Use of scenarios and strategic planning to explore an uncertain future in Greenland

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Imagining the future of Greenland

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Abstract
Scenariobuilding can contribute to reflections and decision-making in complex and uncertain systems. Greenland is presently facing rapid and unpredictable development as heavy exploration in the extractive sector is ongoing, but nearly anything has yet been proven feasible. Development trends are therefore hard to determine and the future impossible to predict in the Greenland context. This article present a study that explores driving forces and uses scenario building to setup four scenarios for potential Greenland futures. The investigation is based on an empirical study and local stakeholder input. The article further discusses the challenges of using scenarios as a strategic planning tool. It is concluded that nine primary driving forces for development in Greenland are important to address in relation to planning independent of which scenario becomes reality. Further it is concluded that there are significant barriers to inclusion of scenariobuilding in strategic planning among others reaching agreement between various stakeholders on values and content of the scenarios can be a challenge and thus choise of parameters to be used as indicators when the development is monitored.

1 Introduction

Greenland in an arctic environment and with a stagnating population of just 56,700 inhabitants (Greenland Statistics 2013), is standing on the brink of radical and unpredictable societal change making it a possible development hub and an interesting case study.

Potentially Greenland is facing an oil rush. According to a 2008 report by the United States Geological Survey, Greenland is expected to contain deposits of up to 51,3 billion barrels of oil equivalent offshore (Bird et al. 2008). These abundant reservoirs of oil and gas have, due to climate change, only recently become accessible; they have previously been innavigable because of ice coverage (Kerr 2007). Decreasing icecoverage and increasing prices on oil and gas has attracted a number of oil companies to explore the offshore subsurface of Greenland (Geuns 2012). Twenty offshore exploration licenses have been awarded since 2001 and seven operators and their partners are presently planning activities in Greenland (Greenland Statistics 2013). However, no commercial founds have been made yet, and there is no guarantee of a commercial found (Bureau of Minerals and Petroleum 2011). Besides the interest from oil companies, Greenland is experiencing an increasing interest from international mining companies. Also minerals have become easier accessible due to the onshore retreat of glaciers and reduction in permafrost (Kerr 2007). Combined with a detailed geological mapping this has caused a quadruplication in numbers of exploration license applications the last ten years (Greenland Statistics 2013). The number of exclusive exploration licenses went from seventeen in 2002 to ninety-four exclusive licenses in April 2011. These were for exploration for diamonds, rubies, tantalum, niobium, zirconium, Iron and more (Bureau of Minerals and Petroleum 2011). So far, there is only one mine in production. Also, the hydropower potentials in Greenland are attracting international attention. The aluminium producing company Alcoa is presently planning an aluminium smelter, which will be the largest industrial project in Greenland, covering, beside the smelter

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itself, construction of hydropower dams, roads, a harbour, dwellings and service facilities for workers during construction and operation etc. (Hansen 2011a). However, according to Alcoa, feasible establishment of the aluminium smelter requires foreign migrant workers working for a salary lower than minimum wages in Greenland. The government of Greenland is still waiting to decide on whether to approve the project or not on these conditions. (Hansen 2011b; Rasmussen 2011) At the same time projections foresee that if business development is not achieved, Greenland faces e.g. a declining economy, increasing urbanisation, increasing emigration and increasing inequality (Government of Greenland 2011; Danish Ministry of Foreign Affairs 2011).

The potential for heavy and rapid industrial development, and the uncertainty related to expected benefits and economic feasibility of the individual projects, places Greenland in a situation where the future is extremely uncertain and the possible consequences of developments very significant. This challenges political decision-making and planning on both the national and community levels in Greenland. As stated by a governmental official at a scenario workshop held in Nuuk (see *Methodology*) *"we have no clue if anything will happen at all and at the same time we are frightened to lack behind and not be ready if something does happen"*. Another government official at the workshop expressed the challenge that: *"there are many influencing parameters we can not control, which have determining impact on the future development. This means we have to plan after more potential future scenarios at the same time"*.

At the same time there are more general planning challenges. One is a perceived lack of cooperation among different sectors in the administration and between different actors; another is a lack of broad participation and discussions, as stated by a participant at a scenario workshop held in Nuuk (see *Methodology*) "*significant decisions are taken without enough discussion, which is a democratic problem*". Thus Greenland is facing both a considerable need for planning and considerable challenges for planning.

Planning in a situation such as that in Greenland can be characterised as strategic, in accordance with the definition of strategic level as encompassing (Hansen and Heide 1992):

- High complexity
- Long time horizons
- Major uncertainties

According to organisational and management literature "*strategic planning is defined as a systematic process for managing the organisation and its future direction in relation to its environment and the demands of external stakeholders…*" (Berry and Wechsler 1995, p. 159). Strategic planning can serve many purposes, e.g. guiding policy directions and decisions through assessing the external and internal environments, setting goals and attempting to manage strategic issues (Berry and Wechsler 1995).

