

How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?

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## Abstract

The importance of community members being fully informed about infrastructure projects and the possibility of public participation is evident. The specific case of the gas pipeline project that will be executed by the company Eagle LNG on the island of Aruba was examined for this research to investigate the significance of communicating risks surrounding infrastructure projects to the public and whether this affects the permission that the public gives to a company to execute this project in their community. The research thus looked at how risk communication influences the social license to operate of the Eagle LNG gas pipeline in Aruba. The stakeholders that were identified as being affected by or having an influence on this specific project consisted of a government department, a non-governmental organization, and inhabitants living near the proposed gas pipeline. Semi-structured interviews were conducted with these stakeholders using interview guides tailored to the expertise and the topics that the different stakeholder groups are knowledgeable about. The lack of credibility and partnership from Eagle LNG with the stakeholders was the main issue that influenced most stakeholders to not give the social license to operate to this company. Stakeholders mention not receiving information from the company, not being approached by the company, and no opportunities for public consultation. Further research should focus on the role of stakeholder mapping in risk communication and what effects this has on the social license to operate.

# 1. Introduction

## 1.1 Background

Liquefied Natural Gas (LNG) is currently being promoted as a stepping stone for clean energy and net zero carbon emission in the future, as it produces less carbon dioxide than other fossil fuels like coal and oil, and does not produce certain toxins that are harmful for the atmosphere (National Grid, 2023). Companies that export LNG have to construct LNG terminals used for the storage, regasification, odourisation, and then finally the distribution of natural gas to customers (Elengy, 2023). One of these companies is the American-based company Eagle LNG, which focuses on the development of LNG solutions for industries, providing them with clean and affordable energy (Eagle LNG Aruba, 2021). The company also focuses on project developments in the Caribbean and Latin America, with one of these projects being the Eagle LNG receiving and regasification terminal on the island of Aruba (Figure 1). Water en Energie Bedrijf (WEB), the state-owned power and utility company in Aruba, has signed a long-term supply contract with Eagle LNG that includes the construction of a receiving and regasification terminal (Offshore Energy, 2021). Refineria di Aruba (RdA), which currently supplies the WEB powerplant with heavy fuel oil that they purchase, has signed an exclusivity agreement with Eagle LNG for the development of this gas terminal at their location in San Nicolas (Gobierno Aruba, 2021).



Figure 1: Pipeline route (Lacle, 2022)

The terminal will be constructed at the industrial area of RdA and LNG will be delivered, stored, and re-gasified at this location (Figure 2). The liquified natural gas will then be sent to the power and water utility company of the island where it will be used to fuel the power plant. An underground pipeline will be constructed following the existing heavy fuel oil pipeline and water pipeline (Figure 1) to transport this gas from the RdA location to the power plant.



**Figure 2: Concept of Eagle LNG Terminal at RdA location (Diario, 2022a)**

The worldwide increase in LNG use consequently means the construction of more LNG terminals and pipelines to transfer the LNG, with the construction often being met with opposition when the proposed pipeline route affects a community (Forbes, 2022). This opposition is due to communities having concerns about the safety of the pipeline, specifically about potential explosions that could happen and the subsequent effects on the community. Similar concerns are also present in the case of the gas pipeline of Eagle LNG in Aruba. The company held information sessions to address public concerns surrounding the project and to answer these questions the project manager of Eagle LNG Aruba was present along with technical experts from the Dutch consultancy and engineering firm Royal Haskoning (Bon Dia Aruba, 2022). However, the information that was given was insufficient as the inhabitants that will be directly affected by the construction of this pipeline have voiced their concerns two months after these information sessions were held (Caribisch Netwerk, 2022). These concerns were related to the fact that Eagle LNG has not been informing them about the safety aspects of this pipeline and that they are worried about the risk of explosions due to the proximity of the pipeline to their home, as is illustrated in Figure 3. Local non-governmental organizations have also voiced their concerns regarding the lack of information and transparency from Eagle LNG as only a selected group of non-governmental organizations (NGOs) have been invited to a hearing to discuss the impacts of the project (Diario, 2022b).



**Figure 3: Proximity of existing pipelines to houses (Diario, 2022c)**

The research delves into the broader concept of a Social Impact Assessment (SIA), specifically the change to a community's environment, through the use of the case study of the Eagle LNG gas pipeline project in Aruba. The change to a community's environment can mean a change in subjects such as water quality, food quality, or exposure to noise (Vanclay et al., 2015). For the purpose of this research, the focus will be on the risks that are perceived by the community with regard to the gas pipeline project. Moreover, the research adds to the concept of risk communication by focusing on the way the risk of the gas pipeline project is communicated by Eagle LNG to the community. The purpose of this will be to reinforce the importance of public involvement and consultation in not only the risk communication process but also the risk mitigation strategy of companies.

## 1.2 Research Problem

The aim of this research is to look at risk communication and how this influences the social license to operate (SLO) of the Eagle LNG gas pipeline project in Aruba. In order to expand more on this topic, the following research question was created: How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba? Furthermore, to support this question, the following secondary questions were formulated:

- How does risk assessment influence the social impact assessment?
- What are the community perceptions of the Eagle LNG project in Aruba?
- How can risk communication be improved during stakeholder engagement?

## 1.3 Thesis Structure

The research paper presents a theoretical framework, which is then followed by a methodology, results analysis, and a conclusion. The main concepts that were focused on for this research were risk communication and SLO. To build upon these concepts that form a part of the main research question, the concepts of risk perception, risk assessment, stakeholder engagement, and fully informing community members were included in the paper. The relation of these theories with each other was then visualized with the use of a conceptual model. Analyzing the theories in the context of the Eagle LNG project on Aruba required a research method that would provide in-depth opinions of stakeholders. Consequently, semi-structured interviews were carried out with stakeholders and the interview guides were tailored to specific stakeholder groups. Ethical considerations were taken into account because the privacy of the community members that were being interviewed needed to be protected. The limitations of the research consisted of the ESIA document not being available and certain stakeholders not being interviewed. The results of the research focused on describing the community perceptions of the Eagle LNG project, analyzing how risk communication should be improved, and looking at the effects of risk assessment on social impact assessment.

