Earth and Life Sciences

Evaluation of the (New) Netherlands Polar Programme 2009-2014

Netherlands Organisation for Scientific Research

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1 Conclusions and Recommendations

Quality of the research funded

Dutch researchers make an outstanding contribution to the most urgent issues on the international political and scientific agenda. The science-driven and policy-driven research priorities tie in well with the main themes included in the policy framework "The Netherlands and the Polar Areas 2011-2015". The positive results of the policy-supporting research are directly noticeable due to the active role and contribution of the Dutch delegations in the various policy forums concerning polar research and polar policy.

The expertise of the researchers realising NPP/NNPP projects and their research activities are very highly valued within the international community. Overall Dutch polar research occupies a 16th place with respect to the quantity of publications in worldwide polar research. Furthermore, this work is cited more than average: the Netherlands realises striking top three positions for several bibliometric indicatiors representing citation impact. The exact contribution of the NPP in Dutch polar research has, however, not become clear.

The NNP/NNPP publications bear further witness to a good collaboration and a strong international embedding. The relatively limited funding for logistical support, compared to other countries, has had a positive and encouraging effect on this up until now; due to its logistics-dependent position the Netherlands has had to actively seek collaboration with other countries and international researchers.

In the evaluation period mainly individual projects were funded. The committee found little or no indications for consultation/harmonisation between the researchers and projects awarded funding or for collaboration between different disciplines. Projects therefore remained isolated entities and collaboration across projects and synergy between different NPP/NNPP projects was not sought.

Recommendations

- Invest in extra attention among researchers for the **translation of research results into policy-relevant information** so that a larger and more accessible outcome for policy can be realised.
- **Create the possibility for wide-ranging programme proposals** through an integrated multi-disciplinary team. With this, encourage networking and collaboration between researchers/ projects in different disciplines in addition to the encouragement of participation in transnational calls. Preferably choose broad themes to minimise the risk of constricted visions or blockages due to the mixing of interests.
- **To encourage innovation** ensure that other researchers not previously involved in the NNP/NNPP can submit proposals and due to clear selection criteria can compete with researchers who were already involved in the design of the call. Ensure that new research groups are given the possibility to acquire a place within the existing research community.

Quality of the funding programme

The visibility of the (New) Netherlands Polar Programme in the Dutch scientific community is successful. The programme is well organised and clearly structured by means of four themes that tie in with national and international research agendas. With respect to the size of the themes there appears to be an imbalance between themes 1, 2 and 3 and the fourth theme "Human sciences and changes in polar areas".

The themes and policy priorities are an updated continuation of the previous NPP and IPY themes and that has ensured continuity within the programme. This has had a stabilising effect on the implementation and realisation of the NNP/NNPP. Due to the ongoing support, the Netherlands has become an important, sought after and clearly visible research and discussion partner with respect to polar activities. This is borne out, for example, by the chairmanship of the Legal & Institutional Working group of the Antarctic Treaty Consultative Meeting, the observer's role in the Arctic Council and the recent housing of the European Polar Board.

Via existing partnership agreements and sustainable – mainly logistical – collaboration with a number of countries, the NNP/NNPP has acquired access to both polar areas and to a high-quality research infrastructure. The construction of the Dirck Gerritsz Laboratory has met the existing need for a higher contribution to polar logistics and infrastructure particularly well. The further opening up of the North Pole area, as a result of which even more research will take place there, could be a reason for preserving funding for a new Dutch polar station on Spitsbergen.

The interaction between researchers and policy makers does not occur automatically and there is too little matching and active communication. In this regard a clear discrepancy was encountered between what many researchers think is relevant for policy and what the policy makers expect to receive as information to support or adjust their policy. Matching and interaction can be improved in various phases: in the drafting phase of an application, during the assessment of the policy relevance and in the realisation phase of research awarded funding.

NWO is a very suitable and successful administrator of the NNP/NNPP. Various stakeholders have explicitly stated their appreciation of the manner in which the NNP/NNPP is being realised and have said that the realisation of the NNP/NNPP in period 2009-2014 has been professionalised. It is positive that several government ministries are actively involved in the NNP/NNPP.

Recommendations

- Invest in extra awareness among policy makers for the **translation of research results into policy-relevant information** so that a greater and more accessible outcome for policy can be realised.
- To realise a **better translation of research into policy** the responsible ministries need to follow the projects closely and direct communication between the interested ministries and the researchers involved needs to be realised. This can be in the form of user or follow-up committees.
- **Greater awareness needs to be generated for the valorisation** of the research from the NPP.
- **More active input of the ministries involved** in the definition of research questions and knowledge gaps within their competency area and in the drafting of research proposals (in consultation with researchers) is desirable. To ensure a good supporting of the ministries' policies, the ministries involved need to determine in good time how and to what extent (draft) research proposals can give a more tangible and focused answer to their knowledge questions.
- **Strengthen the administrative support of the NNP/NNPP**. The recommendations in this report, partly aimed at further increasing of the policy benefit of the NNP/NNPP, will lead to growth in the desired supporting policy and programme management activities.
- **Strengthen partnerships**, consolidate existing collaboration and invest in new partners, also outside of the existing logistics arrangements.

Use of the available funds

The financial contribution for the NNP/NNPP 2011-2015 was budgeted at €10 million a year in the Master Plan Pole Position NL.[1] In 2010, the Terlouw Committee advised an annual investment in polar research of 6.5 million euros. In the subsequent policy framework with 3.7 million euros per year, far less funding has been made available. With this budget, NWO has realised the programme as well as possible but on a far smaller scale of course. Various components of the programme and funding instruments were not implemented or developed.

An expansion of the available budget could be realised by aligning the NNP/NNPP with one or more of the economic priority areas. This will bring opportunities for policy-driven polar research in particular. For fundamental research, however, a direct linking with economic priority area-policy will not give any immediate benefit due to the practice-oriented perspective of the economic priority areas.

The funding and structure of the programme realised has ensured that a critical mass of research expertise has developed within themes 1, 2, and 3 and that this could be maintained and optimally used within the constraints at a national and international level. For theme 4 this is not as clear.

To retain Dutch positions in national and international research and policy forums, an ongoing support and continuation of the NPP is vital but a long-term funding strategy is lacking. The continuity of the NNP/NNPP and with that the derived continuity of significant long-term monitoring research could consequently be at risk.

[1] Master Plan "Pole position NL"; New Netherlands Polar Programme (NNPP) 2010-2014. NWO, 2009

The division of funds across science-driven and policy-driven research is disproportionate but in view of the origin of the funding understandable.

The choice to invest relatively little in an own large infrastructure has had positive effects: it stimulates researchers working with other countries and has led to the development of new productive partnerships. The involvement in campaigns organised by other countries has also led to a broader dissemination of insight and ideas and facilitates a global overview of the research. The costs of good and productive research remain small and the human footprint remains limited.

Little has been invested in the setting up of or active participation in calls for proposals in collaboration with international research programmes.

Recommendations

- **The annual budget has to be increased**. An annual budget of 3.7 million euros, just as in the period 2011-2015, is not enough for the realisation of a fully-fledged research programme in both the Arctic region and Antarctica. The budget of 6.5 million euros per year proposed by the Terlouw Committee back in 2010 is the absolute minimum needed just to realise all of the plans stated in the Master Plan from 2010. A further expansion of activities, for example by aligning with the economic priority areas, is only possible if this budget of 6.5 million euros per year is increased.

- Investigate whether the balance between policy-driven and science-driven research needs to be adjusted through the **growth of the policy-driven part**. This is only possible by means of an extra investment – both financial and scientific – by the ministries responsible for policy-driven polar research.