In this paper we aim to provide an overview of the external environment, through answering the question: **Which are the main driving forces for development in Greenland?** And thus which are the main parameters that should be considered when choosing goals, future directions and policy decisions in Greenland? Further the internal environment will be touched upon in a discussion of challenges for strategic planning in Greenland.

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For the exploration of the Greenlandic case study this paper utilises scenario development as a framework. As described in section 2, scenario development can be based on understanding the main driving forces for development, and thus using approaches to scenario development can help to explore these driving forces. The article touches upon the 'demands of external stakeholders', pointed out as part of strategic planning. This is based on the assumption that a positive development includes protection of local values, promotion of local interests and that local participation and knowledge is essential in a situation such as that in Greenland. The aim is therefore to develop and apply a method for exploring scenarios based on theories on uncertainty and scenario development. These choices and the specific approach are described in section 2. The exploration of driving forces and use of the scenarios approach also leads to a more overall discussion about use of scenarios in strategic planning in the case of Greenland, and what the challenges are to planning.

In section 3, three steps used for collecting and analysing empirical data are described. The results in form of identified drivers and parameters are presented in section four and in section five four scenarios are presented. Section six presents a discussion about strategic planning and scenarios in Greenland, and the challenges this involves. Finally section seven contains a conclusion.

2 Conceptual framework: Scenarios

In general terms, scenarios are helpful when making decisions regarding complex and uncertain systems, where unforeseen and abrupt changes are possible (METIER 2009). Uncertainty can be defined as "*a condition where we lack certain knowledge that we think may be important to making a decision*" (Willows and Connell 2003), and can for example be the result of (Raskin 2005):

- Ignorance: Limits to our knowledge about future developments and dynamics
- Surprise: Inherent unpredictability of complex systems
- Volition: The unpredictability resulting from the future choices made by humans, in social, cultural and economic systems

In the case of Greenland, there are both elements of ignorance, surprise and volition. Ignorance for example relates to the fact that it is not known whether there is oil in the Greenlandic underground in quantities worth extracting. Currently, oil companies are exploring for oil, based on analyses that show prospects of oil (Planke et al. 2009; Gregersen and Bidstrup 2008). Surprise could be related to the possible changes in the climate system, which is described as a very complex system with a range of uncertainties as to the future outlook (IPCC 2007). As mentioned, these changes in the climate system may have significant impacts on Greenland, for example melting of the icecap, tripled precipitation in places and thawing of permafrost (DMI 2012). With volition an example from the Greenlandic context might be choice of residence, i.e. will the urbanization keep increasing, emptying the small remote settlements? This all leads to multiple uncertainties around how the Greenlandic society will develop and thus challenge planning.

Scenarios may be viewed as a structured way of discusssing a future characterised by uncertainty and complexity, such as the situation in Greenland. Scenarios can be defined as: "*plausible and often simplified descriptions of how the future may develop based on a coherent and internally consistent set of assumptions about key driving forces and*

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relationships" (MA 2005) Thus, scenarios are not predictions. When predicting, a choice is made to rely on one possible outcome among many, because this is viewed as the most probable outcome. This is illustrated by figure 1.

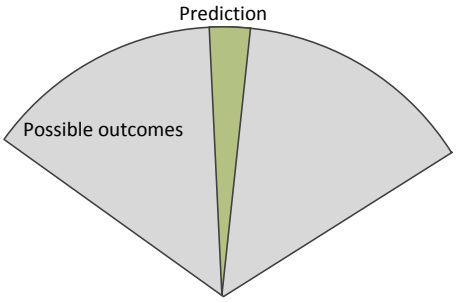

Fig. 1 Prediction among a range of possible outcomes

However, in systems characterised by uncertainty, reliance on a prediction for planning and decision-making leaves a vulnerability to other actual outcomes. This is illustrated in figure 2.

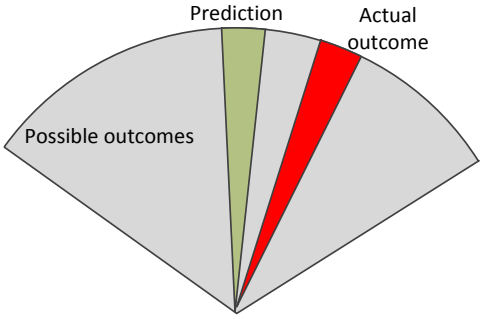

Fig. 2 Prediction versus actual outcome

In uncertain systems, predictions based on present conditions sometimes fail because of a lack of ability to imagine major shifts and changes, and if planning and taking actions is based on wrong predictions, it may miss the target (Schoemaker 1995). Schoemaker (1995) makes the point that we can use scenarios as a "*disciplined method for imagining possible futures*". Thus, scenarios are tools to help identify trends, shifts and changes and to prepare for or influence the development (Shell 2008). In Greenland, the question of whether or not a commercial oil fund is made can be used as an example; what happens if we plan and develop society based on the assumption that oil will be found and it is not? How do we ensure that Greenland has the best possible outcome and desirable development either way?