## 2. Theoretical Framework

### 2.1 Theories

The social impacts of infrastructure projects, whether this is a pipeline or a highway, are summarized and explored through the use of a social impact assessment (Vanclay et al., 2015). SIA is useful to be able to analyze, monitor, and manage both positive and negative impacts that can arise from projects. A SIA is used for the purpose of analyzing the probable social effects of planned development projects and it incorporates economic and biophysical impacts together with social impacts (Nautiyal & Goel, 2021). The negative social impact that can be recognized in the case of the gas pipeline project in Aruba is the impact of a change to the community's environment, specifically to the level of risk that is related to the environment of the impacted community.

#### *Perceived Risk – The Influences on Community Risk Perception*

Risk perception is the individual's subjective view of the uncertainties that can arise from situations and this perception can be shaped in various ways (Hanna et al., 2016). Hampel (2006) mentions that the aspects that influence risk perception are the context of the situation and the trust people have in institutions. Additionally, risk perception is higher when the mechanisms surrounding a risk are not understood and when the risk is also present in the future. Risk perception of the public in comparison to the risk perception of the technical experts can differ but this is not necessarily due to the lack of scientific understanding of risk of the public (Hampel, 2006). The public's risk perception not only includes the scientific understanding of risk but also takes into account institutional and cultural variables that can influence risk perception. For this research, risk perception will be connected to risk communication, as the communities' risk perceptions are partly influenced by the risk communication of infrastructure projects. The way in which the risk of a project is communicated by the technical experts to the affected community influences the risk perception (Hanna et al., 2016).

#### *The Process of Risk Communication*

Risk communication entails communicating the risk factors of a project in a responsible and effective way (Leiss, 2004). According to Frewer (2004), risk communication is becoming increasingly important for the process of risk management as it has an impact on public concerns and attitudes. Risk management involves coming up with measures to mitigate risks related to a project, specifically when projects are ready to be carried out, and mitigating the costs of these risks if the project faces any delays (Schieg, 2006). Hampel (2006) states that risk communication needs to include both the scientific understanding of risk and the public's understanding of risk considering the difference in understanding of risks between the public and experts. It is important to note however that there are also differences between the risks that experts recognize and understand. Hanna et al. (2016) state that experts identify risks based on their areas of expertise and this is based on their subjective bias. Those risks which are identified by experts are thus not entirely based on technical risks. The way in which risk is communicated by experts in the broader risk management process increasingly involves more public consultation and participation (Frewer, 2004). Furthermore, risk communication includes simultaneously addressing public concerns about risks and the risks that project leaders find important to communicate.



Addressing public concerns depends on the topic of concern, mainly concerns that are related to technical issues, concerns that relate to institutional performance and judgements, and concerns related to a difference in world views (Renn & Levine, 1991). According to Renn & Levine (1991), there are specific ways in which communicators should address public concern based on the topic of concern. Concerns related to technical issues should be addressed by technical experts and scientists, concerns related to institutional performance and judgements should be addressed by senior management staff, and concerns related to a difference in world views should be addressed by opening a discourse with different stakeholder groups to share their opinions. The way Eagle LNG communicated the risks surrounding the gas pipeline to the community will be analyzed by looking at which concerns were included in the risk communication, who communicated these risks to the community, and how the public was involved in the risk communication.

#### *Risk Assessment – The Relation with Risk Communication and Risk Perception*

Risk assessment is part of the bigger process of risk management and it mainly deals with the risks that arise from projects (Hanna et al., 2016). The importance of risk assessment for this research is due to the concepts of technical and non-technical risks that can be applied to the pipeline project. Technical risks are aligned with the concept of known risks due to the fact that technical risks are predictable, while non-technical risks are equivalent to unknown risks as they are not easy to quantify (Hanna et al., 2016). The combination of risk communication and risk assessment is useful for this research as the technical risks that are identified during the risk assessment process also include uncertainties that need to be communicated to the public (Frewer, 2004). Communicating these risk uncertainties makes it possible to mitigate public distrust and influence the public risk perception surrounding the project. The mitigation of public distrust is important for the implementation of the gas pipeline project. Risk assessment is also useful as it helps companies with a risk mitigation strategy to be able to continue with the project following their timeline (Ahmed, 2017).

#### *Social License to Operate – From Risks to Granting Permission*

Assessing the risks of a project and the way risks of a project are communicated to the community can be factors that have an influence on risk perception. SLO is an important concept for understanding the gas pipeline project in Aruba, as proper risk communication can possibly play a role in the company Eagle LNG gaining the SLO for the pipeline project. Boutilier (2014) states that the contemporary usage of the term SLO relates to the idea that communities also have power in granting permission for the activities of a corporation. Acquiring the SLO furthermore includes meeting the expectations of stakeholders, especially the expectations of community members and NGOs (Vanclay et al., 2015). The credibility and partnership that the company establishes with the local community has an influence on whether they receive the SLO (Alves et al., 2023). This research delves into the role of risk communication in gaining the SLO of the Eagle LNG gas pipeline project in Aruba.

