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Evaluation of the Royal Belgian Institute of Natural Sciences

Management Summary



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Management Summary

This evaluation

This report presents the results of the evaluation of the research activities of the Royal Belgian Institute of Natural Sciences (RBINS). The evaluation was performed by the Technopolis Group in the period April 2014 - February 2015 and commissioned by the Belgian Federal Science Policy Office (BELSPO).

The purpose of this evaluation is to support RBINS in the development and determination of its research strategy. RBINS is one of the ten Federal Scientific Institutes (FSIs) that will be evaluated in order to optimise the quality and relevance of the research efforts and to increase the national and international visibility of the FSIs.

The report is based on the results of desk study, interviews with RBINS' staff and stakeholders, case studies, benchmark, bibliometric analysis, peer review and a self-assessment by RBINS.

Context of the Federal Scientific Institutes

Belgium is a politically complex country: a federal state with three regions (Flanders, Wallonia, Brussels-Capital) and the three communities (French-, Flemish- and German-speaking). BELSPO is responsible for coordinating science policy at the federal level. Among BELSPO's tasks are the design and implementation of research programmes and networks and the supports of ten FSIs. The FSIs of BELSPO have a two-fold mission:

- Delivering scientific public services (including museum activities, collection conservation and policy support).
- Performing research: performing fundamental and applied research.

The FSIs receive structural funding from BELSPO, which consists of a general dotation and funding for part of FSIs personnel.

During this evaluation the Belgian governments announced budget cuts of the dotation of the FSIs of up to 20-30 % and of the salaries. The full extent of the impact of these budget cuts is gradually becoming more visible at this time of writing.

Within the last couple of years FSIs have been asked to modernise and optimise their management, their organisation and their services, to being integrated in the Belgian, European and international research area, to contribute to the international radiance of Belgium and to link with other federated entities. In addition, a commercial logic is little by little imposed to the FSIs, demanding them to have a significant economic impact and to increase the auto financed part of their budget. However regulation does not determine whether the services provided by the FSIs to external partners are free or need to be paid for.

Over the past few years, new sources of financing were found (such as the National Lottery) – and again lost or minimised over the last years. Some of the FSIs such as RBINS were able to find additional sources of income through longstanding agreements. For RBINS the cooperation agreement with the Directorate General for Development and Humanitarian Aid is very important in this context.

Being a federal research institute, FSIs are subject to certain rules that affect the context in which scientific research is performed. For example, FSIs can only access regional sources of research funding (FWO, IWT, FNRS) through collaboration with universities; neither can they recruit PhD students independent of universities. FSIs are also subject to rules regarding the recruitment of staff (both in selection procedures which involve a federal recruitment agency and/or BELSPO, and in linguistic constraints).

Mission, assignment and activities of RBINS

RBINS was founded in 1846 and received its current name in 1948. In 1997 the federal organisation 'Management Unit of the North Sea Mathematical Models and the Scheldt

estuary', abbreviated to MUMM, became part of RBINS, followed in 2003 by the Geological Survey of Belgium (GSB; founded in 1896).

RBINS' mission is *to actively contribute to a better knowledge of nature and to actively disseminate this knowledge for the protection of nature.*

RBINS is responsible for a wide range of tasks, ranging from its museum function to performing scientific research and offering scientific services, to collection management. The tasks of RBINS are determined by Royal Decree (8 April 2002):

- To perform scientific research in the area of the natural sciences, mainly concerned with the study of evolution, diversity, and ecosystems.
- To provide scientific service to public and private institutions and bodies involved in the management of the natural heritage, in particular in the application of conventions and regional, federal, European, and international legislation.
- The management and development of collections, databanks, libraries, and specialised archives, in the abovementioned domains, that constitutes a resource at national and international level.
- The dissemination of knowledge regarding natural sciences through developing permanent and temporary exhibitions and various other educational activities at the Museum of Natural Sciences

The first three tasks (research, services and collection management) are subject of the current evaluation. The museum function of RBINS is not part of this evaluation.

