Please indicate which statement you agree most. (N=1015)

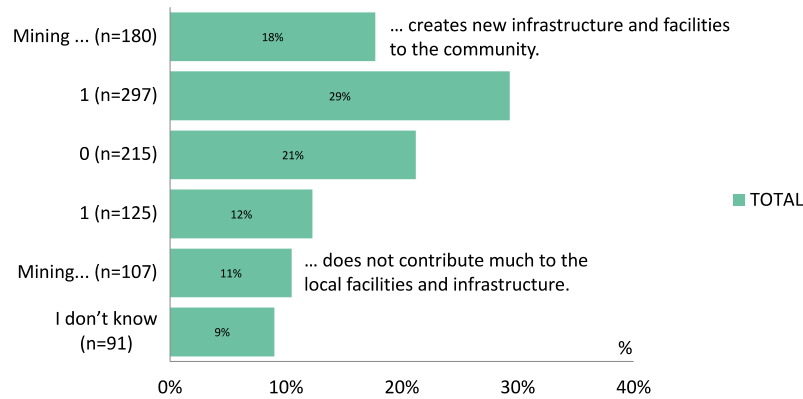


Figure 26: Germany Question 12: Mining and mining regions - Please indicate which statement you agree most. (N=1015)

In Germany 18% fully agreed with the positive statement that mining indeed creates new infrastructure and facilities locally, 29% thought this statement was partly correct. 21% did not tend to either the positive or the negative statement. 12% of the German participants thought the negative statement was partly correct and only 11% fully agreed that mining does not contribute much to the local facilities and infrastructure of a community.

Overall, the research can draw from this, that also here the positive attitudes of the German participants towards the possible benefits considering infrastructure and facilities dominate. Later the researchers will be able to use this aspect in the dissemination as one of the key benefits attached to mining activities.

Environment

Environment is an important issue when discussing the possible difficulties of mining with stakeholder engagement. Thus, it is important to understand the general public perception of environmental dangers caused by mining activities.

In Germany 6% of the people asked stated that “The impact on the environment caused by mining is minor and can be handled well.” 9% partly agreed with this statement. 30% agreed fully with the statement “The impact of mining on the environment is huge and its consequences are not acceptable”, while a total of 28% of the participants partly agreed with this statement. Only 8% decided to mark “I don’t know” as their answer.

GERMANY

Question 13: Mining and environment - Please indicate which statement you agree most. (N=1015)

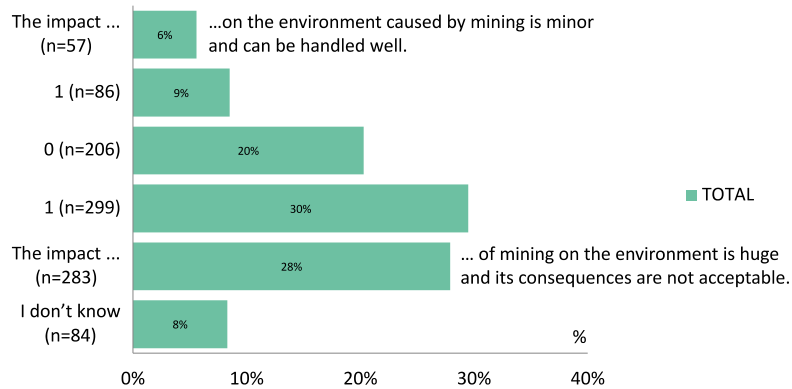


Figure 27: Germany Question 13: Mining and environment - Please indicate which statement you agree most. (N=1015)

Environment is actually one of the factors that received the lowest rate of positive attitude amongst the participants. Here is where the most work will have to be done. 58% of the participants agreed (fully or partly) with the statement “The impact of mining on the environment is huge and its consequences are not acceptable”, which is alarming considering the relatively low negative responses towards other topics. Further research could include looking deeper into the environmental threat frame, in order to help comforting the public’s fears before and during future projects.

Acceptance of mining in a community

In order to determine the pre-existing notion of the German public considering how socially accepted mining activities in general are said to be, the participants were given two statements, one stating that mining is indeed well accepted by local communities and another one stating that mining causes a lot of controversies in mining community. They also had the option to say that they did not know the answer, which 27% did.

This figure is possibly as high considering that the majority of people stated that they are not living in a community affected by mining. As for the positive statement “Mining is well accepted by most local communities – only 10% agreed fully, a total of 18% partly agreed.

Indecisiveness was indicated by deciding for the middle between the 2 statements by 21% of the participants.

There were then 15% of participants partly agreeing with the negative statement “Mining causes a lot of controversies in a community in which mining is conducted” and 10% fully agreed with the negative statement.

As the positive and the negative here is equally balanced with a large portion of participants indicating that they were neither for nor against (27%), or they simply didn’t know (21%), it is rather difficult to see a clear trend. However, there are altogether 25% of participants who agreed with the negative statement. These 25% could become a problem when they feel they are not taken into account during the planning stage. As a result, it should be incorporated in the planning stage to find out whether some members of the public fear tensions in their community, created by mining and this concern should be treated carefully as it has potential for friction between the industry and the members of a community.

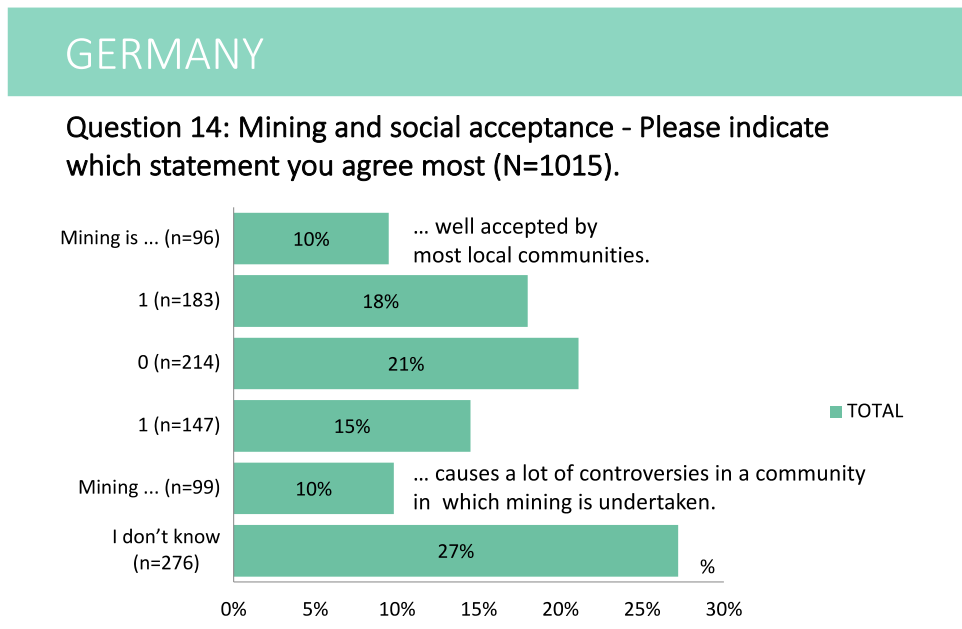


Figure 28: Germany Question 14: Mining and social acceptance - Please indicate which statement you agree most (N=1015).

Answers to the open question concerning the acceptance of mining in a community

Above, respondents answered the question if they think mining is accepted in a community, or it causes too many controversies, they could comment their answer if they wanted with the following request “Please explain your answer...”.

The respondents mentioned negative impacts such as “air pollution”, “noise”, “possible subsidence of the ground”, “damages or cracks in buildings and infrastructure”. Furthermore, “relocation” is an important issue which is recognised when in the past entire communities had to give way to mining.

The creation of jobs seems to be a significant issue that creates acceptance for the mining industry. For some, entire regions, such as the German Ruhr area, used to depend on mining. They occasionally think that working in mining is the only possible employment strategy there. The interviewees also like to stress that mining brings prosperity to the municipalities, for instance, through tax revenues.

In summary, it can be stated that there is one negative and one positive area in the justification. The negative area includes the environment impacts with a possible damage through mining activities in communities. The benefits of mining are the economic impacts with higher economic prosperity, increasing or maintaining jobs in the community or tax revenues.

3.3 Attitude towards mineral exploration

General attitude towards mineral exploration

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important need in the public view.

The open question "What comes first to your mind when you hear the word "Exploration"?" associates feelings and attitudes of people when they think of "search for raw material" spontaneously. The answers can be split in different groups, dealing with "products of exploration", "technique of exploration" and "damage of environment" and some additional comments of various topics.

In the group "products of exploration" the respondents primarily name as raw materials "coal", "lignite", "gas", "oil", "salt", "ore" or "metals" similar to question 6. Some specify it more as gold, silver, uranium, mica, quartz or copper. Additionally, they count "wood", "stone", "sun", "wind" or water as a resource, which implicit a renewable energy aspect to the question.

Besides the keywords for raw materials, the "drilling technique" plays a major role. The answers covered "drilling", "drilling research", "test drilling", "wells", "pit", "fracking". Especially the term "fracking" shows that many people go beyond the "exploring" area and associated "digging and exploitation" too. Similar to question 6, the respondents answered many times impacts on environment "as "damage", "harmfulness", "destruction", "degradation" or "contamination". They regard exploration as the destruction of the environment or of the nature and their covered solution as "sustainability", "harmony with nature" or the "renewable energy resources".

However, people seem generally well aware of the importance of the exploration of raw materials. They realize that they depend on raw materials, and without them, no economy would be able to function. Frequently, the exploitation of other, possibly poorer countries plays a role. The words "unsafe countries of origin" should also be mentioned in this context. Some people seem to be very worried about this topic, and then like to give longer answers.

What is striking about this question is that some participants cannot think of anything when asked about it. Perhaps some of the participants have problems to understand the term "exploration" correctly and thus can't think of anything, perhaps the process of exploration is not in their knowledge.

To summarize, coal is often associated with the word "exploration". Wells are also mentioned. Negative points are all mentioned the group "damage of the environment" that people fear. However, probably most of the participants are aware that Germany and its economy need the mining industry producing raw materials. The findings are again aligned with results of the German study from Nippa (2014).

Exploration of raw material

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important need in the eyes of the general public. The study from Nippa (2014) also covered this research question for the German population.

The participants were again given two statements – one positive one ("Exploration of raw materials is important, and we need to search for new mining sites") and a negative one ("Exploration of raw materials is not important, and we do not need new mining sites.") Here again the participants could mark whether they fully agree with each statement (2), partly (1), agree with neither (0) or whether they did not know the answer.

In Germany 15% fully agreed with the positive statement, 29% partly agreed with the positive statement considering the need for more mining activity. 25% were neither for one nor against another of the two statements.

As for the negative responses, a total of 12% agreed partly with the critical statement and 9% fully agreed with the negative statement. 9% stated not to know the answer to the question asked.

The results to this question are similar to the ones from Q10 (Mining in Germany). It suggests that people still are optimistic towards the mining industry's future in Germany and that they even think there may be regions of potential in Germany that have not yet been explored. This is very positive for the mining industry, however the 21% of critical attitudes towards that idea have to be taken into careful consideration when proceeding to establish new mining sites in a community. Negative emotions can have a tendency to mobilize more people and thus form a stronger opposition which can easily become very determined and hard to convince of the positive effects of mining activities.

GERMANY

Question 16: Exploration in Germany - Please indicate which statement you agree most (N=1015).

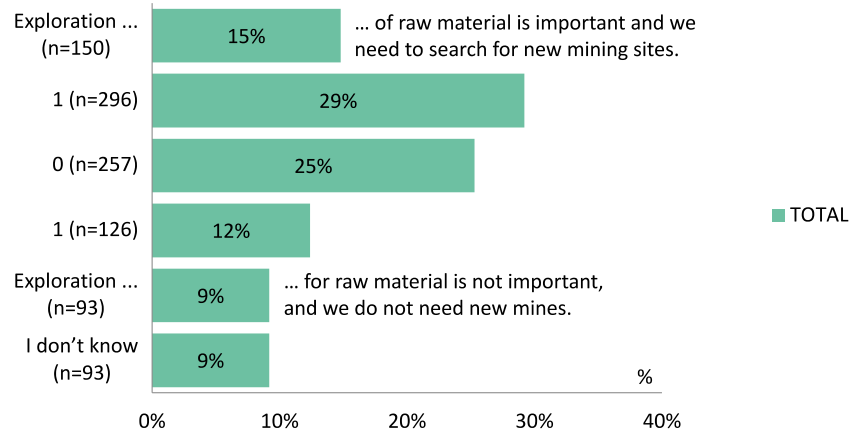


Figure 29: Germany Question 16: Exploration in Germany - Please indicate which statement you agree most (N=1015).

Exploration with drones

In order to find out more about the public’s acceptance of technical equipment, the participants were asked whether encountering a drone flying with measuring equipment on a walk outside their house or in the countryside would bother or worry them in any way.

The German participants had the options of agreeing fully (2) or partly (1) with the positive statement that they would not be bothered by drones, of agreeing fully (2) or partly (1) with the negative statement that this indeed would concern them. They could also state that neither would be the case or that they did not know the answer.

24% of the German participants thus said that they would remain entirely unaffected (fully agreeing with the positive statement that they would not be bothered by it), 20% partly agreed with this statement.

18% agreed with neither of the statements and 8% claimed to not know the answer.

As for the negative statement a total of 15% said that this indeed would be a problem for them and they would feel bothered by a drone flying in their visual periphery, while 16% said this could potentially be a problem for them and that they are very likely to be bothered by a drone in their proximity.

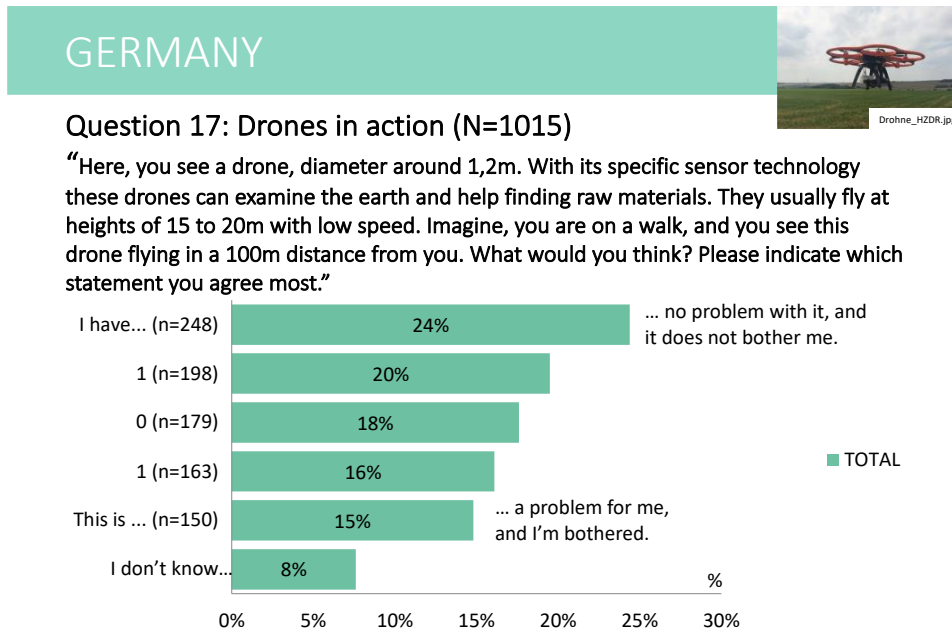


Figure 30: Germany Question 17: Drones in action (N=1015)

Here again one can see a slightly more technology-accepting attitude, however 24% are not high enough a percentage to think that there is no need for further steps to be taken in order to convince the communities. The numbers clearly show that over 30% of the participants are still critical towards this technology and any form of trying to increase the acceptance of such technologies within a community should be undertaken in order to ensure support locally.