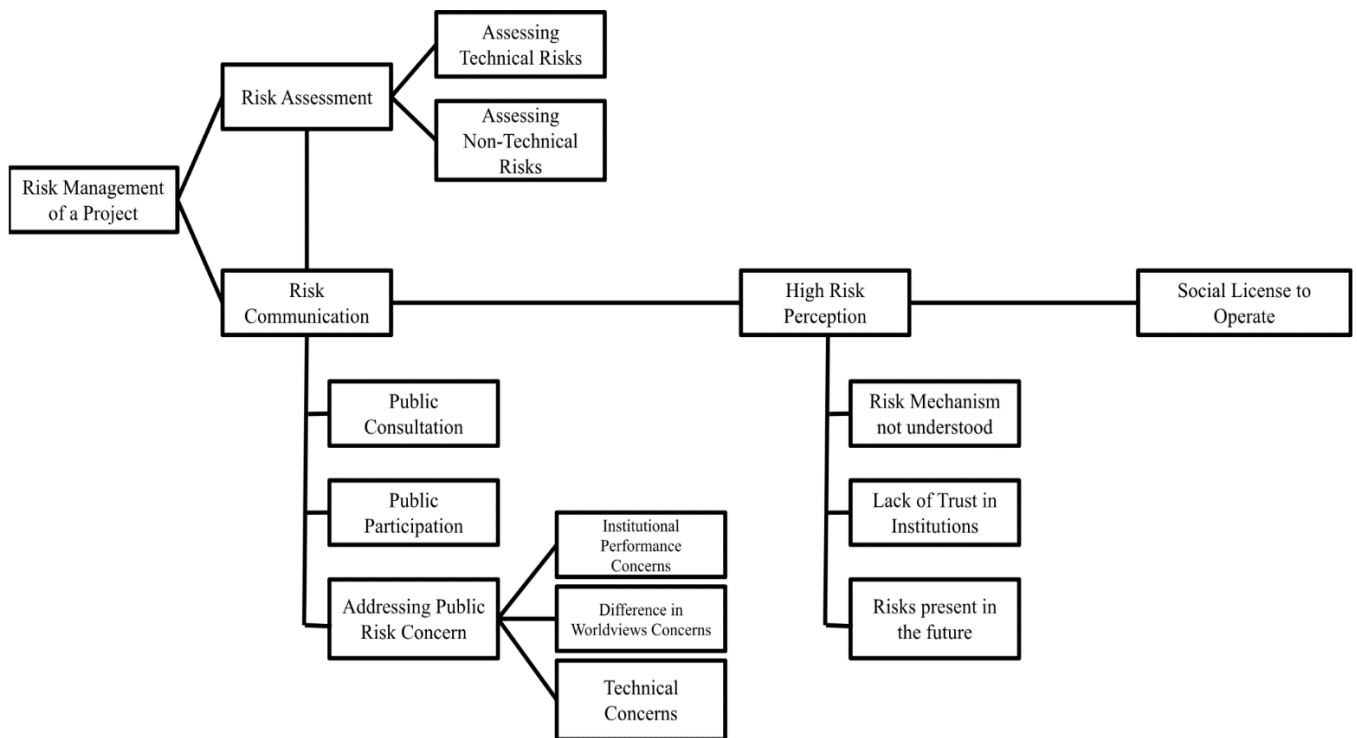
The SLO can furthermore be looked at with the use of a SIA, as this covers a wide range of tasks that relate to the interaction between companies and communities (Vanclay et al., 2015). One of these tasks of SIA is that of fully informing community members. Fully informing community members entails that community members are fully informed about a specific project that will affect their community (Vanclay et al., 2015). Informing community members in the case of the Eagle LNG project consists of proper communication

about the risks of the project, addressing public concern about the risks of the project, and communicating risk uncertainties of the project.

Vanclay et al. (2015) state that in order for SIA to manage social issues and influence decision-making, genuine community engagement is required and the most vulnerable members of the community have to be involved. One concept that can thus be utilized when talking about the SLO that communities give to companies is the concept of tokenism stakeholder engagement. Tokenism engagement is viewing community engagement as a checklist of things that have to be done (Wilkinson et al., 2022). This means that engagement is only prioritized in the early stages of a project and that stakeholder voices are ineffectual. Stakeholder mapping is another concept that relates to the SIA requirement of the involvement of vulnerable community members. Stakeholder mapping entails looking at the level of impact and interest of stakeholders to get an overview of which stakeholders should be a part of the stakeholder engagement process (Styk and Bogacz, 2022). The stakeholders that are identified as having low interest or low influence are monitored but are not actively involved in the project, and this can mean that vulnerable community members are neglected.

## 2.2 Conceptual Model

Figure 4 visualizes the conceptual model that is used to further explain the relevant theories of the research. The model starts with the risk management of a project, where risk assessment and risk communication form a part of this wider process. Risk Assessment consists of assessing both technical and non-technical risks that are connected with a project. Risk communication on the other hand deals with the way risks surrounding a project are communicated to the community. For this research, consulting the public, addressing public concerns, and including public participation are all needed for proper risk communication. Risks that are assessed are also included in the risk communication. Addressing public risk concerns includes looking at concerns related to institutional performance, a difference in worldviews, and technical concerns. If proper risk communication is not carried out, the community will have a high risk perception. This is caused by risk mechanisms not being understood, a lack of trust in institutions, and the fact that these risks are present in the future. Risk communication thus has an influence on the SLO as this influences the risk perception of the community that has to grant permission.



**Figure 4: Conceptual Model (Author's own, 2023)**

## 2.3 Hypotheses

Risk communication can influence the SLO of projects. To demonstrate this, the case of the Eagle LNG gas pipeline project will be looked at. The reasoning behind risk communication influencing the SLO is derived from the fact that risk assessment evaluates the risks that can affect communities (Hanna et al., 2016). Similarly, SIA looks at the impacts that a project can have on people (Vanclay et al., 2015). One of these impacts that can be seen in the Eagle LNG project is the impact of changes to the environment of the affected community, especially the level of the perceived risk of explosions in that environment. Risk communication can thus be an important step in the SIA process, as this can influence the risk perception of people in the community. If the risk of a project is communicated well enough to the affected community in a way that they can understand, their perception of the risks associated with the project can be altered. It may also be possible that from the correct implementation of SIA and risk assessment, proper risk communication can be carried out and social issues can be mitigated. Communicating risks properly makes it possible for Eagle LNG to gain a SLO for the gas pipeline project and a lack of communication would lead to distrust and consequently not receiving this license.

## 3. Methodology

### 3.1 Research Method

The research method that was used for looking at the influence of risk communication on the SLO of the Eagle LNG project in Aruba is qualitative research. Data was collected through semi-structured interviews with relevant stakeholders surrounding the project. The people who were interviewed were contacted through email or by telephone and the interview itself took place online. The use of online interviews posed a challenge, as the group of people that would be interviewed would have to have access to Wi-Fi thus some inhabitants might have been excluded from the results. The native language of Aruba, Papiamentu, was used for most of the interviews but in some cases, English was also used. Due to my own positionality of being of Aruban descent, the choice for doing the interviews in the native language seemed fitting as I can speak it. This furthermore made it possible to contact potential interviewees in the native language and know who to contact from the community. The following stakeholders were interviewed: community members that live in the area of the gas pipeline route, representatives of retirement home SABA located on the pipeline route, representatives of the Department of Nature and Environment, and the non-governmental organization Stimaruba. Eagle LNG and the Minister of Energy, Labor and Integration have not responded to the requests for an interview and the Environmental and Social Impact Assessment (ESIA) has yet to be made available to the public. The data consequently lacked the perspective of the project leaders and government representatives about which risks they have identified. This gap was addressed by looking at what information the different stakeholder groups received and which risks were communicated to these groups.