Locations

RBINS' research activities are performed on three locations. RBINS' headquarters is located in Brussels on the Rue Vautier. The 'MUMM unit' is located at Gulledele, while the third location is located near the North Sea in Oostende, hosting a laboratory for marine chemistry and the management of the oceanographic research vessel Belgica.

RBINS' buildings are not owned by RBINS. They are the responsibility of the Building Agency of the Federal Government. This means that every need for restoration/change should be introduced at and is evaluated by this agency before works can start. RBINS' lack of autonomy in these matters has a negative impact on the working conditions and puts up barriers for RBINS' staff in performing their tasks adequately. It is advised to explore how the effectiveness and efficiency of the procedures concerning renovation and improvement of the infrastructure can be improved.

Internal governance structure and management

The governance structure of RBINS is relatively new: it was implemented in 2013 after a reorganisation process of several years. The process took a long time because of the lack of a government of full exercise from December 2009 to December 2011 onwards, that blocked the publication of the position for Operational Directors during two years.

In the new structure there are five management bodies: the General Director, the Direction Council, the Management Commission of the Nature pole, the Scientific Advisory Council and the Jury for recruitment of promotion.

The scientific departments and services are organised into six directorates/scientific services. There are three Operational Directorates (ODs) for research, expertise, and science support to decision-making: the Directorates Taxonomy and Phylogeny, Natural Environment, and Earth and the History of life. Furthermore there is a directorate Public Services, which is dedicated to the dissemination of knowledge, and a directorate Support Services, which is responsible for all the administrative and technical services. Last but not least, with the new organisation structure a specific service for scientific heritage (including collection) was established: Scientific Service Heritage (SSH).

The new organisational structure is considered an improvement. There is much more clarity on the different tasks and responsibilities, and it has resulted in better internal communication and increased multidisciplinary collaboration. However, there is still the

need for more synergies and cooperation. This can be done by the development of cross-directorate projects as they promote multi-disciplinary working and minimize the risk of increasing competition between research teams. Establishing synergies and networks between researchers with different backgrounds using various approaches within and across OD boundaries and on an international level is important and could also contribute significantly to increased international visibility of the ODs. Overall, it is advised to evaluate (the implementation of) the new organisational structure at regular intervals.

Although the internal communication has already been improved by the reorganisation, it can still be further strengthened. Developing a coherent strategic plan will contribute to this, but also measures like communal tea/coffee and/or lunch areas will have a positive impact, similar to organising more internal activities and organising a bimonthly tour of the institute for new employees.

The management and support of the scientific staff is considered adequate, except for the role of the Scientific Advisory Council. The fact that representatives of RBINS management team are council members is somewhat confusing. It is recommended to review the mandate of the Scientific Advisory Council.

Funding and human resources

RBINS has an annual budget of around €32m (2013). BELSPO structural funding constitutes the majority of the Institute's overall income (57% in 2013). BELSPO's funding has remained relatively stable over time, while the project-based research funding acquired by RBINS has greatly increased with 63% since 2009. RBINS' most important funders of research activities are BELSPO and other federal administrations, regional administrations and the European Commission.

The overall expenses have increased over time. This is mainly caused by an increase in costs for salaries and operational management. More than half of RBINS' budget (62%) is dedicated to research (three research ODs and the Scientific Heritage Service).

The budget cuts announced by the Belgian governments are expected to have a great impact on the total budget for RBINS for the coming years. Already, the budget of RBINS is mostly non-compressible (budget for salaries, buildings, library, research projects, etc.). There is hardly any 'free strategic budget'. The announced budget cuts of the dotation of 10-15% will limit this room for manoeuvre, for example in implementing research strategies, even more. The budget cuts also pose a possible threat to the maintenance and development of the scientific collections, which budget is already too little to ensure the safeguarding and development of the collections according to common international standards.