Scenarios can serve different purposes, among these (METIER 2009):

- Avoid being caught off guard
- Testing robustness of decisions and plans
- Identify possible choices of action
- Providing better policy and decision support
- Raising awareness e.g. about posible future risks, creating and supporting dialogue about the future
- Stimulating discussion, creative thinking and engagement

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When viewing these purposes in relation to Greenland, it is clear that the first four purposes are relevant to the described current challenges of planning for an uncertain development with possible significant consequences, and trying to identify the most important parameters in the development. Thus scenarios are viewed as a relevant framework to use to explore the Greenlandic case.

Development of scenarios

A characteristic of scenario development is that scenarios are unique and has to be developed for the specific aims and context (METIER 2009). Thus first of all the purpose and goal of the scenario development must be settled. One of the issues of relevance is who should participate in developing the scenarios. When stressing that scenarios are not predictions, it follows that they are part science and part judgment, and that they are rather a way of structuring science and knowledge (METIER 2009; Parson 2008).

If the main purpose is scientific exploration and the end-product is in focus, scientists and researchers are likely to be the most relevant participants. However, if the purpose is education, information and decision-support, a broader range of stakeholders and the public are likely to be relevant participants. (METIER 2009) Scenarios for Greenland based on scientific input and exploration have already been developed and presented in the book *Megatrends in the Arctic* (Rasmussen 2011). Further, the purpose of working with scenarios is also to support dialogue and information in Greenland regarding planning and future developments, since this, as pointed out in the introduction to this paper, constitutes a challenge.

There are different conceptual ways to develop scenarios. For this article the *deductive approach* is applied, where main concerns, driving forces, factors and actors are identified, and the logics and description of the scenarios are based on this. (METIER 2009) Following this, three steps for developing scenarios are examined as described below.

1. First a focal issue is identified. The focal issue should be formulated as a specific question that should be explored using scenarios (METIER 2009). For the purpose of this paper the focal question is: How will Greenland have developed as a society in 50 years?

2. Second, driving forces and scenario logics are analysed. What are the driving forces that determine the development of the focal issue? Driving forces often span disciplines and include: demographic, economic, social-cultural, political, technological, legal and environmental drivers. Driving forces can be divided into controllable and uncontrollable, where controllable driving forces are often in focus, because this makes it possible to test different options for actions. The key driving forces should also be identified, as those driving forces that are both very uncertain and very important. One way to build scenarios from this information is to choose two key driving forces that are independent from each other and let them form a matrix making four scenarios as illustrated below in figure 3. (METIER 2009)

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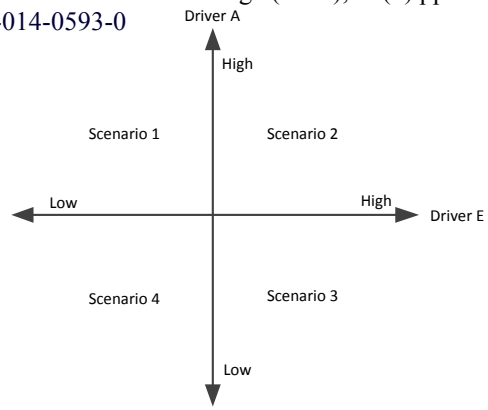

Fig. 3 Building scenarios from a matrix of key driving forces

3. Third, the scenario logics, storylines and final description of the scenario at the end of the set time horizon are devised. This is based on the scenario logics and a mapping of interactions and dependence among the driving forces e.g. causal mechanisms. (METIER 2009)

Regarding development of scenarios, it is important to note that it is not only about finding the 'correct' answer, but also about understanding the system and the mechanisms that determine future development (METIER 2009). This is exactly the basis for using scenarios as a framework for discussing driving forces and strategic planning in Greenland.

3 Collection and processing of empirical data

The empirical data for this paper was collected and processed in three stages: 1) An email-survey, 2) input from students and 3) a workshop. Each stage formed the base for the next. The three stages are described in the following.

Email-survey

The first stage concerned identification of driving forces behind the development in Greenland. As stated previously, experts have recently pointed at general development trends in the arctic (Rasmussen 2011). However, as the goal for this article is to base the scenarios on values and parameters of concern to local stakeholders, a broad number of stakeholders from Greenland were invited to give their input to the focal issue; the question of where Greenland will be 50 years from now and to point out the two most significant key driving forces. 30 stakeholders representing researchers, business leaders, planners in ministries, planners in municipalities, media, politicians, interest organisations and individuals who are active in public debate were contacted via email and 25 responded. The responses were collected and sorted by stakeholder type and the driving forces were categorised and grouped. It should be noted that the respondents are not ordinary laymen, but rather more or less organised stakeholders chosen to represent local values and interests.