Answers to the open question concerning exploration with drones

At the end of this question above, participants could give a brief explanation. In contrast to the results of the closed question above, people raise a lot of concerns and do feel affected by drones while they are on a walk. This is in line with studies from Christen et al. (2018) and Thompson and Braken-Roche (2015). Public sees drones very critical. Reason are that the drones were more often used in military action compare for humanitarian use.

Many respondents answered that drones would violate their privacy, when a drone crosses their private ground, taking photos or videos. They do not want to have pictures taken of them, especially not when they haven't been informed about a drone flying in their proximity. The noise factor also plays a role in the negative responses. Additionally, the arguments “scary” and “anxiety”, “fear”, “alien” are frequently mentioned, which shows that drones can cause very negative feelings and they find a flying drone threatening. Drone flights over private property will likely not be tolerated and the public have no

acceptance when drones intrude into the privacy of others without being asked, or - to a lesser extent - as troublemakers in recreational areas (compare Christen et al. 2017).

On the positive side, people see the benefits that such a way of mineral exploration brings. The other group of respondents would probably only wonder if they see the drone flying around, but would not associate it with a possible threat. Some recognize the benefit of not having to drill and thus less damage to the environment. They believe that the search for raw materials is important for an industrial nation like Germany. It is also interesting how technophobia is visible in some of the respondent's answers.

In general, people want to be informed when a drone is being operated and don't tolerate it when it is flying over their private ground without permission. There is also a group of people who are very interested in this technology and believe it is already "part of live today" and of future of ecological technology. They want to know more about it and also see how pioneering such research flights are.

Exploration with helicopters

When asked about helicopters with equipment conducting test flights, the participants were with 28% fully accepting this technology, 24% were still positive towards this, however slightly less (1). 18% were neither for nor against either of the statements, while 6% chose "I don't know" as an answer.

Only 11% were opposed to the idea of helicopters flying in their proximity, while 12% were critical towards it, but did not entirely dismiss the idea of having helicopters flying in their proximity conducting research by using equipment.

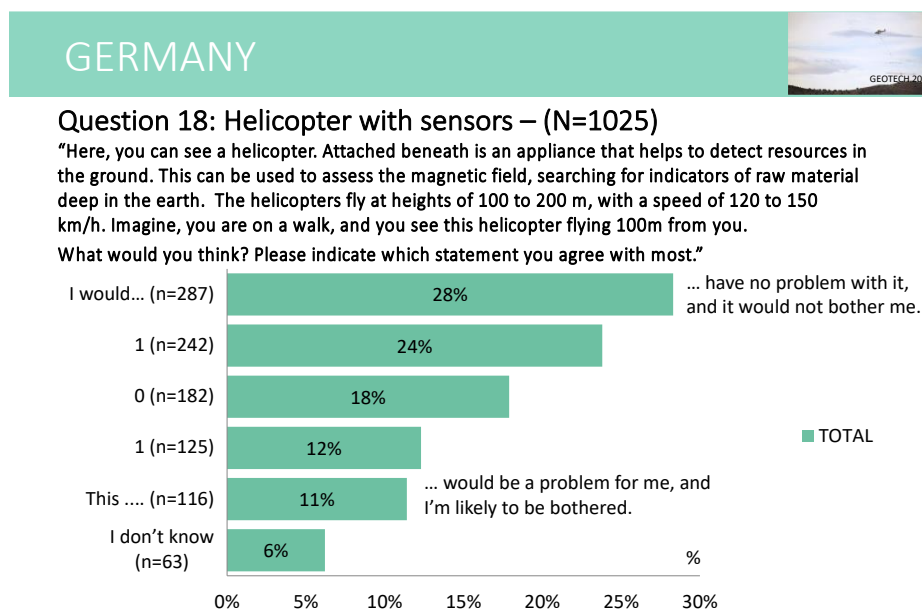


Figure 31: Germany Question 18: Helicopter with sensors – (N=1015)

With a total of 23% of the participants being critical towards this technology the recommendations for helicopters are very similar to the ones for drones. It is interesting that helicopters, which are known to be noisy are regarded less problematic than drones. This may be the case, as people either think helicopters a more tested and trustworthy technology as opposed to the relatively new drone technology, it may also be the case because drones are relatively small and could be seen as a threat to domestic privacy more than helicopters.

Maybe people also assume that helicopters are flown by professionally trained pilots whereas they trust the skills and training of a drone operator less strongly. In either case a show-and-tell with members of local communities could help to minimize fear of such technologies. Workshops where the public would be allowed to haptically experience the different technologies could help decreasing the opposition in a community where mining activities – and exploration as a preparatory step are planned.

Answers to the open question concerning exploration with helicopters

Again, people were asked to give an explanation concerning helicopters flying by with a sensor, which was linked with the previous question. Concerning the open question at the end of this, people think very differently about the helicopter with sensors than about equipped drones.

Generally, people see a helicopter flight with sensors beneath it positive. Helicopters are part of everyday life for many people and used the rescue teams, the police or leisure activities in Germany. Compared to the approval for drones, the helicopter is perceived as much more familiar by humans and thus less problematic.

The topic of "information of the population" plays a crucial role. People expect of being informed about the research and its necessity, then they are able to accept or tolerate probably the flights more likely. However, some participants see a problem in the helicopter's proximity to the ground.

Some of the respondents are talking about a fear of the helicopter crashing or losing equipment while flying. It is notable that in contrast to the answers with the drone topic, not so many put up arguments like "observation with camera" or "this scares me". As with the drone, some are interested in the technology. They believe it is a good idea to use sensors in order to detect raw materials.

The argument "noise" is dominating on the negative side and is frequently mentioned as "too loud". People see it as a nuisance. Furthermore, CO₂ emissions also play a role in this context, caused by the helicopter flights. Otherwise, however, there are no conspicuously mentioned negative points.

In summary, the helicopter is rated positively evaluated than the drones. A clear advantage of the helicopter is that it is a well-established flying device and people are used to seeing such a flight vessel. It is a technology that has been known to the public for ages as opposed to drones, and the public trusts this technology slightly more than the drone. But the noise factor, however, plays a decisive role for it

being perceived negatively. Also, the duration of the flights could cause negative tensions in local communities.

3.4 Attitude towards mining industry and public authorities

Mining company and responsibility

In order to ensure that people accept mining activities in their communities it is important for them to believe that the agents involved handle the affairs in a responsible manner. This question asked participants whether they trusted that the mining industry in their country was handling matters either in a fair and responsible manner or whether they did not trust the mining industry to do so. They could fully agree (2), partly (1), not agree to either statement (0) and state that they did not know the answer.

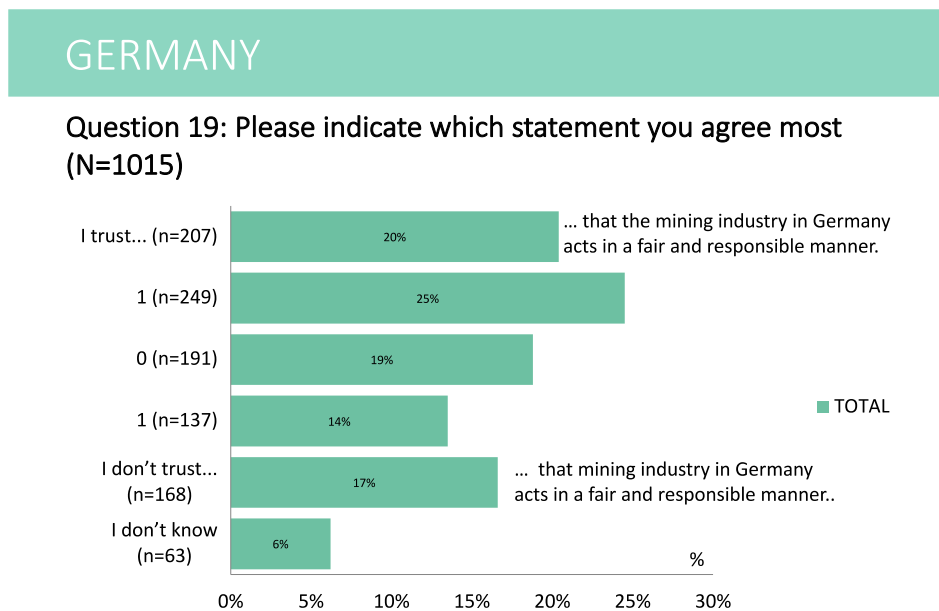


Figure 32: Germany Question 19: Please indicate which statement you agree most (N=1015)

20% were fully positive towards the way the mining industry acts, 25% were partly positive considering their trust in the mining industry. 19% neither trusted nor distrusted the way the mining industry in their countries acts.

Complete mistrust was indicated by 17% of the participants, less strong mistrust was indicated by as much as 14% of participants.

The trust ratings for the mining industry correlate pretty accurately with general trust levels towards the industry in general (see section 14 of the combined analysis of all three countries). Thus, the mining industry need not worry about increasing this figure as it is in line with the German public's general trust levels for the industry.

Public Authorities and handling of mining

Question 20 asked for the trust of the participants in public authorities by giving them the Statement “Public authorities in Germany handle all the issues on mining well.” And asking them to indicate their approval of this statement by marking either Fully agree, partly agree, neither, partly disagree or fully disagree. They could also state that they did not have an opinion, which 14% of the participants did.

Of the German participants only 6% stated that they fully agreed with this statement, 24% partly agreed. Neither was indicated by 26% of the participants. 17% stated that they partly disagreed with the given statement and 14% answered that they fully disagreed with the statement in question.

As for the relatively negative outcome of this question it needs to be said that the term “issues” might have influenced the answers negatively, as people before were not aware that there even was an “issue”. When they read the question, they might not have an actual event in mind, they might just feel that “if there are issues and I have not heard of them, they probably are not handling them well”. Here a follow up analysis could have helped. Or a nearer specification by asking the participants to actually name an event of which they thought it had been handled in an irresponsible fashion.

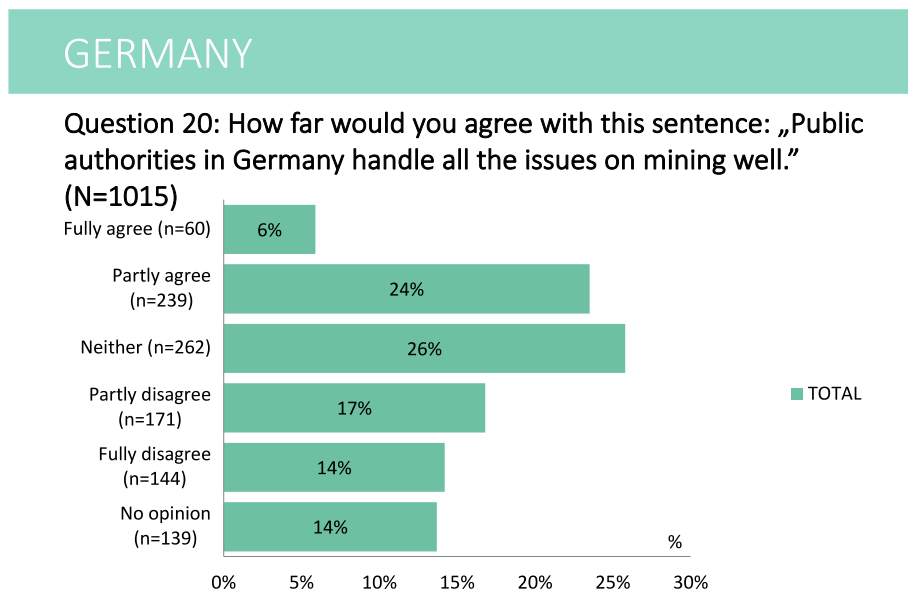


Figure 33: Germany Question 20: How far would you agree with this sentence: „Public authorities in Finland handle all the issues on mining well.” (N=1015)

Last question and additional comments from the German respondents

In order to get all open points, concerns, positive and negative argument, not mentioned before, the survey finished with the question “Is there anything you would like to add or comment on, concerning the topic of ‘Mining and Exploration’?”

Analysing this very last section, two lines of argumentation become visible. Firstly, respondents clearly see the need for mining and the search for new resources, and to produce it in the own country. Some of the respondents considered mining in Germany as absolutely necessary. Participants are aware that the mining industry represents an important economic sector in Germany, which potentially has the power to create jobs. Another argument is that people generally think of their country as dependant on raw materials from other countries, and they fear losing independence. It looks that the acceptance for mining is given.

Secondly, the answers manifest the huge responsibility of the mining industry in terms of protection of environment and nature, impact on the local community and the need for renaturation after the closure. People fear that the effects on nature are huge, and it is the mining industry task to solve this issue.

3.5 Conclusion of the German part

Similar to the results in Finland and Spain, the German population is positive about mining activities when it comes to the overall importance of this sector for the national economy, the chances to create or maintain jobs, and the advantages mining could have for own resources in the own country. Especially the last two aspect seems important: Firstly, mining creates new jobs and the economy and infrastructure of the community proper indicate around 65% of the respondents. If the local community is part of local economy and benefit, negative impact could rather faded-out or ranked lower in priorities than communities with no local benefit.

Secondly, providing the own industry resources and avoid an import of raw material from other countries support more than 50% of the respondents. It seems the aspect of sustainability come into their mind, where the production of local resources is important and more sustainable as to import raw material from other countries.

Lowest rates of opinion receive mining when asking people about the impact on the environment and a conflict between economic interest and environmental welfare exist. Here, it must be taken into consideration that a stable part of the Germans of around 20% oppose and neglect in general mining activity. The majority thinks there are huge impacts to the environment, flora and fauna around a mining site which can't be handled well (58% of the respondents). Indeed, nearly half of the respondents (45%) answer that the mining industry act in a fair and responsible manner, but nearly one third think the opposite.

There is an alarming signal that the image of mining industry is still very negative, and the issues of environmental impacts can dominate the whole debate of mining activity in a region. Here a more

sustainable policy of mining industry is important which plans the revitalization of the area in tight cooperation with affected community at the beginning of a project.

Important results for the INFACT project are the attitude towards drones and helicopters as a tool of exploration. Overall, people do not feel bothered by helicopters and drones flying by, but often concerns are being raised by the noise a helicopter cause, and the observation over private ground via camera attached to a drone. A few answers indicate that the research being done with helicopter, which is well established and known by locals, is perceived better than drones. Perhaps the technique “mineral exploration by drones” is still too much unknown and seems a bit scary for citizen. Here an information campaign - as planned part of the project INFACT how the new technology is used - will be helpful.

4 Results of Public survey in Spain

4.1 Demographic structure of respondents

Gender

The Spanish sample consisted of 50% female (n= 502) and 50% male (n= 521) participants. The base was 1023 participants.

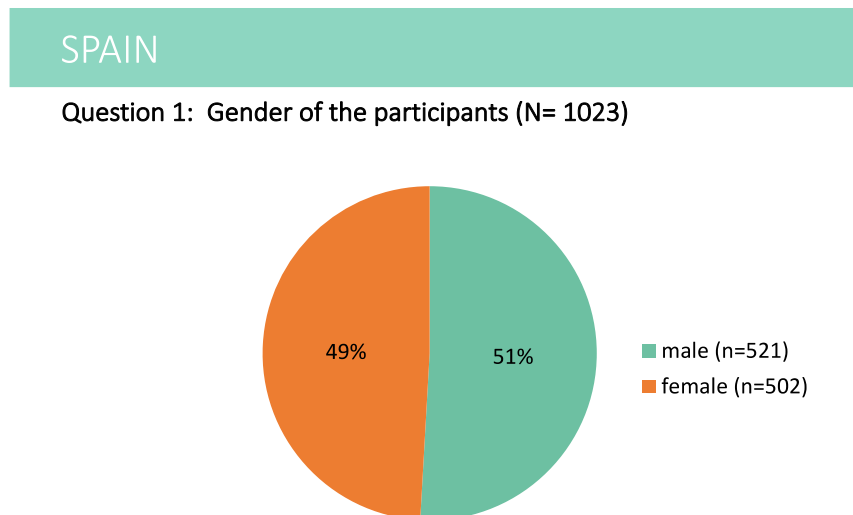


Figure 34: Spain Question 1 Gender of the participants (N= 1015)

Age

In terms of the age of the participants the Spanish survey was conducted with around 17% young adults (18-29, n=175), 21% of middle-aged adults (30-39, n=216), 20% of older adults (40-49, n=204), 16% of old adults (50-59, n=163), 15% of senior adults (60-69, n=157), 11% of the oldest age group (70-85, n=107). This means that the ages of the participants were very balanced, with a slight surplus in the older adult age group (40-49).

