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REPORT

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A revised NOVA collaboration model from 2020

Report from the SLU working group

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1 Background

The Nordic Forestry, Veterinary and Agricultural University Network, NOVA, was founded in 1995. It started as a prolongation and further development of previous PhD course projects funded by the Nordic Council of Ministers (NMR). The vision of NOVA was that the universities/faculties/schools in forestry, agriculture and veterinary medicine in the five Nordic countries, by merging resources in a formalised long-term collaboration, would raise teacher and student interactions as well as quality in education and research, and thereby their competitiveness nationally and internationally.

Throughout the 25-year history of NOVA there are numerous success stories; the most significant being the courses provided for hundreds of PhD students each year. These courses have enabled young scientists, also in very specialized fields, to meet with highly qualified international teachers and to build networks for their future scientific careers. NOVA has also supported different forms of Nordic collaboration in MSc education, e.g. short intensive courses, differentiated specializations in semester blocks, and even the development of joint Nordic MSc programmes. However, collaboration at MSc level has proven demanding due to organizational and economic restraints and has not been as successful as the collaboration at PhD level. A challenge for NOVA has been to fulfil an ambitious strategy while still limiting its administrational costs.

During the last ten years various structural changes have taken place in the Nordic countries at national university level, including internal reorganizations and university mergers. In addition to trends like increased digitalisation and internationalization, a continuously reduced direct governmental funding of universities has affected the motivation and ability of the NOVA members to support the network.

Against this background, at its 83rd meeting on 3 June 2019, the board discussed various options for a reconstruction of NOVA by adjusting the organization and its level of ambition to the current situation. The board thus decided that a new and slimmed version of NOVA should be implemented from 1 January 2020. An expectation is that a reduced cost model makes it possible for members to remain in NOVA and also to attract former members to re-join the network. To this end, the board decided to give a working group a mandate to investigate how a reconstruction of NOVA could be accomplished. Two key objectives for a new model should be to prioritize cooperation on PhD level and a significant reduction of the costs.

Consequently, a working group was established to investigate a renewed model for NOVA from 2020. The group consists of Professor Arvid Uggla, former Dean of the Faculty of Veterinary Medicine and Animal Science, SLU, Associate Professor Lena Andersson-Eklund, former Deputy Vice-Chancellor of SLU and board member of NOVA, and Associate Professor Lotta Hansson, Principal Administrative Officer at the Division of Planning, SLU.

Based on the mandate from the board, the working group has focused on the PhD course activities within NOVA, thus omitting the MSc education, external cooperation and other accessory activities. At its forthcoming meeting on 22 November 2019 the board is expected to decide upon the new format of NOVA for the mutual benefit of its members.

2 NOVA today

2.1 Members

NOVA has developed from a project of all Nordic agricultural universities to a network between some of the Nordic universities with research and teaching in agricultural, forestry and veterinary sciences. In 2019 the members were:

- Aarhus University: Science and Technology (AU-ST; selected units)
- University of Helsinki: Faculties of Agriculture and Forestry (HU-AF) and Veterinary Medicine (HU-V)
- University of Eastern Finland: School of Forest Sciences (UEF-F)
- Agricultural University of Iceland (LBHI)
- Norwegian University of Life Sciences (NMBU)
- Swedish University of Agricultural Sciences (SLU)

2.2 Operative units

Board – governs the network and defines the mission, long-term objectives and strategy of NOVA. It consists of one representative from each member university and two representatives from the NOVA student board.

Chair – is responsible for preparing items for consideration by the NOVA board and for the day-to-day running of NOVA.

Secretariat – consists of a central coordinator who is responsible for the daily administration and secretarial functions for the board. The secretariat rotates between members every third year. During 2014-2019 it has been based at NMBU.

Local NOVA coordinators – coordinators at each member university are responsible for promoting contact between administration, teachers and students locally and with the NOVA secretariat.

