

# Strategic Plan 2019 - 2024

---

2019-02-20

ISP Dnr 2019/23-4

## Contents

<b>1</b>	<b>Summary</b> .....	<b>1</b>
<b>2</b>	<b>ISP’s Operational Model</b> .....	<b>3</b>
2.1	<b>ISP’s Vision, Mission and Goals</b> .....	<b>3</b>
<b>3</b>	<b>Strategic Plan and Actions 2019-2024</b> .....	<b>4</b>
3.1	<b>General strategies</b> .....	<b>4</b>
3.1.1	Long Term Support to Scientific Research Groups and Networks .....	4
3.1.2	Sandwich PhD training .....	4
3.1.3	Local ownership, collegiality and improved conditions .....	5
3.2	<b>Review of 2013-2017 strategies</b> .....	<b>6</b>
3.2.1	Fields of Science.....	6
3.2.2	Selection of Target Countries.....	7
3.2.3	Mode of Operation .....	7
3.2.4	Systematic Approach to Monitoring, Follow-up and Evaluation.....	12
3.2.5	Gender equality promotion .....	13
3.2.6	Communication Strategy .....	14
3.2.7	Collaboration Strategy .....	15
3.2.8	Funding and Extension of the Program.....	17
3.3	<b>New strategies 2019-2024</b> .....	<b>19</b>
3.3.1	Baseline analysis and development chronology .....	19
3.3.2	Introducing a more clearly time-bound modality of support.....	19
3.3.3	Improved procedures for the Scientific Reference Groups .....	20
3.3.4	A post-doctoral scheme .....	21
3.3.5	Making better use of previously supported partners .....	22
<b>4</b>	<b>References</b> .....	<b>22</b>
	<b>Appendix 1. ISP in a Theory of Change Perspective</b> .....	<b>24</b>
	<b>Appendix 2. Logical Framework for ISP</b> .....	<b>27</b>

## 1 Summary

Uppsala University established the International Science Programme (ISP) in 1961. ISP provides long-term support to institutionally based research groups (RG) and scientific networks (SN) in developing countries, to attain sustainable research activities and postgraduate training in the basic sciences physics, chemistry and mathematics. In a long-term perspective, the resulting outcomes and acquired skills are expected to favorably impact society.

**ISP's vision** is that development challenges are efficiently addressed in partner countries through increasing scientific knowledge.

**ISP's mission** is to strengthen the scientific knowledge, research capacity and postgraduate education in the basic sciences chemistry, mathematics and physics in countries where such capacity is non-existing or weak.

**Objectives:** In the period 2019-2024 ISP will strive to achieve the following specific objectives:

- 1) To improve supported partners' ability to
  - a) plan, manage, and carry out high-quality scientific research,
  - b) train high-quality postgraduates at the Master and PhD levels,
  - c) disseminate research results at high-quality venues,
  - d) on a longer term, use research results and acquired skills and engage in outreach activities having a favorable impact on society.
- 2) To improve the gender equality in supported RG and SN.
- 3) To increase supported partners' financial independence of ISP, with the ultimate goal of becoming self-sufficient and sustain on grants awarded in open competition.
- 4) To make better use of previously supported partners in the development of new support.

### General strategies

- To support scientific research groups in partner countries to develop their research activities and postgraduate training.
- To support scientific networks, linking scientists in partner and other countries.
- To facilitate partners' collaboration with better resourced host institutions.
- To build on local, needs-based ownership of research activities and training, applying a collegial approach to collaboration, and with a focus of improving the local conditions for developing scientific activities.

### Strategies proposed in the 2013-2017 plan, that will continue

- To focus on supporting physics, chemistry and mathematics in present partner countries and to develop new collaboration in additional countries, where there is a need, and to promote interdisciplinary cooperation.
- To further increase the transparency in the "application by invitation" modality.
- To continue contributing to the enhancement of quality at all levels with supported partners, including establishment of a well-developed academic and scientific research culture.
- To continue increasing supported partner's skills with regard to financial management.
- To develop and implement guideline criteria for the phase out of ISP support.
- To refine the monitoring and evaluation of ISP's performance to better show the results and the efficiency of the program.