- Where possible, **alignment and synergy should be sought with one or more of the economic priority areas** in order to make a growth in the budget possible. This could, for example, be realised within the public-private partnership constructions developed within the economic priority area-policy. Possible alignment is foreseen for policy-driven research only.

- Within policy-driven research, make a **distinction between long-term research** that relates to international research priorities **and the more focused short-term priorities** that directly relate to the research questions of the ministries involved.

- **Supplement the current budget with funds for long-term research** (> 5 years), for example the scientific research into sea level rises as advised by the Advisory Council on International Affairs.[2]

- Ensure a further **harmonisation and synergy with international research programmes**.

[2] "The future of the Arctic Region". Advisory Council on International Affairs (AIV), September 2014

2 Introduction

2.1 Background and origin of the programme

For scientific, national, and foreign policy reasons, the Netherlands aims to fund a clearly visible and respectable scientific research programme for the purpose of acquiring knowledge about the polar areas and the effects of changes in these regions on our own living environment. The Netherlands has a consultative status to the Antarctic Treaty since 1990 and highly values its observer status in the Arctic Council. Four ministries are involved in the Netherlands' polar policy: the Ministries of Education, Culture & Science, Infrastructure & Environment, Foreign Affairs, and Economic Affairs.

2.2 New Netherlands Polar Programme

Dutch scientific research in the polar areas is organized and implemented through a national research programme. This Netherlands Polar Programme (NNP) originates from 1984, when it only comprised Antarctica. In 2002 an Arctic component was added, the Netherlands Arctic Programme. In 2010 the NPP (the Antarctic and Arctic component) was financially and administratively restructured to become the current New Netherlands Polar Programme (NNPP), which aims to encourage, fund and coordinate high-quality scientific research in and into the polar areas. The NNPP is jointly financed by the ministries responsible for the Netherlands' polar policy and the Netherlands Organisation for Scientific Research (NWO). The NNPP operated with an annual budget of 3.7 M€.

The Earth and Live Sciences division of NWO (in short: NWO) is responsible for the coordination of all NNPP-activities, including logistic support and maintaining an international network. For research funded within the NNPP a distinction is made between science-driven and policy-driven research. The NNPP focuses on four main research themes[3]:

1. Ice, climate and sea level
2. Polar oceans
3. Polar ecosystems
4. Human sciences and changes in polar areas

2.3 Evaluation

In order to stimulate and maintain research of the highest quality, the Netherlands Polar Programme is periodically evaluated. The objective of the current evaluation is to assess scientific quality, relevance and impact of the programme. Given that the programme was previously evaluated in 2005 and 2010[4], the current evaluation focusses on the period between 2009 and 2014.

[3] A more detailed description of the themes can be found in the Masterplan "Poolposition-NL" (in Dutch, with English summary available).
[4] "Report on the Scientific Evaluation of the Netherlands Polar Programme 2000-2004" focussing on scientific quality and "Evaluation of the Netherlands Polar Programme 2007 -2010" (in Dutch only), focussing on policy.

3 Evaluation

3.1 Outline and constraints

The NNPP was evaluated by an independent committee of five international experts (see Annex 1) whose expertise spans the four main research themes and research programmation in general. The committee was also asked to evaluate the standing of Dutch polar research in a global context and the allocation of available resources. To this end, the committee members individually composed a written assessment based on the following information provided by NWO:

- Annual reports of the (New) Netherlands Polar Programme: NNPP (2011, 2012, 2013); NPP (2009, 2010, 2011, 2012); IPY (2009, 2010, 2011, 2012).
- Policy documents: Masterplan Pole position-NL (in Dutch); policy evaluation by committee Terlouw
- Output documents: Centre for Science and Technology Studies (CWTS) report on polar research; NWO output records; Background document NNPP 2009-2014
- Evaluation protocols: The Standard Evaluation Protocol 2015-2021 (NWO, KNAW, VSNU); the Golden Rules for Evaluation Processes of the European Science Federation
- Terms of Reference for the evaluation

The committee discussed their assessments and held interviews with several stakeholders during a two-day meeting in The Hague. The conversational partners (see table in Annex 1) varied from principle investigators (PI) active in one of the four research theme's, to members of the assessment committee for policy-driven proposals and representatives from the financing ministries. The interviews were an open discussion, guided by the questions posed in the Terms of Reference (see Annex 2) which were:

1. What is the quality of the research conducted within the (New) Netherlands Polar Programme?
2. What is the quality of the (New) Netherlands Polar Programme?
3. Have the available resources been well spent?

An evaluation of research over the last five years means that many of the projects funded during that period are still running. Hence, the output of these projects is incomplete. The evaluation committee was supplied with information about the NNPP, but missed a self-evaluation by NWO. The lack of this plus the yet incomplete output records of the NNPP between 2009 and 2014 hampered a detailed evaluation of the programme. It is important, therefore, to bear in mind that given the available information on the awarded projects and the track records of the principle investigators on these projects, supplemented by data from the CWTS, a qualification of the programme could only be achieved in general terms.

3.2 Quality of research and researchers

The evaluation committee concludes that in general the quality of Dutch polar research projects, researchers, and output has been very good to excellent. As mentioned, these conclusions are partly based on the bibliometric analysis of Dutch polar research provided by the CWTS. This analysis involves all Dutch polar research publications that appeared between 2000 and 2013 and not only NNPP publications. In addition little output has been generated within the NNPP-funded programmes for the period 2009-2013 yet. Therefore the outcomes of the CWTS analysis cannot be used to evaluate the NNPP programme per se. The implications of the CWTS analysis for the quality of Dutch polar research in general are discussed in section 3.2.1.

The CWTS analysis discussed below indicates that Dutch polar publications are well cited and relatively often appear in top-tier journals. It is also consistent with studies from Aksnes et al 2009[5] and Ji et al 2014[6]. The committees' positive view of Dutch polar projects was further supported by the policy representatives who were interviewed: results from Dutch polar research are used in (inter)national negotiations. Together this evidence indicates that Dutch polar research is internationally highly regarded. Considering the number of Dutch polar publications identified by the CWTS and information in the NWO output records, it is expected that the New Netherlands Polar Programme will play an important role based on the quality of the projects that were awarded within the NNPP.

The positive results of "*policy supporting research*" are manifested in the active role and contribution of Dutch delegations, including Dutch polar researchers, in the various policy fora on polar research. The international visibility is further increased by their participation in high profile European and international committees and consortia. Additionally, Dutch polar researchers contribute both as representative for the Netherlands and participate in research projects within the different working groups of the Arctic Council (CAFF, AMAP and SDWG).

The committee sees a strong international embedding of Dutch polar science. It seems likely that the developed Dutch polar infrastructure has had a positive effect on the already established collaborations with the British Antarctic Survey (BAS) and the German Alfred Wegener Institute (AWI) and is leading to future collaboration with the French Institut polaire francais Paul Emile Victor (IPEV). A successful example is the realisation of the Dirk Gerritsz Laboratory at the British Rothera Research Station during the evaluated period.

3.2.1 Bibliometrics

In the run-up to this evaluation, the CWTS was asked to provide a bibliometric analysis of Dutch polar research for the period 2000-2013. To this end, polar research literature was delineated using a list of search terms selected in close collaboration with NWO and the Netherlands Polar Committee (NPC). Using this delineation 62,473 publications were selected in the Web of Science database, which were dubbed "polar publications". These publications were used to calculate a number of bibliometric indicators on publication output, citation impact and collaboration for both Dutch and worldwide polar research. To allow international comparison, citation indicators are normalized for field and publication year. The results presented only feature countries that published more than 100 polar research publications in the selected time period.