Based on this the two key driving forces, pointed out by most respondents, were chosen, to form a matrix such as that in figure 3. The remaining driving forces and input was gathered in four main categories, which structure the description of each scenario. Based on this, four draft scenarios were built.

Input from students

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The second step in the empirical data collection and data handling was based on interaction with students from the University of Greenland. As an assignment in a course in Social Impact Assessment and Sustainability, 22 students discussed the potential positive and negative impacts on the driving forces for each scenario and prepared descriptions for the four scenarios based. This contributed to quality control of the scenarios.

Workshop

In the third step of the gathering of empirical data, a full-day workshop focusing on scenario building as a planning framework was undertaken under the headline: *Scenarios – From theory to practice*. The workshop was arranged in cooperation with the Greenlandic Ministry of Finances on March 2nd 2012 in Nuuk, Greenland. There were 16 participants, mainly from different ministries in the Greenlandic administration, but also from interest organisations, a municipality and a private company. The purpose of the workshop was to discuss scenario building as a planning framework and its application in practice in Greenland. Based on this, the workshop is used in this paper for the discussion of scenarios and strategic planning in Greenland in section 6.

4 Key driving forces for development in Greenland

This section reports on results in the form of driving forces identified through the email-survey among stakeholders and the input from students. The following driving forces for development in Greenland over the next 50 years have been identified by four or more of the stakeholders: Communication, settlement, education, governance, public/private sector, control over development, industrial development, labour market politics and societal adaptation. The descriptions of driving forces are made on the basis of the input from stakeholders, and vary in extent dependent on the details provided by these. The quotes used in the text are anonymous, but the authors know which stakeholders they originate from.

Communication

The stakeholders point out that the current access to electronic communication is untenable and that whether it is changed so that cheap, fast, fixed-price, high capacity electronic communication is secured or not will have significant influence on where Greenland is headed in 50 years. On the negative side, this requires investments, but the stakeholders see it as a precondition for developing an economically profitable IT sector in Greenland. Stakeholders also mention the need for electronic media giving the Greenlanders access to information in their native language – something, which is currently scarce. In general the stakeholders discuss language and the need to use Greenlandic as official language to include Greenlanders properly. It is viewed as problematic that there are two dominating languages; Danish and Greenlandic and in the future possibly also English, and that juggling with three languages can lead to poor communication and misunderstandings.

Settlement

Stakeholders point to the emigration from Greenland, and the importance of whether or not society succeeds in retaining especially women in Greenland. As stated by a stakeholder: "*Whether the current tendency where women choose education and opt out of Greenland is changed or not will have fundamental importance to how society will look in 50 years*". On the other hand development in immigration is also important: How many foreigners will

arrive? From where? And what will be their share in the development of society relative to the natives? This also relates to the issues of language as mentioned under communication.

Also the stakeholders discuss centralisation. Currently there is a trend of urbanisation focussed on the capital Nuuk and some stakeholders imagine the smaller settlements being phased out in the future. The development in this area is dependent upon strategic choices made through planning: Whether settlements are actively closed down, whether educational facilities are decentralised, what infrastructure is built etc. One stakeholder points out that such a strategy is currently lacking, and that this is problematic because the development is significant for where Greenland is headed.

Education

Regarding education, stakeholders mention the need for a better quality of education. This is especially focussed on strengthening the municipal primary and lower secondary school, as a basis for further education of more students, providing better qualifications for business and industry. Challenges for this are e.g. having qualified teachers available, and securing a well-functioning multilingual school. As stated by one stakeholder "*whether the current situation where much too few get real and adequate qualifications from school and education is changed or not, will have fundamental importance to how society will look in 50 years*". Related directly to this issue is raising the percentage of Greenlanders who get an education, especially among the youth. As stated by one stakeholder: "*I believe that what share of the Greenlandic population have an education or other qualifying training is of the greatest importance to how Greenland will have developed in 50 years*".

