The Arctic as a food producing region

Background. The Arctic or northern areas are important as a food producing region, although food production and capabilities differ among regions. In the Arctic countries, fisheries and aquaculture are often large-scale and export-oriented, while agriculture might seem quite marginal compared to farming in more favorable locations further south. Agriculture, gathering and herding is still important for livelihood in these regions, and is producing both commodities and high value niche products. Within the region, though, there is considerable variation between countries.

Consumers generally prefer food that is healthy, with good taste and produced in a sustainable manner, and increasingly they prefer food with a unique story. Food from the Arctic may score high on all these properties, especially with marketing based on properties increasing the value of Arctic food. Climate change may both enhance and challenge these advantages.

Purpose. In this study we want to assess the potential for increased production and added value of food from the Arctic. The questions we raise are: (1) what is the status and what is the potential for various food production in the Arctic? And more interestingly, (2) what are the added value of these products when marketed by their special qualities and unique origin? And (3) what factors are important to further develop the Arctic as a food producing region? Climate change will be a driving force for increased food production in the Arctic, but climate change does not in itself cause increase in food production or value-adding from this production. It just provides the opportunity for development. The effects of climate change must be assessed together with other driving forces like market conditions and infrastructure, and the political, social and business conditions for the industries or productions.

Project tasks. Based on knowledge of the present production and established “Arctic” niche products, together with the expected and already experienced effects of climate change on different kinds of productions/species, the project will explore and describe possible paths of development for arctic food production. We have decided to focus on the three primary industries fisheries, aquaculture and agriculture, in addition to herding and gathering. We will outline different but still realistic scenarios of future development, based on market knowledge, commercial interest of the industry and their structure and public policy. Focus will be on local and regional industrial development. To gain understanding, and to compare experiences across regions, we will include case studies of successful product developments of foodstuff/species. The aim is to identify conditions for increased production, new species and added value of food from the Arctic.

Value of the project. Knowledge about how climate change, market conditions, industry structure, and public policy together impacts on the prospect for developing Arctic as a food producing region from the study will be useful for policy making, research and business development alike. A comparative project involving all the Arctic states can provide useful insight into common challenges as well as provide good example of success histories. As such, the project can contribute to strengthen food production in the Arctic. Common case studies in all the arctic countries will also strengthen the collaboration between areas, create extensive networks and increase knowledge flows.

Project organization. The project period will be three years (June 2014 to June 2017), and aims to have participants/consortia from all the 8 Arctic states. However, the starting lead countries will be fewer. Each partner/country will administrate and finance its own part of the project. Nofima will lead the project.

Consortia

Norway

Nofima – the Norwegian Institute of Food, Fisheries and Aquaculture Research, Ingrid Kvalvik
Nofima is an interdisciplinary research institute working in research and development for the food, fisheries and aquaculture industry in Norway. Some relevant research areas on fisheries and aquaculture are industrial economics, strategic management, and consumer and marketing research.

Nilf - Norwegian Agricultural Economics Research Institute, Hilde Helgesen
NILF do research and provide background material for general agricultural economics decisions, economic development and decisions on farms and rural development.

Bioforsk – Norwegian Institute for Agricultural and Environmental Research, Sigridur Dalmannsdottir
Bioforsk is a natural science institute conducting applied and specifically targeted research linked to multifunctional agriculture and rural development, plant sciences, environmental protection and natural resource management, with a specialised research area focusing on Arctic agriculture.

Expression of interest:

USA: *ISER - Institute of Social and Economic Research, University of Alaska Anchorage*, Gunnar Knapp.
ISER is a multidisciplinary institute studying public policy, economic and social issues in Alaska and the Arctic. The aim of the institute is to provide Alaskans with a better understanding of the state's changing economy and population and the challenges and opportunities that come with change. The institute has a long tradition of studying fisheries, the seafood industry and its markets.

Iceland: Matis ltd., Sveinn Margeirsson.
Matis is the Icelandic food and biotech research and development institute. It is an interdisciplinary institute focusing on applied research with the goal of increasing the value of food production as well as ensuring the safety, quality and sustainability of Icelandic products. Matis has competence in both fisheries and agriculture production and marketing.