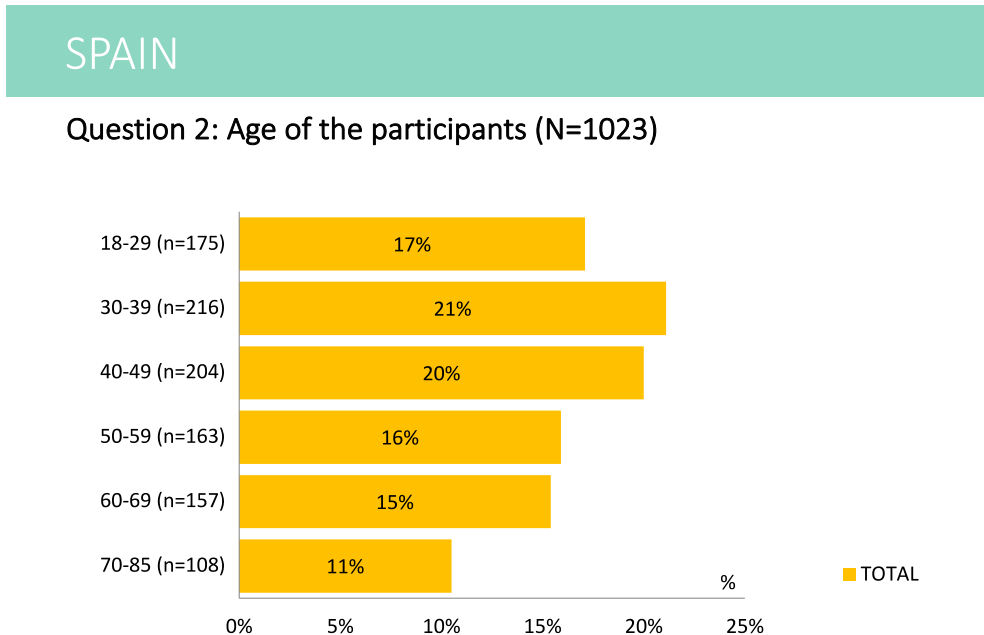


Figure 35: Spain Question 2: Age of the participants (N=1015)

Urbanity

Concerning the population sizes of the communities of the Spanish participants, the largest proportion of participants came from the biggest Spanish cities with 500.000 or more inhabitants, representing the 25% of the participants. The second biggest group of participants (20%) lives in suburban cities with 10.000-49.999 inhabitants.

Meanwhile, 12% of the survey participants live in cities with a population ranging from 200.000 to 499.999 inhabitants, 11% came from cities as big as 100.000-199.999 inhabitants and 12% of the people interviewed were from cities ranging between 50.000-99.999 inhabitants. Only 6% of participants were from towns with a population ranging from 5.000-9.999 inhabitants and 8% from communities as big as 1.000-4.999 inhabitants. Finally, just 2% of the people live in towns with 500-999 inhabitants and 3% of the participants are from towns with less than 500 inhabitants. It can be stated for Spain that the population groups of people interviewed were rather varied, not as the other two reference countries:

the largest group (25%) was from the biggest Spanish cities. However, the suburban sized communities of 10.000 to 49.999 inhabitants still ranged as the second largest group.

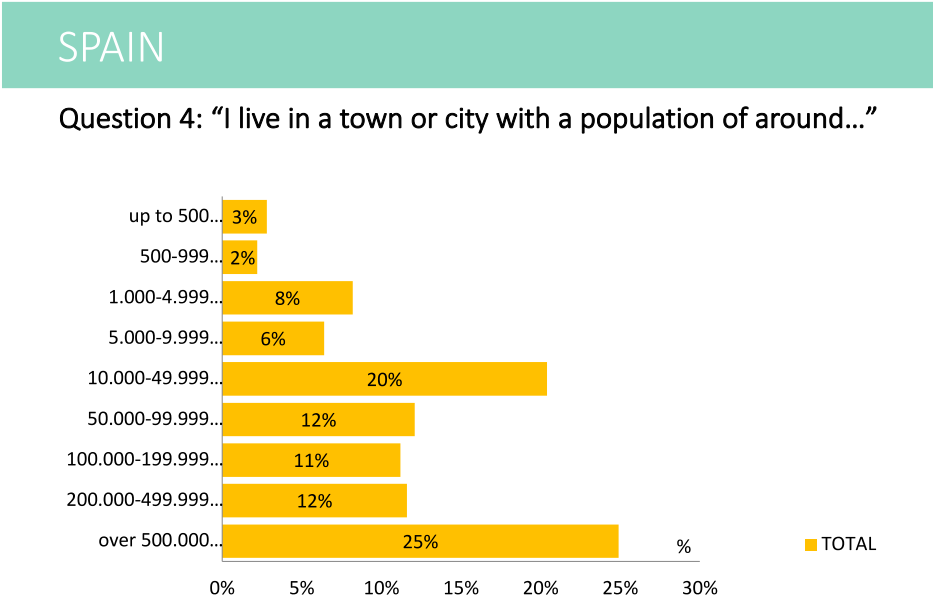


Figure 36 Spain Question 4: “I live in a town or city with a population of around...” (N=1023)

Considering that in Spain, medium-large sized cities are considered to be those with at least 50.000 inhabitants, the example above situates most people responding to the survey in larger cities and wouldn't see regular mining where they are located. This is consistent with the next question (q5) as most people who answered said that they are not affected by mining activities.

Place of Residence influenced by Mining Activities

In Spain 71% of the participants answered that their place of residence was not affected by mining activities (the largest proportion among the three reference countries). 11% were not sure whether that is the case or not and 18% of the participants claimed that their place of residence is affected by mining activities.

This could result in a common shared view in the questions, because they belong to a similar context where the relations to mining are probably different from people living in mining regions.

According to this idea, the next hypothesis is considered: mining perception could be related to the place where the people live in, this is, between people from big cities and people from rural areas. These two variables could be found in the question q4 and, mostly, in question q5 (perception of living in an area influenced by mining activities). The fact that most participants live in big cities or areas not influenced by mining may risk the consistency of the sample.

SPAIN

Question 5: “My place of residence is influenced by mining activities” (N=1023)

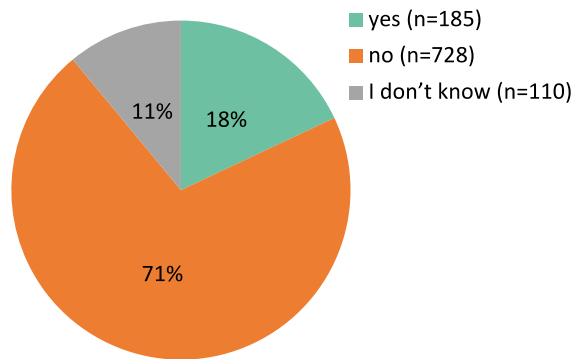


Figure 37: Spain Question 5 “My place of residence is influenced by mining activities” (N=1023)

Considering it can be stated:

- People in big cities do not experience mining activities directly, so they get information on mining through indirect channels like mass and social media (these being: TV, radio, Internet, and social networking sites, i.e. Facebook and web blogs).
- The dominant ideas on these channels regarding mining are those coming from high profile people with the power to communicate their ideas (e.g. politicians or green movements).
- One popular idea, seen and read about by people today, is that mining is good for the economy and creates employment (shared by politicians and power groups) while the other main idea and belief is that mining damages the ecosystem and contributes to pollution (green movement).
- The environmental movement is considered a post-industrial philosophy, linked to developed, post-industrial and complex societies, which are represented by big cities or a cosmopolitan context rather than small cities or a rural context. It is associated with certain groups of people: civil servants, scholars, union workers, etc., both associated or not.
- People in small cities can experience mining activities directly (mostly when they live in a mining region), so their opinion will be formed on what their own direct exposure.
- The environmental movement can be present as what is called the neo-rural movement, characterised by urban style people who move to rural areas in search of an alternative way of life.

4.2 Attitude towards mining in general

General attitude towards mining

The participants were asked to respond with as many words or sentences as they wish to the open question “What comes first to your mind when you hear the word “mining”?”

“Coal” is the most representative idea. It is not frequently linked to other concepts, always appearing isolated. “Work”, “minerals” and “hard” are also highly represented. It is consistent with the traditional image people have of mining activity, associating it with the extraction of coal. This people’s image of a mine is one of a dark place from where men come out with faces covered with black soot, stained and sweaty, after a long, hard day at work extracting coal.

Analysing a possible meaning for “work” when related to positive ideas (question q7), respondents offered no more information. It seems there is no need to explain why work is good. But when “work” is related to negative ideas (question q8), respondents offer more information, associating it with ideas like “hard work”, “badly paid”, “dangerous” and even “child labour”.

General literature concerning the issue of mining image shows that we could have found more ideas referring conflict or opposition among the answers, beyond references to work or hard work, i.e. Although no studies have been carried in Spain on mining perception, at a global scale literature reflects a rising number and prominence of cases of mining-related conflicts with open expressions of resistance (Conde, Le Billon. 2017). More research remains needed, for this rise in conflict seems to combine both an increase in the number of mining projects between 2005 and 2012, and possibly in the frequency of opposition to mining by affected communities. In this literature, distrust emerges as one of the main factors that generate a negative perception and opposition to mining (Conde, Le Billon, 2017), but no references to trust in negative or positive way has been found in the answers. This draws the attention that responses to this question don’t offer an scenario of opposition, as expected, but direct description of isolated negative aspects.

Perceived positive aspects from mining

In total, “work” is the most represented idea (12%), followed by “wealth” (3,8%) and “none” (2,4%). Female participants chose “work”, “none”, “wealth” and “resources” as the most representative concepts of mining benefits. Male participants chose “work”, “wealth” and “employment” and “none”. Both used the same set of ideas to describe the positive features of mining sector.

Considering quotes related to mining work, participants perceived that working on mines is something hard and dangerous. At the same time, it is described as good as it is gainful employment but the job itself has also got some negative aspects, such as, tough conditions, low salaries, safety risks and dangers. A wealth increase for the area is also perceived. However, some people even associated mining

with employing children. When looking into what main benefits are perceived regarding raw materials, participants believed coal, gold and silver are the main minerals extracted from mines, giving a traditional image to this sector.

Perceived negative aspects from mining

Considering the disadvantages of mining, “pollution” is the most common idea (7%), followed by “danger” (6,3%) “disease” (5%), and “work” (4,73%). There are however, differences between the ideas of male and female participants. Women valued, “work” and “pollution” as the most representative. However, men chose “pollution” more frequently, followed by “work” and “danger”. There are more differences when discussing the negative traits and concepts than in positive ones regarding mining.

Regarding comments made about “the environment”, if it is linked to positive feedback it is associated with “pollution” and “exploitation of resources”, but without almost any other descriptions. Surprisingly, when “environment” is considered in a negative sense, it is also associated with “pollution” and “resources exploitation”. However, the descriptions and concepts are more varied, giving the participants more details. “Ecosystem destruction”, “nature” and “dirt” are also related words.

In general, it can be said that, in Spain, mining is seen as an activity that causes pollution, has environmental impacts and exploits the natural resources. But people tend to accept mining as it generates jobs within the local communities.

Mining and economy

The participants were asked on a scale from 1 to 5 how much or little do they agree with the statement “Mining is an important industry in our country.”

In Spain 12% of participants fully agreed with this statement, 27% partly agreed, 38% said that they neither agreed nor disagreed, while 14% partly disagreed and 5% fully disagreed. 4% of the participants stated to not have an opinion concerning this statement.

In this question, the difficulties for some people to have a clear idea on how relevant an industry (or anything else) is to a country, must be considered. Asking people to know how important a main industry or sector is at a national level, and to judge its level of importance is useless if they do not have at least a minimum knowledge of the topic. In the end, it may lead to evaluations of what people say when they do not have the necessary information on an issue and participate based on feelings or emotions. It is especially relevant when that issue could be important at a national level.

SPAIN

Question 9: To what degree would you agree with this sentence: "Mining is an important industry in our country." (N=1023)

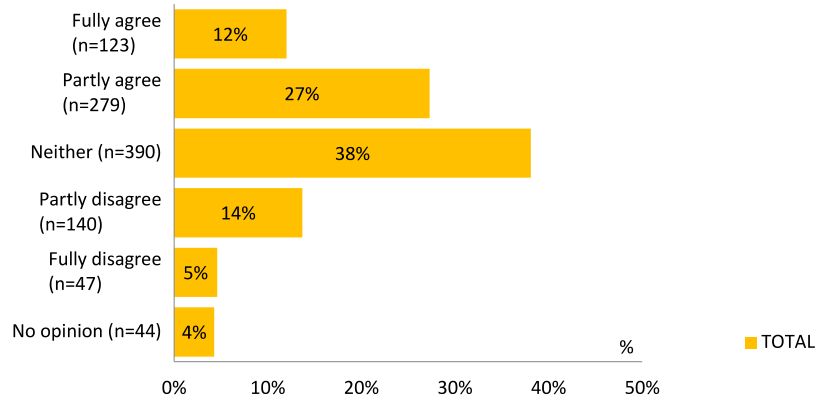


Figure 38: Spain Question 9: To what degree would you agree with this sentence: "Mining is an important industry in our country." (N=1023)

Analysing the survey, most participants stuck to the question and a high percentage of them did not position themselves. At the same time, more participants stated that mining is important for Spain. But to what extent do people have information about the contribution of mining to Spain? Could their opinion be measured by the information they received through mass media? When people are asked to evaluate how important a popular activity is to Spain (mining in this analysis), they first perceive the relation between Spain and mining has to exist, and then they will probably perceived a positive relation (39%).

In general, there is a need of research in this field. Mining is a very important activity for economic and social development, but traditionally research has focused on its technical and operative aspects, instead of studying the image transmitted to the rest of society (Ruiz-Martin, 2014). This has originated diverse problems, fundamentally due to the information which the population receives via the mass media and which sometimes creates a climate of opposition to the development of this extraction activity (Ruiz-Martin, 2014).

Mining and own resources

In Spain the participants were asked whether they think "Mining in Spain is important for providing our own industry with resources" on the one end of the scale or whether they believed "Mining shouldn't happen in Spain and raw materials should be exported from somewhere else".

30% of participants were fully in favour of the statement that “Mining in Spain is important for providing our own industry with resources”, while 33% agreed with it less strongly and 18% neither agreed with the one nor the other statements. At the same time, 6% of the participants rather thought the statement “Mining should not happen in Spain, and raw materials should be imported from other countries” to be valid, while 4% fully agreed with this statement. 10% of the participants expressed that they did not know what to answer considering the statements.