An improved level of education, through both increased quality and more people taking an education can have several benefits; higher affluence whether there is an industrial development or not, more self-supporting individuals (thus not burdening the public funds), more possibilities of "*utilising the potential up-coming possibilities for qualified labour in the possible large scale industry and thus the sense og being part of driving the development in Greenland and any possible benefits this might lead to*" as stated by one stakeholder. Also some stakeholders identify problems with having an 'A-team' and a 'B-team', where there is a growing gap between those who are well-educated and those who are un-educated as well as between the populations of the larger cities and the rest of the country. One of the important ways of countering this development is a focus on education. The last issue pointed out by the stakeholders is one of personal development. To some of the stakeholders a better educational system is also one that teaches the youth to take responsibility for themselves and thus take part in development rather than being a bystander: "*It is very necessary that we all become more independent and take more care of our own affairs, more than 2/3 of us rent from the public sector for example. It is important that Greenlanders become able to exploit the potential for example in raw materials and turism, that they mentally take part in the battle for their part of the pie and are not passive.*"

Governance

Among the issues of governance is securing balance: in the economy, between the population and the authorities etc. As one stakeholder puts it: "*If we do not secure a steady and equilibrious development of the many aspects in society which is out of balance, then we are merely pushing the problems in front of us and we will see ourselves as slaves of our own past in 50 years."* There are calls for a more holistic approach and collaboration across sectors,

authorities and geography, as one stakeholder puts it "*it is important that Greenland is considered as a whole*" in order to attain the goals for society.

Other important issues are participation and transparency, which are seen as necessary to create an appropriate development of society. Here the question of language surface again, since to some of the stakeholders, it is a precondition for proper involvement that people cn participate in their own language. Also education resurfaces as a well-educated public is also seen as a precondition for "*an enlightened understanding and participation in a real democracy*". Thus there are calls for the authorities to become more professional and more transparent in their administration.

Public/private sector

Some of the stakeholders point out that the public sector in Greenland is much too large compared to the private sector: "*There are all too many employees in public positions or in the 'semi-private' market which is primarily government subsidised*". The point is made that the public sector should be decreased, the private sector should be increased and innovation and entrepreneurship should be encouraged. A larger private sector is seen as a way to secure less import and thus that the funds stay in Greenland. This is also related to the mentioned issue of taking responsibility (see Education), where "*all too many today are dependent and find an identity in being provided for by the public sector*" in stead of working in productive industries.

Control over development

The stakeholders call for a clear political path, priorities and vision, which they find is important but lacking. As one stakeholder puts it "*we are facing massive challenges and need for changes, but without a direction or vision for society. We need to priotitise (and also deselect) what we believe will bring us forward economically and socially, and then all parts of society must support this*". Stakeholders believe it is important for politicians to be responsible in relation to development and be able to also take less popular but important decisions, "*politics is not a popularity contest or an eternal occupation, so make a difference immediately.*" According to some stakeholders it is important that Greenland develop at its own pace and "*it will be decisive for development whether we let the corporations set the agenda or whether the Greenlandic society sets demands, decide the development and have a share in the profit!*"

Industrial development

Another important issue for development is whether or not the industrial development takes off. For some stakeholders the goal with industrial development is to get the economic basis to gain independence from Denmark. However, an industrial development will affect many other issues such as occupational structure, social development, settlement, demography etc. At the same time development in other industries such as fishery and turism is also important because they can secure more diversification and thus less dependence on the heavy industries alone, a dependence that may make Greenland very vulnerable to changes in this sector. As stated by one stakeholder "*there is also a need to consider other sources of income than the raw materials sector and a diminishing subsidy*" (from Denmark red.).

Labourmarket politics

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One of the issues on labourmarket politics is diversification in the available jobs in terms of achieving a balanced labourmarket in terms of gender, and level of education and sectors. Another issue is the expedience of having the executive positions occupied by local Greenlanders, something that may be hindered by lack of qualified labour. As one stakeholder states "*We can already see how companies have to give up plans for expansion because there is no qualified labour*". This is of course linked to education of Greenlanders but also to issues of immigration in terms of importing labour and staff retention. Retention is mentioned as a problem currently, while "*for example in the public sector, it is important to have employees with knowledge of the area they cover but it is equally important to retain staff to avoid gaps. I imagine the same is true in private companies where it is important to get employees with the right education but equally important that they stay*".

Societal adaptation

Societal adaptation relates to the ability of society to adapt to coming changes. One stakeholder states "*the most important parameter for the development of Greenland the next 50 years is the the willingness to adapt in society in general. Can we adapt to the new possibilities that are coming? We have to.*" Other issues demanding adaptation is a change from traditional ways of life with sealing and whaling to oil and minerals extraction industry and the move towards a higher level of education.

After presenting the main drivers pointed out by stateholders, the following table 1 shows how many stakeholders in the different stakeholder groups that identified each as one of the two most significant drivers.

Stakeholder group	*Communication*	*Settlement*	*Education*	*Governance*	*Public/private sector*	*Control over development*	*Industrial development*	*Labourmarket politics*	*Societal adaptation*
Business (3)			xx	x	x	xx	x	x	
Municipal planners (3)		xx	xx	x	x	x			x
Planners in ministries (4)			x			x	xxx	x	x
Researchers (4)	xx	xx	xxx	x			x	x	x
NGO (3)			x	x	xxx		x	x	
Media (3)	x		xx						xxx
Politicians (3)			xxx	xx			x	x	x
Individuals (2)	x			x			x		
Total	4	4	14	7	5	4	8	5	7

Table 1 Number of stakeholders in each stakeholder group that identified each driver as one of the two most important for development in Greenland.