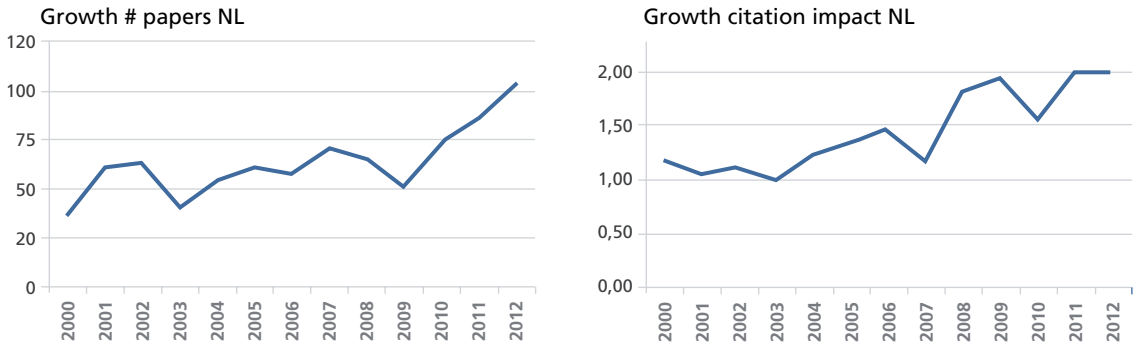

Figure 1 | Development of polar research in the Netherlands in the new millennium. In the left panel the number of polar publications per year are depicted. In the right panel the citation impact indicator MNCS[7] is presented.

[5] Dag W. Aksnes and Dag O. Hessen, "The Structure and Development of Polar Research (1981-2007): a Publication-Based Approach", *Arctic, Antarctic, and Alpine Research.* Vol 41 No 2 (2009), pp 155-163.
[6] Qing Ji, Xiaoping Pang and Xi Zhao, "A bibliometric analysis of research on Antarctica during 1993-2012", *Scientometrics.* Vol 101 No 3 (2014), pp 1925-1939
[7] MNCS. The average number of citations of the polar research publications of a country. Citations have been normalized for field and publication year. An MNCS value of 2 for instance means that the polar research publications of a country on average have been cited twice as frequently as the average of their field and publication year.

In terms of output, the CWTS analysis shows that the annual number of Dutch polar publications has increased from 37 in 2000 to 104 in 2012 (Figure 1). In total the Dutch polar community published 826 polar research papers or reviews in the period 2000-2013, accounting for 1.3 percent of the total number of publications worldwide. Regarding global publication output this puts the Netherlands in a 16th position. The top 3 is formed by the United States (21.8%), Canada (9.5%) and the United Kingdom (7.8%). Exploring the Web of Science categories in which polar research papers appear, the CWTS analysis indicates that Dutch researchers are engaged in a wide range of scientific disciplines relevant to the polar region. Furthermore, the top 20 categories in Dutch polar research largely overlap with the top 20 most studied topics in polar research worldwide (table 1), indicating that the disciplines receiving Dutch research interest largely align with the global priorities in polar research.

Table 1 | List of top 20 science categories in which polar research is published globally and in the Netherlands

	Worldwide			The Netherlands	
	WOS category	# papers		WOS category	# papers
1	geosciences, multidisciplinary	8654	1	geosciences, multidisciplinary	142
2	meteorology & atmospheric sciences	6026	2	meteorology & atmospheric sciences	128
3	oceanography	5277	3	oceanography	67
4	geochemistry & geophysics	3293	4	geography, physical	61
5	ecology	3173	5	ecology	56
6	environmental sciences	2926	6	geochemistry & geophysics	46
7	geography, physical	2785	7	environmental sciences	32
8	marine & freshwater biology	2240	8	plant sciences	31
9	multidisciplinary sciences	1364	9	multidisciplinary sciences	26
10	zoology	1280	10	ornithology	23
11	biodiversity conservation	1233	11	marine & freshwater biology	22
12	astronomy & astrophysics	1162	12	paleontology	18
13	geology	1150	13	biodiversity conservation	14
14	paleontology	1135	14	astronomy & astrophysics	13
15	plant sciences	1012	15	microbiology	12
16	microbiology	906	16	geology	12
17	fisheries	692	17	zoology	9
18	public, environmental & occupational health	583	18	chemistry, multidisciplinary	8
19	ornithology	509	19	limnology	6
20	biochemistry & molecular biology	499	20	biochemistry & molecular biology	6

In terms of citation impact the Netherlands are high up the worldwide rankings. Globally, the Netherlands are in third position when comparing the average number of citations of the polar research publications of different nations (Figure 2). Switzerland and the United States take up the first and second positions, respectively. Switzerland, the United States, and the Netherlands also take up the top three positions when calculating the proportion of the polar research publications of a country that belong to the top 10% most frequently cited of their field per publication year (Figure 3). When assessing the average number of citations of the journals in which the polar research publications of a country appeared, the Netherlands even switch positions with the United States, ranking second (Figure 4). These results indicate that Dutch polar research publications generally are highly influential and of outstanding quality.

Top 10 Polar citations, normalized for field and year

	Country	Score
1	Switzerland	1,73
2	USA	1,64
3	Netherlands	1,51
4	United Kingdom	1,50
5	France	1,27
6	Australia	1,27
7	Germany	1,20
8	Belgium	1,16
9	Austria	1,16
10	Canada	1,14

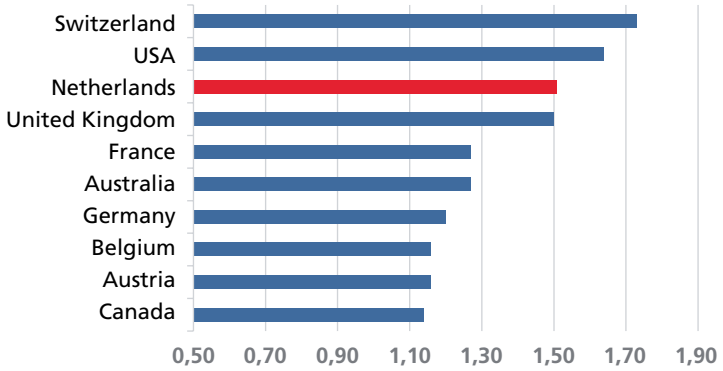

Figure 2 | Citation impact MNCS. The average number of citations of the polar research publications of a country. Citations have been normalized for field and publication year. An MNCS value of 2 for instance means that the polar research publications of a country on average have been cited twice as frequently as the average of their field and publication year.

Top 10 proportion of 10% most frequently cited polarpublications in a field

	Country	% in top	Total #
1	Switzerland	20,5	514
2	USA	18,1	13631
3	Netherlands	16,7	826
4	United Kingdom	16,1	4882
5	France	13,4	2094
6	Ireland	12,8	103
7	Australia	12,7	2162
8	Germany	12,6	3772
9	Belgium	12,5	499
10	Austria	12,1	201

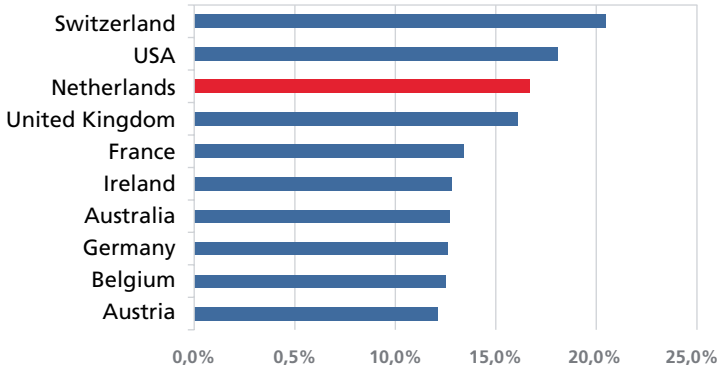

Figure 3 | Citation impact PP: The proportion of the polar research publications of a country that belong to the top 10% most frequently cited of their field and publication year.

