Investigating the social impacts the expansion of Lelystad Airport will have on Gelderland and Overijssel



Figure 1: Lelystad Airport (Laconi, 2021)

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Abstract

In the future, Lelystad Airport is planned to be used as a wingman for Schiphol Airport. This means that Lelystad Airport will host flights for holiday destinations. However, because of the limited airspace in the Netherlands, aircraft will fly at a lower altitude than normal. These are called the low flying routes. These low flying routes will influence the living environment and well-being of affected residents. This thesis seeks an answer on what social impacts these low flying routes will have on the residents of Gelderland and Overijssel. Research shows that it is difficult to measure which social impacts there will be on the affected area. On the one hand, Lelystad Airport complies with all the laws and therefore any social impacts that might occur will be in accordance with legal requirements. On the other hand, affected residents state that they are afraid that they can't enjoy the quietness and peace anymore because of noise pollution. This is combined with the fear that residential devaluation will happen in the future due to the increased noise pollution. In terms of positive effects, these will only occur in the area where Lelystad Airport is located, namely in Flevoland.

1. Introduction

1.1 Background

Airports have played a massive role in the connection of the world. With the increase in demand for flight tickets, countries must respond to meet this demand. Schiphol Airport is the biggest airport in the Netherlands and functions as an airport for holiday destinations, business trips, and freight transport (Schiphol Group, 2021). However, Schiphol Airport soon will reach its so-called 'expansion limit' and must designate another airport in the Netherlands to act as a wingman to host more flights as the demand for flights increases¹. To illustrate the situation, in 2019 Schiphol Airport organized 489.588 flights. According to the Dutch government, the number of flights is increasing by 1,5% every year for the next 30 years. The 'expansion limit' for Schiphol Airport has been set at 540.000 flights per year. (Stil, 2020). With the use of the formula of exponential growth, this will mean that Schiphol will reach its limit in 7 years.

A prime example is Lelystad Airport located in the Netherlands. Lelystad Airport needs to be the new wingman for Schiphol Airport in the future. In 1973, Lelystad Airport opened its doors as an official airport. During that time, the only purpose of the airport was to host private flights for enthusiasts. In 1993 the Schiphol Group saw the potential of expanding the airport for large commercial air traffic and invested heavily in fulfilling these plans (Uitbreiding Lelystad Airport, 2021).

With limited space in the air, Lelystad Airport is forced to be creative to make sure the airplane traffic runs safely and smoothly. The initial solution to this problem is to create 'low flying routes', where airplanes fly at a lower altitude underneath the airplane traffic of Schiphol Airport (Barendregt, 2021). However, this will impact residents living nearby since airplanes produce a lot of noise and pollute high amounts of carbon dioxide (Harrison et al. 2015)

Researching the concept of low flying routes adds to the scientific relevance since its social and environmental effects are a relatively little researched topic. In terms of societal relevance, there are many stakeholders involved with the reopening of Lelystad Airport. Examples of stakeholders involved in this case study are residents, the province of Lelystad, and the Ministry of Infrastructure and Water Management. However, there is a lot of miscommunication and dissatisfaction amongst stakeholders. To illustrate the situation, 60.000 concerned residents have signed a statement against the re-opening of Lelystad Airport (van der Peet, 2017). These 60.000 residents are accompanied by 21 protests group who are actively trying to delay the opening as long as possible (de Brug, 2020). On the other hand, the world is facing permanent climate change in the future. In 2015, 195 countries (including the Netherlands) agreed in the Paris agreement to act against climate change. With plans of re-opening Lelystad Airport in the future, questions arise if it's morally acceptable to open a new airport (UFCC 2015).

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¹ Given the situation without the COVID-19 pandemic

1.2 Research Problem

The expansion of Lelystad is a hot topic amongst politicians and people living nearby. The opinions are widely varied since the social aspects of the expansion affect many stakeholders. Currently, the opening of Lelystad Airport has been delayed due to the COVID-19 pandemic (Markus, 2021). This decision by the government gives the people that live nearby a bit more time to adapt and prepare for the new situation. Residents have been trying to figure out for many years what is going to happen to their living environment, but they experience the communication with the government as insufficient, resulting in a decrease in trust (ten Cate, 2020).

As mentioned above, using low flying routes results in high amounts of noise and air pollution (SATL, 2021a) The exact amount needs to be calculated based on a so-called Environment Effect Report (In Dutch: Milieueffectrapportage, abbreviation MER). In 2014, the Ministry of Infrastructure and Water Management published the first version of this report, and it contained a lot of mistakes in the assessment of potential impacts. Critical research done by Leon Adequest revealed that the figures for noise pollution were incorrect and needed rectification (Siep, 2019). The second version of the report, which also has been researched by Leon Adequest, contained mistakes in the calculations of the expected environmental pollution. Adequest calculated that nitrogen emissions figures were way higher than anticipated and would precipitate over a larger area (Siep, 2020). Leon Adegeest is an independent consultant established in Zwolle (LinkedIn, 2021). In 2020, the National Institute for Public Health and the Environment (RIVM) admitted that mistakes were made and agreed with the research of Adegeest (SATL, 2021c). This makes research relevant because it shows that without enough desk research, even big consultation firms make mistakes or understate impacts. Understating impacts is a widely used technique to make the outcomes of the report look better than they are. For example, this technique is used in Nigeria to ensure acceptance of a project and gain funding (Ubani et al. 2015).