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Three driving forces were mentioned by less than 4 stakeholders and have thus been excluded from further analysis, these are: Global climate change, international positioning and political independence. As can be seen from table 1, the driving forces include: demographic, economic, social-cultural, political, technological and to some extent legal drivers. However, environmental drivers are not included. It is interesting that climate change is seen as a vital driver in the development in the arctic area which is perhaps especially vulnerable and very much debated in a climate change context (see for example COP15 Climate Greenland n.d.; DMI 2012), but this suggests that this issue does not have the same attention and weight among the local stakeholders – it is simply not high on the local agenda.

Another issue that emerges from the analysis is that the development in many of the drivers may contribute the same core results, for example Greenlanders becoming a marginalised minority in Greenland. As stated by a stakeholder:

"*One of my greatest concerns about the development in the next 50 years is that we in Greenland risk becoming a minority in our own country. And that is an uneducated minority in many respects. This is a development I fear because of climate change and the world economy (and thus mineral extraction and other projects such as the aluminium smelter) and because I see that in Greenland there are so incredibly many citizens without a decent education and many who do not have prospects of an education.*"

On the other hand there are links between the drivers, which provides the opportunity of using them to steer development. As stated by a stakeholder: "*The future business opportunities will probably lie in raw materials, turism/experienceindustry and fishery. Because of this the educational system, communication sector, infrastructure, labourmarket politics and tax politics should be planned with a view to how they best support development in these sectors*".

As stated in chapter 2, driving forces that can be controlled and driving forces that are very uncertain and important are often in focus. From table 1 it can be seen that education and industrial development have been pointed out by most stakeholders and by the broadest group of stakeholders, as significant drivers for development in Greenland. At the same time especially the rate and magnitude of industrial development is highly uncertain, as described in the introduction. Education is a driver that can be controlled or influenced and provides possibilities to test different action paths. Thus it is chosen to work with education and industrial development as key drivers. Further, for the purpose of this paper it has been chosen to delimit the broad issue of industrial development to working with the issue of oil.

5. Scenarios for development in Greenland

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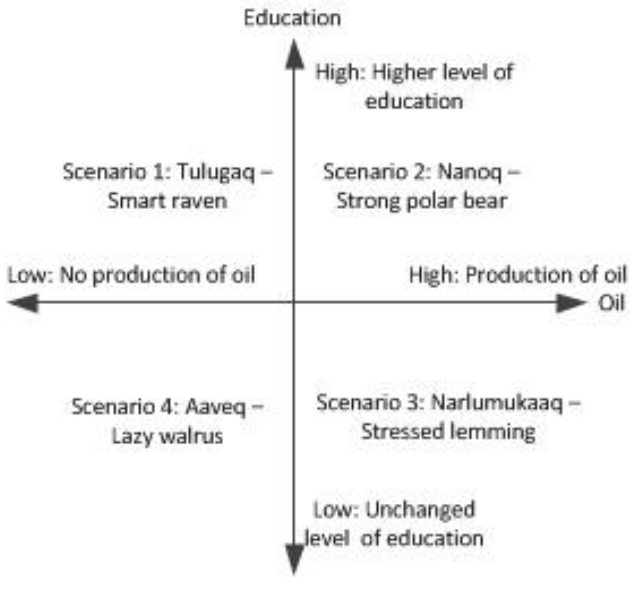
Based on the knowledge of driving forces, four scenarios are developed using a matrix as shown in figure 4.

Fig. 4 Matrix with the four developed scenarios

When describing the four scenarios, the response from the email-survey is used again. The scenarios are described under four headlines: *Financial development*, *Political status*, *Labourmarket*, and *Society and settlement*.

Scenario 1: Higher level of education – No production of oil Tulugaq – Smart raven	
Financial Development - Large public sector - Fewer resources in circulation - More entrepreneurship from educated Greenlanders - Less import (more production in Greenland) - More robust to changes in the market and depletion of resources	**Political status** - Financial dependence - Less increased political independence (selffinancing is a strain on welfare) - Still much oriented towards Denmark
Labourmarket - Few immigrants, Greenlanders in majority - Lacking retention of educated citizens and women - Major sectors are the public sector, mining, tourism and fishery - Few new jobs created - Jobs requiring higher educated are occupied by Greenlanders (if the education is in the right sectors)	**Society and settlement** - Greenlanders in majority - Lack of infrastructure means centralisation - Greenlandic language is threatened - Lacking or less service in small, remote communities - Pressure on culture and identity due to centralisation