Top 10 citation of journals in which polar publications appeared, normalized for field and year

	Country	Score
1	Switzerland	1,54
2	Netherlands	1,42
3	USA	1,38
4	France	1,37
5	United Kingdom	1,37
6	Germany	1,22
7	Australia	1,22
8	Ireland	1,22
9	Denmark	1,17
10	Sweden	1,16

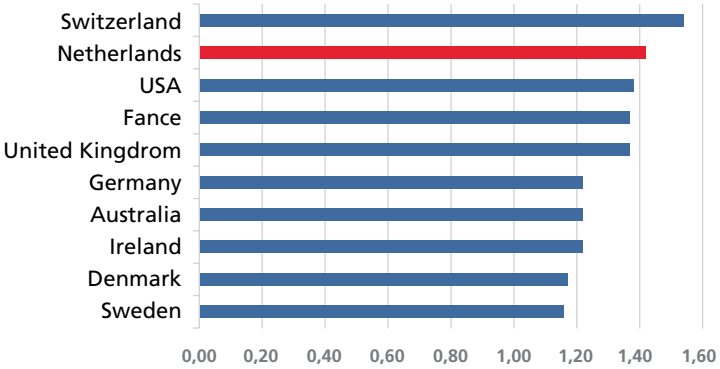

Figure 4 | Citation impact MNJS. The average number of citations of the journals in which the polar research publications of a country have appeared. Citations have been normalized for field and publication year. An MNJS value of 2 for instance means that the polar research publications of a country have appeared in journals that on average been cited twice as frequently as the average of their field and publication year.

To examine international collaboration involving Dutch polar scientists, the proportion of the Dutch polar research publications that involve collaboration with one or more other countries was calculated. With a proportion of 77.2% the Netherlands are among the top 10 most collaborative nations in polar research, the top three being Greenland followed by Ireland and Switzerland. While the value of collaboration in science is clear, the extent of collaboration necessary may differ per country. For instance, the Netherlands has a limited number of research groups engaging in polar research, international collaboration is therefore of great importance. At the same time nations such as the United states have sufficient manpower and facilities to operate individually. Taken together, the high collaborative nature of Dutch polar research is crucial for the quality of Dutch polar research and a prerequisite for its success.

3.2.2 Realisation of ambitions

Considering the ambitions regarding the quality of research as expressed in the Masterplan Pole position-NL, the following has been achieved during 2009-2014.

All calls for proposals, both science-driven and policy-driven, have had a focus on the four themes (mentioned in Chapter 2). The selection process resulted in a funding of proposals with the highest scientific quality in science-driven calls. The main application areas for the policy-driven calls for proposals that were specified in the Masterplan Pole position-NL were not applied specifically. The Policy Framework "the Netherlands and the Polar Regions 2011-2015" provided the framework for the assessment of policy relevance. In policy-relevance calls, each proposal received a score for scientific quality and a score for policy-relevance that both weighted equally.

The followed procedure in both science-driven and policy-relevance calls resulted in a dominance of theme 1-researchers, both in terms of the number of submitted proposals and in allocated funding. Theme 4-researchers, on the other hand, generated very few proposals and funding.

An important characteristic of polar research is the need for fieldwork and the required expensive facilities and logistic services, such as field stations, research vessels with icebreaking capacity, and geophysical measurement platforms (such as satellites), that come with it. Most Dutch polar research operates within international consortia. In these collaborations, NWO has focused mainly on investing in, and sharing of, scientific equipment in areas in which the Dutch polar researchers are strong (and not on logistical participations). One of the ambitions has been to further professionalise and upgrade existing collaborations with other countries to achieve a reciprocal relationship. Hence, the existing MoU's with the British Antarctic Survey and Alfred Wegener Institute were renewed and upgraded.

The Masterplan Pole position-NL did not aim for the construction of a Dutch research base in Antarctica. Dutch law renders this impossible. However, the Masterplan did mention the ambition to make two large infrastructural investments for Dutch polar research, one in Antarctica and one in the Arctic region. The Dirck Gerritsz Laboratory was constructed at the British Research Station Rothera in Antarctica. This laboratory, consisting of four mobile modules, was officially opened in January 2013. In November 2014 a second round of projects started in the lab. This was a logical continuation and an intensification of the existing collaboration between NWO and the British Antarctic Survey. Additionally the intention was expressed by NWO to update the present Dutch polar station in Ny-Ålesund on Spitsbergen by joining building plans of the German Alfred Wegener Institute (AWI) and the French Polar Institute (Institut Polaire Français Paul Emile Victor; IPEV) for a new research station. The building process will start probably in 2016.

No additional international polar initiatives (infrastructural, transnational calls for proposals) were joined due to the lower available budget of 3.7 million euro that resulted from the Masterplan Pole position-NL.

3.2.3 Highlights

Over the years the Dutch polar research community has made excellent contributions to priorities set on national and international polar research agenda's, such as climate change and sea-level rise, and the impact of human activity on the cryosphere, on the polar marine and terrestrial ecosystems. In addition to a substantial number of high profile papers, several scientific highlights were mentioned by the PIs representing the different research themes. Among others, the achievements in theme 1 were praised by the committee. For instance, important internationally recognized steps were made in interpreting satellite data, new proxy benchmarks were established in ice core measurements for climate change, and advances were made in modelling of regional sea level rise. The latter are now used by the Intergovernmental Panel on Climate Change (IPCC). In October 2014 one of the top researchers within this theme was awarded the Louis Agassiz Medal of the European Geosciences Union 2015.

Within theme 2, major progression has been made regarding trace element research and relating unique facilities; among others within the international project GEOTRACES that has resulted in a special issue of the journal *Deep Sea Research*. One of the labs in the Dirck Gerritsz Laboratory is an ultra-clean lab specifically designed to conduct trace element-research. For this purpose ultra-clean equipment was developed, such as a titanium winch for taking water samples in Marguerite Bay, close to Rothera Research Station. One of the PhD students whose research was funded by specific International Polar Year (IPY)-funding within the Netherlands Polar Programme received the Heineken Young Scientist Award in October 2014.

The scientific representatives of theme 3 are particularly positive about their research in cluster I, which is supported by their attractiveness as collaborative partner for other international research groups including the British Antarctic Survey. Considering the limited manpower within this theme the output has been high. A yearly symposium is held to facilitate collaborations, but the researchers stress that collaboration in the field is paramount.

The representatives for theme 4, who both have a legal background, stressed that the *Netherlands Institute for the Law of the Sea* (NILOS) from Utrecht University has strong scientists who contribute to the NNPP. Highlights made possible by the NNPP-funding include the book "*Interactions between Global and Regional Regimes: Trends and Prospects*" and an international workshop in 2012 on sea law that discussed the relationship between global regimes and the specific regimes in the polar areas. These results enhance the profile and prestige of Dutch researchers in the international research field and illustrate that within legal research significant results can be achieved with a relatively modest budget. Nonetheless, the committee notes that while sufficiently strong individual researchers, including anthropologists, tourism and legal researchers, are active within this fourth theme, focus and mass beyond the Arctic Centre seems limited. The NNPP could play a role here in organizing a conference on theme 4 to bring together the different research fields that potentially could be financed within theme 4.