### 3.2 Data Collection

Interview guides were utilized to interview relevant stakeholders, with the questions being asked based on five different themes. These themes are the Eagle LNG project, social impact assessment, safety, risk communication, and SLO. The stakeholders were interviewed according to a specific interview guide: community members (appendix A1), non-governmental organizations (appendix A2), and government and project experts (appendix A3). The interview guides are tailored accordingly to the various stakeholders so there are differences in the themes and the questions asked to these stakeholders. Some questions were asked to all of the stakeholders while other questions were only asked for specific stakeholders based on their area of expertise. The interviews were then transcribed and translated into English. The ATLAS.ti software was utilized to analyze the interview transcripts with different codes and coding groups (appendix B1). To get a better overview of important topics, both inductive and deductive coding was used. A coding tree was constructed to better demonstrate the most important concepts and how these are interrelated with each other (appendix B2).

### 3.3 Ethical Consideration

The ethical considerations that are touched upon in the research have to do with positionality, privacy, and informed consent. Seeing as the researcher is considered an insider this can affect the research because of bias and certain aspects of the research might be overlooked. To prevent this, transparency concerning the interviews is important. Privacy and informed consent are also relevant as real people will be interviewed. Names, places, and any other specific characteristics that might affect the privacy of an interviewee were redacted. Before doing an interview, the interviewees were informed about their rights, and consent forms were also signed (appendix C1 – C6).

## 4. Results

### 4.1 Risk Assessment and Social Impact Assessment

The data collected from the interviews with stakeholders surrounding the gas pipeline project demonstrate that technical risks that are assessed have an influence on the social impact assessment. By evaluating the risks related to a project, SIA has more information to better analyze, monitor, and manage negative impacts that arise from infrastructure projects. The negative social impact of perceived risk of explosion was one impact that community members reflected when asked what the different risks are surrounding the Eagle LNG gas pipeline. The technical risks were related to the erosion of the pipeline due to its proximity to the sea, if the pipelines were to disconnect due to earthquakes, and the lack of accessibility to the pipeline as it is underground. Inhabitants were especially concerned about the uncertainty surrounding the technical risk of an explosion and what the consequences would be for them, as Frewer (2004) emphasizes that this risk uncertainty should also be communicated. The risk of explosion was a main focus for them due to the location of these pipelines in a populated area and unlike the existing heavy fuel oil pipeline leaks, potential gas leakage is not visible to the citizens. The risks that were assessed give insight into why the community has the perception that the pipeline will explode and this gives Eagle LNG the opportunity to mitigate the negative social impact that ensues from this risk perception and also adds to the overall risk mitigation strategy of the company.

The interviews furthermore revealed that certain concepts related to SIA, specifically fully informing community members and genuine community engagement (Vanclay et al., 2015), are affected by risk assessment. As mentioned above, the ESIA has not been made public which means the community affected by this pipeline does not have a complete overview of the risk that were assessed by Eagle LNG. Hence, this indicates that the task of fully informing community members which is a part of the SIA process (Vanclay et al., 2015) has not been carried out. The social impact of perceived risk of explosions, which is observed from the interviews with the community, could have been limited by the publication of the ESIA with its assessed risks and the risk mitigation measures that could have been carried out. This follows the theory of Ahmed (2017) that risk assessment is an important part of the risk mitigation strategy of a company. Community members could have been able to compare the risks that they have assessed and the risks that Eagle LNG found to be of importance.

Genuine community engagement, as mentioned by Vanclay et al. (2015), is influenced by risk assessment because Eagle LNG assessing risks in collaboration with relevant stakeholders can assist in mitigating social issues. This can be noticed from the interview with the Department of Nature and Environment (appendix D1), where they found that Eagle LNG overlooked certain technical risks related to the project. The impact assessment that the Department of Nature and Environment received from Eagle LNG did not contain some risks surrounding the proposed gas pipeline route, as the department noticed that heavy fuel oil had other risks than gas but these risks “were not quantified” (appendix D1). Stimaruba has assessed other risks that were not identified that have to do with the digging that has to be done in people’s backyards in order to place this pipeline underground. By collaborating with the Department of Nature and Environment and Stimaruba, the SIA of Eagle LNG can include risks that might have been overlooked and communicate the uncertainties surrounding risks (Frewer, 2004).

## 4.2 Risk Communication

In the case of the Eagle LNG project, the type of risks that were communicated to the stakeholders were almost exclusively scientific risks and lacked the public's understanding of risk. According to Hampel (2006), risk communication needs to include both types of risks. There was also a lack of public risk concerns and public consultation which are both important for risk communication (Frewer, 2004). Risk communication thus can be improved during stakeholder engagement. One of the main risk concerns that inhabitants were worried about was the safety of the pipeline because this was not properly explained by Eagle LNG, with one inhabitant (appendix D4) describing "they only show a map that shows the way they want to run the pipeline and that's it." The public was furthermore only involved in the risk communication through the public meetings where they could ask questions about the project. According to one inhabitant (appendix D6), Eagle LNG did not have answers to their questions: "when they would ask questions and other people would ask questions as well, they wouldn't have an answer for them. "No, we'll come back". They never came back afterwards."

Risk communication was carried out in different ways by Eagle LNG, as the stakeholders received information about the risks in different forms. This resulted in community members with less information feeling like they were not fully informed about the project, which is a crucial SIA task (Vanclay et al., 2015). The Department of Nature and Environment had access to the ESIA document as this was a requirement for Eagle LNG to receive the implementation permits for the construction phase of the project. For Stimaruba, the risk was communicated by showing an informational video about a similar project abroad at a meeting with only two local NGOs being included. Public participation and consultation were thus lacking here and this also represents tokenism engagement, seeing as the different stakeholders were only given specific information and there was no proper community engagement (Frewer, 2004; Wilkinson et al., 2022). Due to the fact that they have not received the impact assessment document, the NGO felt that they had less information about the risks of the project and they also felt less involved in the process of risk communication, stating: "we've always gotten this Impact Assessment document but here we have not received anything - the impact itself to Aruba and with my, our questions, and with that we were not satisfied."

The stakeholder mapping of Eagle LNG resulted in inhabitants getting little to no information about the risks of the project. The way inhabitants living near the proposed gas pipeline route were informed of risks was different from the way the Department of Nature and Environment and Stimaruba were informed. Inhabitants that are a part of the neighborhood activist group have received a booklet with information while senior home SABA and other inhabitants have not received anything. According to Styk and Bogacz (2022), stakeholder mapping determines which stakeholders are part of the stakeholder engagement process, which is also noticeable in the case of Eagle LNG. Certain stakeholders were overlooked due to the stakeholder mapping identifying them as having low interest or low influence. These stakeholders thus did not understand the risk mechanisms or context of the situation and this resulted in a heightened risk perception and distrust. Accordingly, risk communication can be improved during stakeholder engagement by considering which stakeholders are identified during stakeholder mapping and not excluding certain groups from receiving information about the risks of the project.