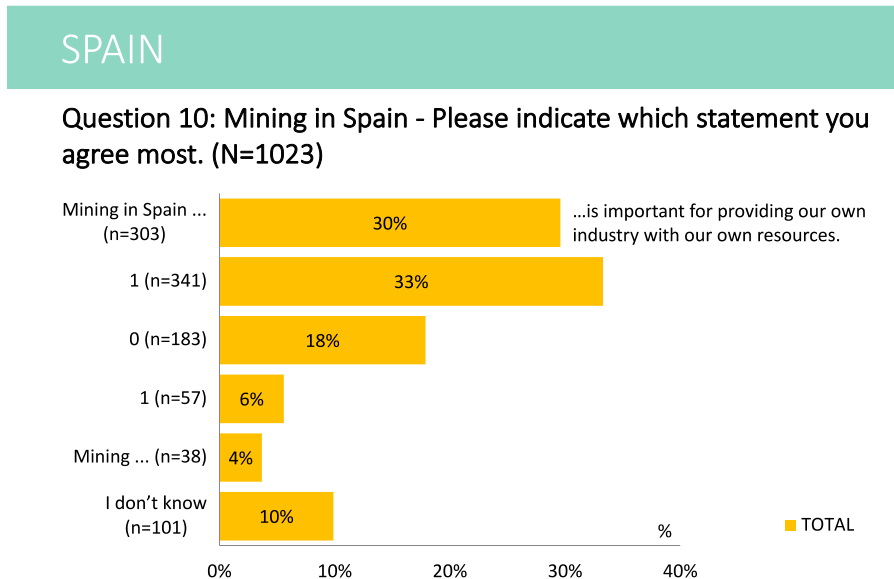


Figure 39: Spain Question 10: Mining in Spain - Please indicate which statement you agree most. (N=1023)

When examining the interpretation of this question, the fact that the two statements could be asking about different concepts, and not about positive and negative factors should be taken into consideration. The two topics covered might be:

- Whether an activity is important for a country (mining) and for what reason (to get raw materials)
- Whether an activity should not happen in a country (mining), not indicating the reason, but the repercussions (importing materials)

In general, it should be expected that people will support the idea of the importance of mining for providing a country with raw materials, as it is positive for the country.

No studies have been found in Spain evaluating perception of mining and the resources provided to the country. Those who deal with the topic, just assess how in general people perceive and value the goods and services provided by ecosystems affected by mining, as that on Mar Menor Lagoon (Velasco et al. 2017) where the population is well aware of these services.

Mining and Employment in a Community

Considering the perception of the correlation between mining and employment in a community, the Spanish participants were given two statements, one in favour of the idea that mining creates many jobs locally, leading to the whole community benefitting from this, and the other stating that mining employs only a few people of the community, and the benefit for a community located near a mine is small.

Participants then could indicate on a scale with those two poles on the far ends, how much they agreed with each of the statements.

In Spain, 33% (2) of the participants were of the opinion that “Mining creates many jobs locally, and the whole community benefits from this”. Also 32% (1) did not fully agree with that statement, but indicated that they rather agreed with the positive effect on employment through mining activities. 13% (0) neither tended towards one or the other statement. 9% (1) were of the opinion that “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” And 6% (2) fully agreed with the negative statement. 7% of the Spanish participants indicated “I don’t know” as their answer to the question.

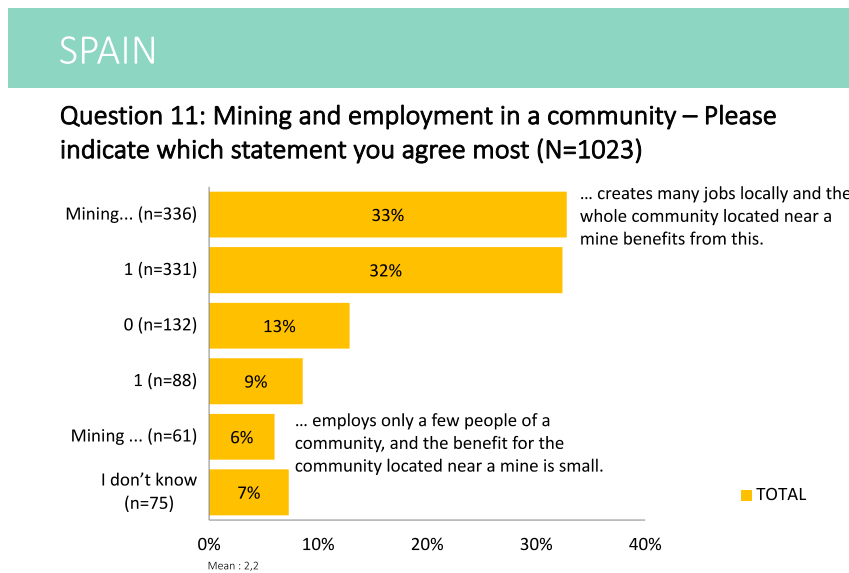


Figure 40: Spain Question 11: Mining and employment in a community – Please indicate which statement you agree most (N=1023)

To answer the question, as to whether “mining creates many jobs on the community“, it should be considered the participants may be living in a place where mining happens, so they know the effects it has on employment, or if they don't live in a place where mining happens, and then have an opinion based on the information they may be exposed or have access to through mass and social media.

Usually there is the dominant discourse or prevailing opinion that there is a direct relation between big industries or big companies and the creation of jobs. High profile bodies who have power, such as businessmen, politicians and the media, play the same role here and have the same thing to say. So, it should be expected that the majority of people in big cities will share the idea that mining (being a big industry or company) creates jobs.

Considering the data from the graph above, people in Spain perceive that mining relates positively to local employment, even when most of them live in an area not influenced by mining. The most feasible explanation to this is that traditional idea that links mining and local communities and employments is strongly present.

In Spain, despite this general perception, the reality points to another direction and changes in the relation between mining and employment have weakened, at least in the Coal industry. In the last fifteen years, the coal industry in Spain has been under pressure from political decisions that have forced the dismantling of the industry, a labour reconversion of mining areas, and the conversion of coal-fired power plants into combined-cycle gas power plants (Zafrilla, 2014). The policies implemented have focused on providing benefits and subsidies, not achieving a real reconversion in terms of labour in mining areas. Protests from the industry have been constant in recent years. These industries have been under pressure by politicians and have suffered from various regulations with dissimilar results. The so-called Coal Decree was born as a kind of “golden retirement” for the coal industry, which tried to ensure employment in mining areas but faced undesirable socioeconomic and environmental consequences (Zafrilla, 2014). This is one of the scarce academic researches that can be found delving into the topic and showing how the perception of mining as a provider of employment in communities may lack of consistency in some cases.

Infrastructure and Facilities in a Community

In order to find out what the perception of the Spanish people in terms of the effects of mining on the infrastructure and facilities in a community were, participants had been given two statements, one positive towards the effects of mining on the local infrastructure and facilities (“Mining creates new infrastructure and facilities to the community”) and one negative (“Mining does not much contribute to the local infrastructure and facilities”). Both statements were poles on the ends of a scale from 2-0-2, and the participants could select whether they fully agreed (2), partly agreed (1), neither agreed nor disagreed with either of the statements (0) and they also could mark “I don’t know” as a possible answer which 9% of the participants marked as their answer.

In Spain 26% of the participants fully agreed with the positive statement that mining indeed creates new infrastructure and facilities locally, 32% thought this statement was partly correct. 17% did not

tend to either the positive or the negative statement. 9% of the Spanish participants thought the negative statement was partly correct and only 6% fully agreed that mining does not contribute much to the local facilities and infrastructure of a community.

Overall it can be stated that also here the positive attitudes of the Spanish participants towards the possible benefits considering infrastructure and facilities dominate.

Again it should be remarked that no academic literature in Spain was found, so it is not possible to support further interpretations.

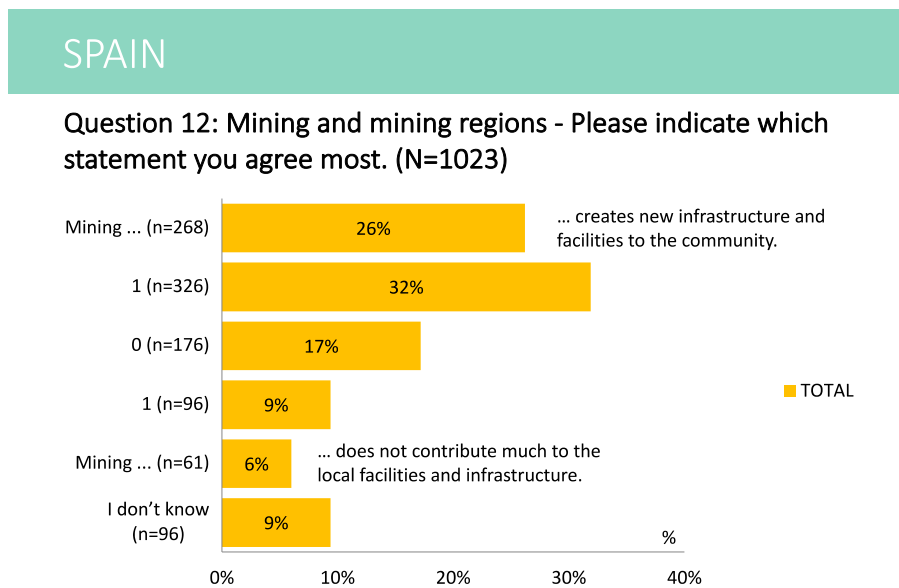


Figure 41: Spain Question 12: Mining and mining regions - Please indicate which statement you agree most. (N=1023)

In this question the same situation mentioned as before was faced, where the statements are not opposed ideas on one issue. Besides, the meaning of those concepts (infrastructures and facilities) may not be shared by everyone and could be hard to understand for some of the participants, as they are concepts mostly used in a professional context, but not in everyday language.

Given the context, people would tend to respond positively if they don't have enough information, because to support the contrary, you may need to have reasons to say so, so it is normal to approximate to the less complicated, positive, option.

It is expected that people will support the idea that mining has many positive results (including infrastructure and facilities). By default, a big business would create these positive results, which are present in hegemonic discourse.

Although studies analysing the perception of people on how mining activity may promote infrastructures in the areas are scarce, there is a recent study carried out in Spain, where people were asked about main infrastructures and the mining operations (Ruiz Martin, 2014). The study carried a personal survey in the streets of the mining towns of Belmez and Peñarroya Pueblonuevo (Andalusia), for the purpose of getting to know the opinion of the people who work or reside near the mining activity on the impact of mining in five factors, and how this could be lead to the construct of the mining image: (1) social impact, (2) environmental impact, (3) government and communication treatment, (4) employment and housing impact, and (5) infrastructures and industry impact. People were asked about infrastructure related to employment, that is, the housing activity (since workers need a minimum quality of life); and the infrastructures required by the mining industry, like land for the placement of operational infrastructures, roads, airports, pipelines, storage facilities and a multitude of other project facilities. The results were that “infrastructures and industry impact” and “employment and housing impact” had good results (reaching values above 0.6 out of 1), just behind the factors “social impact” and “environmental impact”, which obtained the highest scores (RuizRuiz Martin, 2014).

Environment

Environment is an important issue when discussing the possible difficulties of mining with stakeholder engagement. Thus it is important to understand the general public perception of environmental dangers caused by mining activities.

In Spain 9% of the participants stated that “The impact on the environment caused by mining is minor and can be handled well.” 17% partly agreed with this statement. 25% agreed partly with the statement “The impact of mining on the environment is huge and its consequences are not acceptable”, while a total of 17% of the participants fully agreed with this statement. 11% decided to mark “I don’t know” as their answer.

SPAIN

Question 13: Mining and environment - Please indicate which statement you agree most. (N=1023)

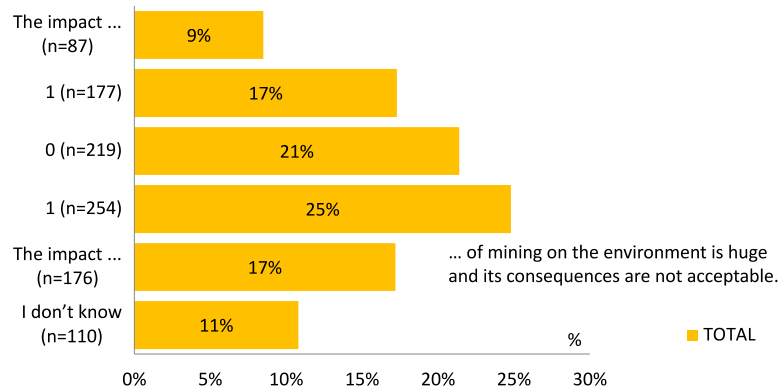


Figure 42: Spain Question 13: Mining and environment - Please indicate which statement you agree most (N=1023).

Considering what has already been stated, and the higher representation of the negative view on mining (26% have a positive view, while 42% have a negative view), the idea that people may have an opinion on mining and its effects on environment through channels already mentioned (mass and social media) is being supported. It is also probable that in most situations, when mass media speaks about mining and its effects on the environment, it is when something negative has happened or when opposition groups such as Ecology Movement protest or try to intervene in some area. Most of the information gathered in this question is to demonstrate the perception of mining is only showing the dark side of this activity. It is also probable that those with a positive outlook or evidence don't have the power or the means to reveal it to create the necessary awareness.

Few researches have been carried out in Spain regarding this topic. The above mentioned study in Mar Menor (Velasco, 2017) assessed the natural goods and services provided by the Mar Menor Coastal Lagoon, as well as the environmental risks it is exposed to. This ecosystem is affected by the mining activities held in the nearby mountains of Campo de Cartagena. Although the mining activities ceased many years ago, the watercourses that flow into the lagoon have deposited and still deposit heavy metals. The results showed that people highly evaluate the services, and a high percentage of people had perception of the principal environmental risks and impacts. Moreover, of all the respondents, 60.75% would be willing to accept the establishment of an annual fee to ensure conservation and a sustainable ecosystem use (Velasco, 2017). In these cases, when negative effects of mining occur, Vintro (2012) suggests that in order to improve the reputation of mining, these should be immediately remediated.

Acceptance of mining in a community

In order to determine the pre-existing notion of the Spanish public considering how socially accepted mining activities in general are said to be, the participants were given two statements, one stating that mining is indeed well accepted by local communities and another one stating that mining causes a lot of controversies in mining community. They also had the option to say that they did not know the answer, which 17% did.

This figure is possibly not valid, considering that the majority of people stated that they are not living in a community affected by mining. As for the positive statement “Mining is well accepted by most local communities” only 13% of the participants fully agreed and 22% partly agreed. Hesitant participants to pick any of the statements were the 22% of the sample. The 15% of participants partly agree with the negative statement “Mining causes a lot of controversies in a community in which mining is conducted” and 23% fully agreed with the negative statement.

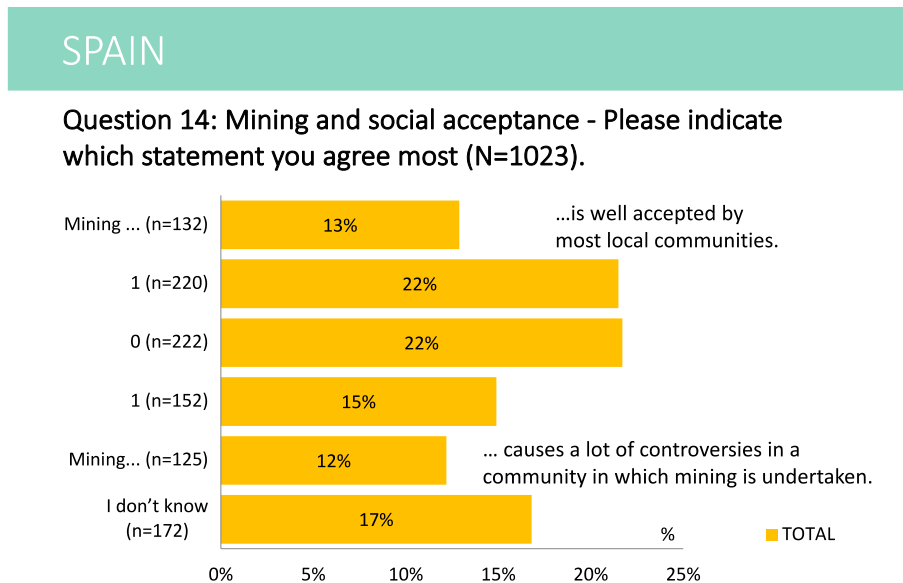


Figure 43: Spain Question 14: Mining and social acceptance - Please indicate which statement you agree most (N=1025).