Canada: BPBE - Department of Bioresource Policy, Business and Economics, College of Agriculture and Bioresources, *University of Saskatchewan*, David Natcher
The College of Agriculture and Bioresources is an interdisciplinary agricultural institute. The BPBE department is doing research in economics, entrepreneurship and policy and relating to agriculture, food and resource sectors.

Russia: NArFU - *Northern (Arctic) Federal University* – positive, but not yet confirmed
NArRU is a federal university with the mission to create innovative scientific and human resources for the purposes of intellectual exploration of the Russian North and Arctic. The Institute of Humanities, Social and Political Sciences and the Institute of Economics and Management are considered relevant participants in the consortia.

Further planning of the project is awaiting the response from the Ministries.

We will also contact partners in the remaining Arctic states.

Objective

Aim: To assess the potential for increased production and added value of food from the Arctic

Research questions:

1. What is the *status* and what is the *potential* for various kinds of food production in the Arctic?

2. What are the *added value* of Arctic food products when marketed by their *special qualities* and *unique origin*?
    a. Nutritional/biological
    b. Consumer perception and promotion

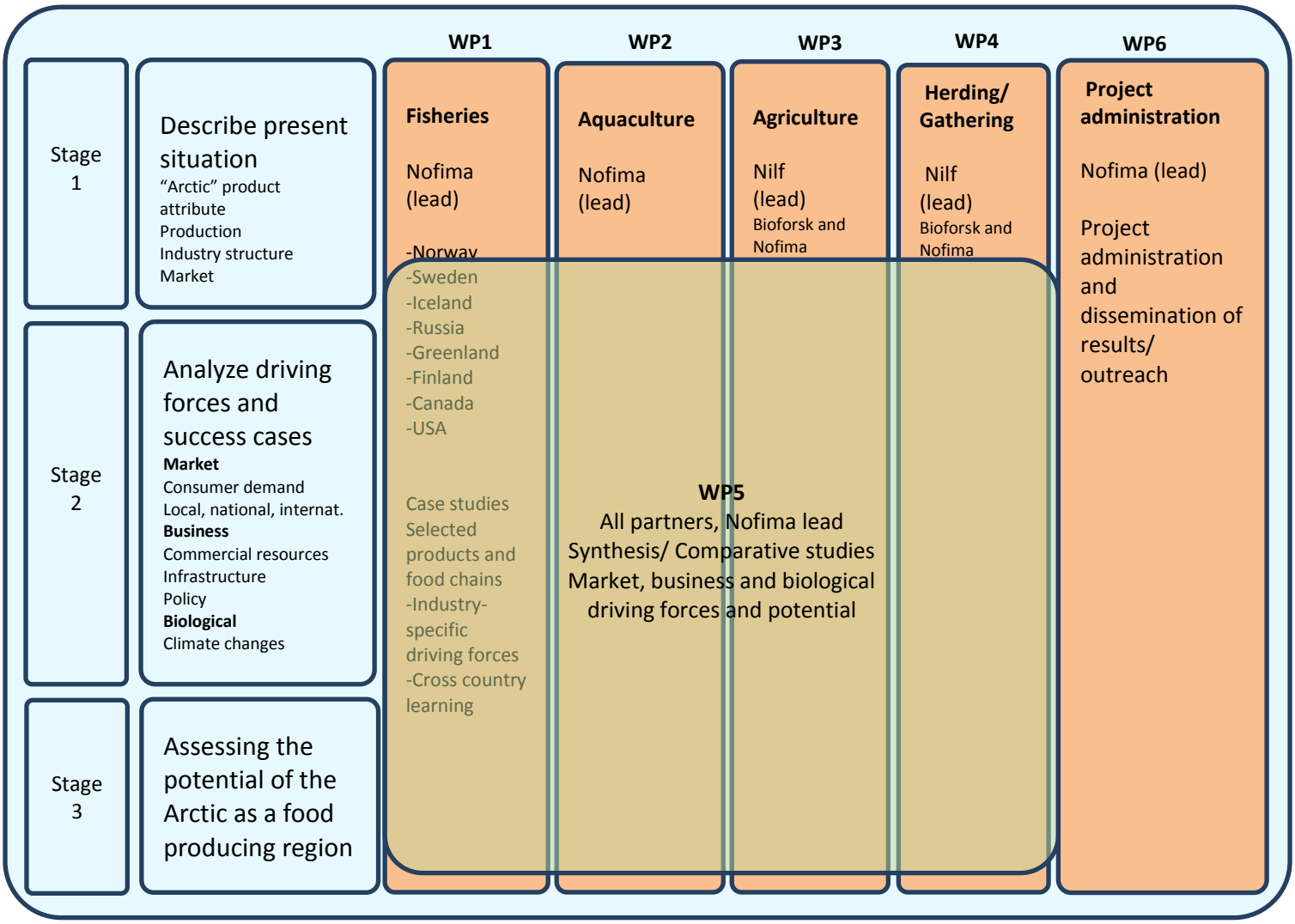
3. What factors are important to further develop the Arctic as a food producing region?
    a. How can production be increased and how can new species and products be developed?
    b. How are the market conditions for adding value or branding the "Arctic" at local, national and international markets?
    c. What role does industry structure, infrastructure and organization of different value chains and industry policy play for the potential development?