Risk communication moreover addressed public concerns depending on the topic of concern and these risks were communicated by the relevant people during the public meetings. According to Renn & Levine (1991), risks should be addressed by the relevant people depending on the risk concerns. Technical experts were present to communicate concerns related to technical issues and company representatives were communicating concerns related to institutional performance. However, there was no stakeholder discourse to address the difference in world views between the company and the stakeholders themselves. One inhabitant (appendix D3) mentions their frustration with how the risk is currently being communicated: “If I were to listen, again, to the people from WEB, people from the government, then I’d say that’s BS.” By following Renn & Levine’s (1991) model and including stakeholder discourse to address the risk concern surrounding world views, stakeholders could be better informed about the risks and understand the project itself better. Discourse between the stakeholder groups is thus an important part of risk communication, as only communicating these risks to the public is insufficient. Companies should give stakeholders the platform to have a discourse and share their opinions about the project.

### 4.3 Risk Perception

The community perceptions of the pipeline project were related to the risk of explosion that the gas pipeline would bring. The risk perception of the inhabitants in the area was influenced by the trust people have in institutions and the context of the situation (Hampel, 2006). The lack of trust in institutions had to do with a lack of trust in the government due to the government not being transparent. Inhabitants brought up the government withholding information and one inhabitant (appendix D3) even stated that when it comes to politics in Aruba there is a lot of corruption. The lack of trust in institutions thus heightened the community’s perception of risk as they feel like there is no transparency and these institutions will not do their jobs properly. One main reason inhabitants were worried about institutions is due to poor maintenance of the pipelines, specifically that these pipelines will erode due to the proximity to the sea. The context of the situation also played a role in the increased risk perception of the community. Eagle LNG not communicating the risks related to the gas pipeline project was one main issue that was brought forward. Moreover, the location of the gas pipeline in an inhabited area with schools, churches, hotels, and senior home nearby was worrying for the inhabitants. The community also mentions that the gas pipelines will be something new and will have more risks than the existing pipelines. This is because of the existing pipelines are above ground and only transport water and heavy fuel oil.

The risks surrounding the project being present in the future were also a factor that influenced risk perception. The community was especially worried about the risk related to their environment if an explosion were to happen. Overall, there seems to be a heightened risk perception of the community with regard to the gas pipeline and the effects that this will have on them in the future. This perception of the gas pipeline in some cases has led to feelings of worry and anxiety for some inhabitants. The inhabitants seem indifferent to the use of LNG itself and the economic benefits of the project. The environmental impacts of the project are less present in the community perceptions, with only Stimaruba highlighting the issue of the current construction of other projects and the destruction of the environment on the island. According to Stimaruba, the construction of this pipeline will only add to this issue. Risk communication, specifically a discourse between stakeholder groups, can play a role in mitigating the risk perception of a community. Inhabitants having a lack of trust in institutions can be resolved by a discourse between these stakeholders so the opinions about a project can be discussed.

## 4.4 Social License to Operate

The Social License to Operate that companies obtain is influenced by the credibility and partnership that this company establishes with the community where the project will be placed (Alves et al., 2023). Moreover, it is also important that the community's expectations are met (Vanclay et al., 2015) and that this community grants permission to the company. For the Eagle LNG project, inhabitants mention that they do not want this project to come and that this should have been placed somewhere else, thus the company has not been given permission to implement this project. This permission is an important aspect of the SLO (Boutilier, 2014). The expectations of how Eagle LNG would interact with the community were also not met, as inhabitants mention that they were expecting to receive more information from the company about the project. Public consultation, which is one aspect of risk communication (Frewer, 2004), is therefore important as it can aid companies in meeting the expectations of community members and getting their permission for the project by engaging with them. The inhabitants furthermore highlight the lack of credibility and partnership that the company did not pursue with them. One inhabitant (appendix D4) even mentions being left in the dark by the company, which is the feeling that most stakeholders expressed, along with feelings of doubt and concern about the project. Addressing public risk concerns can enhance the credibility and partnership of the company with the community that will be affected by the project.

The SIA task of fully informing community members (Vanclay et al., 2015) was not tackled by the company. Community members and Stimaruba indicated not being fully informed about the gas pipeline project, specifically the communication of risks surrounding the project. The community wants easily accessible information, more transparency, and more communication from Eagle LNG. The risks of the project were communicated differently depending on the stakeholder group leading to only the group with the most detailed information about the project giving this SLO to the company. The contrast with the rest of the community additionally highlights the importance of stakeholder mapping and what information is given to the different types of stakeholders. Withholding information from stakeholder groups can result in the feeling of tokenism engagement among the stakeholders that were involved in the project (Wilkinson et al., 2022). Stimaruba notes that they have not been contacted anymore after the meeting with local NGOs and the company. Inhabitants nearby have also not gotten any more information from the company and have not received any other visits from the company. The community engagement of Eagle LNG was consequently perceived as not being genuine and they felt that their opinion did not matter for the bigger part of the project. Genuine community engagement (Vanclay et al., 2015) is important as it correlates with the credibility and partnership that a company should establish with the affected community in order for them to receive the SLO.

## 5. Conclusions

The role of risk communication in the process of community members not giving the social license to operate is evident. The credibility and partnership that Eagle LNG did not have, which determine if the SLO is given (Alves et al., 2023), has resulted in them not receiving the SLO and this is mainly because the company did not communicate risks properly to the stakeholders.

Risk assessment is important as this gives the company more information for the SIA to mitigate negative social impacts and improve the risk mitigation strategy of the company. Risk perception of the community living near the proposed pipeline route was heightened due to the lack of communication, the context of the situation, and the trust the community has in institutions (Hampel, 2006). The perceived risks were related to the potential explosion of the gas pipeline, with this perception being heightened by concerns surrounding poor maintenance, the location of the pipeline close to the community, the pipeline being underground, the difference between existing pipelines and this new one, and the risk being present in the future. The way in which risk was communicated to the stakeholders did not make it possible for the public risk concerns (Frewer, 2004) to be addressed. When information was communicated to stakeholders they felt like there was no possibility of discussing their concerns with the company, leading to these stakeholders also having the feeling of a lack of partnership and thus a lack of trust in the company. Risk communication needs to include similar information for the different stakeholders, so as to not withhold relevant information from any particular groups. Furthermore, risk communication cannot exclude consultation with the public about their risk concerns.