To sustain sufficient funding for the future an "external income" strategy should be developed with particular focus on the value provided to any given contract by RBINS' biological collections and research infrastructure (the molecular labs, mineralogy labs, ship, plane, and JEMU). RBINS could consider establishing a heritage service charge and charge-out rates for use of its scientific infrastructure in all external awards, grants, and contracts. For a professional policy on external contracts it is mandatory to have a clear view on budgeting and on how to calculate the costs of project proposals and contracts offers. Full costs rates should include a component for internal recurrent funding allowing for an internal competitive research policy to promote new challenging research. To implement this strategy successfully a centralised project management and administrative assistance for researchers could be established.

A surprising issue is that RBINS' researchers have no access to closed-access electronic journals. Access to Web of Science is too costly for RBINS to afford, but so far no investment has been made by BELSPO for the FSIs. The lack of direct access could certainly limit scientific productivity and therefore access to the electronic journals must be ensured.

RBINS has 424 staff members of which 164 scientists and 260 non-scientists (including museum employees) (2013). With 430 staff members in 2009, the total number of staff has been relatively stable over the years. Less than half (43%) of the total number of staff

is working in research. Of these 43%, more than 4/5 is working as a scientist, while the other 1/5 is employed as a technician. The majority of staff has a non-permanent position (under a contract). The majority of the scientists work within OD Natural Environment (49%), followed by OD Earth and History of Life (30%), OD Taxonomy and Phylogeny (15%), and the Scientific Heritage Service (6%).

The allocation of scientific statutory positions plays an important role in RBINS' research strategy. By recruiting persons with a specific expertise RBINS ensures that its scientific quality remains at an internationally competitive level. However, RBINS is obliged to follow rigid rules in its human resource management. These restrictions in recruitment clearly contradict with the position of RBINS as an internationally recognised research institution that should look internationally for the best staff with the possibility of a permanent position. RBINS' restrictions in recruitment need to be fundamentally revised and implemented on an international level since current procedures are contradictory and damaging the goals of RBINS.

Research strategy

RBINS is currently drafting a new research strategy. As input for this strategy, every OD has prepared a strategic plan for the coming years using a bottom-up approach. For most of the thematic areas this is the first time that they develop a specific research strategy. The strategic considerations reflect the broad range of operational activities present before the restructuring. The strategy process is highly appreciated by researchers who are now more aware of the institute's objectives. There is some room for improvement however, as the bottom up approach currently applied in strategy development would benefit from a complementary top down strategy developing a common institutional vision and profile, promoting multidisciplinary research between ODs (currently underdeveloped) and fostering networking with other national and international organisations.

Developing collection-based research agendas is an important strategic direction and distinguishes RBINS from universities (where generally no large research collections are present). This provides RBINS with a unique feature as well as providing a basis for co-operations with universities (as exemplified by the quite high number of Master and PhD students co-supervised by staff from RBINS).

Overall, there may be a mismatch between what governmental authorities are expecting as tasks of RBINS, what the Institute is considering to be the scope of its tasks, what is explicit or implicit in related budget allocations, and what is required, or feasible, to execute the tasks. In view of its diverse tasks it is recommended that RBINS develops a more coherent strategic plan with a rationalised portfolio of tasks and budgets. This plan should be communicated to the staff so that they can fully engage and understand their contribution to the organisation. By revisiting and focusing its mandates with BELSPO, and attaining a common coherent vision and scientific strategy, RBINS would solve many of its current challenges related with identity, branding, and visibility. This is particularly important in the current context of the increasing need to access external resources on a competitive basis. In addition, the governmental authorities and RBINS should explore to which extent the institute can increase its autonomy, going into contract with funding agencies with applicable administrative rules. This also would open up opportunities to negotiate special arrangement as with regard to the vessel Belgica and the research plane.