4. Case studies and scenarios
    a. Wild fish products
    b. Aquaculture products
    c. Agricultural products
    d. Gathering/reindeer

Project organization

The project will run through three stages and is divided into six work packages (WPs), one for each industry – fisheries (WP1), aquaculture (WP2), agriculture (WP3) and gathering/herding (WP4), in addition to a WP to compare and synthesize insights from different productions/industries (WP5) and a WP to administer the project and have the overall responsibility for stakeholder participation and dissemination of results (see figure 1).

Figure 1: Project organization (to be supplemented by the other partners)



Stage 1: Describe the present situation

In the first stage of the project we will make a rough overview of the present food production in the Arctic (as defined by each country), focusing on types of productions, industry/production structure, and main markets (whether local, national or international). Further, industry actors emphasizing their products' "Arctic" origin and product attributes will be explored, as will the added value of these products. Such products and industry actors may be chosen among products with protected designation scheme where public legal protection is given to products with close links to a specific geographical area, for example through the Matmerk label in Norway . This national background information will form the basis for selecting case studies of products and food chains to identify critical factors influencing on success or failure, focusing on the entire food chain. The food producers in the Arctic area is facing similar challenges related to harsh climatic conditions, climate change, infrastructure and distance to export markets, and they also share the possibilities to frame the special attributes of the food from the Arctic. Comparison and exchange of experiences can therefore provide useful experiences and contribute to learning and new ideas. The first stage of the project will make the basis for this comparison. The work will be divided in 3 tasks to be conducted in all of the four food sectors (fish, aquaculture, agriculture, and herding/gathering (WP1-4)), which will be the basis for comparison and synthesizing across sectors (WP5).

Tasks in the WPs

Task 1: General outline of production and products, the market and industry structure

Task 2: Biological "Arctic product attributes" selected products

Task 3: Comparison with other countries

Organisation of the work

Task/WP	WP1 Fisheries	WP2 Aquaculture	WP3 Agriculture	WP4 Gathering and herding	WP5 Cross sector comparison
Task 1 - General outline	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nofima, Nilf Matis ISER BPBE NArFU
Task 2 - Arctic attributes (biological)	Nofima	Nofima	Bioforsk (vegetabl) Nofima (meat)	Bioforsk (berries) Nofima (reindeer)	Nofima, Bioforsk
Task 3 - Comparison	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf, Bioforsk, Nofima Matis ISER BPBE NArFU(?)	Nilf, Bioforsk, Nofima Matis ISER BPBE NArFU(?)	Nofima, Nilf, Bioforsk Matis ISER BPBE NArFU(?)