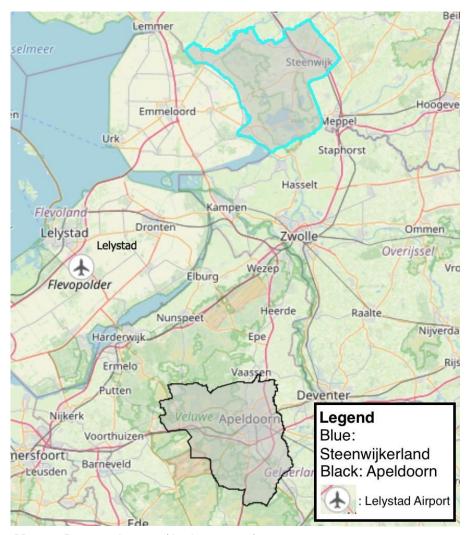
Figure 2 illustrates the low flying routes that will be used in the future and the affected areas. This figure was not included in the MER and has been designed by Wim Liesker.



Figure 2: Flight routes of Lelystad Airport (Liesker, 2019)

This thesis will focus on the provinces of Overijssel and Gelderland. In these provinces, airplanes will fly at an altitude of 1800 meters high, whereas normally, airplanes will fly at an altitude of around 10.000 meters (SATL, 2021b). Next to that, the province of Overijssel has a nature reserve called the Weerribben-Wieden, and Gelderland has the Veluwe which will be affected by the low flying routes. Both nature reserves are classified as Natura-2000 areas. Natura-2000 areas are selected areas where certain habitat types and plants live which have been given protected status by the European Union (Natura 2000, 2021). Looking at the MER, the effect of low flying routes on the Veluwe has been considered in the research. On the other hand, the Weerribben-Wieden is not mentioned. With mistakes made in the MER, it is uncertain to what extent these nature reserves are affected by these low flying routes.

However, one disadvantage of researching two provinces is the sheer size of the research area. Therefore, the research area will focus on the (living)environment of two parts of Overijssel and Gelderland. For Overijssel, the focus area will be the municipality of Steenwijkerland. The reason for the choice of this municipality is because of the nature reserve that is located in the municipality: the Weerribben-Wieden. For Gelderland, the focus will be on the area surrounding the nature reserve the Veluwe. This area will be the municipality of Apeldoorn. The research area is highlighted in map 1.



Map 1: Research area (Author, 2022)

This section has provided a brief overview of the problem surrounding the reopening of Lelystad Airport. The expansion of the airport will bring significant changes to the living environment and well-being of residents. In combination with the residents' misunderstanding of the EIA due to mistakes in the report regarding noise and environmental pollution make the case of Lelystad very complex in finding the ideal situation. This results in the following **research question**:

"What are the social impacts on the residents of Gelderland and Overijssel with the expansion of Lelystad Airport?"

The following 3 sub-questions will be used to help to find results for the main question:

- 1. What are the environmental effects on the living area and well-being of the affected population?
- 2. How can the collaboration between different stakeholders be improved?
- 3. What positive impacts will the expansion of Lelystad Airport have on the affected population?

The objective of this research is to gain a better understanding of the social impacts the expansion of Lelystad Airport has on the population. Furthermore, this research tries to be an inspirational example to improve the collaboration between stakeholders.

For this thesis, environmental impacts will be considered as an element of social impacts on the living environment and well-being. According to Vanclay (2003), health, wellbeing, and the environment are essential concepts in conceptualizing social impacts. The expansion of Lelystad Airport is accompanied by an increase in environmental changes to the area where the low flying aircraft will operate. The consequence of these environmental changes will be a cause of social impacts on the affected residents, which will be discussed in the theoretical framework and the results section.

1.3 Structure of the thesis

This thesis is structured as follows. First, the theoretical framework will discuss the definition of essential concepts. This is followed by the methodology section which will explain how the qualitative and quantitative data has been collected during the research. This data will be analyzed in the result section. The thesis concludes by taking the results and linking them back to the research questions mentioned in the introduction. Finally, the conclusion will discuss the limitations of the research that have occurred along the way in combination with recommendations for further research.

2. Theoretical framework

2.1 Theoretical framework

2.1.1 Infrastructure development

Infrastructure development has become an increasingly important agenda item for policymakers in recent years. With an increasing number of stakeholders (project developers, locals, NGOs, etc.) involved in the planning process, infrastructure development has become a more complex process than ever before (Sengür & Vasigh, 2018). This theoretical framework will focus on the social aspects of infrastructure development. Vanclay et al. mention that "infrastructure development has all kinds of social impacts that affect or concern people, whether directly or indirectly." (2015, p. 2). Social impacts are changes to the environment or surroundings of people and can be distinguished into various categories. A few examples of social impacts are changes to people's way of life, their culture, and changes to their community (Vanclay, 2003). The social aspects of infrastructure development are a widely discussed topic by academics. For instance, Hanna et al. analyzed the importance of cultural aspects in impact assessment and project development based on a case study conducted in Brazil. In 2001, the construction of the Lajeado Hydroelectric Dam was finished in the state of the Tocantins located in centralnorth Brazil. However, the construction of the dam has had social and environmental impacts on the indigenous population, who are located a few kilometers downstream. The Brazilian government created a compensation program for the affected population. By conducting qualitative research, it gradually became clear that there is still room for improvement in terms of mitigating social and environmental impacts caused by infrastructure development (Hanna et al, 2016).