3.2.4 NNPP scientists

"*Scientific quality of the research team*" is one of the criteria used in the assessment of NNPP applications. As such, the procedure facilitates the selection of high quality researchers. Indeed, in the field of polar research the NNPP laureates are internationally well respected and their work is frequently cited. Furthermore, the available output indicates that NNPP researchers are highly collaborative and have a strong international presence. As such, they are important for the visibility of Dutch polar research in the (inter)national arena.
During the stakeholder interviews several participants underlined that the individual excellence of the researchers is essential to conduct research in the polar areas. Due to the isolated position of, and extreme circumstances in the polar regions, polar research necessitates intensive preparation and

collaboration to gain access to specific facilities and infrastructure. The excellence of the researchers is an important prerequisite to act as an equal partner to international collaborators that own these facilities.

The evaluation committee subscribes to the high quality of research executed by Dutch polar researchers. A potential pitfall is, however, that a number of these scientists tend to act on highly individual basis. This may impede inter-institutional and interdisciplinary collaboration within the Netherlands. Indeed, the committee has seen only limited evidence for cooperation between different disciplines or coordination between the awarded projects. As is further discussed in section 3.3.2, over the last five years small steps have been taken to stimulate collaboration within the NNPP by means of the core programme call for proposals in 2012. The committee recommends using the NNPP to increase collaboration and stimulate interdisciplinarity within Dutch polar research.

3.3 Quality of the programme

The funded NNPP projects range from focused to holistic approaches, span both polar areas and were financed from both cluster 1 (science-driven research) and cluster 2 (policy-driven research). In this diversity of projects, theme 1 "*Ice, climate and sea level"* is most dominantly present.

In the interviews, the different stakeholders commended the professionalization and rationalization of the modus operandi of the NNPP that was realized by NWO over the last five years. Aside from some criticism that is addressed below, the NWO operation of the NNPP is widely supported by the stakeholders. The programme as a whole is well structured, creates unity, and promotes international visibility. The calls for proposals were relevant and have been formulated in consultation with the stakeholders. The assessment procedure for science-driven proposals is well accepted. The assessment for policy-driven proposals is less accepted by the research community, however, important improvements have been made: A separate policy assessment committee was founded composed of researchers who also work as policy advisor for the ministries of Infrastructure and the Environment, and Economic Affairs, and two people experienced in polar issues working for the Ministry of Foreign Affairs. Additionally, the assessment procedure was completely isolated from the assessment of scientific quality of the proposals. Science-driven calls for proposals are separately organised from policy-driven calls for proposals.

Successful investments in infrastructure have strengthened the programme and increased both national and international visibility. The organisation and decision-making structure was simplified by establishing the Netherlands Polar Committee (NPC) and the awarding of grants was transferred from the Steering Committee of the NPP to the Board of NWO-ALW.

3.3.1 Programme strategy and support

The committee concludes that the implementation of the strategy – defined in the Masterplan Pole position-NL and complemented by the recommendations made by the committee Terlouw – resulted in an attractive and internationally relevant programme. Implementing two assessment frameworks – one for scientific quality and one for policy relevance – has improved the assessment procedure as well as the scientific programme compared to the 2007-2011 NPP-period.

The early involvement of the scientific community in the development of the strategy and calls for proposals is a clear strength. As a note of caution, the NNPP should remain vigilant not to exclude newcomers who were not included in the developments of calls. Another important step forward, that was already initiated during the IPY and continued throughout the NNPP, was to stimulate polar scientists to step forward and engage in society.

With the involvement of four ministries the programme is strongly anchored in the Dutch government. Furthermore, by signing the Antarctic Treaty the government is obligated to execute Antarctic research. Through renewed memorandums of understanding (MoU) with the British Antarctic Survey and Alfred Wegener Institute, in addition to the realization of the Dirck Gerritsz Laboratory at Rothera Research Station, durable access to polar facilities is ensured.

There is no doubt that NWO is the appropriate assignee to execute the New Netherlands Polar Programme. At the same time NWO is open to constructive partnerships and collaborations to further strengthen the programme. Capacity from outside (Dutch researchers) was hired to support a number of policy-related activities.

Maintaining continuity in scientific themes has contributed to the stability of the programme, and allowed the Netherlands to become an important research partner and interlocutor in polar activities. This international role is further emphasized by the recent decision to host the European Polar Board Secretariat in the NWO headquarters. Overall, the polar programme has successfully enhanced the international visibility of Dutch polar research; it has resulted in high quality output and increased focus and mass within Dutch polar research.

3.3.2 Synergy and balance within the programme

The selection of four overarching research themes was necessary to guarantee the continuity of Dutch polar research. The decision to focus on these themes was logical and just, given that the themes are based on areas of expertise within the Dutch Polar research community and follow the research challenges set in preceding NPP- and IPY-programmes. Furthermore, the themes closely align with the priorities defined by national and international polar committees and councils and with the interest of the ministries that are involved in the NNPP.

As was already touched upon in the section 3.2.2, theme 1 "*Ice, climate and sea level*" is most dominantly present within the NNPP and theme 4 *"Human sciences and changes in polar areas"* is the least represented. As such, there is an apparent imbalance between the different research themes. In part this may be a reflection of the size of the Dutch research community within the different themes. This can also be partly due to the choice made in the Masterplan to focus in Antarctica on themes one and two. During the stakeholder interviews the representatives from *Human sciences and changes in polar areas* suggested that this focus is no longer desirable, because policy relevance has become increasingly important in Dutch polar research and research within theme 4 particularly addresses policy-relevant themes. Another potential aspect affecting the balance of awarded projects may be the excellence-based peer review strategy to evaluate projects, yielding that only NNPP projects of the highest scientific quality were awarded regardless of theme involved. It was suggested that differences in assessment and publication culture operated within the human sciences and the natural sciences may play a role. Even so, the committee has not found evidence that the scientific quality within one of the four themes is lacking behind the others. In addition, it is stressed that the individual identities of the themes remain of importance and the 4 themes should be maintained.

Designating research on and into the polar regions as 'polar research' indicates that there are many similarities in the nature and challenges of the two. But there are also important differences between the Arctic and Antarctic. Both require their own approach, given that they are positioned at the two extremities of the globe offering unique environmental circumstances and presenting specific political and legal issues. As such, it is important to distinguish between the two within the programme.

Within the different themes, NNPP research projects can be either science-driven (cluster I) or policy-driven (cluster II). Of the currently running projects, 59% fall within cluster I and 41% within cluster II. While some investigators focus on only one of these clusters, others act as lead scientists in both. The

committee urges to take caution that excellent researchers remain willing to apply within policy-driven research, since investing in policy-relevant research projects takes time and energy from researchers that they subsequently cannot invest in their fundamental research projects and perhaps has not the same scientific value when it comes to publications in high impact journals.

The four overarching themes are implemented in the different NNPP funding instruments, which should help to create synergy between the two clusters. However, at the moment synergy between projects seems mostly to originate from coincidence, for instance due to the establishment of the Dirck Gerritsz Laboratory that resulted in an increase in collaboration among the Dutch researchers using the lab. As such, a new NNPP-strategy could be more directed at actively creating (interdisciplinary) synergy within the programme.

The committee would have liked to see a more equal balance in the number of projects, and in available funding, between clusters I and II. However, as will be detailed in section 3.4.1, the committee agrees that under the current circumstances the financial balance in favour of cluster I is justified. Nonetheless, over the last five years an effort was made to improve the balance between policy-driven and science-driven research as is detailed below.