In each WP (1-4) cross country comparisons will be made. In this WP the aim is to identify and compare relevant stories of success and failures as a basis for learning and new ideas across sectors. The comparison will be done both nation wise and for the whole consortia. Comparisons/learning

arenas will therefore be made a) within sectors across countries, b) across sectors nationally and c) between sectors and countries.

Stage 2: Analysis of driving forces and success cases

In stage 2 the aim is to synthesize knowledge about driving forces and challenges for increased production and value creation of food from the Arctic, looking at biological, market and business conditions. In each of the four WPs the three conditions will be assessed and compared.

In this stage the project will operate at two levels of analysis. On a macro level we will study the driving forces affecting the food-producing industries (task 1). At a micro-level we will study selected successful cases to highlight possibilities and challenges (task 2). In task 3, the insight from task 1 and 2 will be combined to discuss how the different industries are affected by various driving forces and how they can evolve given these driving forces.

Some driving forces we assume to be common for all industries, while some driving forces might be industry- or country specific. Drivers will be identified through literature studies, interviews with firms in each of the industries (and in workshops held in each country?). It is therefore a direct link to the case studies in task 2.

Driving forces will be studied along three dimensions:

a: Biological conditions - climate change, increased production and new species
b: Business conditions - commercial resources, infrastructure, and industry policy
c: Market conditions - market opportunities and consumer demand - local, national, and international market)

Market conditions for Arctic food will also be studied under WP5 as consumers' preferences for these products in many ways are assumed to be quite similar irrespective of whether it is a seafood or agricultural product. The main market for these products are however different, where agricultural products are more focused on the local and national market and the fisheries and aquaculture market is more export oriented. Therefore, when analyzing the added value of these products when marketed by their special qualities and origin, the work to analyze the different markets - local, national, and international will be coordinated through WP5, while the more general industry specific market conditions will be conducted under each WP..

The outline of the different driving forces will be combined with studies of selected products and food chains based on insights from the cases in Stage 1. We will study successful products and business developments and analyze how they make room for their products in the market, solve logistic challenges, how their value chains are configured and how they make strategies for the future. Here the dialogue and participation of industry actors are essential, both directly and through established "food networks".

Finally we will combine the insight from the cases and the analysis of driving forces to assess and compare how the industries are affected by industry policy and how this could be adjusted to make it easier for initiatives to succeed.

Tasks in WPs

Task 1: Description and assessment of driving forces

Task 2: Case studies

Task 3: Comparison across sectors and with other countries

Organisation of the work

Task/WP	WP1 Fisheries	WP2 Aquaculture	WP3 Agriculture	WP4 Gathering and herding	WP5 Cross sector comparison
Task 1 – driving forces	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nofima, Nilf, Bioforsk, Matis, ISER, BPBE NArFU(?)
A – biological conditions	Nofima	Nofima	Bioforsk (vegetables) Nofima Mat (meat)	Bioforsk (berries) Nofima Mat (reindeer)	Nofima Bioforsk
B – Business conditions	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nofima, Nilf, Matis ISER BPBE NArFU(?)
C – Market conditions	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf Matis BPBE ISER NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nofima, Nilf, Matis ISER BPBE NArFU(?)
Task 2 – Case studies	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf, Nofima, Bioforsk Matis ISER BPBE NArFU(?)	Nilf, Nofima, Bioforsk Matis ISER BPBE NArFU(?)	Nofima, Nilf, Bioforsk Matis ISER BPBE NArFU(?)
Task 4 - Comparison	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf, Nofima, Bioforsk Matis ISER BPBE, NArFU(?)	Nilf, Nofima, Bioforsk Matis ISER, BPBE NArFU(?)	Nofima, Nilf, Bioforsk Matis ISER, BPBE NArFU(?)

In each WP (1-4) cross country comparisons will be made. In addition comparison will be done both nation wise and for the whole consortia. Comparisons/learning arenas will therefore be made a) within sectors across countries, b) across sectors nationally and c) between sectors and countries also in this stage of the project.