2.1.2 Environmental and Social Impact Assessment

The compensation program was designed as a result of an environmental impact assessment (EIA) and social impact assessment (SIA) completed in 2000 (Hanna et al, 2016). According to the International Principles for Social Impact Assessment the definition of an SIA is: "the processes of analyzing, monitoring, and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions" (Vanclay et al. 2015, p. 1). Conducting an SIA and an EIA (combined: ESIA) is considered one of the most important tools to gain insight into the social aspects of infrastructure development. To improve the results of the SIA and EIA Hanna et al. (2016) concluded that it is essential to include ethnographic fieldwork. Ethnographic fieldwork can be described as a situation where fieldwork meets the culture of certain communities, like the Xerente Indigenous people in Brazil, and try to gain an 'insider's point of view' (Hoey, 2014). Ethnographic fieldwork could be a useful tool to distinguish the differences and understand how these communities might experience impacts differently.

As mentioned above, an SIA and an EIA can be considered important tools in the research on social aspects of infrastructure development. In the world of planning, SIA and EIA are considered legal licensing procedures. However, when implementing the two methods, there has been some critique towards them. A scientific report written by Dendena and Corsi published in 2015 discussed the pros and cons of the SIA and EIA. While Vanclay et al. (2015) see the SIA and EIA as two separate assessments, Dendena and Corsi (2015) mention that the SIA has for long been considered as a component subordinated to the EIA. To make the two assessment methods more effective, they are integrated into the so-called Environmental and Social Impact Assessment (ESIA).

When looking at research gaps in terms of infrastructure development, Lelystad Airport (the Netherlands) is an interesting case. To ease some pressure from Schiphol Airport (Amsterdam) Lelystad Airport planned to open its doors at the end of 2018. However, the opening date was postponed due to mistakes in the noise and nitrogen calculations. With the ongoing COVID-19 pandemic, the future of the airport is uncertain (Laconi and van der Aa, 2021).

Using the concept of the ESIA could help in gaining an insight into what social consequences the opening of Lelystad Airport could have on the living environment and well-being of people living on the flight routes. Conducting an ESIA helps also gain insight into the environmental impact on nature reserves like the Weerribben in Overijssel. For an even better insight into the environmental impact, a Biodiversity Impact Assessment could be conducted

Nature reserves play an important role in the daily life of people as ecosystem services. Ecosystem services can be defined as "a function of complex interactions among species and their abiotic environment; complex use and utilization patterns; and various perceptions by beneficiaries" (Fisher et al. 2007). Every individual utilizes a nature reserve differently and has a certain feeling towards it. For example, green spaces tend to increase the quality of life and the well-being of individuals in many ways. It reduces stress and provides a great sense of tranquility and health (Chiesura, 2004).

2.1.3 Noise pollution

For the case of Lelystad Airport, the Dutch government has opted for an EIA (in Dutch: MER). The mistakes made in the MER in combination with the lack of communication by the government resulted in a decrease in trust in the Dutch government (ten Cate, 2020). According to CBS (2020), governmental trust has decreased over the years in the Netherlands. This is noticeable in the increase in protests by young people, businesses, farmers for example. Such a protest has taken place at Lelystad Airport by local farmers who do not agree with the nitrogen emission rules set out by the government for Lelystad Airport. This protest was accompanied by residents who fear that the reopening of Lelystad Airport will result in residential devaluation because of noise pollution (van Oirschot, 2020). Noise pollution is exposure to intense sounds for a long time. Noise pollution could result in negative effects on health, like for example hearing impairment, mental problems, and cardiovascular disorders (Hygge, 2001). Research conducted in Brazil showed that noise pollution produced by the airport of Bacacheri leads to residential devaluation to 61% of the people living nearby the airport (Silva et al. 2021).

Residential devaluation caused by airports also has been researched in the state of Ohio in the United States. Research shows that house sale prices have declined by 2 to 10% after the opening of a new runway by the airport of Columbus (Lawson, 2021).

2.2 Hypothesis

This thesis will focus on the social impacts of the expansion of Lelystad Airport on the inhabitants of Gelderland and Overijssel, in particular the inhabitants of Steenwijkerland and Apeldoorn. The following hypothesis will help answer the main research question:

"In the population, there is no difference in social impacts between the inhabitants of Gelderland and Overijssel because of the expansion of Lelystad Airport"

Airplanes produce around 40 to 70 dB when descending and ascending (MER, 2014). In combination with figure 2, it shows that these planes will fly over the provinces of Overijssel and Gelderland. Since airplanes produce a consistent number of decibels, it will affect the residents of Overijssel and Gelderland roughly in the same way. Some differences in effects might occur if a house has better soundproofing than others for example. However, when sitting in the garden, the noise pollution will affect everyone in the same way.