3.3.3 Policy-driven research

To create a better balance between scientific quality and policy relevance in the assessment for policy-driven projects, the procedure was adjusted. Among others, the scores of scientific quality and policy relevance now have equal weight. The committee finds that this change is an important step forward. Although the scientific community recognizes the necessity of the implemented improvements, it does not necessarily agree with this view. Many scientists regard scientific quality as the most important feature of a research project. It is argued that scientific quality fuels policy relevance and therefore should be given a larger role in the final outcome of a call for proposals. Furthermore, the researchers note that the assessment procedure regarding policy-relevance is not yet at the same level as the scientific assessment. On the one hand this is a matter of a learning curve the applicants need to go through to understand how new criteria are used. Several researchers acknowledge that this is an ongoing process. On the other hand, the scientific community fairly raises questions regarding clarity and practicability of the policy relevant criteria. In their experience, the assessment criteria seem subjective or not specific enough. As a consequence, judging whether a project proposal meets the criteria is therefore difficult. For scientists who were denied funding on grounds of policy relevance, it was often unclear why this was decided.

Importantly, the policy representatives have a different view of the matter. They indicate that policy relevance cannot be measured in the same way as scientific quality. In addition, they would like to see more openness among researchers for policy-related questions from the government and express that their input is often perceived as intrusive by researchers who have their own agenda's. From the stakeholder meetings it becomes apparent that communication between the two groups is largely failing, despite efforts made by both parties to reach out and connect. Interestingly, within theme 4 *Human sciences and changes in polar areas* communication seems less of a problem. An additional difficulty is that different ministries are involved in the formulation and evaluation of policy-relevance. The two groups, researchers and policy makers, clearly have different perspectives, modes of communication, and needs. The scientific community urges the policy representatives to present a strategy for the future and create clarity about the rationale behind the funding decision-process in order to compose their research proposals. In turn, the policy representatives ask the scientific community to formulate their ideas clearly and to the point to facilitate the formation of a long-term perspective and clarity in the decision-process. Currently, no explicit mechanisms are included in the programme to facilitate communication between the two on this matter.

Taken together, it appears that the interface between polar research and policy is underdeveloped in the Netherlands, which hampers knowledge exchange. As such, the different perspectives of the scientific community on the one side and the policy representatives on the other are a crucial issue that needs to be dealt with in order to secure the success of the policy-driven cluster of the NNPP.

3.3.4 Polar infrastructure

An ongoing discussion is whether to invest in polar infrastructure. As was addressed earlier, the limited investment in infrastructure is seen as a strength of the New Netherlands Polar Programme. From the point of view of science the return on investment and ratio between science and logistics is excellent. Furthermore, it has had a number of other beneficial effects. The need for infrastructure has facilitated new, strong and productive international collaborations. It led to widely applicable (rather than site-specific) models and concepts. It eased the transfer of knowledge between international research groups and minimized the human polar footprint. Nevertheless, it also makes Dutch polar researchers reliant on international partners.

The Dirck Gerritsz Laboratory at Rothera became operational in the Antarctic summer season 2012-2013 and is regarded as a successful infrastructural investment. It is a highly innovative, flexible, and world-class modular mobile lab facility consisting of a general purpose 'container docking station' with four containerized mobile laboratories. The initiative benefits both partners (NWO and BAS) due to cost sharing and close scientific collaboration. The latter was further facilitated by two NNPP calls for research proposals, dedicated to working at the Dirck Gerritsz Laboratory in which collaboration between Dutch and UK scientists was mandatory. Funded scientists are now working towards a special volume with co-authored papers for an international high impact scientific journal – Deep Sea Research II – based on research undertaken at the Dirck Gerritsz Laboratory.

The choice for the Dirck Gerritsz Laboratory also has a downside. Due to the limited NNPP budget, it necessitates to focus resources at one location, which makes the programme more rigid. Is Rothera the right place to be, and should it be the only Antarctic location for Dutch Polar research? To secure the continued success of the Dirck Gerritsz Laboratory a long-term strategy is needed.

The scientific community expresses an urgent need for investment in long-term research, including the possibility for long term monitoring. The present way of funding of the NNPP, however, renders this impossible because NWO cannot secure funds for research proposals that exceed a running period of 5 years.

3.3.5 Collaboration

As was illustrated in the bibliometric analysis the Dutch polar research community is actively collaborating with international colleagues. Within NNPP strong partnerships exist with the Alfred Wegener Institute and the British Antarctic Survey. However, collaborations with other partners are lacking and should not be overlooked.

The Dutch researchers have an active role in various policy fora on polar research and participate in high profile international committees and consortia. A matter of concern, however, is the collaboration between disciplines within the Netherlands. The committee has seen few examples of interdisciplinary collaboration between Dutch research groups, and no evidence of built-in mechanisms in the NNPP to support this. The NNPP has mostly invested in individual researchers and 3 to 4 year projects. By combining themes within a specific call for proposals national collaboration can be enhanced.

Unfortunately, it remains largely unclear to the committee how knowledge transfer between the different projects is organized in the NNPP. In general, valorisation of results and mechanisms to support valorisation are matters that deserve more attention in the NNPP. Lessons can be learned from best practises from other countries, such as Belgium.

In order to increase the yield of the NNPP budget, focus and mass within the Netherlands Polar Programme was pursued. In the Masterplan this goal was envisioned by means of core-programmes. This instrument was expected to facilitate integration and interdisciplinarity in the Dutch polar research community. Unfortunately, the actual received NNPP budget was lower than calculated and therefore the NNPP-core programmes were downsized. The committee supports this choice and indicates that directing funds to the core-programmes should not jeopardize independent research. A negative consequence of downsizing the core-programmes is that their impact could not live up to the ambitions of the Masterplan. To fulfil their full potential, additional funding is required. Furthermore, each project within a core programme was assessed individually. To facilitate synergy, however, the core-programmes should be assessed as a whole.

NWO takes part in the economic priority areas-policy (Topsectorenbeleid) of the current Dutch government. Within nine designated sectors, the collaboration between companies, researchers and the government is being encouraged. Within the Dutch polar research, several activities are ongoing that fit within (one of) the economic priority areas. There is also clear interest from the industry, however collaboration is still limited. As such, it is worthwhile to explore the opportunities the economic priority area-policy may offer. Nonetheless, the scientific community indicates that caution is warranted and fundamental research and scientific independence should be protected. The committee agrees that the economic priority area-policy can only be included as an addition to the Netherlands Polar Programme and should not threaten the already limited budgets for fundamental research. As outlined in section 3.4.1, the committee sees a clear role for the Ministry of Economic Affairs here.

3.4 Distribution of funds

The Masterplan Pole position-NL requested the budget for the NNPP in the period 2010-2015 to be 10 million euro annually, including a five-year "rolling contract". A budget of this size would be required for the Netherlands to be regarded as a strong international collaboration partner, it would allow crucial long-term investment agreements, and it would secure continuity for the programme.

Although the Terlouw Committee advised an annual investment in polar research of 6.5 million euros, the actual budget achieved was 3,7 million euro per year. While this is significantly lower than the budget proposed in the Masterplan Pole position-NL, the funding-level was such that it could sustain the level of funding realized during the IPY. However, as is elaborated on in the next section, there is much concern regarding the continuity of funding.

Researchers stress that NNPP-funding is important for the branding of Dutch Polar research, that is, for the international visibility of Dutch Polar research. In addition, NNPP-funding is crucial for maintaining and building expertise and for creating focus and mass within polar research in the Netherlands. For many PIs, the NNPP funding is indispensable for their polar research. Others have additional sources of funding, but rely on the NNPP to complement and extend their research. Overall, funding from the New Netherlands Polar Programme is crucial to maintain continuous high quality polar research in the Netherlands.