- To continue promoting gender equality among supported partners.
- To continue increasing the visibility of the program
- To continue supporting research groups in complementarity with Sida’s bilateral programs and facilitate regional cooperation.
- To continue cooperation with other organisations to the benefit of the program.

**New strategies 2019-2024**

- To develop and implement an instrument for systematic baseline assessment and chronology of capacity development stages with supported partners.
- To develop an instrument for periodical planning of progress expectations with supported partners at a time course over a number of support agreement cycles.
- To further develop the Terms of Reference for, and operation of, the Scientific Reference Groups to obtain a more coherent scientific review and support process.
- To clarify the possibility to budget postdoctoral activities within awarded allocations.
- To increase the use of capacity built in research groups and networks to facilitate the strengthening of more recently introduced partners.

An ISP “Theory of Change” model and a refined results framework is appended.

*A conceptual representation of an ISP’s Theory of Change model*

<p><b>1. ISP’s MISSION</b>  <b>To strengthen the scientific knowledge, research capacity and postgraduate education in the basic sciences chemistry, mathematics and physics in partner countries where such capacity is non-existing or weak.</b></p>	<p><b>2. ISP’s OUTPUTS</b>                  To provide long-term support to institutionally based research groups, to develop research activities and postgraduate training, and scientific networks, promoting their cooperation and sharing of resources, build on local, needs-based ownership of research activities and training, applying a collegial approach to collaboration, and with a focus of improving the local conditions for developing scientific activities and a culture of scientific research</p>
<p><b>3. BASIC OUTCOMES</b>                  In up to 5-15 years’ time, funding, collaborative links and mentoring/ guidance are expected to result in:                  - Better resourced research groups and scientific networks                  - Training of staff and students to MSc and PhD level with collaborating partner or locally                  - MSc and PhD programs being developed                  - Better conditions for scientific research</p>	<p><b>4. INTERMEDIARY OUTCOMES 1</b>                  In up to 5-30 years’ time, an improved ability to produce scientific results.                  - More staff members are trained to PhD level                  - Scientific results are being produced and disseminated                  - Academically strong MSc and PhD programs have developed                  - Research leadership and management are improved                  - A research culture is established                  - Improved gender balance</p>
<p><b>5. INTERMEDIARY OUTCOMES 2</b>                  In up to 10-30 years’ time, an established ability to produce scientific results.                  - Increased production of postgraduates                  - Stronger research groups, with local PhD programs.                  - Laboratories at sufficient standard to carry out quality research                  - More quality research publications, more of international conference contributions,                  - Increase in non-ISP funding                  - More qualified women scientists                  - Increased management skills</p>	<p><b>6. LONGER TERM OUTCOMES</b>                  In up to 15-40 years’ time, continued development of research activities independent of ISP support, implying quality scientific research relevance own country and region, addressing development challenges, and continued training of skilled graduates contributing to society</p>
<p><b>7. VISION</b>                  Development challenges are efficiently addressed in partner countries through increasing scientific knowledge</p>	

## 2 ISP's Operational Model

Uppsala University (UU) established the International Science Programme (ISP) in 1961 (Lindqvist, 2001).

There are currently three programs:

- The International Programme in the Physical Sciences (IPPS), dating back to 1961,
- The International Programme in the Chemical Sciences (IPICS), started 1970, and
- The International Programme in the Mathematical Sciences (IPMS), started 2002.

ISP provides support to institutionally based research groups (RG) and scientific networks (SN) in developing countries, to attain active and sustainable research and postgraduate training in the basic sciences physics, chemistry, and mathematics. The support is collaborative, flexible, and long-term, and is managed on a collegial scientist-to-scientist basis with a strong ownership of activities at the receiving side. “Sandwich” PhD programs are employed to maintain a high retention of graduates, while local PhD programs are being developed. Regional cooperation gives access to advanced equipment, and contributes to reaching a critical mass of intellectual capital.