2.3 Conceptual model

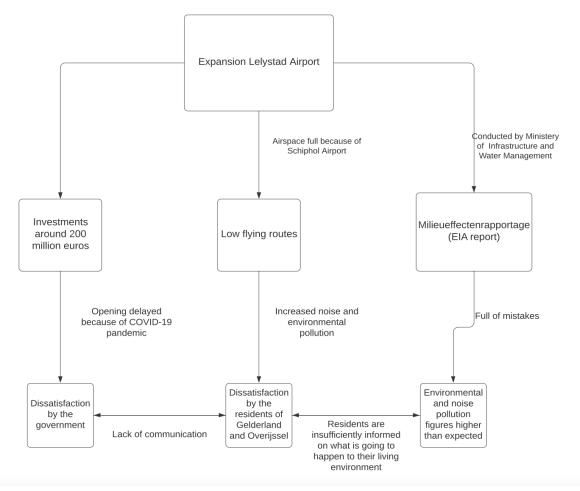


Figure 3: Conceptual model (Author, 2021)

This conceptual model can best be described as a conceptual model of dissatisfaction and can be seen in figure 3. Plans of expanding Lelystad Airport have been designed a long time ago but many factors have delayed the opening. Approximately 214 million euros have been invested into the expansion but there is still a lot of uncertainty about whether the airport can be used (NOS, 2020). The government is responsible for these kinds of investments figures and is dissatisfied since these costs can be considered as sunken costs. The government advocates opening the airport to earn back those investments. The re-opening of the airport results in dissatisfaction by the residents of Gelderland and Overijssel. The EIA mentions that noise pollution will result in nuisance and sleep disturbance. Concluding, the re-opening of Lelystad Airport is a very complex case, and finding a consensus is proven to be very difficult.

3. Methodology

3.1 Collecting data

This research has opted for a mixed-method approach to gain a better understanding of the complex situation. The reason to choose this mixed-method approach is to collect various answers. With the qualitative method of interviewing stakeholders, a detailed framework can be drawn of the situation. This is supplemented by conducting a questionnaire amongst residents of Steenwijkerland and Apeldoorn. The goal of the questionnaire is to draw a more general view of the situation.

3.2 Qualitative method

At the moment of writing this methodology, the COVID-19 pandemic has its effects on collecting primary data. Therefore, meeting interviewees face to face was not possible at all times, and often an online platform had to be used to conduct the interviews. Table 1 provides an overview of the interviewees and illustrates which role every respondent has played in the process of the project. Choosing the right respondents is often difficult. A method that can help to filter out the best respondents is snowball sampling. Snowball sampling is a method where respondents use their social network to get in contact with the next respondent (Valentine, 2005). In the end, a mix of different stakeholders was selected who were involved and/or affected by the expansion of Lelystad Airport. This mix contained residents of the affected municipalities, a consultant who was actively involved in the decision-making process, and an environmental specialist, who used his expertise to answer questions on the environmental effects. All interviews were conducted in Dutch and based on an interview guide. This interview guide can be found in appendix B.

Name used in thesis	Stakeholder	Profession	Way of interview	Duration (minutes)
Interviewee 1 (I-1)	Consultant	Manager of a process management and advice firm	One on one	55
Interviewee 2 (I-2)	Resident of Steenwijkerland	Manager of a day nursery	Zoom	22
Interviewee 3 (I-3)	Resident of Steenwijkerland	IT manager at the Dutch Police	One on one	28
Interviewee 4 (I-4)	Resident of Apeldoorn	Copywriter at an insurance company	Zoom	30
Interviewee 5 (I-5)	Nature and spatial planning specialist	Employee at environmental federation Gelderland	Email	N.A.

Table 1: Interviewee's overview (Author, 2021)

3.3 Quantitative method

In addition to interviews, a survey has been sent out to inhabitants of Gelderland and Overijssel via random sampling. Random sampling ensures that the survey reaches all kinds of different individuals in the population and reduces the chance of bias (Alchemer, 2018). This survey was made with Google Forms and sent out via social media. The survey has been filled in by 57 respondents across the municipalities of Steenwijkerland and Apeldoorn. The main reason why an additional survey has been sent out in combination with interviews is to gain an understanding of the general opinion on Lelystad Airport. The survey questions can be found in appendix A.

To test the statistical significance of a survey, a minimum of 30 cases is required. Using this rule of thumb for this specific survey, its statistical significance could be tested. However, reflecting on the 57 responses, a greater number of respondents would make things more interesting when comparing the opinions of the residents of Steenwijkerland and Apeldoorn with each other. Another drawback is that the division of respondents is skewed towards residents of Steenwijkerland. This can be seen in map 2. Map 2 shows an overview of the locations of residence. Respondents were not obliged to fill in this question if they did not feel comfortable doing so. Furthermore, not all responses could be used in testing the statistical significance and therefore the hypothesis. This is because the respondents filled in a location of residence which does not fit the survey description.