NOVA student board (NSB) – a forum for students from the member universities. NSB has one live meeting each year.

2.3 Funding principles

From 2016 to 2018 a yearly average of 167 000 EUR were used for funding PhD courses, 25 000 EUR for other activities including MSc courses and student mobility, and 40 000 EUR for the secretariat. More than 90 % of the costs were covered by member fees and the rest from organizations within NMR. For 2019,

the member fee distribution is based on the proportion of degrees produced by each member in 2012-2016 and on the proportion of students from each member participating in NOVA PhD courses during the same time period.

3 PhD education at the member institutions

In Finland and Sweden the doctoral education is four years, whereas in Norway, Denmark and Iceland it is three years. All member universities require training courses as part of the PhD education with required number of credits varying between 30 and 60 ECTS. The responsibility for providing and funding subject related courses lies on departments/faculties (in HU doctoral program boards). UEF-F does not organize specific PhD courses.

None of the members have rules or recommendations that a certain number of credits should be from international courses. All PhD courses at the member institutions are normally open also for doctoral students from other universities. At HU, UEF and SLU participation of such students is considered rare; AU, NMBU and KU did not give any estimate. International teachers/lecturers – often visiting researchers – are frequently contributing to PhD courses at all member institutions.

None of the NOVA universities are members of other international networks that provide support for PhD courses on a permanent basis. KU and HU are members in NorDoc (Nordic Doctoral Training in Health Sciences) which is an agreement for an open market for PhD courses within the fields of medicine and health sciences.

Students fees, travel and accommodation in relation to PhD students participation in NOVA courses are financed in different ways at the member universities – from research grants, local travel scholarships or other sources.

4 Facts about the NOVA PhD courses

4.1 Number of courses and participants

Over the last ten years, the number of courses supported by NOVA has varied between 8 and 21 per year and an average of 220 doctoral students from NOVA members have participated yearly. Also non-NOVA PhD students have participated, making up on average 25 % of the participants, including a few students from the Baltic countries according to a collaborative agreement with BOVA, the Baltic Forestry, Veterinary and Agricultural University Network.

The following table shows at which NOVA member the students were enrolled (grey headings), and the organzing university (green) for courses during 2017 and 2018. Student participation from a university increased when their home university organized the course.The left column shows the average annual number of courses organized by each NOVA member during 2017-2019.

		Participants enrolled at member X*								
Mean number of courses organized per year (2017 – 2019)	Course organizing member	AU	HU-AF	HU-V	KU	LBHI	NMBU	SLU	UEF-F	Total
1.0	AU-ST	17	4	0	0	0	11	9	0	41
3.0	HU-AF	2	36	0	0	1	11	4	9	63
1.7	HU-V	4	1	25	0	0	3	8	0	41
1.0	KU**	3	0	0	15	0	4	9	3	34
0.3	LBHI	1	2	0	0	1	4	1	2	11
3.0	NMBU	0	4	0	0	0	9	2	0	15
6.0	SLU	16	15	7	2	1	31	75	1	148
0.7	UEF-F						5	3	14	22
16.7	Total	43	62	32	17	3	78	111	29	375

*Students from the parts of AU, HU and UEF that are not members of NOVA are not included in this table as they are not regarded as NOVA-students.

**KU Science remained as a NOVA member until the end of 2016 but organized courses also in 2017. The student numbers for KU refer to KU Science in 2017.