ISP usually starts support at a stage where the infrastructure and capacity needed to carry out research is scarce, where no domestic research funding is available, and where there is limited possibility to attract external funding. Therefore, ISP practises application by invitation targeting tentative partners in such situations. Consequently, the long-term aspect of ISP collaboration is significant in the development of supported partners to become self-sufficient and sustain on grants awarded in open competition. In a long-term perspective, the resulting outcomes and acquired skills are expected to favorably impact society.

### 2.1 ISP's Vision, Mission and Goals

**ISP's vision** is that development challenges are efficiently addressed in partner countries through increasing scientific knowledge.

**ISP's mission** is to strengthen the scientific knowledge, research capacity and postgraduate education in the basic sciences chemistry, mathematics and physics in countries where such capacity is non-existing or weak.<sup>1</sup>

In the period 2019-2024 ISP will strive to achieve the following specific objectives:

- 1) To improve supported partners' ability to
  - a) plan, manage, and carry out high-quality scientific research,
  - b) train high-quality postgraduates at the Master and PhD level,
  - c) disseminate research results at high-quality venues,
  - d) on a longer term, use research results and acquired skills and engage in outreach activities having a favorable impact on society.
- 2) To improve the gender equality in supported RG and SN.
- 3) To increase supported partners' financial independence of ISP, with the ultimate goal of becoming self-sufficient and sustain on grants awarded in open competition.
- 4) To make better use of previously supported partners in the development of new support.

---

<sup>1</sup> ISP's mission has been formalized by the Swedish government (Ordinance UHÄ-FS 1988:18).

### 3 Strategic Plan and Actions 2019-2024

ISP's support modality has over the years developed into a general model of operation. Where successful, the model – the manner and approach – has been confirmed as valid and economic, where less successful, the model has been changed. As a result, a number of general strategies developed in earlier years continue to be deployed. In the 2013-2017 Strategic Plan, a number of specific areas were identified to further improve the operation of the program. Some of those strategies have been implemented and some require continued attention and development. For the period 2019-2024, additional strategies are outlined to further improve the program.

#### 3.1 General strategies

##### **General strategies**

- To provide long-term support to scientific research groups in partner countries, to develop their research activities and postgraduate training, and scientific networks, linking researchers in partner and other countries, promoting their cooperation and sharing of resources.
- To facilitate partners' collaboration, exchange, and "sandwich" PhD programs with better resourced host institutions.
- To build on local, needs-based ownership of research activities and training, applying a collegial approach to collaboration, and with a focus of improving the local conditions for developing scientific activities and a culture of scientific research.

##### 3.1.1 Long Term Support to Scientific Research Groups and Networks

The strategy to apply long-term support to institutionally based scientific research groups in partner countries to facilitate their development of research activities and postgraduate education in the basic sciences physics, chemistry, and mathematics, started to be discussed in the early 1980's and has been generally applied since the end of the 1990's (Lindqvist, 2001; Sundin, 2013). Lindqvist (2001) stressed that *"developing a local research capacity of significance could involve ten years or more, and even a master's degree, which may be a small component thereof, is a matter of 2–3 years."*

The strategy to facilitate and support the creation and maintenance of scientific networks, linking scientists in partner and other countries, promoting their cooperation and sharing of resources, started to be discussed in the early 1980's and has been applied generally since the end of the 1990's (Lindqvist, 2001; Kiselman, 2011; Sundin, 2011). According to Lindqvist (2001), *"An important part of the ISP activities is the regional exchange system, whereby members of research teams from recipient countries visit laboratories in neighbouring countries where complementary research facilities and competence are available. [...]. Such exchange has in some cases developed further, into the establishment of active regional scientific networks, administrated by the scientists in the region concerned."*

##### 3.1.2 Sandwich PhD training

The strategy to facilitate partners' collaboration and exchange with better resourced host institutions, in the north and in the regions, has been practiced since 1979 (Lindqvist, 2001). A model for "sandwich" PhD training was outlined already in 1967, and started to be implemented in the 1980's (Lindqvist, 2001; Andersson, 2017).