Map 2: Location of residence respondents (Author, 2021)

3.4 Data analysis

All one-on-one interviews were recorded via the dictaphone app on the iPhone. For the online interviews, a screen recording recorded the conversation. The transcripts are coded with the help of software called ATLAS.ti. Coding helps to organize the observations made by the interviewee. For the quantitative data, the data will be imported into the software SPSS. SPSS is a statistical software package that can run many statistical tests to prove statistical significance (SPSS handbook, 2021).

3.5 Ethical considerations

Conducting research and being ethical go hand in hand. It is essential that the researcher is always transparent to protect everyone who is involved in the research. Therefore, before every interview, a consent form will be sent out to the interviewee. This consent form consists of information about the research and a question of whether they agree if the interview is recorded or not. If there are any other wishes, like anonymity, for example, the researcher is obliged to fulfill this wish. When the consent form is signed, the interviewee permits to be part of the research, and their data can be used in the thesis. However, this data won't be used for any other purpose. Every transcript has been sent out to the interviewee so they can check if the researcher used their words correctly. This has been done for every single interview to guarantee the privacy of the respondent.

4. Results

4.1 Environmental effects

Calculating the environmental effects has proven to be difficult in the past. The mistakes made in the MER (Siep, 2020) created uncertainty on what the low flying routes will bring to the living area of the affected population. According to nature and spatial planning specialist (I-5), the environmental damage to nature reserves like the Veluwe and the Weerribben-Wieden produced by low flying routes is of great concern:

"The background deposition of nitrogen in the Veluwe is already too high when it comes to the various nitrogen-sensitive habitats (vegetations such as heathland, old oak forests ,and others), streams, and habitats of various species. This means that the quality of nature decreases. This does not comply with the legal obligations to conserve and restore nature. The depositions and thus the emissions from the various sources must therefore be reduced. Increasing the depositions due to more emissions from extra flight movements is completely at odds with this. This is not even considering the CO2 emissions and the consequences for climate change and the high energy consumption of this branch of transport. And then we haven't even mentioned the visual disturbance and the noise disturbance caused by aircraft flying over, while the core qualities to be protected for the Veluwe are silence/peace, space, and darkness." (I-5, 2021).

When it comes to the Weerribben, it is hard to predict if these effects also will affect the nature quality of this nature reserve. This is because the soil, habitats and living area are different than of the Veluwe (I-5, 2021). As mentioned above, one core quality of the Veluwe is silence, space, and darkness. This is also the core quality for the Weerribben. The resident of Steenwijkerland is afraid that this will come to an end when the low flying routes will be implemented:

"It is an area where a great number of birds, wildlife, plants come together and grow. It has been declared the most beautiful 'silence area' in the Netherlands not that long ago. That silence will be gone in the future, so the experience of the people who recreate in the area will disappear." (I-3, 2021)

However, this feeling is nuanced by the consultant who played a role in the decision-making process (I-1). Thorough research has shown that according to the law, there is nothing to worry about. The Dutch law has implemented a decibel threshold of 48 decibels. If this threshold is exceeded, the government must take measures to deal with noise pollution. According to the consultant, this is not the case for Gelderland and Overijssel.

"But if I'm standing in the middle of the Weerribben, where it is very quiet, yes, then I don't rule out that you hear a plane coming over [...]. Yes, with the law in the back of our minds, there is nothing to worry about" (I-1, 2021).

Comparing the perspectives of these three stakeholders with each other, it is striking that the stakeholder has a rational, legal viewing point towards the noise pollution issue. On the other hand, the resident of Steenwijkerland (I-3) and the nature and spatial planning specialist share (I-5) roughly the same perspective. They see the increase of noise as a threat to the quality of ecosystem services, like the Veluwe and the Weerribben.

Another threat to the living environment is residential devaluation because of noise pollution. According to the resident of Steenwijkerland, the neighborhood is already changing because of the low flying routes that will be implemented in the future:

"I know for a fact that neighbors further down the street already have sold their house because they are afraid of residential devaluation because of the low flying airplanes [...] They thought it was the right time to move and tried to be ahead of the devaluation" (I-3, 2021)

Comparing this to the situation in Apeldoorn, people seem to experience less urgency to move than in Steenwijkerland for example. According to the resident of Apeldoorn, the residents are less afraid of residential devaluation. It is the nuisance that outweighs residential devaluation. If the situation like in Ohio also will occur in for example Steenwijkerland and/or Apeldoorn, there is a high chance that more people will move out in the future.