Overall organisation of the research activities

As described above, research at RBINS is organised into three thematic ODs:

- OD Natural Environment;
- OD Earth and the History of life;
- OD Taxonomy and Phylogenics;

OD Natural Environments is the largest of the three research ODs, both in terms of research staff and research budget. In 2013 the OD had 97 FTE, of which 15 FTE statutory and 51 FTE contractual scientists, and a budget of €12m. This includes the

operational costs for the research vessel Belgica and the surveillance plane (€3.1m in 2013). The staff working at the OD has a large and diverse expertise in ecology, molecular biology, nature conservation and protection, biodiversity, chemistry, hydrodynamics, modelling, databases and image processing. This expertise is applied to terrestrial, freshwater and marine environments worldwide. The OD delivers science policy support, scientific services and scientific research.

The OD Earth and History of Life is the second largest OD in terms of staff and budget, although much smaller than OD Natural Environments. In 2013 the OD consisted of 53 FTE, of which 15 FTE statutory and 25 FTE contractual scientists, and a budget of €3.8m. The OD Earth and History of Life offers fundamental and applied research in the fields of geology, palaeontology, bioarchaeology and human evolution. With the creation of this OD RBINS aimed to establish synergies between researchers from different horizons, to rationalise the research tools and to propose integrated scientific programmes. The OD has the ambition to be a reference and pioneering Centre of excellence in the field of Earth Sciences in support of the sustainable management of the georesources and of the protection of the geoheritage. In addition to performing research, the OD also offers scientific services.

In terms of scientific staff in FTE, OD Taxonomy and Phylogeny is the smallest of the three research ODs. In 2013 the OD had 32.9 FTE of which 10 FTE statutory and 10 FTE contractual scientists, and a budget of €2.2m. Research at OD Taxonomy and Phylogeny focuses on animal biodiversity and evolution. More specifically, it focuses on speciation, adaptation, biotic interactions and integrative taxonomy. Particular topics of attention are the identification of new taxa (primarily via DNA barcoding), the impact of invasive species, the importance of chemical communication in insects, the effects of habitat disruption, the reconstruction of phylogenetic relations and the creationism versus evolution debate. Although the research is largely fundamental by nature, the OD also is engaged in applied research, in services and activities for society.

Research performance

There is a significant amount of which RBINS can be proud – a strong history, a unique collection, a significant public focus through the museum, and enthusiastic and dedicated staff with an excellent collection infrastructure. The scientific collections are the “raison d’être” for RBINS. Together with the scientific activities, these contribute to the profile and visibility of the Institute.

RBINS can also be proud of its global achievements in the advancement of natural sciences, especially in recent years, as reflected in the overall publication record and the worldwide recognition of excellent work among peers and stakeholders.

The scientific activities and output of RBINS are very good. The number of RBINS’ publications in peer-reviewed, high impact journals shows a steady increase (163 in 2010 to 188 in 2013). From 2005 to 2013 there is an average annual growth rate of 6.9%. Currently the number of publications well exceeds the number of scientists. The benchmark shows that RBINS is comparable in terms of scientific output to the benchmark institutes with high performance in terms of volumes (both publication counts and citation counts).

RBINS’ scientific collections are among the largest in the world and considered a major asset of the institute with considerable international value. The collections are the basis for highly competitive research in taxonomy, phylogeny, palaeontology, and geology, with an international relevance. Maintenance of this unique treasure and promotion of its use for high-grade research should be a priority of RBINS and BELSPO.

The research activities of the RBINS are complemented with extensive environmental assessment of the North Sea and an active survey of the national geological resources. External stakeholders especially value the data acquisition activities, although these are mostly reflected in reports rather than in highly ranked peer reviewed publications. Besides their role as data providers, the scientists of the RBINS also use the acquired environmental data directly for research activities.

The research activities of the OD Taxonomy and Phylogeny are considered excellent. This OD is making best use of the rich biological collections of RBINS, and constitutes the main source of new material for developing the collections. The OD is well positioned for operating next generation sequencing techniques with its experienced staff and access to the JEMU lab facility.