The sandwich student alternates between the home institution and a better resourced scientific host institution. The model is generally applied when no degree program is available at the home university – the student is then registered with the host. Once the home university establishes a degree program students usually register at home, but local training

may still be alternated with periods at a better resourced host. When a degree program is well established at the home university, most students are trained there, and sandwich graduates from earlier phases may now be PhD advisors.

### 3.1.3 Local ownership, collegiality and improved conditions

The strategy to build on local, needs-based ownership of research activities and training was emphasized by Lindqvist (2001): *“A starting point [...] has always been the situation in the respective countries. Projects should be designed as much as possible according to how the cooperation partners envision them. [...] This means by necessity that we must be flexible in our operations. Further, there must be the aim to transfer as much as possible of the responsibilities to the [supported partners].”*

According to ISP (2003), *“Ownership, to plan and decide about activities and budget, is and should be with the supported groups/networks. ISP will continue to transfer administration and handling of funds as far as the local situations permit.”*

The importance of transferring responsibility to direct and manage funds locally, is strongly supported by a recently published study (Honig, 2018), drawing on a novel database of over 14,000 discrete development projects across nine aid agencies, where it is concluded that *“aid agencies will often benefit from giving field agents the authority to use their own judgments to guide aid delivery”*, because *“high-quality implementation of foreign aid programs often requires contextual information that cannot be seen by those in distant headquarters”*. Translated to the operational modality of ISP, the strong ownership by research groups and scientific networks, combined with a flexibility in the use of funding depending on how the local conditions develop, may be factors that contribute significantly to the efficiency of the program.

The local ownership is further strengthened by *“having senior scientists from developing countries [...] involved in the planning and evaluation of the projects”* (Lindqvist, 2001). This is reflected in the fact that in the scientific reference groups (SRG; see Section 3.3.3), composed by renowned senior scientists, half of the members come from the regions where ISP operates. A SRG was introduced at an early stage (before 1990) by the physics program, in 2001 by the chemistry program, and from the start 2002 by the mathematics program.

The program directors, the SRG members, and most members of ISP’s Board, are well-established scientists with profound experience of competing for grants, conducting research, dissemination of results, and supervising graduate students. Hence, the interactions with supported partners are of collegial nature involving mutual learning processes (see further Section 3.2.3, “Quality enhancement of research activities”).

A major reason why the original fellowship modality was abandoned, was the realization that the conditions facing the trained participants upon returning to their home institutions didn’t allow for continued research activities (Lindqvist, 2001). With the introduction of the capacity building modality directed at institutionally based scientific research groups and networks, the improvement of local conditions became a major goal, but nevertheless, in many cases, a considerable challenge still to date. The long-term commitment is necessary to address this. *“The project grants, allocated after application, may be used not only for the exchange of scientists and training of technicians, but also for purchase of equipment or of chemicals and other material to support the local research environment. [...] Grants may also cover the arrangement of courses or conferences, often involving the participation of scientists from the host laboratories.”* (Lindqvist, 2001)



## 3.2 Review of 2013-2017 strategies

### **Strategies proposed in the 2013-2017 plan, that will continue**

- To focus on supporting physics, chemistry and mathematics in present partner countries, and to establish and develop new collaboration in additional countries, where there is a need, and to promote interdisciplinary cooperation.
- To further increase the transparency in the “application by invitation” modality.
- To continue contributing to the enhancement of quality at all levels with supported partners, including establishment of a well-developed academic and scientific research culture.
- To continue increasing supported partner’s skills with regard to financial management.
- To develop and implement guideline criteria for the phase out of ISP support.
- To refine the monitoring and evaluation of ISP’s performance to better show the results and the efficiency of the program.
- To promote gender equality by working to raise consciousness about the gender bias, and the importance of gender equality, mainstreaming and equal opportunities, among supported partners.
- To continue increasing the visibility of the program and provide information about ISP at available venues.
- To continue supporting research groups in complementarity with Sida’s bilateral programs and facilitate regional cooperation.
- To continue cooperation with other organisations to the benefit of the program.