4.2 Course subjects

On average 17 courses were supported during 2017-2019. They represented a wide diversity of subjects within the areas of agricultural, forestry and veterinary sciences. The diversity is illustrated in the list of courses announced in 2019:

- Application of genome wide SNPs in single step genomic analysis
- Biological consequences of selection
- Equitation science
- Keeping the hindgut and the horse healthy
- Advances in feline and canine nephrology and urology
- Multilevel modelling
- Reproductive health in a changing world – Effects of environmental contamination and climate change
- Dynamic modelling of cropping systems
- Eco-stacking in theory and practice: A new approach to crop protection
- Epidemiology and population genetics
- Functional biodiversity for biocontrol and pollination – Underlying mechanisms in crops
- Phenotyping technologies in plant-environment interactions – Image based phenotyping
- Plant breeding for sustainable plant health management
- Sustainable Nordic and Baltic food – Technologies, quality, and health
- Advanced production economics

- Modelling and simulation of ecosystem services and environmental resource management with artificial intelligence
- Advanced course of innovation systems in circular bioeconomy
- Wetland ecology and management
- Hybrid inference
- Environmental collaboration and conflict resolution: Renewable energy and emerging land-use conflicts

Some subject areas have been more commonly represented in NOVA courses than others. For example, courses concerning different aspects of plant protection have been common during the years. Collabortion between course leaders at several NOVA members have resulted in course series running over several years where the universities take turns in organizing the course. Examples of recent series are "Environmental collaboration and conflict resolution" and "Climate change entomology in the North".

4.3 Quality, networking and internationalization

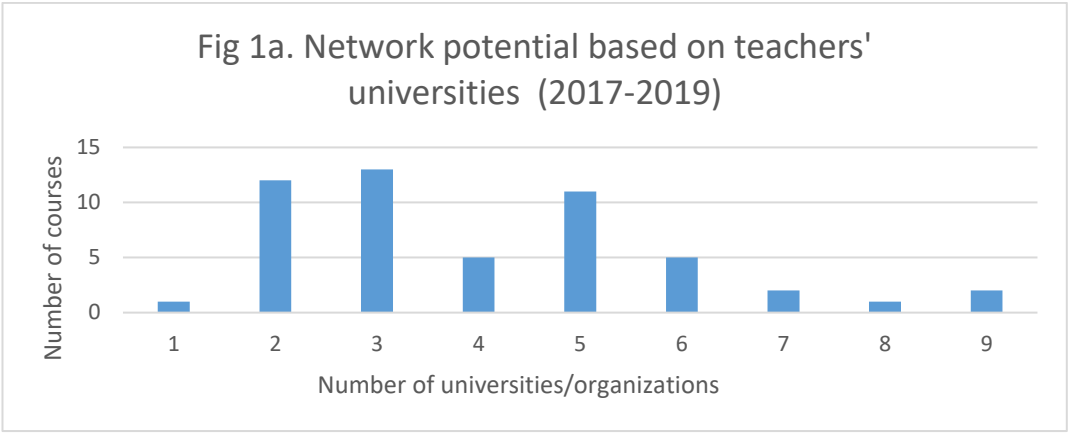
Throughout the years the high quality has been a major argument for the NOVA concept of PhD courses. According to the student course evaluations (available at NOVA's web) the students in general were very satisfied with form, quality and level of content, as well as pedagogic method and communication before and after the courses.

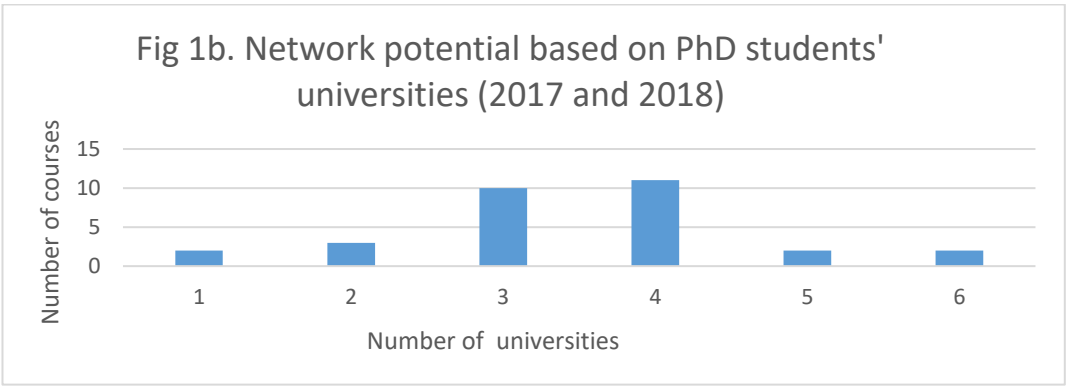
The process of evaluation and approval of applications has had three steps:

1. Official approval by the home university.
2. Technical approval by the NOVA central coordinator.
3. Final evaluation and approval by the NOVA board or the NOVA chair.