In the end, the approximate balance between positive, negative and in between answers is showing that people don't have a firm stance on whether mining activity is accepted by them or not.

Answers to the open question concerning the acceptance of mining in a community

The open question, regarding acceptance of mining, shows that the most represented ideas are: “work” (4%), highly above the others, the following being “people” and “mining”. Regarding gender, no difference between male and female participants was found, “work” being the most representative for

both of them. “People” and “mining” are ideas also associated with mines in this question. Again, it may be demonstrating the problem that the traditional idea of mining generates many jobs within communities, despite them sharing the common idea that jobs are normally of not good quality.

At Laciana Valley, Northern Spain, Herrero-Cabrejas (2012) analysed the social consequences of environmental impact of mining, and the response that might be found by locals and social movements. When opposition of social movements to mountaintop removal coal mining (MTR) happened, these groups were neglected by locals because they were perceived as contrary to their interests. This means they had another perception of the mining impact on environment. Four narrative variations were explored —disease, traitor, lazy foreigner, and salon environmentalist— that combine to construct a picture of environmentalists as destroying the future of a traditional coal-mining valley. Social exclusion practices carried out by locals are perceived as rightful and legitimate as they are understood to be protecting both workers and an historical coal-mining culture. However, they also fracture local ecological resistance, while promoting a culture of silence within the local population, implicitly allowing the continuation of those practices. In Laciana, as well as in many other contexts of environmental struggle, activists are responding in different ways to these practices of prosecution and scapegoating (Herrero-Cabrejas, 2012).

4.3 Attitude towards mineral exploration

General attitude towards mineral exploration

Within this section people were given the option to offer ideas that they could relate to the word “exploration”.

In the first question of the section, the participants were asked to describe “What is the first thing that comes to your mind when you hear the word “exploration”?” The first main idea is search (7%), followed by “mines and minerals” (3,8%), “new” and “resources”. First idea used by men is “search”, “minerals” and “resources”, while the main ideas stated by women are “minerals”, “search” and “research” (investigation).

Even if it could be considered that participants had a vague idea of what mining exploration is, the explanations given are simply an expansion on the literal meaning of exploration, that being to search for something, using words or ideas related to exploration and the search of minerals, mining and resources. It is stated that people think that exploring happens when mining companies want to discover something new or find something they are looking for. Occasionally, it is found that certain participants think “companies that explore only do so to make as much of a profit from the territory, despite the consequences it may bring”.

Some of the answers gave more details on the meaning of exploration and related it to being a short term plan with the goal of it resulting in the long term use of resources in a mining context. Some people even associated exploring with a widely reported technique (fracking), which they described as “if exploring, you crack the land and the environment and that is difficult to reverse”.

Exploration of raw material

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important need in the eyes of the general public.

The participants were again given two statements – one positive (“Exploration of raw materials is important and we need to search for new mining sites”) and a negative one (“Exploration of raw materials is not important and we do not need new mining sites”). Here again the participants could mark whether they fully agree with each statement (2), partly (1), agree with neither (0) or whether they did not know the answer.

In Spain 36% of the participants fully agreed with the positive statement, 29% partly agreed with the positive statement considering the need for more mining activity. 16% of them were neither for one nor against another of the two statements. As for the negative responses, a total of 7% agreed partly with the critical statement and 4 % fully agreed with the negative statement. 8% stated not to know the answer to the question asked.

The topic arose while dealing with previous questions throughout the survey. This statement is considered to be highly complex - too much so to ask the average person to discuss it. It may have been difficult for them to express an opinion on whether exploration is something positive or negative, or even whether it was a concept associated with mining. In these situations, when asked that, the easiest option may be instead of confronting the problem to support the idea that might sound more feasible and reasonable. A general thought could be: exploration sounds important and having new mines should be encouraged.

At the same time, statements are not mutually exclusive points. They may consider that exploration is important to search for new ores, for example, but not necessarily need new mines.

SPAIN

Question 16: Exploration in Spain- Please indicate which statement you agree most (N=1023).

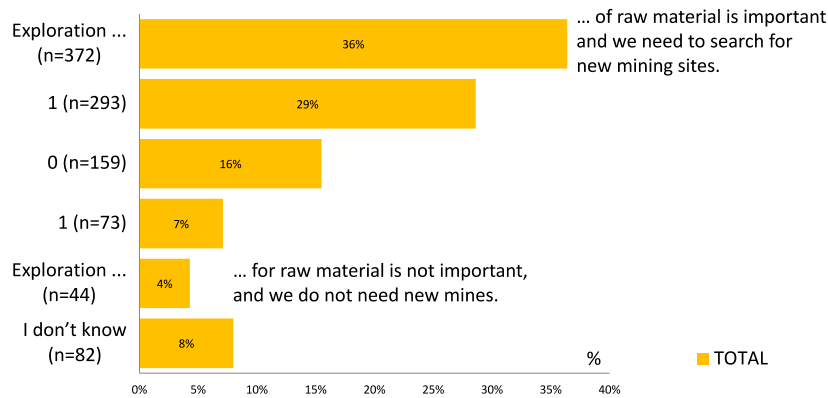


Figure 44: Spain Question 16: Exploration in Spain - Please indicate which statement you agree most (N=1023).

Some studies in Spain point out that acceptance of experimental facilities by local population depends upon how communication and relations to the people is handled. In a study conducted in the mining areas of Cubillos del Sil and Hontomin (Northwest of Spain), positive results were observed towards two experimental facility researching Carbon Capture and Storage, run by public body Fundación Ciudad de la Energía. In these projects, strategic communication was implemented. Positive results are thought to be due to a very close interaction with the local stakeholders and authorities, following an integral communication plan. When a social characterization was done in the town of Hontomin, where one of the facilities is based, it was revealed that 60% of the population saw the project as beneficial for the region. The project actions in this area are fully integrated in local activities, they feel the project as their own (Lupion, 2013). Other research project conducted in the same area of Comarca del Bierzo in Castilla y León, researched social perception of an upcoming research centre on clean coal combustion. In this study was found that only 21% of population had heard about the project and that a 15% of it had wrongly interpreted it (considering it a Renewable Energy Research Centre) (Sola, 2009).

Exploration with drones

The Spanish participants were asked whether encountering a drone flying with measuring equipment on a stroll outside their house or in the countryside would bother or worry them in any way.

The participants had the options of agreeing fully (2) or partly (1) with the positive statement that they would not be bothered by drones, of agreeing fully (2) or partly (1) with the negative statement that

this indeed would concern them. They could also state that neither would be the case or that they did not know the answer.

The 3% of participants said that they would remain entirely unaffected (fully agreeing with the positive statement that they would not be bothered by it), and 21% partly agreed with this statement. At the same time, 14% of them agreed with neither of the statements and 11% claimed to not know the answer. As for the negative statement a total of 11% of the participants said that this indeed would be a problem for them and they would feel bothered by a drone flying in their visual periphery, while 13% stated this could potentially be a problem for them and that they might likely be bothered by a drone in their proximity.

In Spain, the results may be influenced by the fact that most people have never seen a drone flying close to them. Certainly, most people could not differentiate between a drone, which is equipped with sensory equipment and one which is not. So this question addresses the reaction of the participants to something they had never experienced. Furthermore, in bigger cities, where most of them live, it would be very difficult to form an opinion, as the picture showed a drone flying in an open space in the countryside.

On the other hand, drones are associated with technology, modernity and advanced societies. There is a high probability that people have a positive perception of what a drone means (despite it being related to mines or not). Mass media usually covers news about drones used in different fields and is mostly associated with something positive or innovative.

Furthermore, as drones are not usually seen every day, the reaction expected would be of surprise and interest in new technology.

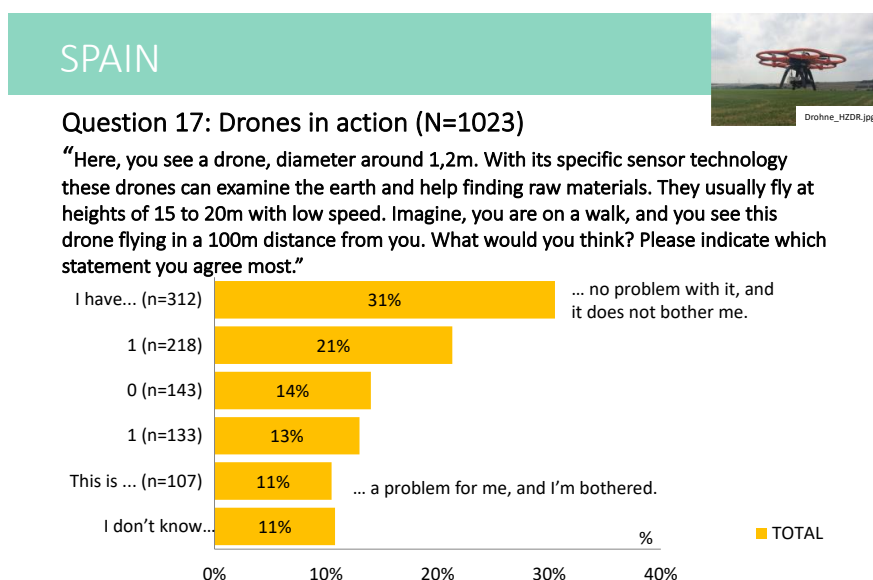


Figure 45: Spain Question 17: Drones in action (N=1025)

Answers to the open question concerning exploration with drones

Examining the open questions, most of the feedback on drones is that people do not have a problem or that they are simply indifferent to them. The general idea is that, as long as they are under control and people have information about what they are doing, drones in mining wouldn't be an issue. Looking further into the feedback the researchers could state that interviewees accept drones, as long as they do not invade their privacy, record video or images of them.

Exploration with helicopters

This question follows a similar structure to the preliminary one about the drone. People were given the idea of viewing helicopters with equipment conducting test flights, and the respondents were with 31% fully accepting this technology, 20% were still positive towards this, however slightly less 18% of the participants were neither for nor against either of the statements, while 9% chose "I don't know" as an answer. Only 10% were opposed to the idea of helicopters flying in their proximity, while 11% were critical towards it, but did not entirely dismiss the idea of having helicopters flying in their proximity conducting research by using equipment.

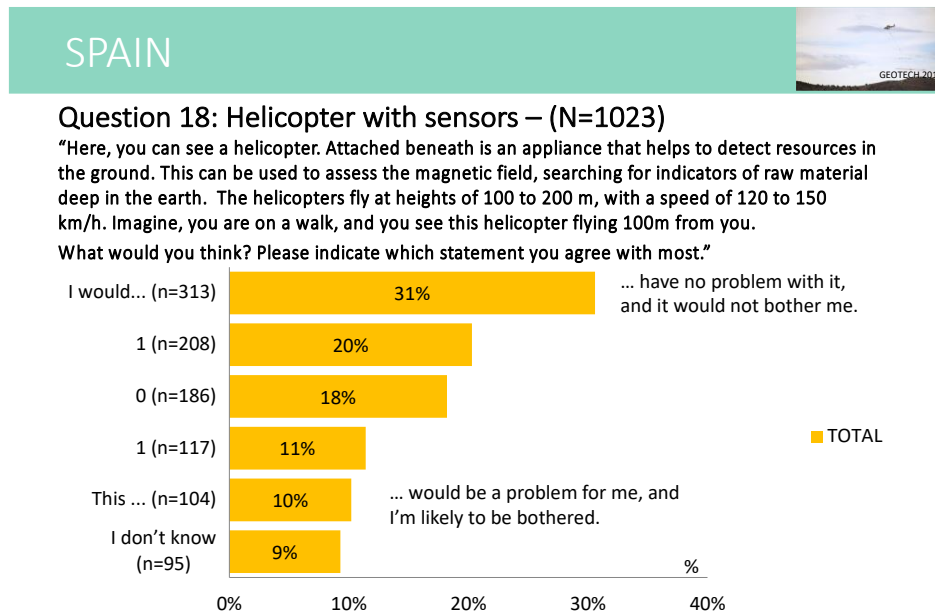


Figure 46: Spain Question 18: Helicopter with sensors – (N=1023)

People's reactions and the perception of this flying technology is similar to that of the drones. It is very likely that people have accepted something that is generally related to progress and when covered con media is mainly associated with positive situations.

Answers to the open question concerning exploration with helicopters

Looking at the open questions, when people were given the option to explain their answers, they stated that the main idea they related to helicopters was the “noise” (2,7%), together with “it bothersome” (2,7%) and “problem” (1,1%). The conclusion may be considered similar to the one drawn when discussing drones: as long as the helicopter do not disturb them because of the noise, respondents don’t seem to have a problem with them.

4.4 Attitude towards mining industry and public authorities

Mining company and responsibility

In order to ensure that people accept mining activities in their communities it is important for them to believe that the agents involved handle their business in a responsible manner. This question asked participants whether they trusted that the mining industry in their country was handling matters either in a fair and responsible manner or whether they did not trust the mining industry to do so. They could fully agree (2), partly (1), not agree to either statement (0) and state that they did not know the answer. 27% of the participants were fully positive towards the way the mining industry acts, 29% were partly positive considering their trust in the mining industry. 17% neither trusted nor distrusted the way the mining industry in their countries acts. Complete mistrust was indicated by 10% of the participants, less strong mistrust was indicated by as much as 10% of participants.

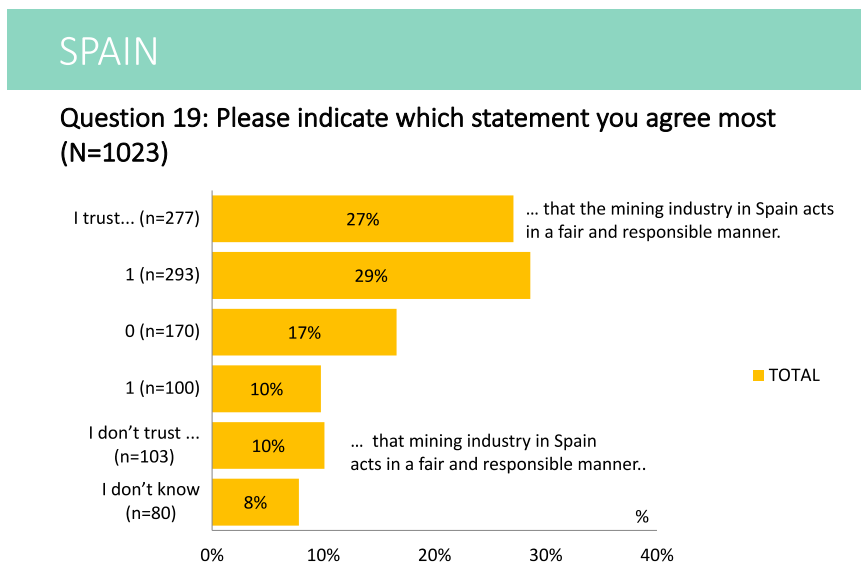


Figure 47: Spain Question 19: Please indicate which statement you agree most (N=1023)

It should be considered that the statements given, referred to the mining industry and not to mining companies. In Spain, the industry itself receives little attention in mass media coverage, while mining

companies are the ones that appear in media, and this is mainly when there is a news story related to accidents or environmental damage.

It can be said that in a context where there is a lack of information about mining activity, the general opinion may accept that the mining industry is made up of responsible businesses. This could be applied to any high positioned agent/institution in the social structure (i.e.: university, government, big companies). The words “have to” accept they act in a fair responsible manner. Although all know there are certain moments of shared public doubt regarding this acceptance, it is generally only temporary. These two ideas could be the basis of the general trust showed by respondents.