Prior research has focused on the role of credibility and partnership of companies to receive the SLO and this research builds upon it by adding the importance of risk communication. Risk communication is important as it influences the community's feeling of credibility and the partnership it has with the company. Due to the ESIA not being available to the public as Eagle LNG has not published this, the research was limited in identifying the risks that the company found to be of importance. The risks were identified through the information that stakeholders have received from the company. Further research should focus on the role of stakeholder mapping and how this relates to the risk communication of a project and the social license to operate of a company.

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# Appendices

## Appendix A1: Interview guide community members

<b>Interview guide community members - English</b>
The following interview will be conducted to find out more about the perception of the risks associated with the Eagle LNG gas pipeline project in Aruba. The information that you will give will be used for the Bachelor thesis titled “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. The Bachelor thesis will be guided by the Faculty of Spatial Sciences at the University of Groningen and all information that is provided for this interview will be solely used for academic purposes. For this research, risk perception is defined as an individual's subjective view of uncertainty that arises out of situations. The risk perception of the community affected by the gas pipeline project of Eagle LNG is important for this research as it can indicate to what extent risk communication influences the social license to operate of a project.
Thank you for your participation in this research.
<b>Eagle LNG project</b>
1. What do you know about the Eagle LNG project?
2. Do you think that the project is beneficial for the community?
3. What do you know about the gas pipeline that will be built as part of the project?
4. What do you think of the location of the gas pipeline?
5. Do you know about similar projects that have been done in the past?
6. Do you know what Liquefied Natural Gas is?
7. What do you think about LNG?
<b>Social Impact Assessment</b>
1. Are you familiar with a social impact assessment?
2. Do you think a social impact assessment is important?
3. What do you know about the social impact assessment of Eagle LNG?
4. Have you been informed about taking part in the social impact assessment of Eagle LNG?
5. Do you think a social impact assessment is important for the Eagle LNG project?
<b>Safety</b>
1. What do you know about the safety of the Eagle LNG gas pipeline?
2. How safe do you think the gas pipeline is for the inhabitants?
3. How safe do you think the gas pipeline is for the environment?
4. What are your concerns about the gas pipeline in the future?
<b>Risk communication</b>
1. How well has Eagle LNG informed you about the gas pipeline that will be constructed?
2. Do you feel that sufficient information was given about the gas pipeline?
3. How did you feel about the quality of information that you received?
4. Do you feel that the information that was given is understandable?
<b>Social License to Operate</b>
1. What were your expectations regarding the Eagle LNG project when they first announced the project?
2. What are your expectations regarding the Eagle LNG project now?
3. How do you feel about the way in which Eagle LNG handled the whole project?
4. Do you feel like Eagle LNG is a trustworthy company? Why?

<b>Interview guide community members - Papiamento</b>
E interview aki ta wordo hasi pa haya sa mas tocante e impresion di risico asocia cu e proyecto di pipa di gas di Eagle LNG na Aruba. E informacion cu bo persona lo duna den e interview aki lo wordo usa pa e tesis titula “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. E tesis lo wordo ehecuta bou di guia di e Facultad di Spatial Sciences na Universidad di Groningen i tur informacion cu wordo duna lo ta pa uso academico. Pa e investigacion aki e concepto di percepcion di risico lo wordo usa i esaki ta wordo defini como un persona su perspectiva di cierto risico nan cu ta mara na un situacion. E percepcion di risico di e comunidad cu ta wordo afecta pa e proyecto di pipa di gas di Eagle LNG ta importante pa e investigacion aki pasobra e por indica cua rol e comunicacion di risico tin pa cu e Social License to Operate di un proyecto.
Danki di antemano pa bo participacion den e investigacion aki. ñ
<b>Proyecto di Eagle LNG</b>
1. Kico bo sa tocante di e proyecto di Eagle LNG?
2. Bo ta pensa cu e proyecto tin beneficio pa e comunidad?
3. Kico bo sa tocante e pipa di gas cu lo wordo construi como parti di e proyecto?
4. Kico bo ta pensa di lugar unda e pipa di gas lo wordo construi?
5. Bo tin conocimiento di proyecto similar cu a wordo ehecuta den pasado?
6. Kico bo sa tocante Liquefied Natural Gas?
7. Kico bo ta pensa tocante Liquefied Natural Gas?
<b>Documento di Impacto Social</b>
1. Bo tin conocimiento di e documento di impacto social?
2. Bota pensa cu e documento di impacto social ta importante?
3. Kico bo sa di e documento di impacto social di Eagle LNG?
4. Bo persona a wordo acerca pa yuda contribui na e documento di impacto social di Eagle LNG?
5. Bo ta kere cu e documento di impacto social lo ta importante pa e proyecto di Eagle LNG?
<b>Seguridad</b>
1. Ki conocimiento bo persona tin tocante e seguridad di e pipa di gas di Eagle LNG?
2. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu habitante?
3. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu medio ambiente?
4. Ki preocupacion bo tin pa cu e proyecto di pipa di gas pa futuro?
<b>Comunicacion di risico</b>
1. Con bon bo ta pensa cu bo persona a wordo informa tocante e proyecto di Eagle LNG?
2. Bo ta pensa cu Eagle LNG a duna suficiente informacion tocante nan proyecto?
3. Bo ta pensa cu e informacion cu Eagle LNG a duna ta di un calidad halto?
4. Bo ta pensa cu e informacion cu Eagle LNG a duna ta comprendibel?
<b>Permiso Social pa Opera</b>
1. Kico tabata bo expectativa pa e proyecto di Eagle LNG ora nan a anuncia esaki pa prome biaha?
2. Kico ta bo expectativa pa e proyecto di Eagle LNG awo?
3. Con bo ta pensa tocante e manera cu Eagle LNG a ehecuta e proyecto?
4. Bo ta pensa cu Eagle LNG ta un compania cu bo por confia? Pakico?