Since January 2018, PhD courses that were approved and met the criteria regarding number of students, received a total sum of 10 000 EUR, plus 1 000 EUR to cover administration. Most courses also received an incentive grant of 2 000 EUR.

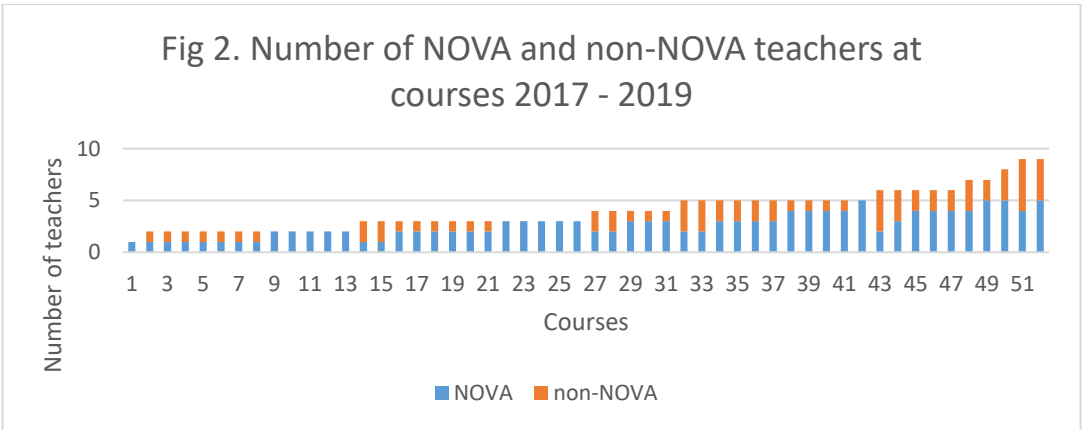
Each course has a responsible leader from a NOVA member, who organizes and performs the course together with teachers from other NOVA members and often also from universities and research institutes outside of the Nordic countries. This process brings about an important potential for networking between teachers, between teachers and students and between the students themselves. The networking capacity is illustrated by Figures 1a, 1b and 2.





Half of the 52 courses had more than four main teachers from different universities/organizations (Fig. 1a). Likewise, about half of the courses had PhD students from four or more universities (Fig. 1b). The number of home universities/organizations of teachers and participants, respectively, in the courses in 2017 and 2018 were positively correlated (r = 0.4 n.s.).

A considerable number of participating teachers was from non-NOVA universities/organizations. 78 % of the courses had teachers from a wide diversity of non-NOVA universities/organizations, and 34 % of the teachers were non-NOVA (Fig. 2). These teachers came from 58 different universities or organizations, out of which 33 % were non-European.



5 Significance of NOVA's courses

In a recent survey to the present board members they emphasized that NOVA facilitates and promotes high quality courses in small academic fields and in areas where a Nordic context is important, including interdisciplinary courses and courses in novel research areas. The inherent collaborative planning and completion provide fora for networking that promotes subsequent scientific collaboration for both teachers and students. Intensive courses with international teachers and students provide an academic and social context that promotes a mature and independent knowledge and understanding of the subject and of the different approaches to research.

Outside the Nordic countries, the Nordics are often perceived as a unit. Thus, knowledge of other Nordic universities and their profiles is important for both university management, students and scientists.