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Scenario 2: Higher level of education – Production of oil Nanoq – Strong Polar Bear	
Financial Development - Very large public sector - More resources in circulation - More entrepreneurship from educated Greenlanders - More possibilities for Greenlandic subcontractors - Increased import and export - High vulnerability to changes in the market and depletion of resources - Increased inflation	**Political status** - Financial independence - Increased political independence - More internationally oriented (includes improved language skills) - Higher risk of corruption
Labourmarket - More immigrants (but less than scenario 3) Greenlanders are a minority - Retention of educated citizens and women - Most jobs will be within one sector (oil) - Jobs requiring higher educated are occupied by Greenlanders (if the education is in the right sectors)	**Society and settlement** - Greenlanders in majority - Development of infrastructure means possbilities for decentralisation - Greenlandic language is threatened - Strengthening development in small, remote communities - Pressure on culture and identity due to immigration - Many male immigrants and thus increased risk of crime, violence and prostitution - Strengthened various services due to increased population - Larger social inequalities - Research and education strengthened due to IBA's

Scenario 3: Unchanged level of education – Production of oil Narlumukaaq – Stressed Lemming	
Financial Development - Very large public sector - More resources in circulation - Increased import - High vulnerability to changes in the market and depletion of resources - Increased inflation	**Political status** - Financial independence - Increased political independence - More internationally oriented (but is inhibited by lack of language skills) - Higher risk of corruption
Labourmarket - More immigrants, Greenlanders are a minority - Retention of educated citizens and women - Most jobs will be within one sector (oil) - Jobs requiring higher educated and with high wages cannot be occupied by Greenlanders	**Society and settlement** - Development of infrastructure means possbilities for decentralisation - Greenlanders risk isolation due to lack of language skills - Development is much controlled by immigrants and international corporations - Pressure on culture and identity due to immigration - Many male immigrants and thus increased risk of crime, violence and prostitution - Pressure on and strengthening of various services due to increased population - Research and education strengthened due to IBA's - Larger social inequalities - Risk of increased passivity

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Scenario 4: Unchanged level of education – No production of oil Aaveq – Lazy Walrus	
Financial Development - Large public sector - Fewer resources in circulation - Increased import, export and inflation	**Political status** - Financial dependence - Less increased political independence (selffinancing is a strain on welfare) - Still much oriented towards Denmark
Labourmarket - Few immigrants, Greenlanders in majority - Lacking retention of educated citizens and women - Many unskilled workers - Major sectors are the public sector, mining, tourism and fishery - Few new jobs created	**Society and settlement** -Greenlanders are in majority - Lack of infrastructure and placement of education means centralisation - Lacking or less service in small and remote communities due to centralisation - Lacking or less service in small, remote communities - Pressure on culture and identity due to centralisation

One of the main issues emerging is that production of oil does not necessarily lead to a desirable scenario on its own. Rather it has to be supported by strengthening other drivers, in this case education. This signals a significant shift in perceptions in Greenland, as illustrated in figure 5.

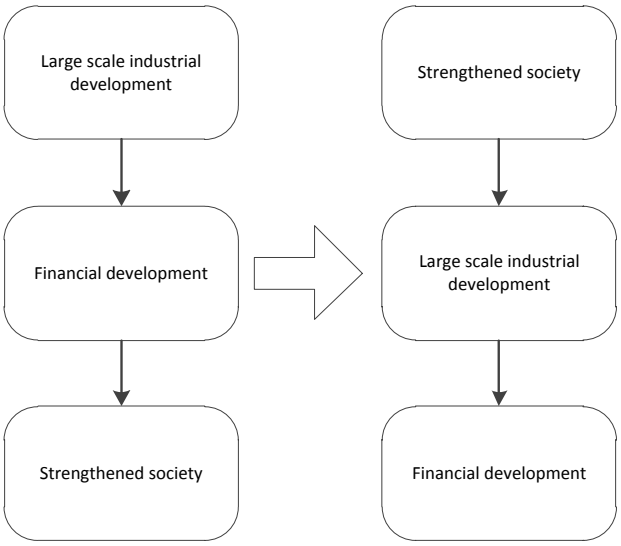

Fig. 5 The change in perceptions signaled by the scenarios

After having presented the scenarios that could be built based on this study, section 6 continues with a discussion of implementing use of scenarios as a planning framework in Greenland.

6. Discussion: Challenges for scenarios and strategic planning in Greenland

This section presents discussions and reflections raised by participants in the workshop described in section three. During the workshop, different issues were raised regarding the challenge of using scenarios as a planning tool in Greenland. It is to be underlined, that the issues are not raised by the authors and are not to be understood as recommendations but reflects a critical discussion on planning practise by authorities and stakeholders in Greenland. Three main themes in the discussion are described in the following.