In the Strategic Plan 2013-2017, particular needs were identified requiring further development of the ISP model. These needs were expressed in a number of strategies to guide the planned development. Below account provides a brief review, and suggests which strategies should be abandoned or should continue during 2019-2024.

### 3.2.1 Fields of Science

Background: In 1961, ISP started in physics. The good results led to the introduction in 1971 of a chemistry program. In 2002, mathematics was added following recommendations in an evaluation. The same evaluation recommended introduction of programs in biology and geosciences, which, however, has not yet been realized.

Current situation and proposed development: For 2014-2017, ISP adopted the strategy to stimulate increased interdisciplinary cooperation within supported activities with scientists of other fields or faculties, and to explore possibilities to open support to other fields within natural sciences and technology.

Although a degree of increased interdisciplinary cooperation has been noted in a few cases (for example interactions with sociologists, and participation from a wider field of science in regional networks), efforts to stimulate such cooperation has been modest. It is finally up to each supported partner to decide on such direction and nothing that ISP should “impose”. Suggesting such widened collaboration may, however, still be justified. In fact, according to Lindqvist (2001), “*expansion of a project to a multidisciplinary approach*” was mentioned already in the early 1990’s as an indicator of favorable development.

Exploring possibilities to open up support in other fields of science is a task that requires considerable time and resources, and it has not been addressed in the previous period, although considerable efforts have been spent to explore the possibilities to attract the supplementary funding needed to embark on such an endeavor (see 3.2.8). While the option still is of interest, efforts to realize this will not be pursued actively in the next period, since it is beyond ISP’s current scope and draws too much of resources from the regular operation of the core program.

Strategy: To promote interdisciplinary cooperation in the development of partner's research activities.

Action: Bring the notion up with supported partners and their collaborator in presentations and discussions during meetings and field visits.

Expected outcome: Research results and acquired skills of a broader nature, better fit to contribute to understanding and addressing development challenges.

### 3.2.2 Selection of Target Countries

Background: The selection of target countries for ISP support has changed over the years. In the past, ISP has had the mandate to operate in “least developed” countries, often meaning “low income” countries. When the classification shifted ISP phased out support, for example in a number of Latin American countries. From 2008, ISP was confined to place Sida-funded support in twelve “focus countries”, prioritized by the Swedish government. Since then, ISP has continued to develop its Sida-funded support in these and a few additional countries subject to later priority, in consultation with Sida's Unit for Research Cooperation. Moreover, thanks to a contribution from Stockholm University starting in 2011 ISP could continue supporting partners in Laos, a country not prioritized from 2007.

Current situation and proposed development: For 2013-2017 ISP had the strategy to continue to establish and develop collaboration in physics, chemistry and mathematics in priority countries, and to develop support to research groups in other countries together with new financial partners, identify synergies and complementarities with other organizations providing development support, and consider to what extent new undertakings may complement existing support.

In the previous period, new support was initiated in Bolivia (chemistry), Myanmar (mathematics and physics), and Zimbabwe (physics). Bolivia also receives Sida bilateral support to research development, but at two other universities than the one hosting the chemistry research group.

In 2019-2024, ISP plans to continue activities in the current scope of countries, but considering support in a few additional countries when justified. Target countries will be low- and lower middle-income countries with a particular emphasis on fragile states. New support in additional countries where there is a need can be considered when financial resources become available, for example after cases of phase-out of current support, and in consultation with Sida. Efforts to identify synergies and complementarities with other organizations providing development support will continue.

Strategy: Establish and develop collaboration in physics, chemistry and mathematics in additional countries, where there is an identified and documented need.

Action: Select countries and initiate new support by applying the strategies described in this plan.

Expected outcome: Strengthened universities in additional countries where the development of research in basic sciences is non-existing or weak.

### 3.2.3 Mode of Operation

#### *Invited applications and competitive calls*

Background: ISP is practicing “application by invitation”, because support is normally initiated in environments where the research capacity has to be strengthened before competition for grants in open calls may be successful.