4.2 Stakeholder collaboration

Many factors influence the quality of project proposals. Implementing a successful EIA can improve the project quality by proposing effective mitigation measures to reduce the negative impacts. Improved quality of a research proposal also leads to a better acceptance of project objectives amongst stakeholders (Slootweg et al. 2001). Good communication is key in an SIA. In the case of Lelystad Airport, communication between concerned residents and the government is often described as poor (ten Cate, 2020). The lack of communication is also noticeable in the primary and secondary data. According to the resident of Steenwijkerland, a special meeting was organized in the local theatre with information about what is going to change soon for residents of Steenwijkerland. However, the information was sent out too late, so many residents of Steenwijkerland missed this evening (I-3, 2021). This statement is backed by the other resident of Steenwijkerland:

"In my opinion, everything started very late. I can remember that there was once a meeting in our municipality. To be honest, I missed out on the information. And the meeting wasn't even that long ago. The airport was already built. There was no real participation possible since it was just an 'information' evening [...] Yes, I had the feeling that it all started quite late" (I-2, 2021)

However, the argument that information was sent too late is refuted by the consultant:

"The turnout was very large at these evenings in the theaters, thousands of people showed up. [...] The evenings turned out to be very special in the end". (I-1, 2021)

Something noticeable which is worth mentioning is that this quote is directly from the consultant who is in favor of opening the airport. Therefore, the quote can be considered slightly biased since he probably does not want to agree with the fact that the information was sent out too late.

Investigating the secondary data, a noticeable trend is visible in terms of the availability of information about the plans of Lelystad Airport.

Are you aware of the expansion of Lelystad Airport?	Are you aware of the 'laagvliegroutes' that will be implemented?	The government has informed me about what is going to happen in the nearby future.
Yes: 85,2 % / No: 14,8%	Yes: 70,4% / No: 29,6%	Yes: 10,1% / No: 88,9%

Table 2: Questionnaire responses (Author, 2021)

Table 2 shows a quick overview of the division in answers filled in by the respondents. Most of the respondents do know that Lelystad Airport will expand in the future. However, not everyone who is aware of the expansion is aware that Lelystad Airport will operate in a different way by implementing the low flying routes. The most striking statistic is that almost 89% of the respondents are not informed by the government at all on what is going to happen to their living environment and well-being in the future. The respondents who were informed of the plans were up to date because of local newspapers or via a letter from the local council.

According to interviewee 3, there is a lot of improvement to be made by the government. Interviewee 3 suggested that the provision of information could have been done much better by actively providing information in especially those places where the low flying routes seem to be coming over. For example, to put letters in the mailbox. Interviewee 2 agrees with this statement and suggests planning the information evenings at the beginning of the project. Also, those information evenings need to give the affected residents the feeling that they can talk and think along. Interviewee 4 states that a piece of trust in the government is lost since she feels like the government is acting on her behalf.

4.3 Positive effects

The main reason for expanding Lelystad Airport is to function as a base for Schiphol Airport when Schiphol reaches its expansion limit of 540.000 flights per year (Stil, 2020). Opening a new airport has its side effects on the region the airport is located in. Not all those side effects are negative. Opening an airport can also bring positive effects to the region. According to Doerr et al. (2020), new transportation infrastructure, like an airport, can stimulate regional economic development by creating job opportunities or an increase in tourism. However, this is limited to only to the region where the airport is located. This statement is confirmed by the primary data. The consultant and the residents of Steenwijkerland (I-4) and Apeldoorn (I-5) agree that the reopening of Lelystad Airport will bring more job opportunities and tourism, but only to the province of Flevoland.

"Here, you have the beginning of a metropolis of Almere. It grows, grows, and grows. This choice has been made deliberately. Lelystad is growing at a slower speed, but the importance of playing a part in such a structure is visible. The direct effects of aviation are much more limited. But having a 'puller' like Lelystad Airport brings all kinds of activities to the local area, like job opportunities. But that is not the case remotely (... in Gelderland or Overijssel)" (I-1,2021)

Referring to the research area of Gelderland and Overijssel, the prognosis is that jobs will be lost in the future. Tourism is the biggest economic driver of the Weerribben. Tourists pay a special visit to the Weerribben because it is a silence area. In the area where the low flying routes will be implemented there are approximately 900 residential recreation locations (like campsites, hotels, and group accommodations) which will be affected by the low flying aircraft (Fix, 2019). Roughly 5000 jobs are connected to these residential recreation locations. With a decrease in tourism, the demand for jobs will also decrease. However, a positive effect for residents of Gelderland and Overijssel could be that the travel time to Lelystad Airport could be shorter than for instance to Schiphol Airport.

5. Conclusion

5.1 Conclusion

Through a combination of qualitative and quantitative data collection analysis, this thesis investigates which social and environmental impacts the expansion of Lelystad Airport would have on the living area of the provinces of Gelderland and Overijssel, with the municipality of Apeldoorn and Steenwijkerland in particular. Social impacts are changes to the environment or surroundings of people and can be distinguished into various categories. A few examples of social impacts are changes to people's way of life, their culture, and changes to their community (Vanclay, 2003). The main social impacts mentioned by the interviewees are the environmental effects the low flying routes will bring to their living area, well-being, nature reserves and its biodiversity. In terms of noise pollution, the opinions are divided. The striking difference is in the perspectives. The consultant, who played an important role in the decision-making process, mentioned that Lelystad Airport complies with all laws. According to the Dutch law, there are no social impacts in the provinces of Gelderland and Overijssel. On the other hand, residents (like interviewees 2,3,4) are afraid that the low flying routes will seriously impact nature reserves like the Veluwe and the Weerribben. This is confirmed by the nature and spatial planning specialist (I-5). The background deposition of nitrogen in the Veluwe is already too high and will increase with the implementation of low flying routes. This way, the low flying routes will contribute to the decrease in nature quality. Next to that, an often-cited fear of residents is that they won't enjoy sitting in their back garden since the noise pollution will affect the silence and tranquility. Residential devaluation is also a social impact that could change the living environment in the future. This change in the living environment is already happening in the province of Steenwijkerland where one resident already sold their house to be ahead of devaluation. This resident tried to anticipate the situation that took place in Ohio (Lawson, 2021).