With regard to the OD Earth and History of Life, the new strategy structuring geoscience in the OD is considered advantageous since it combines the expertise necessary to address the ultimate goal of this directorate: to conduct interdisciplinary, fundamental and applied research in the fields of geology, palaeontology, bioarchaeology and human evolution. The Quaternary Environments and Humans (QEH) domain is considered an asset of RBINS, as it offers the possibility of weaving more connections between all the other activities as developed within the institute.

In the domain of the natural environment, RBINS has implemented an efficient strategy, based on big questions and its expertise on both aquatic and terrestrial ecology and ecosystem modelling. The outputs are increasingly important and of high quality. The remit of the OD Natural Environment covers marine, freshwater (including ancient lakes) and terrestrial realms. This is a wide portfolio with a limited human resource. At the same time there is a desire to expand the work of the OD into the Arctic and deep waters to the west of the continental shelf. These expansions are laudable and understandable objectives, but are probably unrealistic without a significant increase in human resource. Furthermore, it was noted by the review panel that the label of “Natural Environment” could be strengthened through collaborations with specialists in the humanities and social sciences since most of the research has the combined perspective of analysing the natural dynamics with human impacts. The current understanding of the natural environment implies that human perceptions/behaviour, are an important addition to biological, geological, atmospheric component of the environment. It might also lead to additional funding opportunities as several funding bodies have interest in such an approach.

There is some room for improvement in the metrics used by RBINS as only two of the current metrics that are used by RBINS stand out as useful indicators of outputs (rather than inputs and activities): publications (for pure science) and library and collections usage (for scientific infrastructure). It is therefore recommended that RBINS should develop indicators of output, uptake, and impact reflecting RBINS’ breadth of functions, including indicators of the applied elements of RBINS’ mission, such as standard measures of satisfaction from among applied clients, or numbers of environmental impact assessments undertaken using RBINS data and expertise. Furthermore, any indicators of usage of the other scientific infrastructure (labs, vessel, plane) should also be developed and used to the benefit of RBINS.

Collections management

Collection conservation and education is a specific task for RBINS. Since the implementation of the new organisational structure this task is embedded in a specific department: Scientific Service Heritage (SSH). The SSH is responsible for the daily management of the scientific heritage, which includes collections, library and scientific archives. SSH is currently in the process of becoming ISO 9001 and EMAS certified. The establishment of the SSH is a timely and important step forward in the development of the collections of RBINS. The collections are managed more professionally after the reorganisation as it is now recognised as a separate task at RBINS. The overall assessment of the collection management and strategic positioning is very positive. Together with the scientific activities, this contributes to the profile and visibility of the Institute.

The tasks of the SSH are exercised in cooperation with the other directorates when it comes to enrichment, care, valorisation and digitisation of the collection. SSH has 37 FTE, of which the majority (78%) is non-scientific staff. Since the new structure there are six curators, who are embedded in the research groups. Nevertheless, it is advise to pay special attention to close cross-departmental cooperation and a profound understanding of the research requirements by the collection management staff, to secure a connection between collection and research policies. Additional training,

knowledge exchange across collection borders, institutional workshops, joint internal projects, and visits to other collections may contribute to further enhancing the collection management and support to users.

The general condition of the storage facilities is good and provides a solid surrounding and relatively stable climate in which to store the collections in a safe environment. However, the size of the storage facilities is limited in the light of collections growth. It is therefore recommended to re-evaluate the existing collection rooms with regard to more efficient ways of storage and use, taking into account physical limitations as to maximum allowed weights per m². Further consideration is needed for the comprehensive “wet” collections of specimens preserved in alcohol and other liquids that for safety reasons should be or even need to be stored in a separate facility.