Internal and external inclusiveness

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A critical issue was a lack of institutional culture in the governmental administration in Greenland for using scenarios and working with indicators. The administration in general, it was argued, suffers from changing staff members and hence changing competences, as also stated in section 4. The participants underlined, that many academics in the governmental administration are recruited from Denmark, and often return after a few years employment. When long-term planning is carried out, the knowledge, experiences and competences that were built up regarding the system and context, leaves Greenland with the planners. Further, the more permanent employees have a tendency to involve as few 'interfering others' as possible, due to annoyance of the changing staff members, but also due to the complexity of planning when many different interests are represented in the decision-making arena. The tendency to work alone causes de-coupled decisions, makes long-term planning difficult and hinders the authority from moving in one direction towards strategic goals. As a response to this discussion the need for inclusion of more external stakeholders in the planning processes was raised. An inclusive external process, as a participant stated, is needed *"to make sure that no one stands on the outside pointing their fingers at the others"* and also to secure that competences and experiences are built, maintained and become part of local resources.

Coordination and ownership

The recognition of the need for inclusion of both internal and external stakeholders in the process of working with scenarios for Greenland, points to a need for strong coordination and ownership among all the participating actors. This led to the question of who then should be in charge of the scenario process? There was a general agreement at the workshop, that to secure a proper planning process on the national level it is important that politicians take ownership and anchor the project. This should be understood as taking formal decisions regarding the implementation and resource allocation, and that consequences for not following through should be defined, since cross-departmental commitment is essential for success. A participant stated: *"By connecting knowledge and competences, planning is not only strengthened, successful implementation is also more likely"*. Securing ownership and commitment from all stakeholders involved, it was argued, is essential for running a scenario process.

Agreement on content and values

It was raised on the workshop that general agreement of what to use the scenario planning process for will be essential to successful implementation. As one of the participants stated *"The large number of agents needs to agree on the direction – which way to go"*. To obtain general agreement on premises and content among the stakeholders it needs to be based on shared values. Thus the scenario process needs to be open, make room for different interests and viewpoints and to both subjective and objective parameters. Identification of shared values needs to happen in close dialogue with the public and not only in the administration. Further, it requires willingness not only to corporate with stakeholders, but also to delegate power to the public in relation to defining principles behind social investigations and future development.

Summing up, three overall challenges of working with scenarios in Greenland have been identified based on discussions among the participants in the workshop:

- Creating an inclusive process, both internally in the Greenlandic Government and externally among a broad stakeholder group
- Securing coordination, ownership and commitment among the stakeholders

- Fostering an agreement on values and content of the scenarios

The challenges are related and will need to be adressed as interlinked. The challenges reflect general planning and governance challenges, but were emphasised by the participants as especially significant in relation to overall planning exercises such as that of working with scenarios in Greenland.

7 Conclusion

In conclusion this paper has identified 9 main driving forces for development in Greenland:

- Communication
- Settlement
- Education
- Governance
- Public/private sector
- Control over development
- Industrial development
- Labour market politics
- Societal adaptation.

The driving forces are identified by stakeholders in Greenland responding to the question of what will be the two most important drivers for development in Greenland over the next 50 years. Based on the drivers and the knowledge from the stakeholders four scenarios have been developed. The drivers, and thus the scenarios, identified can be viewed as an expression of what it is important for Greenland to focus on the steer the development in the coming decades. Thus the driving forces and scenarios can be used as a basis for longterm planning and strategies.

However, as this paper also identifies there are challenges to such a longterm planning using scenarios as a framework. These are:

- Creating an inclusive process, both internally in the Greenlandic Government and externally among a broad stakeholder group
- Securing coordination, ownership and commitment among the stakeholders
- Fostering an agreement on values and content of the scenarios

Interestingly these challenges resemble some of the more specific issues that were brought up in the identification of driving forces. For example the issue of inclusiveness and stakeholders was also raised in relation to ‘governance’ and issues of coordination, responsibility and agreement was raised in relation to ‘control over development’. In our interpretation the mention of these issues both as drivers and as challenges highlights the importance of resolving governance and government issues for the future development in Greenland.

The results from this paper are based upon a case study of Greenland, directed towards use in Greenland and cannot be directly generalised. However, it may be possible to discuss and explore other cases of smaller developing communities in the arctic in the light of these results, and thus expand the understanding of development in the region as such. One issue regarding the study and results is that the participating stakeholders are a fairly small group who do not necessarily represent the ‘ordinary Greenlander’. While these stakeholders have been chosen because we assess that they do represent main trends and opinions then they are mainly active people in positions in Nuuk, where they must be informed and have opinions. Thus a larger study of the response of private people would be beneficial, also to initiate the

public participation and inclusiveness that is pointed out as a necessity to foster the wanted and needed development in Greenland.

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