Stakeholder collaboration is an important aspect of an EIA. However, the primary and secondary data show that there was a lack of collaboration. Information evenings were organized but the invitations were sent out late and not to everyone who is affected by this expansion. This resulted in the fact that a lot of affected residents missed out on valuable information. Improving stakeholder engagement is valuable for a better acceptance of project objectives (Slootweg et al. 2001).

Opening an airport has also positive side effects on the region. Positive side effects connected to opening an airport are the increase in tourism, creation of job opportunities, and decreasing the travel time for Dutch residents who live far away from Schiphol. The prognosis is that this will only be the case for the province of Flevoland and not for regions like Gelderland and Overijssel. In fact, for regions like Gelderland and Overijssel, there is a risk that more jobs will be lost than gained because of noise pollution near the ecological tourism area.

5.2 Limitations and recommendations

Researching the social impacts of Lelystad Airport often proved to be difficult. The case of Lelystad Airport is described as a hot topic amongst different stakeholders, so people were hesitant to get involved in this research. For example, Staatsbosheer would not participate in the research because they did not want to share their opinion on something the Dutch State funded. The reason is that it is an individual administrative body of the Dutch government (Staatsbosbeheer, 2020). Another limitation is the fact that the protest group and Leon Adegeest did not respond to any of the invitations for an interview. This would be useful since they have invested a lot of time into this project and could provide new information which could help answer the research questions easier. This could have been a result of the ongoing COVID-19 restrictions that were set out by the government at the time. The COVID-19 restrictions have also influenced the interviews that had taken place. Meeting up with interviewees was not always possible and had to be conducted online.

At the moment of writing this thesis, there is still a lot of uncertainty about whether or not Lelystad Airport will be open in the future. Recently, research has shown that Schiphol Airport is legally not allowed to grow to 540.000 flights per year. Schiphol Airport does not comply with the nitrogen regulations and therefore will not receive a nature permit for the future. The only way to receive this permit is to decrease the number of flights by 20% to 400.000 flights per year (NOS, 2021). If Schiphol Airport accepts this measure, more questions will arise about whether Lelystad Airport should open or not. In terms of further research, it could be interesting to investigate what a decrease in flights will bring, for example, in improvement to the nature and living environment and well-being of residents living close to Schiphol Airport. When strictly researching the case of Lelystad Airport, it could be interesting to investigate what social impacts the reopening has on the residents of Flevoland. A final suggestion could be to research if the positive impacts will outweigh the negative impacts on the residents of Flevoland.

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7.Appendix

Appendix A.

Survey questions

Goodmorning/afternoon. My name is Jorik Ouwerkerk. I'm a student at the University of Groningen and I'm working on my bachelor's thesis. I'm researching the impacts of the expansion of Lelystad Airport.

Soon, Lelystad Airport will open its doors again and will be hosting flights towards several holiday destinations. However, because of the limited airspace (because of Schiphol Airport), the aircraft will fly at a lower altitude (making use of the so-called 'laagvliegroutes'). This will result in an increase in noise and environmental pollution. I would like to ask some questions regarding the impacts that will affect the living environment and your social well-being. Filling in this questionnaire will take approximately 5 to 7 minutes.

Your participation in this study is completely voluntary and if you desire to stop, you can do so at any moment. Your responses will be strictly confidential and anonymous, only the researcher and my supervisor will have access to your individual answers and the results will not be published or used for anything else without consent.

If you have any questions or concerns, feel free to contact me at: j.ouwerkerk@student.rug.nl

Likert scale: 1 = totally disagree and 5 is completely agree

- 1. What is your postal code? (you can decide to not answer if you don't feel comfortable)
- 2. What is your age?
- 3. Taking a plane to a holiday destination is morally acceptable considering the environmental effects?
 - Disagree 1-2-3-4-5 Agree
- 4. How often do you take a plane to go on holiday?
 - Never
 - 1 or 2 times a year
 - 3 or 4 times a year
 - 5 times a year
 - More than 5 times a year
- 5. Are you aware of the expansion plans of Lelystad Airport?
 - Yes
 - No
- 6. Are you aware of the laagvliegroutes that will be implemented? (include explanation in the intro)
 - Yes
 - No
- 7. The government has informed me about what is going to happen in the near future.