RBINS' collection includes approximately 37 million specimens, which makes it one of the ten most important natural history collections in the world, as well as the largest in Europe after Paris and London, together with NCB Naturalis and Senckenberg Institute (all sites together). The entomology collection constitutes the largest collection in numbers of specimens. The collection is still expanding through specimens from fieldwork by researchers and collaborators (in Belgium and abroad) and donations and purchases through the research ODS. The focus is on improving the existing collection, not on investing in buying new collections.

Digitisation is an important aspect of the collection management as there is an increasing trend from physical to digital visits. The FSIs collaborate on digitization, sharing scientific staff, tools and systems. To illustrate: there are two scientists who have 50% contract at RBINS and 50% in RMCA. RBINS' strategy and approach regarding digitisation are well thought-through especially in the light of limited financial and human resources.

In 2013 248 scientific visitors visited the collection managed by SSH. The number of visitors has been decreasing since 2009, while the number of loans remained relatively stable (304 loans in 2013). The number of external researchers visiting the collection does not reflect the fact that RBINS has one of the largest collections in the world. More priority should be given to attracting scientific visitors for the collection, especially those in relation to the main research lines of the Institute. The visiting researchers are enhancing the scientific quality of both the collections and the scientific activities, by working with RBINS staff and by encouraging joint publications. Be aware that visitors studying the collections serve as ambassadors. It is advised to document and report on all visits to the collections (visitors, affiliation, duration, visit working days, the part of collections studied, the research areas, and scientific outputs). These statistics are performance indicators for the SSH and the collections and important publicity material showing the significance of RBINS' research infrastructure.

Research facilities

RBINS is responsible for the management or has ownership of a large number of research facilities. Currently RBINS seems to have the research infrastructures needed to perform its tasks. However, the two most prominent facilities, the research vessel *Belgica* and the surveillance plane, have aged and are in need for replacement. According to stakeholders, the vessel and plane are crucial for the wider Belgian scientific and policy community. Because of its need for replacement RBINS has listed a new vessel and plane as its top priority for investments. However, this seems dictated by national stakeholder interests and is not strongly based on institutional research preferences. It is not considered fair that RBINS should prioritise the renewal of the facilities in its core budget between its main activities/services, as the facilities provide mainly support to other policy areas. Budgeting of these multi-faceted facilities should be considered apart from the core of RBINS' activities. BELSPO and RBINS are recommended to review and come to a clear strategy on the budget policies and their input to these areas so as to ensure that RBINS is in a position to influence the management of policy priorities that are outside its immediate control. Given the clear and strong support of stakeholders for the continued availability of a ship, and the need of the various EC Directives, stakeholders, federal organisations and regional organisations should agree together to deliver a research vessel that will service the wide

needs of Belgium. This could be a unifying force helping new alliances to be formed, joint working to be developed and enable a security of tenure

Another prominent infrastructure is the Joint Experimental Molecular Unit (JEMU). The JEMU is the result of a successful collaboration between RBINS and RMCA. RBINS and RMCA intend to upgrade the JEMU lab into a Centre of Excellence on Molecular Systematics and Biodiversity with funding from BELSPO. Despite the constraints of RBINS' building, the staff in charge of the laboratory has made a good job with regards to ensuring the separation of pre- and post-PCR, and the optimal performance of the different machines. In general, management of this facility is considered appropriate.

To increase the visibility of RBINS' research infrastructure it would be advantageous to create a distinct portfolio including all research facilities (including the vessel and plane), which should be published on RBINS' website. This would also enhance the possibility to generate additional income by offering services for external clients.

Knowledge dissemination and visibility

Both the Museum and Institute are well known in specific fields by specific audiences. Several types of media are used to communicate about RBINS' science. Considering the capacity available (2.5 FTE) RBINS seems reasonably successful in getting press attention. Nonetheless science communication about RBINS' research can be further improved. Most importantly, there is a need of a clear strategy for knowledge dissemination; such a strategy could be instrumental in providing clarity on the main message, approach and target groups. In addition the interaction between the research and the museum could be improved and new ways of science communication could be explored (science cafes, movies, etc.). Finally RBINS could team up with other organisation in order to create more impact in science communication.