## Appendix A2: Interview guide NGOs

<b>Interview guide NGOs - English</b>
The following interview will be conducted to find out more about the perception of the risks associated with the Eagle LNG gas pipeline project in Aruba. The information that you will give will be used for the Bachelor thesis titled “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. The Bachelor thesis will be guided by the Faculty of Spatial Sciences at the University of Groningen and all information that is provided for this interview will be solely used for academic purposes. For this research, risk perception is defined as an individual's subjective view of uncertainty that arises out of situations. The risk perception of the community affected by the gas pipeline project of Eagle LNG is important for this research as it can indicate to what extent risk communication influences the social license to operate of a project.
Thank you for your participation in this research.
<b>Eagle LNG project</b>
1. What do you know about the Eagle LNG project?
2. Do you think that the project is beneficial for the community?
3. What do you know about the gas pipeline that will be built as part of the project?
4. What do you think of the location of the gas pipeline?
5. Do you know about similar projects that have been done in the past?
6. What do you think about the use of LNG?
7. What do you think about the environmental impact of the project?
<b>Social Impact Assessment</b>
1. Are you familiar with a social impact assessment?
2. Has your organization worked with a social impact assessment before?
3. Do you think a social impact assessment is important?
4. What do you know about the social impact assessment of Eagle LNG?
5. Have you been informed about taking part in the social impact assessment of Eagle LNG?
6. Do you think a social impact assessment is important for the Eagle LNG project?
<b>Safety</b>
1. What do you know about the safety of the Eagle LNG gas pipeline?
2. How safe do you think the gas pipeline is for the inhabitants?
3. How safe do you think the gas pipeline is for the environment?
4. What are the safety aspects that should be taken into account?
5. What are your concerns about the gas pipeline in the future?
<b>Risk communication</b>
1. How well has Eagle LNG informed you about the gas pipeline that will be constructed?
2. Do you feel that sufficient information was given about the gas pipeline?
3. How did you feel about the quality of information that you received?
4. Do you feel that the information that was given is understandable?
5. Do you feel that risk to the environment was communicated properly?
<b>Social License to Operate</b>
1. What were your expectations regarding the Eagle LNG project when they first announced the project?
2. What are your expectations regarding the Eagle LNG project now?
3. How do you feel about the way in which Eagle LNG handled the whole project?
4. Do you feel like Eagle LNG is a trustworthy company? Why?



<b>Interview guide NGOs - Papiamento</b>
E interview aki ta wordo hasi pa haya sa mas tocante e impresion di riesgo asocia cu e proyecto di pipa di gas di Eagle LNG na Aruba. E informacion cu bo persona lo duna den e interview aki lo wordo usa pa e tesis titula “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. E tesis lo wordo ehecuta bou di guia di e Facultad di Spatial Sciences na Universidad di Groningen i tur informacion cu wordo duna lo ta pa uso academico. Pa e investigacion aki e concepto di percepcion di riesgo lo wordo usa i esaki ta wordo defini como un persona su perspectiva di cierto riesgo nan cu ta mara na un situacion. E percepcion di riesgo di e comunidad cu ta wordo afecta pa e proyecto di pipa di gas di Eagle LNG ta importante pa e investigacion aki pasobra e por indica cua rol e comunicacion di riesgo tin pa cu e Social License to Operate di un proyecto.
Danki di antemano pa bo participacion den e investigacion aki.
<b>Proyecto di Eagle LNG</b>
1. Kico bo sa tocante di e proyecto di Eagle LNG?
2. Bo ta pensa cu e proyecto tin beneficio pa e comunidad?
3. Kico bo sa tocante e pipa di gas cu lo wordo construi como parti di e proyecto?
4. Kico bo ta pensa di lugar unda e pipa di gas lo wordo construi?
5. Bo tin conocimiento di proyecto similar cu a wordo ehecuta den pasado?
6. Kico bo sa tocante Liquefied Natural Gas?
7. Kico bo ta pensa tocante e impacto ambiental di e proyecto?
<b>Documento di Impacto Social</b>
1. Bo tin conocimiento di e documento di impacto social?
2. Bo organisacion a yega di traha cu un documento di impacto social?
3. Bota pensa cu e documento di impacto social ta importante?
4. Kico bo sa di e documento di impacto social di Eagle LNG?
5. Bo persona a wordo acerca pa yuda contribui na e documento di impacto social di Eagle LNG?
6. Bo ta kere cu e documento di impacto social lo ta importante pa e proyecto di Eagle LNG?
<b>Seguridad</b>
1. Ki conocimiento bo persona tin tocante e seguridad di e pipa di gas di Eagle LNG?
2. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu habitante?
3. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu medio ambiente?
4. Cua aspecto di seguridad mester tuma nota di dje?
5. Ki preocupacion bo tin pa cu e proyecto di pipa di gas pa futuro?
<b>Comunicacion di riesgo</b>
1. Con bon bo ta pensa cu bo persona a wordo informa tocante e proyecto di Eagle LNG?
2. Bo ta pensa cu Eagle LNG a duna suficiente informacion tocante nan proyecto?
3. Bo ta pensa cu e informacion cu Eagle LNG a duna ta di un calidad halto?
4. Bo ta pensa cu e informacion cu Eagle LNG a duna ta comprendibel?
5. Bo ta pensa cu e riesgo di e proyecto pa medio ambiente a wordo comunica bon?
<b>Permiso Social pa Opera</b>
1. Kico tabata bo expectativa pa e proyecto di Eagle LNG ora nan a anuncia esaki pa prome biaha?
2. Kico ta bo expectativa pa e proyecto di Eagle LNG awo?
3. Con bo ta pensa tocante e manera cu Eagle LNG a ehecuta e proyecto?
4. Bo ta pensa cu Eagle LNG ta un compania cu bo por confia? Pakico?