In the 2013-2017 Strategic Plan, ISP considered the need to increase the transparency and competition in this process, both within institutions, and between universities in a country. The strategy to increase the transparency and competition of the invitation process within institutions has been gradually implemented and applied to new support, in fact since 2008, and is now practised as the rule. Besides the department of interest, initial contacts must include the appropriate level of university governance, where the possibility of ISP support is presented. The mutual prospects, implications, commitments and expectations should be discussed and established on these occasions. If agreement is reached, the department is invited to apply for ISP funding. Several competing applications may be submitted for review. From the beginning, it is stressed that funding, even if focused on one or a few research areas, is also intended as a common benefit for the development of the department as a whole. Synergies and complementarities with other existing support programs at the target university are important.

Current situation and proposed development: The strategy to increase the competition between universities in a country has not yet been applied but is planned for the next period, for example in the development of mathematics and physics support in Bolivia.

Strategy: Continue inviting for new support at a competitive basis at the university level, and implement a modality for invitation of support on a competitive basis at the country level, when considering the initiation of research group support.

Action: Identify and pursue cases where the strategy can be implemented, following needs assessment based on desk studies, field visits, and discussions with representatives of the concerned institutions, and applying the strategies outlined in Sections 3.3.1 and 3.3.2.

Expected outcome: Identifying the partner most suited for support in a transparent process.

### ***Quality enhancement of research activities***

Background: The development of ISP's support modality to focus on building and strengthening capacity for scientific research and postgraduate training has been paralleled by the introduction of important values leading to the establishment of an academic structure, a scientific culture, and recognition of ISP's partners by the international scientific community. The importance of this was emphasized by Hasselgren and Åkerblom (2001): "*In capacity building it is not the immediate research results that are most important, but the creation of a scientific culture and the building up of a scientific community that can serve the surrounding society [...].*" This has been facilitated through the follow-up of supported activities in visits and meetings, discussing activities and progress in perspective of the local conditions.

The collegial mentoring process by fellow scientists includes asking questions, becoming aware of obstacles, and giving recommendations and advice, providing consultations, giving and attending seminars and workshops, and guiding the scientific approach to research. It also embraces postgraduate students, training locally and in sandwich programs. Besides ISP staff, the scientific reference group members as well as collaborating scientists and hosts play a major role in these processes.

In the past, the success of abovementioned efforts has been accounted for at several occasions. For example, professor Mohammed Mosihuzzaman, Department of Chemistry, Dhaka University, Bangladesh, expressed: "*Close relationship with IPICS has tremendously developed the scientific research capability at Dhaka [University] both by transfer of knowledge and infrastructure development. Equally important, if not more, development has taken place in the creation of an atmosphere of research at Dhaka [University] where higher studies by research was hardly present. The culture of science and research has been rooted first at DU and recently at BIRDEM.*" (Mosihuzzaman, 1961)

The physics research group on Molecular Desorption and Laser Spectroscopy, Department of Physics, Escuela Politecnica Nacional, Quito, Ecuador, headed by Dr. Edy Ayala, was supported from 1992 to 2006. In a recent review (Andersson & Sundin, 2017) the group was found still being active in research and postgraduate training. A letter from Dr. Ayala received already in May 2007 stated the following: “*Before IPPS support, we did not have any research, nowadays we have two well equipped labs, three of our [colleagues] have reached their PhD degrees and a couple of us have been training in several labs of your [...] country. Several undergraduate projects and local and international publications have been carried out. And, perhaps the most important, the labs are still running with new plans and ideas for growing them up.*”

In an overview of past ISP support in Sri Lanka and Thailand (Andersson & Zdravkovic, 2017), two leaders of physics research groups in Sri Lanka witnessed as follows:

*"The most important thing is that they [ISP] have introduced the research culture to this department (...). Before Uppsala came we did not have any research. We had some project but not in this scale. People didn't know how to do basic research. When you send students to Uppsala they come to know how to do research and so other many other things. That culture wasn't here. We didn't have any facilities to get journal articles, a lot of people didn't know about journal articles so that exposure was great. [...]. That culture is still there in a lot of groups. People talk about research."*