In a second survey, directed to 47 leaders for NOVA PhD courses during 2017-2019, the respondents (66%) motivated their engagement with some of the following arguments:

- Bringing together students from Nordic countries enables enough participation to engage international experts as teachers (most common response)
- They required the course for their own students
- A tradition within the subject area
- Necessary to build networks for the future of the subject
- NOVA support essential for engaging teachers from other countries.

Other advantages of organizing courses within the framework of NOVA were the additional funding compared with what is available at the home university, a consistent funding scheme, straightforward application, functioning network and an organization for advertising to students. One survey respondent pointed out that *"organizing an international course is a big effort which needs dedicated support"* where NOVA is an asset.

Among disadvantages, some funding restrictions were mentioned such as the maximum course duration of one-week, compulsory fee for non-NOVA students, and difficulties to engage NOVA teachers without remuneration. However, NOVA has already responded to the latter issues. There is no longer a compulsory course fee for non-NOVA students, and it is now possible to give remuneration to NOVA teachers.

In a statement from the NOVA student board in 2019 they emphasized that NOVA has been the perfect platform for providing resources to create specialized courses in agricultural, forestry and veterinary sciences, where face to face teaching is prioritized. In addition, this type of courses supports the lifelong process of developing an academic network. The networking and learning which take place in a concentrated course environment cannot be replaced through conferences and one-off workshops.

In 2018, a NOVA student board survey was directed to PhD students at all member universities. It was responded by approx. 260 PhD students out of which 90 (35 %) had taken one or more NOVA courses. The respondents emphasized the value of real-life networking but were also interested in including e-learning in the courses. When asked about course preferences, generic skills and field and laboratory training were highly rated. They also valued the early announcement of NOVA courses, e.g. through course series.

6 Directions for a revised NOVA

We suggest that the overarching objectives of NOVA shall be 1) to provide members' PhD students in subjects related to agricultural, forestry and veterinary sciences with relevant, high quality courses, and 2) to support the PhD students and NOVA's young scientists in building international scientific networks.

Both goals can be achieved through course activities, but strict principles should be applied to define a NOVA course:

- The course can be either subject specific or interdisciplinary, but always with NOVA PhD students as the target group.
- Main teachers should have a solid research background and be internationally recognized scientists. At least one of them must be employed by the organizing university.
- The organizing university guarantees the quality of the course, and the other members recognize the course credits without reconsideration (unless there is an overlap with other courses taken by the student).
- The course quality can be subject to follow-up from web-based student evaluations using a NOVA template.
- The course is planned in collaboration between the host university and at least two other partner universities, out of which at least one is a NOVA member.
- Teachers from at least two different countries interact with the students during the course.
- The pedagogic approach builds upon extensive interactions student-student and student-teacher, and in general the courses contain a classroom/field/lab module of maximum one working week combined with distance education modules.
- If the number of seats is limited in a course, visiting students from NOVA members are given priority to a minimum of 50 % of the seats.
- NOVA students shall not pay course fees, and they shall all be given the same conditions for food and accommodation.
- Courses must be announced at least 6 months before the course event, and series of courses over 2-3 years within a specific subject area should be endorsed.

We suggest that these criteria should be fulfilled to reach the purpose of a revised NOVA. This also implies that each member has routines that support planning and organization of courses fulfilling the criteria above, and that funding is made

available for their PhD students to participate in courses at other NOVA universities.

Creating a common NOVA course catalogue or a website with links to the members' own course catalogues would not contribute markedly to the goals of NOVA as this information already should be available to the students. Furthermore, when considering the courses offered at different universities, they rarely include short, intensive courses which would be suitable for students from other countries, and when the number of seats is limited they give priority to their own students and sometimes to students from other universities within the country. This is also the case in the NorDoc network which we believe cannot serve as a model for the revision of NOVA as their courses do not fulfil the principles described above.

