

Annual report 2018 for The Norwegian Programme for Research Cooperation with India (INDNOR)

The INDNOR programme is funded by MFA with 285 million NOK total in the period of 2010-21. The programme has additional funding directly from the Norwegian embassy in New Delhi (169 million NOK). The programme has an Expert Advisory Group (EAG) that meets annually and gives advice on the thematic profile of the programme. The activities of the programme are carried out in cooperation with thematic programmes at the Research Council. Future activities and plans are discussed with the Norwegian Embassy in India in annual meetings.

Objective and purpose of the programme

The Norwegian Programme for Research Cooperation with India (INDNOR) has been established to promote collaboration on research and research funding between India and Norway. The primary objective of the programme was initially to follow up the Norwegian Government's strategy for cooperation between Norway and India, *Opportunities in diversity*, launched in August 2009. A new Strategy for cooperation between Norway and India, Norway-India 2030 was launched by the Norwegian Government in December 2018 and thematic areas highlighted in this document will be the focus of future activities INDNOR programme.

The INDNOR programme has focused on the following five thematic priority areas: international political issues, climate, the environment, clean energy and social development, but the programme aims to including a wider range of thematic areas and scientific fields.

The specific objectives of the programme are as follows:

1. To strengthen bilateral research cooperation with India.
2. To establish binding cooperation on research funding with Indian governmental research funding bodies in collaboration with relevant thematic research programmes and scientific activities at the Research Council.
3. To continue to foster relations with India through cooperation with EU and Nordic countries as well as multilateral organisations in which India and Norway are partners.
4. To implement capacity-building, dissemination and promote the establishment of new research cooperation between India and Norway.
5. To lay the foundation for research cooperation with India in all thematic areas and scientific fields, and encompassing basic research, applied research and innovation. Efforts will be made to ensure the involvement of trade and industry, universities and university colleges, and independent research institutes in both countries.

The programme is also used as a tool to follow up on the bilateral agreement on Science and Technology between India and Norway from 2006. There is a Programme of Cooperation (PoC) that sets thematic priorities for the cooperation, these are: Climate research including ocean and arctic/polar research, Clean energy, Geotechnology and geohazards, Marine research – bioprospecting and polar research, Nano-science/ technology, Vaccines – human and fish/ animal, including vaccination programmes and biotechnology of new vaccine development, ICT, Glaciology and Medical research (cancer, diabetes, infectious diseases etc), Bio-economy and Industrial R&D relevant/complimentary to both countries.

In addition, the RCN roadmap for cooperation with India from 2014 emphasises the following topics to be considered for the future: Energy, ICT, nanotechnology, biotechnology in medical research and integrated social science and humanities perspectives. A new roadmap will be issued in 2019.

The INDNOR programme was evaluated at the end of 2015, and the results show that the programme has been successful and is on its way to achieving its goals. Some of the main recommendations were to increase attention towards industrial oriented research and innovation and to focus on integration of social sciences and humanities.

Potential areas of cooperation in innovation-oriented research highlighted in the roadmap are the maritime, oil and gas, marine and energy (renewable) sectors; the environment; the bio economy; ICT and biotechnology.

In its allocation letter, the Ministry of Foreign Affairs has asked the INDNOR programme to give priority to promoting close ties between research, education and industry.

Sammendrag av aktivitet, måloppnåelse og planer framover

For å skape bevissthet og mobilisere næringslivet til samarbeid innen forskning har Forskningsrådet og Norway India Chamber of Commerce and Industry (NICCI) fortsatt å jobbe tett sammen også i 2018. Under Arendalsuka i august samarbeidet Forskningsrådet med NICCI, Generalkonsulatet i Mumbai og Universitetet i Agder om et seminar "Is Norway responding well to the rise of India?".

Som en oppfølging av møtet i Joint Working Group (JWG) i 2016 ble det gjort en felles utlysning innen IKT (Smart environments og ICT for society) i samarbeid med Department of Science and Technology. Utlysningen ble administrert av Forskningsrådets IKTPLUSS-program. Tilgjengelige midler for utlysningen var 40 millioner NOK, delt likt mellom INDNOR programmet og IKTPLUSS-programmet. Utlysningen mottok ved fristen 6. september 2017 50 søknader og finansierte fem nye prosjekter i februar 2018.