### Appendix A3: Interview guide government and project experts

<b>English</b>
The following interview will be conducted to find out more about the perception of the risks associated with the Eagle LNG gas pipeline project in Aruba. The information that you will give will be used for the Bachelor thesis titled “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. The Bachelor thesis will be guided by the Faculty of Spatial Sciences at the University of Groningen and all information that is provided for this interview will be solely used for academic purposes. For this research, risk perception is defined as an individual's subjective view of uncertainty that arises out of situations. The risk perception of the community affected by the gas pipeline project of Eagle LNG is important for this research as it can indicate to what extent risk communication influences the social license to operate of a project.
Thank you for your participation in this research.
<b>Social Impact Assessment</b>
1. Are you familiar with a social impact assessment?
2. Do you think a social impact assessment is important?
3. What do you think the requirements are for the social impact assessment?
4. What do you know about the social impact assessment of Eagle LNG?
5. Do you think a social impact assessment is important for the Eagle LNG project?
<b>Eagle LNG project</b>
1. What do you know about the Eagle LNG project?
2. Were you involved in the project?
3. What do you know about the gas pipeline that will be built as part of the project?
4. What do you think of the location of the gas pipeline?
5. Do you know about similar projects that have been done in the past?
6. Do you know what Liquefied Natural Gas is?
7. What do you think about LNG?
<b>Safety</b>
1. Do you have knowledge about the safety of gas pipelines?
2. What are the standards for the safety of gas pipelines?
3. What do you know about the safety of the Eagle LNG gas pipeline?
4. How safe do you think the gas pipeline is for the inhabitants?
5. How safe do you think the gas pipeline is for the environment?
6. What are the ways to monitor the safety of the gas pipeline in the future?
<b>Risk communication</b>
1. Have you been informed about the risks of the Eagle LNG gas pipeline?
2. Do you feel that sufficient information was given about the gas pipeline?
3. How did you feel about the quality of information that you received?
4. Do you feel that the information that was given is understandable?

<b>Papiamento</b>
E interview aki ta wordo hasi pa haya sa mas tocante e impresion di risico asocia cu e proyecto di pipa di gas di Eagle LNG na Aruba. E informacion cu bo persona lo duna den e interview aki lo wordo usa pa e tesis titula “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. E tesis lo wordo ehecuta bou di guia di e Facultad di Spatial Sciences na Universidad di Groningen i tur informacion cu wordo duna lo ta pa uso academico. Pa e investigacion aki e concepto di percepcion di risico lo wordo usa i esaki ta wordo defini como un persona su perspectiva di cierto risico nan cu ta mara na un situacion. E percepcion di risico di e comunidad cu ta wordo afecta pa e proyecto di pipa di gas di Eagle LNG ta importante pa e investigacion aki pasobra e por indica cua rol e comunicacion di risico tin pa cu e Social License to Operate di un proyecto.
Danki di antemano pa bo participacion den e investigacion aki.
<b>Documento di Impacto Social</b>
1. Bo tin conocimiento di e documento di impacto social (Social Impact Assessment)?
2. Bota pensa cu e documento di impacto social ta importante?
3. Cua rekisito e documento di impacto social mester tin?
4. Kico bo sa di e documento di impacto social di Eagle LNG?
5. Bo ta kere cu e documento di impacto social lo ta importante pa e proyecto di Eagle LNG?
<b>Proyecto di Eagle LNG</b>
1. Kico bo sa di e proyecto di Eagle LNG?
2. Bo tabata ta parti di e proyecto aki?
3. Kico bo sa tocante e pipa di gas cu lo wordo construi como parti di e proyecto?
4. Kico bo ta pensa di lugar unda e pipa di gas lo wordo construi?
5. Bo tin conocimiento di proyecto similar cu a wordo ehecuta den pasado?
6. Kico bo sa tocante Liquefied Natural Gas?
7. Kico bo ta pensa tocante Liquefied Natural Gas?
<b>Seguridad</b>
1. Bo tin conocimiento di seguridad di pipa di gas?
2. Kico e standards nan ta pa cu e seguridad di pipa di gas?
3. Ki conocimiento bo persona tin tocante e seguridad di e pipa di gas di Eagle LNG?
4. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu habitante?
5. Ki bo ta pensa tocante e seguridad di e pipa di gas pa cu medio ambiente?
6. Con bo por controla e seguridad di e pipa di gas den futuro?
<b>Comunicacion di risico</b>
1. Bo a wordo informa tocante e risico di e proyecto di pipa di gas di Eagle LNG?
2. Bo ta pensa cu Eagle LNG a duna suficiente informacion tocante e risico di nan proyecto?
3. Bo ta pensa cu e informacion cu Eagle LNG a duna ta di un calidad halto?
4. Bo ta pensa cu e informacion cu Eagle LNG a duna ta comprensibel?

## Appendix B1: Atlas.ti Codebook

Code	Comment	Code Group 1	Code Group 2	Code Group 3	Code Group 4	Code Group 5
Context of situation				Risk Perception		
Credibility and Partnership of Company						Social License to Operate
Fully informing community members					Social Impact Assessment	
Grant Permission						Social License to Operate
Meet expectations						Social License to Operate
Negative social impact					Social Impact Assessment	
Predictable Risks		Risk Assessment				
Public consultation			Risk Communication			
Public risk concerns			Risk Communication			
Risk mechanisms not understood				Risk Perception		
Risk present in the future				Risk Perception		
Scientific risks			Risk Communication			
Social Impact Assessment					Social Impact Assessment	
Stakeholder discourse			Risk Communication			
Technical experts			Risk Communication			
Tokenism engagement					Social Impact Assessment	
Trust in institutions				Risk Perception		
Unquantifiable risks		Risk Assessment				

Appendix B2: Coding tree



## Appendix C1: Template Consent Form

### Consent form for participation

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#### Research description

The following interview will be conducted for the purpose of the bachelor's thesis titled “How does risk communication influence the social license to operate of the Eagle LNG gas pipeline in Aruba?”. This thesis will explore the ways in which risk of projects are communicated and how this can possibly influence the social license to operate that stakeholders give to these infrastructure projects. Additionally, the concepts of risk assessment and risk perception will also be utilized for this thesis.

The thesis will be conducted as part of the final Bachelor’s project at the Faculty of Spatial Sciences, University of Groningen. The answers and information you provide in this interview will be used for the sole purpose of analyzing information and will be stored securely. The information provided will not be shared and will strictly be used for academic and educational purposes. Additionally, any personal information that can lead to identification will be disregarded. The data from this interview will be stored for up to two months after my graduation, that is September 2023, and will be deleted afterwards.

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I agree to voluntarily participate in this research and know that I can withdraw from participation at any time.

YES / NO

I have read the information given about the research project and understand the purpose of the data collection and processing.

YES / NO

I understand that any identifiable information will be disregarded by the researcher and that the data collected during this interview will be kept confidential and stored securely.

YES / NO

I understand and agree that the interview will be recorded and that the data will be used to create transcripts for the purpose of analysis.

YES / NO

**Participant’s signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**Researcher’s signature** \_\_\_\_\_ **Date** \_\_\_\_\_

**You have the right to access, change, and erase your data**

**If you have any questions regarding the interview or your rights, please contact me at:  
s.a.mackintosh@student.rug.nl**