7 Suggested model for a revised NOVA collaboration

It is in the interest of every university to promote internationally recognized research and to build international scientific networks. A fundamental way to achieve this is by supporting a high-quality PhD education, both concerning research projects and course work. **We suggest that each NOVA member university takes the responsibility to arrange a defined number of NOVA courses per year**. However, high quality international PhD courses, as described above, cannot be organized without special funding. Such funding can be handled internally in a way that suits each organization and without a common funding administration in NOVA. Still, a revised NOVA requires a basic administration mainly targeting communication tasks. We suggest that a slimmed NOVA organization should comprise:

- A **steering group** consisting of one senior academic management person per university (Vice-Rector level) and two PhD student representatives. The student representatives should be from the PhD student organization from two different members on a rotating scheme. The steering group would meet once a year with a different member as host. The host is responsible for local costs and the participating member for travel and accommodation. At the meetings the steering group should conclude on results achieved within the NOVA course program, and decide about changes on number and focus of courses as well as other ad hoc issues.
- A **secretariat** and a **chair** with terms of three years. The tasks of the NOVA secretariat would be to promote the courses and to follow up on the result each year. The responsibilities of the chair would be to plan the yearly meeting in collaboration with the host university and to lead the decision meeting.

Given the present distribution of member fees (based on averages from 2012-2016) and the assumption that the number of courses is 17-20 per year, the member universities would on average host the following number of NOVA courses:

- AU-ST 3
- HU (V+AU) 4-5
- UEF-F 1
- LBHI 1/10
- NMBU 4-5
- SLU 6-7

The secretariat would be responsible for publishing information concerning planned NOVA courses on the NOVA website, in a newsletter and in relevant social media. The secretariat would also gather information on numbers and home universities of course participants and course evaluations, and assist the chair in preparing the yearly meeting of the steering group. We suggest that the secretariat will require a 10 % position, with an estimated annual cost of 8 000 EUR to be shared between members.

8 Conclusions

In the Nordic countries there are a restricted number of universities specifically focusing on the sciences related to land use and its environmental consequences, and the number of doctoral students in these subjects at each university is limited. The Nordic countries have a shared view on how doctoral training should be pursued including relevant course work for their PhD students. The benefits of internordic collaboration on doctoral training in these sciences is obvious.

The NOVA concept with its originally far-reaching ambitions has now been in place for 25 years. Its activity focus has gradually changed, but what has remained solid over the years is the core of PhD courses with participation of students and teachers from the member universities as well as invited teachers from other countries. These courses have reached a consistent reputation for their high quality and professional performance and are regarded as highly valuable by both students and their teachers and scientific supervisors. The longterm collaboration has also created respect and trust for each others academic competence.

Today’s costs for running the NOVA network is considered too high, but it is our opinion that a discontinuation of the organization would be a great waste of experience and good practice. This is particularly true as regards the constantly successful internordic PhD courses. A termination would also mean that existing scientific networks as well as the doctoral students’ own academic networking would be compromised.

We propose a model for a revised NOVA – a ‘NOVA noveau’ – with a reduced economic engagement for the participating universities but with a continuous commitment to organize high quality courses for Nordic PhD students. Savings

will apply to a sole focus on PhD courses, a diminished central administration of budget as well as to the removed central approval of applications, but also to new incentives to organize ongoing courses within the universities to fulfil the requirements of NOVA.

Our model implies a more flexible network that will be open also to other prospective members in the Nordic and Baltic countries that wish to contribute to the NOVA PhD course program. It is our hope that this model could also attract the former members in Copenhagen University to reconsider an association with NOVA.

9 Sources

This report is based primarily on information available in the https://www.nmbu.no/en/students/nova/about/documents/annual-report and in the minutes from NOVA board meeting 83, course pages during 2017-2019 at https://www.nmbu.no/en/students/nova/students/phd-courses and student course evaluations.

In addition, the working group performed surveys directed to the present board members and to all course leaders 2017-2018. Information from a survey performed by NSB in 2018 was also used.

Finally, we refer to information about NorDoc at https://www.nordochealth.net/about