Forskningsrådet er partner i The EU-India Platform for Social Science and Humanities, EqUIP. EqUIP skal forbedre grunnlaget for forskningssamarbeid mellom EU og India ved å intensivere kommunikasjon, skape nettverksmuligheter og identifisere felles forskningsprioriteringer som kan jobbes videre med. Forskningsrådet er medlem av arbeidsgruppen "Funding futures" i EqUIP, og har gjennom denne gruppen bidratt til utviklingen av en EqUIP felles pilotutlysning "Collaborative research on sustainability, equity, wellbeing and cultural connections" - lansert i 2017. Ved utlysingsfristen 30. november 2017 var 28 søknader med norsk deltakelse sendt inn. INDNOR satte av 10 millioner kroner for norske partnere i denne utlysningen. I november 2018 ble det innvilget seks prosjekter, og av disse hadde tre norsk deltakelse.

Siden 2014 har Forskningsrådet jobbet med å styrke samarbeidet med India om mat- og bioøkonomirelaterte temaer. Som en oppfølging av JWG-møtet i 2016 ble det gjennomført en felles utlysning med DST innenfor bioøkonomi, og dette har resultert i fire felles prosjekter som ble innvilget høsten 2018. Utlysningen ble finansiert av midler fra BIONÆR (5 millioner kroner) og Indiaprogrammet (15 millioner kroner).

Programmet vil fortsette å fokusere på å utvikle mer næringsrettet aktivitet, og som en oppfølging til en innovasjonsrettet workshop innen fornybar energi i februar 2017 på ambassaden i Delhi ble det lansert en felles pilotutlysning med India innenfor fornybar energi (Solar Energy - PV og Energy System - smart grid) med frist 14 februar 2018. Industrimedvirkning var obligatorisk for søknader til Forskningsrådet. INDNOR og ENERGIX bidro med hhv. 7 og 3 millioner NOK i denne utlysningen som ble administrert av ENERGIX i samarbeid med DST i India. 16 søknader ble sendt inn til denne pilotutlysningen og 4 prosjekter ble finansiert.

I samarbeid med Ministry of Earth Sciences, Den norske ambassaden i Delhi og EU delegasjonen til India arrangerte Forskningsrådet i november et to-dagers arrangement "Polar Science Days" i Goa.

Dag 1 av arrangementet var satt av til et bilateralt seminar som viste frem det pågående Norge-India samarbeidet innen polarforskning og geofarar. Dag 2 var dedikert til å mobilisere til deltakelse i en Horizon2020 utlysning innen polarforskning der India har gått inn med finansiering. Ved fristen var det sendt inn 5 søknader innen det tematiske området som er mest relevant for Norge-India samarbeidet innen polarforskning. 3 av disse hadde norsk og indisk deltakelse. Resultatet av utlysningen blir klart i løpet av 2019.

Planer for 2019

Et av de tematiske områdene i Indiaprogrammets programplan som hittil ikke har vært dekket, er internasjonal politikk. Indiaprogrammet bidrar med 10 millioner kroner for å delta i UTENRIKS-programmets utlysning innenfor utviklings-, utenriks- og sikkerhetspolitikk. Utlysningen har frist 10. april 2019 og søknadsbehandlingen ventes å være ferdigstilt i desember 2019.

Som en oppfølging til JWG-møtet i 2016 ble det gjort en felles utlysning innen Nanoteknologi, mikroteknologi og avanserte materialer i samarbeid med DST, med frist 13. februar 2019. Programmet Nano2021 administrerer utlysningen som forventes å konkluderes innen utgangen av august 2019. Totalramme for utlysningen var på 30 millioner kroner, der Indiaprogrammet bidrar med 20 millioner kroner og Nano2021 bidrar med 10 millioner kroner. DST vil finansiere tilsvarende aktivitet på Indisk side.

Som en oppfølging av statsminister Solbergs besøk til India i januar 2019 vil Forskningsrådet i samarbeid med NICCI og andre relevante aktører (Innovasjon Norge, Utenriksdepartementet etc.) arrangere et seminar "India Business Day" 3. juni 2019. Statsministeren var ledsaget av en stor næringslivsdelegasjon til India og det ble arrangert en konferanse med sesjoner på en rekke tematiske områder. Seminaret vil gi en god anledning til å følge opp på de områdene som har størst potensiale for videre forskningssamarbeid.