It is clear that due to the difference between the requested and the actual budget, some of the ambitions from the Masterplan could not be realized. For instance, the number of core-programmes was reduced: only one call for proposals was organized to finance core-programmes and this concerned

only science-driven research. Also no specific calls for proposals were organized specifically aimed at 'innovative research', and less investments were made than envisioned in international collaboration: the collaboration with Norway concerning an ESFRI-project (SIOS) was not executed and the NNPP did not take part in transnational calls for proposals. Investments made for international collaboration were mainly aimed at deepening the already existing partnerships with the United Kingdom and Germany. The committee supports the choices that were made to secure the integrity of the programme within the reality of limited funding. Furthermore, it underscores that despite the limitations, the amount of activities that was executed and the research projects that were funded was quite large.

Regarding the projects that received NNPP funding, it is clear that the available resources have not been evenly distributed over the four themes. The theme *Ice, climate and sea level* is most dominant involving 37% of the funds of the projects that currently run, while *Human sciences and changes in polar areas* constitute only 10% of the funds (Figure 5). As discussed in section 3.3.2, different factors may play a role in determining this distribution, not in the least the size of the Dutch research community within the different themes. The committee indicates that there is no need to address this matter in the assessment procedure. All four themes generate high quality research. Therefore, the committee fully supports the excellence based assessment procedure that is used by NWO.

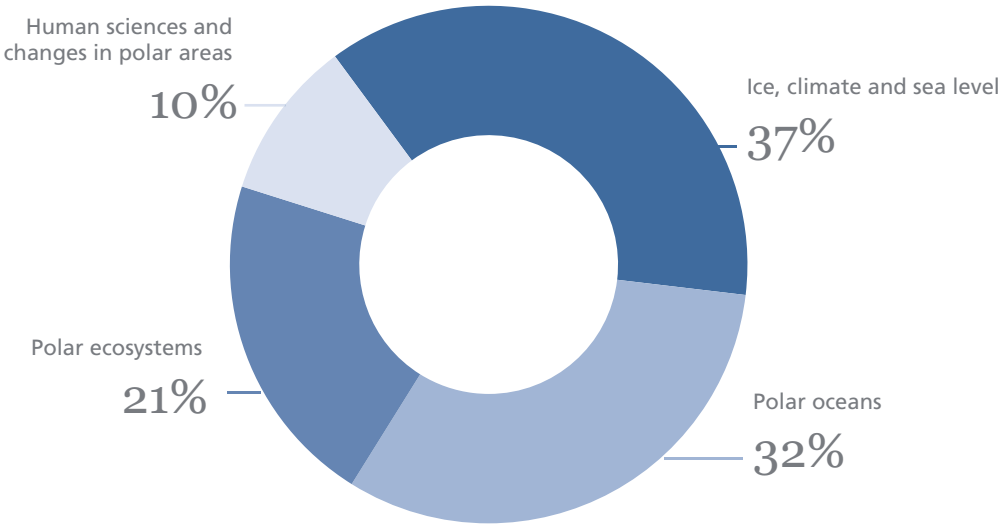

Figure 5 | Distribution of funds over theme's.

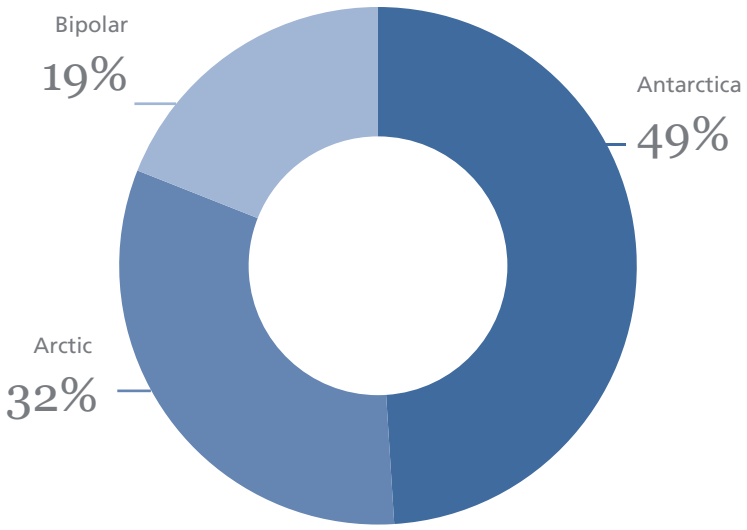

Figure 6 | Distribution of funds over both polar regions.

At the European level the budget ratio between "logistics and infrastructure" and "funding for science" averages at more than 2 (70/30). Because the Netherlands rely on MoUs and do not operate costly polar infrastructure, the return on investment ratio is substantially more favourable from the scientific point of view. As discussed earlier, the committee agrees that this approach is an important characteristic of the NNPP, with additional positive effects regarding international collaboration. Nonetheless, the committee also supports the view of several scientists who indicate that extra investments in logistics and infrastructure are required. On the one hand, extra investments will be necessary as leverage in negotiations for polar research within MoUs. For example, previous investments in semi-permanent weather stations and automated geophysical and remote sensing devices have facilitated past cooperation. On the other hand, several stakeholders indicate that long-term investments are required for specialized equipment and monitoring. This notion is further supported by a recent report of the Advisory Council on International Affairs[8] that recommends that the government continues to actively contribute to the international climate negotiations and should invest in "*resources for long-term research* [in the Arctic]*, for example for research into sea-level rise and thus research on the mass balance of the Greenland Icecap. Such research also broadens the foundation for a successful Dutch policy input to international forums such as the Arctic Council*". Such investments should be mediated through the NNPP.

3.4.1 Continuity and extension of the programme

In the last decade, research in the polar areas and particularly the Arctic region has become increasingly relevant to politics and economy. As such, continuation and growth of the New Netherlands Polar Programme seems warranted. Nevertheless, as mentioned earlier, both the stakeholders and the committee have serious concerns regarding the (apparent lack of) continuity of the New Netherlands Polar Programme. NNPP funding is made available for five years and relies on a number of contributing ministries. No guarantees are given for continuation. This fragmentation and lack of continuity is in conflict with the need for long-term investments in infrastructure and/or long term measurements that are required for polar research in fields such as meteorology, climate change or ecology. To secure the Dutch position in national and international research and policy fora, support, continuation, and expansion of the NNPP is crucial. Unfortunately, there seems to be little clarity regarding the

8 "The Future of the Arctic" (September 2014) Advisory Council on International Affairs (AIV)

continuation of the budget after 2015. There is an urgent need to address this issue as it endangers the continuity of the programme as a whole.

As previously described the budget for the NNPP in the period 2010-2015 of 3.7 million euros per year was effectively used to develop and maintain a variety of activities. However, the current budget is not sufficient to: further develop the interface between polar research and policy; invest extra in policy-driven research; to facilitate interdisciplinary and national and international collaboration; to support long-term research and invest in strategic infrastructure. In order to execute such improvements the NNPP budget will need to be increased. Given that NWO and OCW are currently the main contributors to the NNPP, it is logical that the balance between science-driven and policy-driven research leans towards fundamental science. In order to restore the balance, ministries responsible for policy-driven research, such as the Ministry of Economic Affairs should invest in policy-driven research and the interface between polar research and policy. As addressed earlier, the economic priority area-policy may be an additional opportunity to generate more funds for the policy-driven research. However, integration of the NNPP and the economic priority areas should be approached with caution. Opportunities are mainly found in the coastal areas in the Arctic region and only some polar research topics fit within the economic priority areas. Other research topics cannot be neglected. Furthermore, an increased economic priority area-policy component can only be accommodated as an addition to the New Netherlands Polar Programme and should not threaten the already limited budgets for fundamental research.