Stage 3: Assessing the potential for the Arctic as a food-producing region

In this final stage we will synthesize the knowledge acquired throughout the project and point at the potential for increased production and value adding of food from the Arctic region. Emphasis will be given to criteria for success, and to the possibilities for exploiting biological, business and market conditions. Still, limitations or challenges will also be discussed and possible avenues of development suggested, by looking at political, industry and market conditions.

The potential for Arctic food will be assessed in two steps. Firstly, the overall potential will be assessed, the potential in local, national and international markets will be assessed for each industry. Secondly, in a concluding workshop, experiences and lessons from each case will be discussed, and possibilities for cross-country and cross-industry learning will be assessed. Communication and dissemination will take place through both local/national and international channels. International dissemination is important for building an awareness of the conditions for producing food in the Arctic. At the same time, an important mission for each institution will be to translate and disseminate lessons learned from this project to national industries and markets, as well as policy makers.

Tasks in WPs:

Task 1: Assessing the potential for Arctic food in local, national and international markets

Task 2: Assessing the conditions for industry development (for each industry)

Task 3: Concluding workshop

Task 4: Propositions for increased promoting of food from the Arctic

Task 5: Communication and dissemination

Organization of the work

Task/WP	WP1 Fisheries	WP2 Aquaculture	WP3 Agriculture	WP4 Gathering and herding	WP5 Cross sector comparison
Task 1- Potential for Arctic food in	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nilf Matis ISER BPBE NArFU(?)	Nilf Matis ISER BPBE NArFU(?)
A - local markets					
B - national markets					
C - international markets					
Task 2– Assessing potential for industry develop	Nofima Matis ISER NArFU(?)	Nofima Matis ISER NArFU(?)	Nilf, Nofima, Bioforsk, ISER, Matis, BPBE, NArFU(?)	Nilf, Nofima, Bioforsk, ISER, Matis, BPBE NArFU(?)	Nofima, Nilf, Bioforsk Matis ISER, BPBE NArFU(?)
Task 3 – Concluding workshop					Nofima, Nilf, Bioforsk, Matis ISER, BPBE NArFU(?)
Task 4- Propositions					Nofima, Nilf, Bioforsk Matis ISER, BPBE NArFU(?)
Task 5 – Final communication and dissemination of results	Nofima, Matis ISER NArFU(?)	Nofima, Matis ISER NArFU(?)	Nilf, Nofima, Bioforsk, ISER, Matis, NArFU(?)	Nilf, Nofima, Bioforsk, ISER, Matis, NArFU(?)	Nofima, Nilf, Bioforsk Matis ISER, BPBE NArFU(?)

WP6 Project organization and outreach

WP6 will administer the project and have overall responsibility for stakeholder participation and dissemination of results. Each country will have a national project leader represented in WP5, to coordinate the work in the national project teams if several institutes are participating. The project leader will coordinate the work through these national WP5 leaders. In addition, each WP 1-4 will have a WP leader who will coordinate the work within their WPs.

The aim of the project is to identify ways of increasing production and the value creation of food from the Arctic, therefore contact with the industry will be a prioritized task. In each country a reference group of stakeholders will be established. Through annual meetings these will ensure relevance and also provide valuable insight to the project group.

More to come…

See also deliverables and budget.

Milestones and activities		
June 2014	**Stage 1**	
		Meetings natioal partners (nation wise)
		Project meeting
		Detailed project plan
		Case selection
		Task 1. National background information
		Task 2: Physical “Arctic product attributes” selected products
2015		Task 3: Comparison present situation and cases with other sectors and countries
		Project meeting
		Working papers WPs
		Popular science publications
	Stage 2	
		Task 1:Analyse driving forces:
		Task 1A: Biological conditions - climate change, increased production and new species
		Task 1B: Business conditions - commercial resources, infrastructure, and industry policy
		Task 1C: Market conditions – market opportunities and consumer demand – local, national, and international market)
		Task 2: Case studies of Arctic products and food chains
		Task 3: Comparison with other countries and sectors
		Meeting national partners (nation wise)
		Working papers WPs
		Popular science publications
2016		*Project meeting*
		Compare industry specific driving forces (sector wise between countries)
		Compare driving forces accross sectors
		Comparison selected food chains - success stories, failures and potential for learning
		Meeting national partners (nation wise)
		Publications (scientific and popular)
	Stage 3	
		Assessing potentials and conditions for development
		Synthesis of country and industry driving forces - potential and challenges
2017		Meeting national partners (nation wise)
		Panel at ICASS IX conference in 2017 - synthesis of the project, scientific communication (if accepted)
		Concluding workshop
		End seminar with stakeholders nation wise
		Publications (scientific and popular)