INDNOR har også satt av finansiering for 2-3 strategiske workshoper i 2019. Oppfølging av Norway-India Blue Economy Task Force, som ble igangsatt under statsministerbesøket til India i januar 2019, kan tenkes å være et tema for en workshop. I tillegg er det også potensiale for å følge opp andre tematiske områder som ble diskutert i næringslivskonferansen som fant sted under besøket. NICCI og Innovasjon Norge vil være viktige partnere i å ta dette videre.

Description and assessment of activities, performance and future plans

Results, impacts and societal outcomes

The programme aims at establishing cooperation in broad fields of research. So far, there have been **activities in most of the thematic areas of INDNOR** and the Program of Cooperation of the Science & Technology (S&T) agreement, but not all. During 2018, 22 new projects have been awarded funding through INDNOR initiated calls and calls with INDNOR participation. The calls on ICT and bio-economy were for researcher projects, but within thematic areas that are of relevance to industry. The energy cooperation has matured through three different calls for proposals in the past and the cooperation has shown to be ready to move closer to market and increase industry involvement. The multilateral call within the EQUIP platform focused on sustainability, equity, wellbeing and cultural connections, thus corresponding to the INDNOR prioritized area social development.

The thematic priorities of the INDNOR programme are closely aligned with several of the UN Sustainable Development Goals. In addition, the thematic priorities build on the Norwegian Government's strategy for cooperation between Norway and India, the thematic areas set out in the Programme of Cooperation under the bilateral agreement on research cooperation, and potential

areas for cooperation identified in the Research Council's roadmap for bilateral research cooperation with India. The INDNOR 2018 calls were particularly relevant for goals 2, 7, 9, 16.

The Joint Working Group in 2016 has paved the way for continued cooperation of the core thematic areas, only adding bio-economy as a new topic, and increasing ambitions on involving the industry. It is a challenge however that social science is handled by another ministry than what is our partner for the S&T agreement. Therefore, working through the European platform EqUIP as well as joining coordinated initiatives at RCN are valuable additions to the bilateral arenas for cooperation and will build capacity and knowledge in social development and international political issues relevant to India.

We continue to pursue opportunities related to European and Nordic cooperation; however, more efforts can be put into targeting participation in such cooperation activities in the future.

The programme produces several results as seen in the key figures below. The total volume of ongoing projects is 51, and of these 22 started in 2018. Indicators show that although scientific publication is adequate (21 from 51 active projects, a slight increase from 2017), user-directed publications such as reports and articles including new publications in media are even more frequently used in the programme (87). Even though commercial applications have not been stimulated the programme shows commercial outputs.

Thematic and scientific priority areas, sectoral and industry-related responsibilities

Through the initiatives and activities in 2018 the programme continues to cover the thematic scope of the INDNOR work programme and bilateral Programme of Cooperation. In 2018, the focus has been renewable energy, ICT, bio economy, and cooperation in social sciences and humanities. Especially the cooperation in renewable energy and bio economy is closely tied to solving important global challenges. ICT is an area with Indian strength and where there is a potential for job creation and further contributions to the future development of the Indian economy. Both the bio economy cooperation and renewable energy cooperation is moving in the direction of more industry-oriented research and innovation. The research cooperation has developed excellent relations in several Indian ministries of strategic importance for Norway, such as the Health Ministry (AMR), Ministry of Human Resources Development (higher education, social sciences), Ministry of Earth Sciences (Marin, Arctic) and Ministry of Science & Technology (Research and Innovation).

Further calls will continue the focus on increasing involvement of the industry and develop deeper knowledge and understanding of social issues of relevance for sustainable development in India and Norway.

Ocean Space is an area of high interest to Norway, and the programme is looking into how this might be included in the bilateral cooperation. Marine research is an area in the Programme of Cooperation that has not been covered widely so far. In the RCN roadmap for Research cooperation with India, maritime research is highlighted as an area where there might be possibilities for innovation-based cooperation. NICCI and IN would be important partners in working towards achieving this.