- If so \rightarrow In what way?
- 8. These low flying airplanes will drastically change my living environment
 - Disagree 1-2-3-4-5 Agree
- 9. Environmental impacts should be well-considered before re-opening Lelystad Airport Disagree 1-2-3-4-5 Agree
- 10 The government should introduce a compensation program for the affected residents
 - Disagree 1-2-3-4-5 Agree
- 11. Do you have a suggestion what the government should do for the affected residents?
- 12. What positive impacts will the re-opening bring your living environment (job opportunities, tourism etc.)
- 13. Lelystad Airport needs to be re-opened in the future
 - Yes
 - No
- 14. Could you give an explanation on why or why not?
- 15. Will you make use of Lelystad Airport in the future?
 - Yes
 - No

Appendix B

Interview guide

Generic introduction:

Goodmorning/afternoon. My name is Jorik Ouwerkerk. I'm a student at the University of Groningen and I'm working on my bachelor's thesis. I'm researching the impacts of the expansion of Lelystad Airport. Are you aware of the plans regarding the expansion of Lelystad Airport? \rightarrow If yes, continue with the questions. If no \rightarrow Soon, Lelystad Airport will open its doors again and will be hosting flights towards several holiday destinations. However, because of the limited airspace (because of Schiphol Airport), the airplane will fly at a lower altitude (laagyliegroutes). This will result in an increase in noise and environmental pollution. I would like to ask some questions regarding the impacts that will affect the living environment and your social well-being. With your permission I would like to know if it is possible to record this conversation for the purposes of the research and the research only, your name will not appear in the final product, the recording of the conversation will only be available to me and the examination committee if they request it for grading purposes. After the completion of the research and the examination process, your data will be deleted permanently. I hereby would like to invite you to sign the privacy agreement for the collection and use of your data under the code of conduct for scientific research. If at any point during this interview you feel like you would like to stop or withdraw, you are free to do so, at which point we will stop the recording and end the interview.

If you agree with these terms I would like to start the recording now.

Interview guide for residents of Overijssel and Gelderland:

Questions:

First, some chit-chat questions to get to know your interviewee:

- 1. Could you like to tell me something about yourselves? (Age, profession, etc.)
- 2. When did you move to this location?
- 3. What is your opinion on airplanes in general?

Questions on Lelystad Airport:

- 1. What is your opinion on the expansion of Lelystad Airport? (Is it necessary?, should the focus stay on Schiphol Airport or other airports?)
- 2. Which impacts will you think have an impact on your living environment? / What effect will the airport operations will have on your wellbeing and living environment?
- 3. What is your opinion on the 'laagvliegroutes'? (low flying routes)
- 4. Do you think the laagvliegroutes will affect the neighborhood? (Changes in housing prices, people leaving, etc.)
- 5. Are you aware of the potential impacts the opening of Lelystad Airport has? Has the government sent out any information about the entire project? Do you think the government should have done more on informing the affected residents? If so, what could be done better in the future? (Ask for suggestions)
- 6. Do you think the government should implement a kind of compensation program to meet the demands of the affected residents? If so \rightarrow ask for some suggestion

- 7. What positive impacts will the expansion of Lelystad Airport have for you / other residents (tourism, more work, etc.)
- 8. When Lelystad Airport opens its doors, do you think you will make use of this airport? If they disagree with the plans but do think they will use the airport → ask about the moral considerations
- 9. Is there something you would like to mention/discuss which we haven't talked about?

I would like to thank you for your participation. If there are any questions, you can reach me via this email address

Interview guide for a consultant

- 1. Could you like to tell me something about yourselves? (Age, profession, etc.)
- What is your opinion on the expansion of Lelystad Airport? (Is it necessary?, should the focus stay on Schiphol Airport or other airports?) → ask if this opinion has shifted over time or if it was like this from the get-go.
- 3. What is your opinion on the 'laagvliegroutes'? (low flying routes)
- 4. How did you find out that the MER consisted of mistakes? Did you start your research on your own or have you been appointed by someone else (consultancy firms, unsatisfied residents etc.)
- 5. What are exactly the environmental effects on the living area when the laagvliegroutes will used? Will those effects cause any more harm than first expected?
- 6. Are there any other effects besides environmental effects on the living area of affected residents
- 7. What is your opinion on the communication from the government to the residents? Could this be improved?
- 8. Do you think the re opening of Lelystad Airport will bring benefits to the residents of Overijssel and Gelderland? (tourism, more work etc.)
- 9. Is there something you would like to mention/discuss which we haven't talked about?

Interview guide for planners

- 1. Could you like to tell me something about yourselves? (Age, profession, etc.)
- 2. Could you tell me something about the re-opening of Lelystad Airport?
- 3. Did you have any influence on the planning/policy process of the re-opening of Lelystad Airport? If yes → what influence? If no → do you know someone who has had an influence
- 4. Could you tell me something about the planning process of such a big project? If they haven't had any influence on the project, ask which project they have and ask if it can be compared
- 5. Could you tell me something about the choice of the laagvliegroutes that will be used in the future?
- 6. What were the most important environmental effects that had to be considered in the planning process?
- 7. Did you consider to use a Environmental and Social Impact Assesment? Or an Biodiversity Impact Assesment?
- 8. Are you aware of the research of Leon Adegeest? If no \to explain, if yes \to ask about their opinion of the outcome

- 9. When someone else discovers such kinds of mistakes, how do you feel as a planner?Do you think you have 'failed' or does this not affect you at all?10. Should Lelystad Airport reopen?
- 11. Is there something you would like to mention/discuss which we haven't talked about?