Deliverables

Background papers (country wise):

1. Case study (Norway 1) – status and prospects wild caught fish
2. Case study (Norway 2) – status and prospects aquaculture
3. Case study (Norway 3) – status and prospects agriculture
4. Case study (Norway 4) – status and prospects reindeer
5. Case study (Norway 5) – status and prospects berries

Peer reviewed journals

6. Synthesis article of case studies – conditions for success stories
7. Added value of "Arctic food" - biological and consumer
8. Potential for increased production and value creation

International Conferences

Results from the project shall be sought presented at the following international conferences:
- ICASS VIII – the eight International Conference on Arctic Social Science 2014, Canada (abstract submitted)
- CAC - Circumpolar Agricultural Conference in 2016
- ICASS IX – the ninth International Conference on Arctic Social Science 2017 (see also Scholarly seminar)

Meetings with project participants will be held at the margin of the conferences

Popular science and outreach

To make sure that results from the project shall reach end-users, the research team will present results from the project at industrial seminars and conferences where feasible. The aim of the project is to identify ways of increasing production and the value creation of food from the Arctic, therefore this will be a prioritized task. This will also be ensured through the contact with stakeholders throughout the project.

In addition, to secure general outreach every background and scientific paper should be followed by a popularized short version through feature articles in local or national newspapers, journals and magazines.

Photo "exhibition"/poster: As a contribution to exchange of learning and in order to document and communicate added value of Arctic food products with special qualities (eg related to marketing of origin), we suggest to use photo documentation and photo exhibition as a tool to reach an wide audience of relevant stakeholders and policy makers at local, regional, national, and trans-national level (eg as the The Arctic Council and Nordic Council of Ministers). This approach may also add to social change at local and regional level by strengthen pride and identity through an acknowledgment and understanding of the potentials for value-creation in the Arctic food chain.

Scholarly seminar

At the ICASS IX – the ninth International Conference on Arctic Social Science in 2017 (the conference is held every third year in different arctic countries) we will propose a panel to the conference to present and discuss the findings from the project.

Seminar with end users (nation wise)

At the end of the project period we will arrange a seminar to present the results of the project. The seminar is aimed at the industries, relevant organizations, governance bodies, as well as the media.

Possibility to arrange with all Arctic state participants? (not included in the budget)

Budget proposal

Budget Norwegian part: project stages + annual (in 1 000 NOK)

		WP1 Fisheries	WP2 Aqua	WP3 Agri	WP4 H&G	WP5 Compara	WP6 Adm	Stakeholder food network	Total Norwegian partners
2014	**Stage 1**	450	450	450	450		150	100	**2 050**
2015		100	100	100	100	200			600
	Stage 2	700	700	700	700	400	150	100	3 450
									4 050
2016		300	300	300	200	600	150		1 850
	Stage 3	400	400	400	400	200		100	1 900
									3 750
2017		350	350	350	350	600	150	100	**2 250**
	Total								**12 100**

Annual budget Norwegian part (in 1 000 NOK)

	Norwegian partners	Project meetings, stakeholder networks and survey	International partners
2014	2 050	Project meeting 250? Norw Arctic food network 100	???
2015	4 050	Project meeting 250? Norw Arctic food network 100 International market survey 250	
2016	3 750	Project meeting 250? Norw Arctic food network 100	
2017	2 250	Project meeting 250? Norw Arctic food network 100	
Total	**12 100**	**1 650**	