Public Authorities and handling of mining

Question 20 asked for the trust of the participants in public authorities by giving them the statement “Public authorities in Spain handle all the issues on mining well.” And asking them to indicate their approval of this statement by marking either Fully agree, partly agree, neither, partly disagree or fully disagree. They could also state that they did not have an opinion, which 13% of the participants did.

Only 4% of the participants stated that they fully agreed with this statement, 20% partly agreed. “Neither” was indicated by 32% of the participants. 19% stated that they partly disagreed with the given statement and 12% answered that they fully disagreed with the statement in question.

As mentioned in some of the prior questions’ analysis, people may not have enough information about a certain topic and, as it is not a mainstream issue, it makes it difficult for them to have an opinion on it. This could be the reason why most people position themselves around the centre of the possible answers.

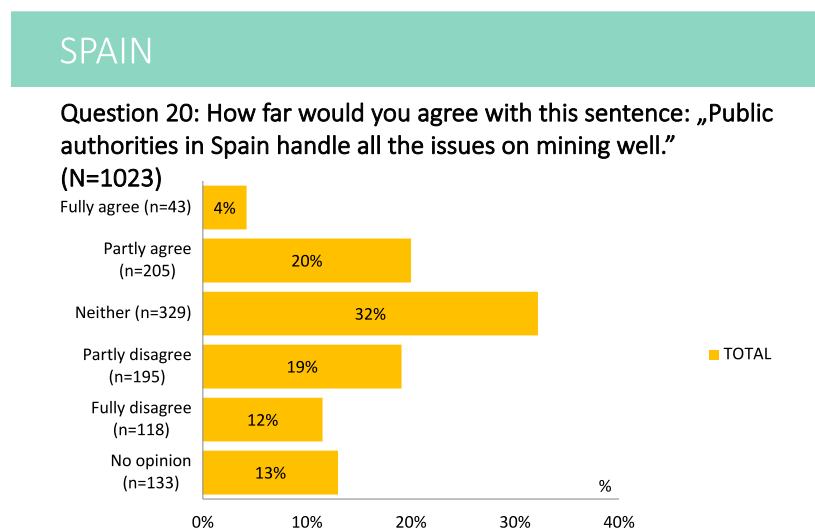


Figure 48: Spain Question 20: How far would you agree with this sentence: „Public authorities in Spain handle all the issues on mining well” (N=1023).

Last question and additional comments from the Spanish respondents

Regarding this question, 23% of the sample did not have anything else to say and from those who answered, 41% responded “no”, so around 50% of the participants did not offer more information.

Analysing the main words or expressions used, it can be concluded that much of it included “Spain” and “mining” related to “work”, as found in prior open questions.

It is also interesting that much of the feedback is very diverse and does not have a main topic. They mention a wide range of topics, such as History, technology, the need for mining, the danger of the activity or the environmental externalities.

4.5 Conclusion for the Spanish part

People living in an area not influenced by mining activity are the most represented within the Spanish sample. In general, women and men share similar perceptions of mining, and slight differences can be seen between people who live in a place influenced by mining and those who don't or don't know.

In general, a traditional perception on mining is seen to be held, that being the general image of a mine being a dark place from where men appear with faces covered with black soot and sweat, after a long hard day of extracting coal. This traditional image of mining is possibly constructed through a communicational and informational context, dominated by an hegemonic discourse transmitted by a mass media and social networks. One could go as far as to state that people have no information about contemporary mining activities or techniques.

The main ideas associated with mining are the employment possibilities, environmental impacts and health problems. On the positive side, people think that mining contributes to the wealth of society, employing local people, although the work is described as hard, dangerous and badly paid. Some people even relate mining to child labour. People stated that mining activity pollutes the environment, causes damage to the land and exploits the natural resources. The results show that people don't know the principal, contemporary uses and products from mining activity, and they don't associate the raw materials extracted locally with their everyday life.

Regarding exploration, the idea doesn't mean very much to people. Exploring is related to searching and research, but not focused on mining or the materials. Among the raw materials mentioned, people think coal is the first mineral extracted from mines, followed by gold and silver. On some occasions people refer to the subjects of the explorations, pointing out that people who want to explore do it to make as much profit out of the land as possible, despite the consequences. Some, albeit the smallest percentage, feel that exploration is a prior short-term activity which leads to a longer exploitation of resources in a mining context, and some link exploration to breaking into the land and the environment as a non-reverse process.

Modern technology used in mining, such as drones and helicopters, don't represent a risk for people, as long as they are under controlled use. Their presence is tolerated, apart from the noise made by helicopters. As long as privacy is not compromised, videos or images recorded, it is generally accepted. There is no information to know people's perception of mining facilities using non-invasive techniques. To solve many of these mining misconceptions, there is a huge need to provide high quality information to people about the processes and repercussions.

5 Comparison between Finland, Germany and Spain

Overall Comparison

Gender

All surveys were conducted with a set of over 1000 participants, ensuring the relevance and representative quality of the sets. The gender of participants was very equally balanced with nearly 50% participants identifying as either male or female. This is important, as both genders would be equally influenced by the researched activities, but there is reason to believe that the topic itself would engage more male feedback if the gender parity had not been ensured.

Age

Table 3: Age of the participants

	Country			
	TOTAL	Germany A	Spain B	Finland C
BASE	3062	1015	1022	1025
18-29	534 17%	167 17%	175 17%	192 19%
05/04/18	516 17%	145 14%	216 21% AC	155 15%
40-49	579 19%	202 20%	204 20%	173 17%
50-59	523 17%	177 17%	163 16%	183 18%
60-69	463 15%	141 14%	157 15%	165 16%
70-85	447 15%	183 18%	107 11%	157 15%
TOTAL	100%	100%	100%	100%

Sign.level: 95%

powered by NORSTAT

In terms of the age of the participants the sets were all very balanced, with the smallest set in one age group at 11% for the 70-85 year old participants in Spain and 21% of the 30-39 year olds also in Spain. The largest divide between age groups thus indicating 10% which is still relatively balanced.

Urbanity

In terms of the population sizes of the communities of all of the participants in three countries, a part of 23% - the largest proportion of participants - coming from the suburban cities with 10.000-49.999 inhabitants. The second largest group with 21% comes from the biggest cities with 500.000 or more inhabitants.

Table 4 Number of inhabitants

	TOTAL	Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
1 up to 500 inhabitants	68 2%	36 4% C	29 3% C	3 0%
2 500-999 inhabitants	64 2%	35 3% C	23 2% C	6 1%
3 1.000-4.999 inhabitants	252 8%	122 12% BC	84 8% C	46 5%
4 5.000-9.999 inhabitants	229 8%	85 8%	65 6%	79 8%
5 10.000-49.999 inhabitants	697 23%	257 25% B	209 20%	231 23%
6 50.000-99.999 inhabitants	382 13%	121 12%	124 12%	137 13%
7 100.000-199.999 inhabitants	335 11%	69 7%	115 11% A	151 15% AB
8 200.000-499.999 inhabitants	392 13%	103 10%	119 12%	170 17% AB
9 500.000 and more inhabitants	644 21%	187 18%	255 25%	202 20%

There are only 2% participants from towns or communities with less than 500 inhabitants and only 2% of the participants were from a community with 500-999 inhabitants. 8% of the participants were from communities as big as 1.000-4.999 inhabitants and 8% from towns with a population reaching from 5.000-9.999 inhabitants. 13% of the people interviewed were from cities ranging between 50.000-99.999 inhabitants. 11% came from cities as big as 100.000-199.999 inhabitants. 13% of the survey participants live in cities with a population ranging from 200.000 to 499.999 inhabitants.

This shows that the different sets in each country did not differ much in the representation of their age groups and were overall very coherent. The smallest groups came from the smallest communities in all three countries. The exception of the otherwise almost linear rising numbers was in all three countries the population size from 10.000 to 49.999 inhabitants which most participants in Finland and Germany came from and the second largest group were from the largest cities. In Spain this was the opposite, with a still very similar overall outlook. In terms of the age groups all three sets should thus be easily comparable and are not likely to cause problems with the accuracy of representation.

Place of Residence influenced by Mining Activities

In all three countries a majority states that they come from a region that is not affected by mining – in sum 73%. Only an average of 15% answered that their place of residence was affected by mining activities, 12% of all of the asked participants were not sure whether that was the case or not –with answers ranking as low as 5% in Germany and as high as 20% in Finland. This again, seems to be very balanced and thus good for a comparison across the three countries.

Table 5: place of residence is influenced by mining activities

q5

q5: My place of residence is influenced by mining activities

		Country			
		TOTAL	Germany A	Spain B	Finland C
BASE		3063	1015	1023	1025
1	yes	466 15%	161 16% C	185 18% C	120 12%
2	no	2232 73%	805 79% BC	728 71%	699 68%
3	I don't know	365 12%	49 5%	110 11% A	206 20% AB
TOTAL		100%	100%	100%	100%

Sign.level: 95% powered by NORSTAT

Mining and economy

The participants in each country were asked on a scale from 1-5 how much or little they agree with the statement “Mining is an important industry in our country.”

Overall 15% fully agreed with this statement, 36% partly agreed with this statement, indicating a rather positive attitude towards the accuracy of this statement. 25% said that they neither agreed nor disagreed with the statement as such, while 13% partly disagreed and only 7% of all of the participants fully disagreed with the above statement. Overall only 5% stated to not have an opinion concerning this

statement. Differences in between the three countries occur, with more positive answers from the German respondents.

Table 6: Mining is an important industry in our country

q9: To what degree would you agree with this sentence: „Mining is an important industry in our country.“

		Country			
		TOTAL	Germany <small>A</small>	Spain <small>B</small>	Finland <small>C</small>
BASE		3063	1015	1023	1025
1	Fully agree	457 15%	154 15% <small>B</small>	123 12%	180 18% <small>B</small>
2	Partly agree	1110 36%	428 42% <small>B</small>	279 27%	403 39% <small>B</small>
3	Neither	753 25%	183 18%	390 38% <small>AC</small>	180 18%
4	Partly disagree	386 13%	115 11%	140 14%	131 13%
5	Fully disagree	209 7%	92 9% <small>B</small>	47 5%	70 7% <small>B</small>
6	No opinion	148 5%	43 4%	44 4%	61 6%
TOTAL		100%	100%	100%	100%

Sign.level: 95% powered by NORSTAT

Mining and own resources

In all three countries the participants were asked whether they tended to think “Mining in Finland/Germany/Spain is important for providing our own industry with resources” on the one end of the scale or whether they believed “Mining shouldn’t happen in Finland/Germany/Spain and raw materials should be exported from somewhere else”.

Differences between the countries were very small. Overall 28% were fully in favour of the statement that “Mining in Finland/Germany/Spain is important for providing our own industry with resources”, while 35% agreed with this less strongly, while 19% neither agreed with the one nor the other statement. 6% rather thought the statement “Mining should not happen in Finland/Germany/Spain, and raw materials should be imported from other countries.” to be valid, while 4% fully agreed with this statement. 10% stated that they did not know what to answer considering the statements.

Table 7: Mining and own resources

	Country			
	TOTAL	Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
Mining in Finland/Germany/Spain is important for providing our own industry with our own resources.	842	231	303	308
2	28%	23%	30%	30%
			A	A
1	1067	337	341	389
	35%	33%	33%	38%
				AB
0	566	233	183	150
	19%	23%	18%	15%
		BC	C	
1	168	65	57	46
	6%	6%	6%	5%
2	113	52	38	23
Mining should not happen in Finland/Germany/Spain, and raw materials should be imported from other countries.	4%	5%	4%	2%
		C	C	
I don't know	307	97	101	109
	10%	10%	10%	11%
MEAN	2,1	2,3	2,1	2,0
Standard Deviation	1,1	1,1	1,1	1,0
TOTAL	100%	100%	100%	100%

Sign.Level: 95%

powered by NORSTAT

Mining and Employment in a Community

Considering the overall perception of the correlation between mining and employment in a community all the participants were given two statements, one in favour of the idea that mining creates many jobs locally, leading to the whole community benefitting from this, one stating that “ Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” People then could indicate on a scale with those two poles on the far ends, how much they agree with each of the statements.

In general 32% (2) of the participants believed “Mining creates many jobs locally, and the whole community benefits from this”. Also 34% (1) did not fully agree with that statement but indicated that they rather agreed with the positive effect on employment through mining activities. 13% (0) neither tended towards one or the other statement. 8% (1) rather thought that “Mining employs only a few people of the community, and the benefit for a community located near a mine is small.” And 6% (2) fully agreed with the negative statement. 7% indicated “I don’t know” as their answer to the question.

Table 8: Mining and employment

q1 1: Mining and employment in a community

		Country			
		TOTAL	Germany A	Spain B	Finland C
BASE		3063	1015	1023	1025
1 2	Mining creates many jobs locally, and the whole community located near a mine benefits from this.	977	322	336	319
		32%	32%	33%	31%
2 1		1048	320	331	397
		34%	32%	32%	39% AB
3 0		399	158	132	109
		13%	16% C	13%	11%
4 1		243	89	88	66
		8%	9% C	9%	6%
5 2	Mining employs only a few people of the community, and the benefit for a community located near a mine is small.	182	67	61	54
		6%	7%	6%	5%
9 I don't know		214	59	75	80
		7%	6%	7%	8%
MEAN		2,2	2,2	2,2	2,1
Standard Deviation		1,2	1,2	1,2	1,1
TOTAL		100%	100%	100%	100%

These findings are relevant in terms of the perceived benefits, and all three countries show very similar answers. Once the perceived benefits outweigh the perceived risks of an industrial intervention in a community, the affected group is more likely to be positive towards the activities in question.

In general, 66% see a rather positive effect on job creation through mining activities, bringing with benefits for a community. On average only as low as 14% of all the participants from the different countries have a negative perception of potential jobs created by the mining industry and the correlating positive benefits. 13% neither agree nor contradict each of the given statements, and 7% saw themselves unfit to answer the question. This is a rather positive result considering future mining activities, because it shows that for 66% of the people asked one major factor – prosperity – is being perceived as likely to happen as a side effect of mining activities.

However, it is important to not “rule on a majoritarian vote” when it comes to public engagement. The 14% of the participants with a negative attitude would need to be included in the debate as much, because the support of a community has to happen as inclusive as possible in order not to create a strong and active minority opposition which can possibly have a negative effect on planned projects and their timelines.

Infrastructure and Facilities in a Community

As previously stated in order to find out what the perception of the participants in terms of the effects of mining on the infrastructure and facilities in a community were, they had been given two statements. One of them was positive towards the effects of mining on the local infrastructure and facilities (“Mining creates new infrastructure and facilities to the community”) and one negative (“Mining does not much contribute to the local infrastructure and facilities”). Both statements were poles on the ends of a scale from 2-0-2, and the participants could select whether they fully agreed (2), partly agreed (1), neither agreed nor disagreed with either of the statements (0) and they also could mark “I don’t know” as a possible answer which 10% of the participants marked as their answer.

Table 9: Infrastructure and Facilities in a Community

q12: Mining and mining regions

	TOTAL	Country		
		Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
Mining creates new infrastructure and facilities to the community. 2	663 22%	180 18%	268 26% AC	215 21%
1	1003 33%	297 29%	326 32%	380 37% AB
0	542 18%	215 21% BC	176 17%	151 15%
1	320 10%	125 12% B	96 9%	99 10%
2 Mining does not contribute much to the local facilities and infrastructure.	238 8%	107 11% BC	61 6%	70 7%
I don't know	297 10%	91 9%	96 9%	110 11%
MEAN	2,4	2,7	2,3	2,4
Standard Deviation	1,2	1,3	1,2	1,2

Overall 22% fully agreed with the positive statement that mining indeed creates new infrastructure and facilities locally, 33% thought this statement was partly correct. 18% did not tend to either the positive or the negative statement. 10% of the participants thought the negative statement was partly correct and only 8% fully agreed that mining does not contribute much to the local facilities and infrastructure of a community.