RBINS is in the process of developing a strong and clear brand that represent both the research and museum function of RBINS. This should result in a more appropriate global branding that takes into account the wide range of activities for which RBINS is now responsible. In addition it is recommended to develop a common vision for the institute as reference, a view on what the Institute and what its ODs and research groups want to achieve in order to act as an international player.

National positioning

RBINS has a unique position in the Belgian landscape because of its Museum for Natural Sciences and its collections and research infrastructures. The federal status of RBINS seems appropriate as RBINS performs national tasks, such as the management of collections and research infrastructures and the representation of Belgium in a number of international platforms and committees. These features make that RBINS is very well positioned for collaborations with partners in Belgium.

RBINS is well connected to the Belgian universities. There are mutual benefits in collaboration between RBINS and universities. For RBINS universities can be a valuable partner in applying for (international) grants and starting research projects and the influx of Master and PhD students provide access to a new generation of young researchers. Finally RBINS can access the Web of Science through the collaborations. By collaborating with RBINS, universities get access to RBINS' expertise and unique features (collection, research infrastructures).

Many RBINS researchers have part-time positions at universities. RBINS co-supervised around 60 PhD-students and around 65 Master students annually over the last five year. Of all Belgium partners RBINS has the highest number of co-publications with the universities of Gent and Antwerp, and the Catholic University of Leuven

It is worrying though that the connections with RBINS' most important partners are based on the individual networks of scientists. In the Belgian context of separate federal and regional agendas, it is crucial that RBINS develops strategic alliances with the regionally positioned universities, and explores the possibility to formalise relations with these universities.

One of the aims of the BELSPO research policy is to increase cooperation between the FSIs. RBINS is situated in the pole 'Nature' together with the Royal Museum for Central Africa (RMCA). RBINS and RMCA have overlapping research domains and work close together both in science and in (research) support services. In addition to the already existing cooperation, four domains for further collaboration are identified by RBINS:

- Research and expertise: Working together in research projects, joint research teams (programmes), joint expeditions and international projects (e.g. in Congo and writing co-publications (42 co-publications over the last 5 years);
- Research support: Increased coordination of investments, sharing research infrastructures and facilities (such as JEMU), support for (international) research projects and working together on collection management;
- Services: Explore the possibilities for shared services like an ARBO-advisor and publication service (although name, logos, etc. will protect the own identity of the both institutes);
- Support staff: Both institutes can share support staff and this will be a point of attention in hiring people.

The added value is bringing in complementary expertise, facilities and equipment but also increased efficiency of the management of the institutes. With regard to the other FSI's, there might be promising future prospects for collaboration between RBINS and the FSIs in the pole 'Space', e.g. for research on Climate Change (models) or using the next generation of satellites.

International positioning

In Europe, RBINS is one of the five leading natural history museums. RBINS has a strong national and international position and is recognised as such by relevant entities. This is illustrated by the numerous joint projects and publications with peer research and collection institutes in and outside Europe, as well as the significant input of RBINS staff to international working groups and committees. The institute is involved in all major European framework projects with leading roles.

The highest numbers of co-publications occur with researchers based in France, the US, and Germany, followed by the UK and Italy. This is followed by Russia, which shares more co-publications than the neighbouring Netherlands.

The aim of these international collaborations is to increase RBINS' capacity to access to data, exchange with foreign experts & perform on-site work within its main research domains. Instruments for international collaboration are FP7 and COST-projects, training projects, bilateral agreements and MOUs, membership of several platforms, networks and associations and visiting researchers.