Annex 1 | Committee and Stakeholders

Evaluation Committee

Dr Hessel Speelman (chair)	The Wadden Academy
Prof. Magda Vincx	Gent University
Mrs. Maaike Vancauwenberghe	Belgian Science Policy Office
Prof. Arjen Stroeven	Stockholm University
Prof.dr. Jurian Edelenbos	Erasmus University Rotterdam
Liesbeth Noor/ Dr Jelte Wouda (ex. Secretary)	NWO Earth and Life Sciences

Stakeholders invited for interviews

Dr R.S.W. van de Wal	Utrecht University, PI theme 1
Prof. H.A.J. Meijer	Universtity of Groningen, PI theme 1, member NPC
Prof. H.J.W. de Baar	Universtity of Groningen, PI theme 2
Dr J. Stefels	Universtity of Groningen, PI theme 2, member NPC, national delegate in SCAR
Dr M.J.J.E. Loonen	Universtity of Groningen, PI theme 3, Station manager Dutch polar station Spitsbergen
Prof. J. Rozema	VU University Amsterdam, PI theme 3, former member NPC
Prof. A. Oude Elferink	Utrecht University, PI theme 4, member NPC
Prof. C.J. Bastmeijer	Tilburg University, PI theme 4
Prof. H.J.P. Eijsackers (em)	VU University Amsterdam, Chair BOC policy-relevance/ chair new strategy NNPP
J.M. de Vries	Chair NPC
Dr J. Rokx	Ministry of Education, Culture and Science, member IPO
J. Splinter	Ministry of Foreign Affairs, ex. secretary IPO
D. van der Kroef	NWO-ALW, Manager NNPP, member EPB and COMNAP

Annex 2 | Terms of Reference

Scientific evaluation of the New Netherlands Polar Programme (NNPP) 2009 – 2014

The quality of the Netherlands Polar Programme is regularly evaluated. The period 2000-2004 was covered by the Report on the Scientific Evaluation of the Netherlands Polar Programme 2000-2004. After that an internal evaluation of the programme took place for the period 2005-2010. In March 2010 another evaluation of the Netherlands Polar Programme (NPP) 2007-2010 was published by the Terlouw Committee. In this evaluation the emphasis was on policy aspects. As recommended by the Terlouw Committee, the NPP was continued in the line of the Master Plan Pole Position NL. With this, considerable changes took place during the period 2010-2014 in the organisational structure, policy and scientific content. In view of the focus of the Terlouw committee on the policy aspects it is important that the current evaluation focuses on the scientific aspects.

Reason for and purpose of the evaluation

Periodic evaluations of the scientific quality are vitally important to encourage the highest quality and safeguard and improve the quality within the (New) Netherlands Polar Programme (NNPP). In this regard NWO distinguishes the following explicit reasons:

- An Antarctic research programme is a condition for being a Consultative Party to the Antarctic Treaty. The Arctic research is vitally important for the position of the Netherlands as a discussion partner in the Arctic Council. To safeguard these positions the Netherlands has an obligation to carry out high-quality polar research. Furthermore, an evaluation has been made compulsory under Article 7 of the Ministry of Education, Culture and Science's Decree Antarctic Research from 9 March 2010.
- In 2015 the theme period 2011-2015 of the NNPP will end. The evaluation is therefore important for the scientific and financial considerations that must be made with respect to the continuation of the NNPP.

Aim, target group and intended use of the evaluation

- The evaluation should provide an assessment of the scientific quality, relevance and impact of the NNPP.
- The evaluation should also consider the position of Dutch polar research in the world.
- The evaluation will contribute to the scientific accountability of the funding awarded.
- The evaluation can lead to recommendations that will be used for the strategic development and scientific realisation of the programme in the period 2016-2020.

Scope of the evaluation: parties involved and period

This concerns a scientific evaluation of the (New) Netherlands Polar Programme in the period 2009-2014. The evaluation will be performed on behalf of NWO.

Terms of Reference

The questions that the evaluation will have to answer are:

1. **What is the quality of the research realised?**
   - What is the quality and quantity of the publications emerging from the NNPP?
   - What is the quality of the polar researchers awarded funding?
   - Which scientific results have been achieved?
2. **What is the quality of the programme?**
   - In the Master plan four themes were given priority. Was this the right choice?
   - What is the scientific impact of the NNPP from a national and international perspective?
   - Has the right balance been found between science-driven and policy-driven research?
   - Have the recommendations of the Terlouw Committee that fall within the scope of this scientific evaluation been implemented?
   - How does the programme relate to national and international research programmes and knowledge agendas?
   - To what extent is there synergy within the NNPP?
   - Are the organisational structure and the policy surrounding the NNPP adequate?
3. **Have the available funds been well spent?**
   - Was the financial contribution to the NNP/NNPP effective and sufficient?
   - Is the balance between the policy-driven and science-driven research in line with the objectives?
   - Do the main themes sufficiently tie in with the scientific expertise and the gaps in knowledge?
   - Less money was available than had been budgeted for. What were the consequences of this?
   - There was a need to contribute more to logistics and infrastructure. Has this been realised?
   - Is there sufficient continuity in the funds available and does that also hold for the future?

Annex 3 | Evaluation Programme

Agenda of the meeting of the NNPP Evaluation Committee 2014

Wednesday 1 October		
Time		**Guests**
10u00	Welcome	
10u40	Introduction NNPP	Mr Dick van der Kroef
11u35	Presentation bibliometric analyses	Dr Jelte Wouda
12u05	Discussion	
12u15	Lunch	
13u05	PI's Theme 4.	Prof. Kees Bastmeijer and prof. Alex Oude Elferink
13u45	Discussion	
14u00	PI's Theme 3.	Prof. Jelte Rozema and dr Maarten Loonen
14u45	Discussion	
14u50	Break	
15u05	PI's Theme 1.	Dr Roderick van de Wal and prof. Harro Meijer
15u50	Discussion	
16u00	Chair NPC	Ms Monique de Vries
16u45	Discussion	
16u55	PI's Theme 2.	Prof. Hein de Baar and dr Jacqueline Stefels
17u40	Discussion	
19u30	Dinner	

Thursday 2 October		
08u30	Start	
08u45	Chair BOC policy-relevance/ new NNPP strategy	Prof. Herman Eijsackers
09u30	Discussion	
09u40	Break	
09u55	Discussion coordination and strategy NNPP	Mr Dick van der Kroef
10u50	Discussion	
11u00	Representatives ministries	Dr Jos Rokx and Mr Jorden Splinter
11u45	Discussion	
12u00	Lunch	
13u00	Drafting first concept of assessment	
14u30	drafting recommendations for continuing the NNPP	
15u00	Closure	

Annex 4 | List of used abbreviations

AIV	Advisory Council on International Affairs
ALW	(NWO Division) Earth and Life Sciences
AMAP	Arctic Monitoring and Assessment Programme
AWI	Alfred Wegener Institute
BAS	British Antarctic Survey
BOC	Assessment Committee in a call for proposals
CAFF	Conservation of Arctic Flora and Fauna
COMNAP	Council of Managers of National Antarctic Program
CWTS	Centre for Science and Technology Studies
EPB	European Polar Board
ESFRI	European Strategy Forum on Research Infrastructures
IPEV	Institut Polaire Français Paul Emile Victor
IPO	Interdepartmental Polar Consultation
IPY	International Polar Year
NNPP	New Netherlands Polar Programme
NPC	Netherlands Polar Committee
SCAR	Scientific Committee on Antarctic Research
SDWG	Sustainable Development Working Group
SIOS	Svalbard Integrated Earth Observing System

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