By this, the data shows that the positive attitudes of all the participants towards the possible benefits considering infrastructure and facilities are dominating. In Finland, level of perception is higher than in Spain and Germany.

Environment

Environment is an important issue when discussing the possible difficulties of mining with stakeholder engagement. Thus, it is important to understand the general public perception of environmental dangers caused by mining activities.

Table 10: Environment

q13: Mining and environment

		Country				
		TOTAL	Germany A	Spain B	Finland C	
BASE		3063	1015	1023	1025	
1	2	The impact on the environment caused by mining is minor and can be handled well.	174 6%	57 6%	87 9%	30 3%
			C	AC		
2	1		359 12%	86 9%	177 17%	96 9%
				AC		
3	0		620 20%	206 20%	219 21%	195 19%
4	1		899 29%	299 30%	254 25%	346 34%
				B	AB	
5	2	The impact of mining on the environment is huge and its consequences are not acceptable.	730 24%	283 28%	176 17%	271 26%
				B	B	
9		I don't know	281 9%	84 8%	110 11%	87 9%
MEAN		3,6	3,7	3,3	3,8	
Standard Deviation		1,2	1,2	1,2	1,1	
TOTAL		100%	100%	100%	100%	

The participants of all three countries combined were rather critical of the environmental dimension of mining activities. Answers differ slightly, being Spain least critical.

Only 6% of the people asked stated that “The impact on the environment caused by mining is minor and can be handled well.” 12% partly agreed with this statement. The weight was much more on the negative side of the scale with 29% agreeing partly with the statement “The impact of mining on the

environment is huge and its consequences are not acceptable, while a total of 24% of the participants fully agreed with this statement. 9% decided to mark “I don’t know” as their answer.

It is obvious that especially here a lot of convincing will be necessary. As long as a majority is convinced there are indeed negative environmental implications and that these are also not able to be handled well, indicates a very important field of engaging negatively biased stakeholder more and putting the topic “Mining and Environment” up at round tables, helping to create a more positive image in people’s heads.

Acceptance of mining in a community

In order to determine the pre-existing notion of the general public in all 3 countries considering how socially accepted mining activities in general are said to be, the participants were given two statements, one stating that mining is indeed well accepted by local communities and another one stating that mining causes a lot of controversies in mining community. They also had the option to say that they did not know the answer, which 21% did.

Table 11: Acceptance of mining in a community

q14: Mining and social acceptance

		Country			
		TOTAL	Germany A	Spain B	Finland C
BASE		3063	1015	1023	1025
1	2	287	96	132	59
Mining is well accepted by most local communities.		9%	10%	13%	6%
			C	AC	
2	1	607	183	220	204
		20%	18%	22%	20%
				A	
3	0	633	214	222	197
		21%	21%	22%	19%
4	1	506	147	152	207
		17%	15%	15%	20%
					AB
5	2	391	99	125	167
Mining causes a lot of controversies in a community in which mining is		13%	10%	12%	16%
					AB
99	I don't know	639	276	172	191
		21%	27%	17%	19%
			BC		
MEAN		3,0	3,0	2,9	3,3
Standard Deviation		1,3	1,2	1,3	1,2
TOTAL		100%	100%	100%	100%

Sign. level: 95% powered by NDRSTAT

This figure is possibly as high considering that the majority of people stated that they are not living in a community affected by mining. As for the positive statement “Mining is well accepted by most local communities – only 9% agreed fully, a total of 20% partly agreed.

Indecisive by deciding for the middle between the 2 statements were 20%.

There were then 17% of participants partly agreeing with the negative statement “Mining causes a lot of controversies in a community in which mining is conducted” and 13% fully agreed with the negative statement. Respondents answered very similarly among the countries.

Exploration of raw material

Within this section the goal was to find out whether the exploration of resources in general was regarded as an important need in the eyes of the general public.

The participants were again given two statements – one positive one (“Exploration of raw materials is important, and we need to search for new mining sites”) and a negative one (“Exploration of raw materials is not important, and we do not need new mining sites.”) Here again the participants could mark whether they fully agree with each statement (2), partly (1), agree with neither (0) or whether they did not know the answer.

Table 12: Exploration of raw material

q16: Exploration in Finland/Germany/Spain

		Country			
		TOTAL	Germany A	Spain B	Finland C
BASE		3063	1015	1023	1025
Exploration of raw materials is important and we need to search for new mining sites.					
2		819	150	372	297
		27%	15%	36%	29%
1		923	296	293	334
		30%	29%	29%	33%
0		557	257	159	141
		18%	25%	16%	14%
1		263	126	73	64
		9%	12%	7%	6%
2	Exploration for raw materials is not important, and we do not need new mines	196	93	44	59
		6%	9%	4%	6%
1	don't know	305	93	82	130
		10%	9%	8%	13%
MEAN		2,3	2,7	2,1	2,2
Standard Deviation		1,2	1,2	1,1	1,2
TOTAL		100%	100%	100%	100%

Overall 27% fully agreed with the positive statement, 30% partly agreed with the positive statement considering the need for more mining activity. 18% were neither for one nor against another of the two statements.

As for the negative responses, a total of 9% agreed partly with the critical statement and 6 % fully agreed with the negative statement. 10 % stated not to know the answer to the question asked.

Exploration with drones

One important aspect in this research concerns the public acceptance of the different flying devices, which will be needed in order to determine the ground conditions for mining activities. Thus, the participants were asked whether encountering a drone flying with measuring equipment on a stroll outside their house or in the countryside would bother or worry them in any way.

The participants had the options of agreeing fully (2) or partly (1) with the positive statement that they would not be bothered by drones, of agreeing fully (2) or partly (1) with the negative statement that this indeed would concern them. They could also state that neither would be the case or that they did not know the answer.

30% thus said that they would remain entirely unaffected (fully agreeing with the positive statement that they would not be bothered by it), 22% partly agreed with this statement. 15% agreed with neither of the statements and 8% claimed to not know the answer.

As for the negative statement a total of 12% said that this indeed would be a problem for them and they would feel bothered by a drone flying in their visual periphery, while 15% said this could potentially be a problem for them and that they might likely be bothered by a drone in their proximity.

There is a rather well dispersed range of opinions here, with no too clear tendencies. It may be that if the public was informed in advance this indecisiveness could be turned into a positive attitude, but it also seems that no clear tendency may derive from a lack of providing enough information that would allow the participants to judge the situation more precisely.

Table 13: Exploration with drones

q17: Drones in action

	Country			
	TOTAL	Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
I have no problem with it, and it does not bother me. 2	904 30%	248 24%	312 31% A	344 34% A
1	672 22%	198 20%	218 21%	256 25% AB
0	445 15%	179 18% BC	143 14%	123 12%
1	451 15%	163 16% B	133 13%	155 15%
2 This is a problem for me, and I'm bothered.	353 12%	150 15% BC	107 11%	96 9%
I don't know	238 8%	77 8% C	110 11% AC	51 5%
MEAN	2,5	2,8	2,5	2,4
Standard Deviation	1,4	1,4	1,4	1,4
TOTAL	100%	100%	100%	100%

Sign.level: 95% powered by NORSTAT

Exploration with helicopters

The participants were asked the same question that they had been asked for the equipped drones considering helicopters with sensors.

As helicopters are likely to produce more noise and their measuring equipment is larger than the drone equipment it was important to find out, whether this was also perceived differently by the participants. On the other hand, drones are more often in the media for having collided or infringed the personal privacy of people. This negative image of drones could also affect the answers of the participants. Helicopters may be louder and have larger equipment, but they are also known to be relatively safe and they are not novel technology.

When asked about helicopters with equipment conducting test flights, the participants were by 31% fully accepting this technology, 23% were still positive towards this, however slightly less (1).

17% were neither for nor against either of the statements, while 7% chose "I don't know" as an answer. Only 10% were opposed to the idea of helicopters flying in their proximity, while 12% were critical towards it, but did not entirely dismiss the idea of having helicopters flying in their proximity conducting research by using equipment.

It seems very important to also here provide more information. People have a similar attitude towards both flying machines and this could only be resolved through more information and calming concerned citizens by explaining how they work and that they are safe to be around.

Table 14: Exploration with helicopters

q18: Helicopter with sensors

	Country			
	TOTAL	Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
2 I would have no problem with it, and it would not bother me.	963 31%	287 28%	313 31%	363 35% AB
1 I would have some problems with it, but it would not bother me too much.	705 23%	242 24%	208 20%	255 25% B
0 I would have a lot of problems with it, and it would bother me a lot.	506 17%	182 18% C	186 18% C	138 14%
1 I don't know	377 12%	125 12%	117 11% AC	135 13%
2 This would be a problem for me, and I'm likely to be bothered.	309 10%	116 11% C	104 10%	89 9%
3 I don't know	203 7%	63 6%	95 9%	45 4%
MEAN	2,4	2,5	2,5	2,3
Standard Deviation	1,4	1,4	1,4	1,3
TOTAL	100%	100%	100%	100%

Mining company and responsibility

In order to ensure that people accept mining activities in their communities it is important for them to believe that the agents involved handle the affairs in a responsible manner. This question asked participants whether they trusted that the mining industry in their country was handling matters either in a fair and responsible manner or whether they did not trust the mining industry to do so. They could fully agree (2), partly (1), not agree to either statement (0) and state that they did not know the answer. 20% were fully positive towards the way the mining industry acts, 27% were partly positive considering their trust in the mining industry.

19% neither trusted nor distrusted the way the mining industry in their countries acts.

Complete mistrust was indicated by 14% of the participants, less strong mistrust was indicated by as much as 14% of participants.

On the one hand one could say that this indicates that the mining industry would be well advised by including more trustworthy stakeholders to the round tables in the planning phase, e.g. stakeholders from the community, the scientific area and perhaps even citizens from other mining areas that can share their (hopefuls) positive experience in order to reduce possible negative preconceived notions, on the other hand are public institutions in general never trusted much more than 40% on average.

Mean trust in public institutions, European countries, 2013 – Figure 3.14 in the OECD report *How's life? (2015)* ⁵

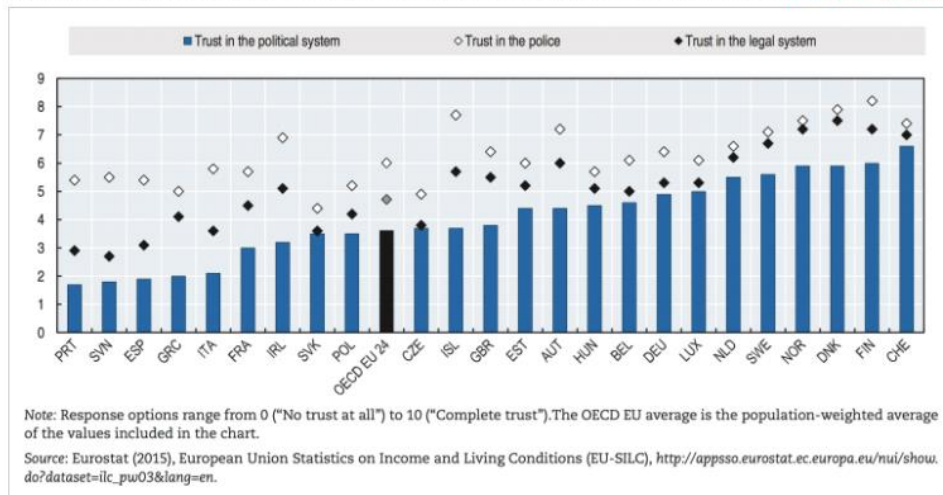


Figure 49: Mean trust in public institutions 2013, Europeans countries (OECD report, Eurostat 2015).

Looking at the mean trust in public institutions, the three countries vary greatly in their average trust levels. Finland ranks second highest, Germany is ranked rather high as well, however Spain is ranked comparatively low.

Table 15: Mining company and responsibility

q19: Please indicate which statement you agree most.

	Country			
	TOTAL	Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
I trust that the mining industry in Finland/Germany/Spain acts in a fair and responsible manner.	620	207	277	136
2	20%	20% C	27% AC	13%
1	833	249	293	291
	27%	25% A	29% A	28%
0	553	191	170	192
	18%	19%	17%	19%
1	429	137	100	192
	14%	14% B	10%	19% AB
2	436	168	103	165
I don't trust that mining industry in Finland/Germany/Spain acts in a fair and responsible manner.	14%	17% B	10%	16% B
I don't know	192	63	80	49
	6%	6%	8% C	5%
MEAN	2,7	2,8	2,4	3,0
Standard Deviation	1,4	1,4	1,3	1,3

In Finland the combined positive feedback then comprises 41%, in Spain 56%, in Germany 45%. Overall the trust feedback comprising 2 (fully trust) and 1 (partly trust) adds up to 47% in all three countries. The respondents from Spain have the best opinion about the mining compare to Finland and Germany. This figure is important because it shows that the mining industry is not faced with a trust problem uncommon for the industry but performs absolutely in line with the overall perception of the business sector.

Public Authorities and handling of mining

Question 20 asked for the trust of the participants in public authorities by giving them the Statement “Public authorities in Finland/Germany/Spain handle all the issues on mining well.” And asking them to indicate their approval of this statement by marking either Fully agree, partly agree, neither, partly disagree or fully disagree. They could also state that they did not have an opinion, which 11% of the participants did. Only 5 % stated that they fully agreed with this statement, 22% partly agreed. Neither was indicated by 25% of the participants. 22% stated that they partly disagreed with the given statement and 15% answered that they fully disagreed with the statement in question.

Table 16: Public Authorities and handling of mining

q20

q20: How far would you agree with this sentence: „Public authorities in Finland/Germany/Spain handle all the issues on mining well.”

	TOTAL	Country		
		Germany A	Spain B	Finland C
BASE	3063	1015	1023	1025
1 Fully agree	141 5%	60 6%	43 4%	38 4%
2 Partly agree	685 22%	239 24%	205 20%	241 24%
3 Neither	763 25%	262 26%	329 32%	172 17%
4 Partly disagree	667 22%	171 17%	195 19%	301 29%
5 Fully disagree	458 15%	144 14%	118 12%	196 19%
6 No opinion	349 11%	139 14%	133 13%	77 8%
TOTAL	100%	100%	100%	100%

The problem here could have been that “Public authorities” is a very vague concept in the mind of an ordinary member of the public. It might be hard to attach an actual institution to the broad term “public authorities”. Also, the way the question was phrased might have induced more negative results, as the term “issues” already implies that there are existing negative effects that have to be dealt with.

As previously mentioned they are generally faced with a decline in trust on an institutional level. On average, the trust stayed well below 30%, which either is due to the implied negative effects by stating that there are “issues” or the participants think of actual problem dimensions that they feel are not handled well. However, they also stated that most of them did not come from regions affected by mining, so it is very difficult to establish where this perception of authorities handling issues on mining in a dissatisfying manner comes from. It could be helpful to ask participants in the future to name – on the same page of the question – one factual incident, where they felt this was the case.

This would influence the subjective immediate answer, but it would also help to ask for a feedback grounded in a realistic context.

6 Conclusion

6.1 Key findings

The attitude towards mining and mineral exploration can't be described in one sentence as "the attitude is positive" or "the attitude is negative", but it has to be examined by the different topics being analysed in this citizens' survey, to get a full picture of this perception from the public.

The results can be interpreted by carefully examining the statistical data and the level of agreement and disagreement. Even more interesting, the results of the open questions come into play, given as comments from all respondents in Finland, Germany and Spain. Here, the researchers examined in more detail opinion, attitudes and motives about all topics of mining and mineral exploration. The next paragraphs give an overview and interpretation for each of the main topics, summarizing both statistical data and the qualitative data. The researchers indicate each topic with a general attitude, ranging from "positive", "slightly positive", "medium/indifferent", "slightly negative" and "negative".