As a follow-up of the Norwegian prime ministers and business delegations visit to India in January 2019, RCN will in cooperation with NICCI arrange a seminar June 3rd, 2019. Innovation Norway and MFA has also shown interest in being co-hosts. This will be an opportunity to further cooperation in relevant thematic areas where there are opportunities to engage the industry sector.

Impact on research capacity

The programme has contributed to increased capacity building in all active areas of the programme portfolio. The total number of persons involved in recruitment positions (PhDs and Postdocs) is 17, however, the full-time equivalent's funded are only 6. Two doctoral degrees was completed in 2018,

both from male candidates and within the energy portfolio. It is worth noticing that recruitment positions involved in the projects that are funded from India are not always reported. Of the recruitment positions, there is a quite equal gender distribution with 8 women and 9 men in these positions. Looking at the gender distribution of the total project portfolio there are more male than female project managers, with a percentage of female project managers amounting to 25%.

Quality of research/Level of innovation

Scientific merit has been used as criteria for quality in all INDNOR calls. All researcher projects bar one awarded in bilateral calls in 2018 had a score of 6 or 7 (7 being the highest score possible). The one project awarded with a lesser score (4) had top score from the Indian panel and was therefore awarded. The three projects from the multilateral EqUIP call with Norwegian participation scored in the top two categories (1,2). The total numbers of scientific publications reported from the 51 active projects were 23. Given that 22 projects are in their very early stages of their projects this is a quite acceptable result. There should be continuous efforts in mobilizing researchers and top institutions in both countries in order to secure quality of the cooperation. However, given the quality of applications in the most recent calls, it seems that the programme is on the right way in this respect.

International cooperation

The programme's main objective is international cooperation, and it is compulsory to have an Indian partner in all projects funded by the programme. INDNOR mainly facilitates cooperation through developing bilateral joint calls with India, and thereby assists other thematic programmes in RCN in achieving their internationalization objectives. Other countries besides India are also involved in the cooperation, mainly European, such as Iceland, Belgium, Germany, France, Netherlands, Denmark, Spain, UK and Switzerland, and countries from the South such as Kenya, South Africa and Nepal.

European platforms such as Inno Indigo and EqUIP are used for joint activities with India when convenient. The science and technology counsellor in New Delhi (cofounded by IN and RCN) also participates in the EU-delegation meetings in order to coordinate and increase the cooperation with the EU and H2020. Recently, the Indian government has signed an agreement with EU for co-funding of participation of Indian partners in a number of upcoming calls, making it more feasible for Indian scientists to cooperate on proposals to these calls. The India programme is now working closely with the RCN's National Contact Points (NCP) to mobilize Norwegian researchers to take advantage of existing collaboration with Indian partners to co-produce proposals to these calls.

Enhancement of the research system

The goal of the programme is to increase cooperation with India in broad areas and covering from basic research to innovation. So far, the programme has mainly used researcher projects as an application type, but innovation projects were used in the last Inno Indigo call in 2017, and for the joint industrial R&D call on energy in 2018 industry involvement was mandatory in applications to RCN.

Communication and advisory activities

Important channels have been meetings and seminars, news items on the INDNOR web-page and the informal Facebook group "Research cooperation with India".

Of formal meetings, the Annual meeting with the embassy took place via video conference in June, and contact meetings with the MFA took place in June and December.

In August RCN, in cooperation with NICCI, Norwegian Consulate General Mumbai and University of Agder, arranged a seminar "Is Norway responding well to the rise of India?" during Arendalsuka. The seminar was opened by Foreign Minister Ine Eriksen Sjøreide and attracted more than 100 participants.

In cooperation with Ministry of Earth Sciences, The Norwegian Embassy in Delhi and the EU delegation to India, the RCN arranged a two-day event "Polar Science Days" in Goa in November. The event showcased the Indo-Norwegian polar science cooperation and also focused on mobilising for participation in a Horizon2020 call on polar sciences. At the deadline, the thematic area most relevant for the ongoing Indo-Norwegian research cooperation in polar sciences received 5 proposals. 3 of those had Indian and Norwegian partners. The call will be concluded in 2019. MFA issued a new Strategy for cooperation between Norway and India, Norway-India 2030, in December 2018. The RCN was asked to contribute to the strategy, both by giving comments and suggestions and by coordinating comments from other relevant actors amongst RCN contacts.