RBINS is very well positioned internationally, but its activities seem very much opportunity driven and based on the networks of individual scientists. As international collaborations are considered a growth area for RBINS, it is recommended to develop a clear and well-elaborated international strategy. Elements of this strategy should be:

- A regularly evaluation of the status and significance of (existing, emerging or possible) networks by RBINS' management in order to assess their strategic relevance for RBINS. Complementing bottom-up initiatives with attention from the management on additional actions may benefit the Institute in various ways.
- Consideration for the national versus international focus of RBINS. Conducting research with a wide reach to many continents is laudable, but probably not sustainable. The size of individual RBINS groups is quite small, and collaborations with many outside groups should be justified by added value for delivery.
- To put more attention to the international significance of RBINS' scientific collections as important international research infrastructure. Research infrastructures offer unique research services to users from different countries, attract young people to science, and help to shape scientific communities. It is

recommended to consider further steps in the European cooperation of big natural science collections in the framework of the ESFRI process.

Policy impact

RBINS provides a number of services to governments, some of these policy services being part of legal or regulatory obligations or the outcome of international treaties and conventions. RBINS represents Belgium also in a number of cases at the international level (e.g. within the framework of treaties and conventions). Each OD has staff dedicated to the performing (policy support) services for clients. The main reason for clients to go to RBINS for services are its specific expertise in certain domains and the broad set of disciplines, which allows a more interdisciplinary approach.

The overall impression is that RBINS is doing a very good job in providing services: RBINS is a reliable and responsive partner, the quality of the work is of high level and the services are timely and adequate. Furthermore, RBINS seems to understand the policy context very well and there are examples that RBINS services had a significant impact on political decisions. RBINS has also a good reputation in the international policy making context.

RBINS has no pro-active strategy to acquire new clients for services. The main driver is to support decision-making in general, rather than to increase third party funding. Providing services to governments in Belgium can also help to better position RBINS: building close relations might prevent governments from political decisions that have a negative impact on the institute.

Recommendations

This evaluation has resulted in the following recommendations for RBINS:

- Revisit and focus your mandates with BELSPO and develop a more coherent strategic plan with a rationalised portfolio of tasks and budgets. This plan should be communicated to the staff so that they can fully engage and understand their contribution to the organisation.
- Explore with the Building Agency how the effectiveness and efficiency of the procedures concerning renovation and improvement can be improved.
- Evaluate the new organisational structure at regular intervals.
- Review the mandate of the Scientific Advisory Council.
- Together with governmental authorities explore to which extent RBINS can increase its autonomy, going into contract with funding agencies and as an employer recruiting staff independently.
- Complement the bottom up approach currently applied in strategy development with a top down strategy developing a common vision and profile for the institute, promoting multidisciplinary research between ODs (currently underdeveloped) and fostering networking with other national and international organisations.
- Develop a clear communication and dissemination strategy about RBINS' research, which specifically addresses the opportunities for collaboration with organisations in science communication.
- Develop an "external income" strategy with particular focus on the value provided to any given contract by RBINS' biological collections and research infrastructure (e.g. developing a heritage service charge and charge-out rates for the use of the infrastructure; support in project management).
- Give more priority to attracting scientific visitors for the collection, especially those in relation to the main research lines of the Institute.

- Put more attention to the international significance of the collections as important international RI and to increase the European cooperation in the framework of the ESFRI process.
- Review and come to a clear strategy on the budget policies regarding the *Belgica* and the research plane that are operated on behalf of the federal authorities, to ensure that RBINS is in a position to influence the management of policy priorities that are outside its immediate control.
- Develop strategic alliances with universities, and explores the possibility to formalise relations with universities.
- Develop a clear international strategy and regularly evaluate the status and significance of (existing, emerging or possible) networks in order to assess their strategic relevance for the Institute. Research collaborations with many outside groups should be justified by added value for delivery.
- Develop indicators of output, uptake, and impact reflecting RBINS' breadth of functions, including (more specific) indicators of the usage of collection and the other scientific infrastructure (labs, vessel, plane) and indicators of the applied elements of RBINS' mission, such as the satisfaction among clients.

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