The results among the countries are relatively equal. However, the level of attitude differs significantly among the topics, ranging from "positive" for mining in general, to "slightly negative" and "negative" for environment.

Attitude to different topics of mining and mineral exploration

Looking at the statistical data for the three topics on "Mining and economy", "Mining and own resources" and "employment", the acceptance is very high in all three countries. People see the chances for employment in terms of number of jobs and income developed by mining, and generally agree that resources must be mined in the own country.

Overall, citizens believe that mining is important for the own economy. Quite positive, people see also options to improve local facilities and the infrastructure by the mining industry.

The acceptance for mining on a local level remain indifferent. Public opinion, in line with other studies (e.g. from Australia) drops dramatically when it comes to environment. Frequently mentioned, and proven by the data, people raise a huge concern about the impact mining could have on the environment.

Table 17: Public attitude towards different topics of “mining and mineral exploration” - results of the survey

Topic	Attitude in Finland, Germany and Spain
Mining and economy	“positive” attitude
Mining and own resources	“positive” attitude
Mining and employment in a community	“positive” attitude
Infrastructure and facilities in a community	“slightly positive” attitude
Environment	“negative” attitude
Acceptance of mining in a community	“medium/indifferent” attitude

Mineral exploration

A positive judgement is given to the need for exploration of raw material in general terms. Two specific questions focusing helicopters and drones are asked, and generally the public does not feel bothered when a drone with sensors or a helicopter with sensors will fly by. Here, good interest among the citizens in the research is stated.

Table 18: Public attitude towards different topics of “Mineral exploration” – results of the survey

Topic	Attitude in Finland, Germany and Spain
Exploration of raw material	“positive” attitude
Exploration with helicopter	“slightly positive” attitude
Exploration with drones	“slightly positive” attitude

However, concerns are raised towards the noise the helicopter will cause, and the fear for an observation, with a camera attached to a drone. A number of respondents feel scared by a drone and also by a helicopter.

Mining industry and public authorities

Following the results in three countries Finland, Germany and Spain, there is no country where the population absolutely trusts in the mining industry acting in a fair and responsible manner. There were certain minor differences in the perceived trust towards the mining industry, where Spanish citizens seemed to be more trusting than Finish citizen, however on the broader scale these differences were far from being striking.

Table 19: Public attitude towards different topics of “Mining industry” -results of the survey

Topic	Attitude in Finland, Germany and Spain is:
Mining company and responsibility	“medium/indifferent” attitude
Public authorities and handling of mining	“medium/indifferent” attitude

However, the trust generally equals the trust any European country currently has towards the industry. Trust in businesses in general is declining, the same holds for the trust in public authorities.

6.2 Implications for the mining sector- two scenarios

This citizens’ survey focused on examining the opinion for mining, mining sector and exploration as one first step. When the people were confronted with the term “exploration”, firstly they think of an established mine in their area rather than an exploration only. It is not in their mind, that companies need hundreds of explorations to find economically worthwhile raw material to start mining. That was also seen in the open question which was asked in the survey “What comes to your mind when you hear the words “mining?”. The first impression of the respondents are impacts of the environment as “destruction or contamination of the environment or of the nature”. In summary there is a mixture of individual knowledge and context that people get information from media or in local the community and personal networks.

The researchers illustrate this with two simple scenarios:

- In a best-case scenario, the mining industry can provide guarantees to the public that they will not create any negative impact for the environment and that health risks are limited or non-existent. In addition, due to the hope of the population for new jobs, new and higher income, and effects on the infrastructure, the mining company could promise to hire locally, ask for the demand on infrastructure, and actively discuss “to give something back”.
- The worst-case scenario looks the opposite. The survey shows that the population perceive mining as a chance for local development, but the acceptance will most likely drop when the locals realize that the number of jobs developed by mining is low, or staff is hired from outside of the region, and financial incentives are not given. Here, the stakeholders from the mining sectors act in a very sensitive area, by also addressing the concerns raised by the population for the environmental impacts of mining.

Here one needs to take trust-creating measures on a local scale in order to ensure that the general tendencies won’t harshly affect them in the near future. A superficial engagement thus is not advisable, and companies need to act responsible in order to not lose societal trust. Not because they would act

ethically by doing so, but because they will eventually lose the acceptance, customers and grounds they need in order to conduct business successfully.

It is, however, more relevant to believe, that in most cases mining industry activities are between the two scenarios. It would be irresponsible for mining industry to promise that there are no impacts as mining industry always have environmental impacts. How these are experienced by the local people, differs between the projects. Mining companies should inform local people clearly and be honest instead of making futile promises. It is the same with the new jobs. In many locations there are not enough professionals for the need of the mining company. It also should be noted, that not everyone is suitable for working in mines (f. ex. underground). Also, the lack of education of mine-workers may affect that the mining company will hire people outside from the mining location.

Local impacts of mining differ between mining projects, and countries. Impacts can be environmental, economic, political, and cultural, and can affect the everyday life and well-being of local people. The impacts can be perceived as bringing wealth to regional economies and local communities, but they also may harm the environment, inhabitants and their livelihoods. As it might be difficult for local people to realize the amount and variation of possible impacts, more information is needed at the local level. In this, environmental and social impacts assessments are in a central role in activating local people to participate the project and giving a greater attention to impacts from the very beginning. These would also help to realize that every exploration and mining case differs.

6.3 Recommendations and implications for the INFACT project

Although the results can't be transferred 1-to-1 to the situation at the reference sites at Sakatti, Geyer, Rio Tinto and Las Cruces, the citizens' survey gives valuable insights about what the INFACT-Team face in terms of opinion and attitude from the local population, and what the local population usually expects in form of information given before field research (with helicopter and drone), dialogue and involving local decision makers and the community, and addressing concerns most likely being raised.

As the citizens' survey has shown, a clear positive or negative, supportive or opposing attitude among the population in Finland, Germany and Spain can't be interpreted. This depends too much on the topics, the personal frame and experiences, and the available information from any kind of mining or exploration activity. Citizens see three topics in a positive light: chances for employment, raw material should be mined in the own country, and the overall importance to the nations' economy. Here, the project INFACT should frame the mineral exploration in a broader context and discuss and address the positive sites mining could have to a community and a country and the public are able to tolerate or accept mining and technology development.

Another positive finding was the general attitude towards implied benefits for a community through mining activities. A potential for a general positive attitude is seen which allows to assume that activities, if conducted with the adequate amount of stakeholder engagement and responsiveness of exploring companies or research institutes, will be received with a general positive attitude.

However, a stable proportion of all participants show a very critical (very negative) attitude towards mining and exploration in the aspect of environmental impacts and will most likely oppose any kind of mineral exploration in a region. The moment a member of the public feels fears, or his or her concerns are being disregarded, the danger of this person actively opposing the project increases.

The moment the perceived (possible) benefits from an industrial project outweigh the risks, the members of an affected community are much more likely to accept and even support the project in question actively. For example, in Australia, where mining historically and culturally is a relevant industry, the general wages of people working in mining areas are often doubled to compensate for the mining sites being far away from larger cities, which helped mining to be accepted and perceived as a prosperous industry.

Here the key factor “environment” comes into play, an often-mentioned argument and mayor concern. INFACT develops non-invasive methods with no – or minor – impact on the environment. For any occasion, the communication should address the environmental aspect, and communication should stress efforts for more sustainability in the mining sector.

Another issue is in the level of information which is provided before, during and after the field phases of the project. Today it is increasingly easier for affected members of the public to access information online, it also becomes increasingly important to actively engage the affected groups right from the beginning of planning an agenda. It may be important for a mining company to arrange a meeting with local people to inform them about activities and impacts. Also giving a possibility to ask questions in face to face situation may be important to local people and other stakeholders as well and may help to avoid misunderstandings when they occur occur. In this way, it also may increase acceptance of a certain project.

Misrepresented information online can lead to an opposing attitude, this worsens, if the affected people feel they have no or very little say in the process. It is also easier for people to voice their concerns about a planned project anonymously online and by that negatively impact the process, thus it is crucial to a successful stakeholder engagement to consider the affected groups (yet critical groups) and their concerns very early on in the planning phase.

Some parts of the population will feel annoyed by helicopter and drone flights, specifically the noise and the fear of violating privacy with video camera. This needs to be taken into account, by a tailored communication, and if ever possible, by reducing the impact of field research at the reference sites.

Also, by a touch-and-feel experience with the technology with different target groups, the acceptance will be most likely positive. Also helping public to understand that these drones have no negative health implications (radiation, failure rate, possible crashes, noise at night etc.) would be one way to raise the acceptance rate of such technologies.

Another approach focuses on the often-stated high interest among the population for more details about this type of research on non-invasive methods, and to learn more. Here, communication should aim at learning experiences with all target groups (yet the local population), events for showing equipment, explaining the background, and linking modern technology with mining history. Before exploration and later a potential mining activity, it might be of a high importance to contact for example a local newspaper and request a short article about the operations. Giving information this way may reach more people in local and regional level than a possible meeting. This may also help local people to find more information about the activities for example from the internet.

On a broader level this research reaches beyond the research of public acceptance and stakeholder engagement considering the mining industry. The findings of this research can be used, and their corresponding recommendations employed across a broad range of different industries that face difficulties with public acceptance and stakeholder engagement.

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8 Appendix

Questionnaire (English translation)

No	Question English
Intro	
1.	<p>The future of Mining and Exploration in Finland/Germany/Spain</p> <p>Have your say!</p> <p>We appreciate your time and effort to participate in this citizens' survey. It is part of the INFACT-Project and is funded by the Horizon2020-Programme (European Commission).</p> <p>All personal data will be kept confidential and the answers will be made anonymous.</p> <p>Your answers are very important. We'd like to know what you think and feel around mining and exploration in Finland/Germany/Spain.</p>
2.	First of all, we'd like to know a bit more about you.
3.	<p>Question 1:</p> <p>Are you</p> <ul style="list-style-type: none"> - Male - Female
4.	<p>Question 2:</p> <p>In which year were you born?</p> <p>(...)</p>

5.	<p>Question 3:</p> <p>I live in _____</p> <p>Please indicate where you are presently living with your 5-digit postal code.</p>
6.	<p>Question 4:</p> <p>I live in a town or city with a population of around _____ people.</p> <p>Please write down the number of people of your town or city.</p>
Mining	
7.	<p>Question 5:</p> <p>My place of residence is influenced by mining activities</p> <p>_ yes</p> <p>_ no</p> <p>_ I don't know.</p>
8.	<p>Question 6:</p> <p>What comes first to your mind when you hear the word „Mining“?</p> <p>_____</p> <p>Please note down as many single words or sentences in this section as you like.</p>


9.	<p>Question 7: Mining and positive things</p> <p>Mining, this is good....</p> <p>Please note down some arguments that you think are good on mining.</p>
10.	<p>Question 8: Mining and negative things</p> <p>Mining, this is bad....</p> <p>Please note down some arguments that you think as bad on mining.</p>
11.	<p>Question 9: To what degree would you agree with this sentence:</p> <p>„Mining is an important industry in our country.“</p> <p><input type="checkbox"/> Fully agree</p> <p><input type="checkbox"/> Partly agree</p> <p><input type="checkbox"/> Neither</p> <p><input type="checkbox"/> Partly disagree</p> <p><input type="checkbox"/> Fully disagree</p> <p><input type="checkbox"/> No opinion</p>
12.	<p>Question 10: Mining in Finland/Germany/Spain</p> <p>Please indicate which statement you agree most.</p> <p>Mining in Finland/Germany/Spain is important for providing our own industry with our own resources.</p> <p>Mining should not happen in Finland/Germany/Spain, and raw materials should be imported from other countries.</p>

13.	<p>Question 11:</p> <p>Mining and employment in a community</p> <p>Please indicate which statement you agree most</p> <p>Mining creates many jobs locally, and the whole community located near a mine benefits from this.</p> <p>Mining employs only a few people of the community, and the benefit for a community located near a mine is small.</p>
14.	<p>Question 12:</p> <p>Mining and mining regions</p> <p>Please indicate which statement you agree most</p> <p>Mining creates new infrastructure and facilities to the community.</p> <p>Mining does not contribute much to the local facilities and infrastructure.</p>
15.	<p>Question 13:</p> <p>Mining and environment</p> <p>Please indicate which statement you agree most.</p> <p>The impact on the environment caused by mining is minor and can be handled well.</p> <p>The impact of mining on the environment is huge and its consequences are not acceptable.</p>

16.	<p>Question 14:</p> <p>Mining and social acceptance</p> <p>Please indicate which statement you agree most.</p> <p>Mining is well accepted by most local communities.</p> <p>Mining causes a lot of controversies in a community in which mining is undertaken.</p> <p>Please explain your answer:</p> <hr/>
<p>Exploration</p>	
17.	<p>Question 15:</p> <p>And now we ask a few questions concerning „Exploration of raw materials“.</p> <p>What comes first to your mind when you hear the word “Exploration”?</p> <hr/> <p>Please note down as many single words or sentences in this section as you like.</p>

<p>18.</p>	<p>Question 16:</p> <p>Exploration in Finland/Germany/Spain</p> <p>Please indicate which statement you agree most.</p> <p>Exploration of raw materials is important and we need to search for new mining sites.</p> <p>Exploration for raw materials is not important, and we do not need new mines.</p>
<p>19.</p>	<p>Question 17:</p> <p>Drones in action</p> <p>Here, you see a drone, diameter around 1,2m.</p> <p>With its specific sensor technology these drones can examine the earth and help finding raw materials.</p> <p>They usually fly at heights of 15 to 20m with low speed.</p> <p>Imagine, you are on a walk, and you see this drone flying in a 100m distance from you.</p> <p>What would you think?</p> <p>Please indicate which statement you agree most.</p> <p>I have no problem with it, and it does not bother me.</p> <p>This is a problem for me, and I'm bothered.</p> <p>Please explain your answer:</p> <hr/>



20.	<p>Question 18:</p> <p>Helicopter with sensors</p> <p>Here, you can see a helicopter. Attached beneath is an appliance that helps to detect resources in the ground.</p> <p>This can be used to assess the magnetic field, searching for indicators of raw material deep in the earth.</p> <p>The helicopters fly at heights of 100 to 200 m, with a speed of 120 to 150 km/h.</p> <p>Imagine, you are on a walk, and you see this helicopter flying 100m from you.</p> <p>What would you think?</p> <p>Please indicate which statement you agree with most.</p> <p>I would have no problem with it, and it would not bother me.</p> <p>This would be a problem for me, and I'm likely to be bothered.</p> <p>Please explain your answer.</p> <p>_____</p>
	
Mining industry	

21.	<p>Question 19:</p> <p>Please indicate which statement you agree most.</p> <p>I trust that the mining industry in Finland/Germany/Spain acts in a fair and responsible manner.</p> <p>I don't trust that mining industry in Finland/Germany/Spain acts in a fair and responsible manner.</p>
22.	<p>Question 20:</p> <p>How far would you agree with this sentence:</p> <p>„Public authorities in Finland/Germany/Spain handle all the issues on mining well.</p> <p><input type="checkbox"/> Fully agree</p> <p><input type="checkbox"/> Partly agree</p> <p><input type="checkbox"/> Neither</p> <p><input type="checkbox"/> Partly disagree</p> <p><input type="checkbox"/> Fully disagree</p> <p><input type="checkbox"/> No opinion</p>
<p>Closing</p>	

23.	<p>Question 21</p> <p>Mining and exploration in Finland/Germany/Spain</p> <p>This is our last question.</p> <p>Is there anything you would like to add or comment on, concerning the topic of ‘Mining and Exploration’?</p> <hr/>
24.	<p>Thank you very much for your participation.</p>