Available funding and resources

The INDNOR programme has a programme period from 2010 to 2021.

The INDNOR programme (2010–2021) receives a total of NOK 185 million in funding from the Norwegian Ministry of Foreign Affairs for the period 2010–2019, and a total of NOK 100 million for the period 2017–2021 from the Ministry of Foreign Affairs via the Royal Norwegian Embassy in New Delhi. The programme also receives an additional NOK 169 million in funding directly from the Royal Norwegian Embassy for the period 2011–2020. This amounts to a total of NOK 454 million in funding over the entire programme period.

In addition, cooperation with thematic research programmes at the Research Council has resulted in some funding via these programmes. This funding is expected to continue.

The funding available for the INDNOR programme for 2018 has been 39 million NOK from the MFA and from the Embassy in Delhi.

The programme has had a slight delay as to distribution of funds. This is partly caused by the budget cuts by MFA in 2015 which lead to delayed start up for new projects, and partly due to time consuming processes of committing Indian government partners for arranging joint calls.

Given the high activity in 2018 and planned calls for 2019 and later the budget transfers are expected to diminish over the programme period, being exhausted by the end of the programme's duration. The budget transfers have gone down from 2017 to 2018, with a budget transfer of 70 million NOK in 2017 to a budget transfer of 45 million NOK in 2018. The programme will seek to keep up the activity level in the coming years in order to limit budget transfers.

The evaluation from 2015 emphasized that there are not sufficient funds for the programme to fulfil the goal of contributing to increasing research in all thematic areas, covering basic science to innovation. Given the signals from MFA to focus more on linking research with higher education and innovation both the Ministry of Education and research and the Ministry of Trade, Industry and fisheries are important stakeholders in moving the cooperation further.

KEY FIGURES FOR THE INDIAPROGRAMME					
Number	2017	2018	Allocation (mill. NOK)	2017	2018
total number of active projects	29	51	R&D revenues	38	39
Total calls for proposals	2	4	Ministry of Foreign Affairs	38	39
number of joint calls	2	3			
Number of applications received	78	162	Disposable budget available	108	114
			Funding used	33	27
Number of new projects	11	22	Budget transfers	70	45
Percentage of applications awarded funding	14 %	32 %			
Energy		29 %			
Bioeconomy		12 %			
SSH		9 %			
ICT		10 %			
Travel support/support for events		100 %			
Share of woman project managers among all	23 %	25 %			
Doctoral fellow (full time equivalent's/number of)	3/4	2,85/5			
Men	2/3	2,25/4			
Women	1/1	0,6/1			
Postdoctoral fellows (full time equivalent's/number)	4/7	3,23/12			
Men	2/2	0,83/5			
Women	2/5	2,4/7			
Doctoral degrees completed	0	2			
Men	0	2			
Women	0	0			
Number of events	1	2			
Scientific publications					
Articles published in scientific/scholarly journals	16	21			
Articles published in antologies	1	0			
Monographs published	3	2			
Dissemination activities, societal impact	0	0			
Reports, memoranda, articles, presentations held at meetings/conferences for the project target groups	154	75			
Popular science publications (articles/books, books/articles in the public debate, documents formally circulated for review, exhibitions, fiction etc.)	11	6			
New publications in the media (newspapers, radio, TV etc.	18	6			
Innovation results					
New /improved methods/models/prototypes finalised	3	1			
New/improved products finalised	0	0			
New/improved processes finalised					
New/improved services finalised	0	0			
Patents registered	0	0			
Licensing agreements signed	0	0			
New companies launched as a result of the project	0	0			
New business areas in existing companies, resulting from the project	0	0			
Companies participating in the project that have introduced new/improved methods/technology	2	0			
Companies external to the project that have introduced new/improved methods/technology	1	1			
Companies participating in the project that have introduced new/improved work processes/business models	0	0			
Project partners					
total within higher education sector	9	17			
Total within institute sector	7	17			
Total within industrial sector	0	0			
total from regional health authorities	2	2			
Total from abroad	54	46			