*"From the ISP support we got reputation among the scientific community. That is the best thing we got. We published and interacted with foreign research and were introduced to foreign research and they knew us by name. So that reputation we could not have got without ISP. Even when we apply for local grants we have all the publications and we have the background so the chance to get the grant is very high."*

Current situation and proposed development: Quality enhancement and assurance is an integrated part of ISP's operation, and a number of direct quality measures have been included in the follow-up of the activities of supported partners. These measures include the quality of scientific publications, of conference contributions, and of PhD programs.

In the 2013-2017 strategic plan, ISP aimed to contribute to the quality enhancement of MSc and PhD programs at the institutional and science faculty levels, for example by facilitating contacts between Units of Quality Assurance at Swedish universities and at partner universities. ISP also meant to stimulate and contribute to quality enhancement at the wider faculty and university level, where feasible.

ISP continues to stress the need for high quality in research, both with supported partners and with the wider faculty and university levels, but has so far not involved Units of Quality Assurance at Swedish universities in the process. The strategy to provide tools for partners' scientific quality enhancement, including research planning and management, and skills in writing research proposals, ultimately facilitating their efforts to attract competitive funding, was intended to be strengthened from 2008. The introduction of the planned activities – workshops, seminars, and training exercises – was however delayed, and did not start until in 2016, when a specific strategy for Scientific Quality Enhancement begun to be implemented. Since then, considerable staff time has been devoted to conducting above-mentioned activities during visits at supported partners and in conjunction with scientific reference group meetings, correspondingly extended.

Still, to strengthen the scientific culture, ISP recognizes the need to emphasize more strongly the need to introduce academic planning, including regular seminar series and the introduction of individual study plans for postgraduate students where this is lacking.

Strategy: Continue contributing to quality enhancement at all levels with supported partners.

Action: Thoroughly discuss the necessity of academic planning and a well-established research culture to obtain high quality research and outcomes with supported partners, their institutional leadership, and collaborators in presentations and discussions at field visits, meetings and workshops.

Expected outcome: Higher quality research and research outcomes in settings characterized by a well-developed academic and scientific research culture.

### ***Scientific coordination and administrative support***

Background: ISP's scientific coordination and administration of the core program has continued to develop in the previous period, improving practices in consultation with Sida's Unit of Research Cooperation and external auditors. The scientific coordination is closely linked to quality enhancement of research activities (see above). In developing administrative procedures, reporting of research results and outcomes of supported activities have been improved, and financial accountability requirements on partners have been strengthened.

Current situation and proposed development: For 2013-2017, the strategy was "*to continue to develop collaboration with groups and networks on the basis of collegiality and to provide administrative support based on modern university practices.*" The ultimate ambition is to enable groups and networks to entirely manage activities and grants by themselves. In addition, the strategy was to strengthen local ownership and commitment by accepting an overhead cost on money transferred for local use. Another ambition was to make attempts to improve the financial reporting by including assessment of institutional in-kind contributions.

In many cases, the local management ability has improved with supported partners. In other cases, the improvement needs are mainly at the faculty or higher levels at universities of supported partners, which is beyond ISP's immediate sphere of influence. However, efforts to strengthen financial management will continue in the coming period, with a particular emphasis on transparency and accountability in governance and management.<sup>2</sup>

The acceptance of overhead costs on funds transferred for local use has been implemented, as established by ISP's Board in 2014, on the conditions that it has been previously decided and documented by the appropriate institutional body (department/faculty board, or at higher university governing level), and is applied equally to all grants received.<sup>3</sup> An evaluation is, however, called for to determine to which degree these conditions have been fulfilled when institutional overhead costs are given in the yearly statements of accounts of local use of funds.

Assessment of institutional in-kind contributions and co-funding of ISP's partners has been successfully implemented and has been reported yearly, on the aggregated level, beginning with the annual report 2015.

Strategy: Continue increasing supported partner's skills and accountability with regard to financial management.

Action: Develop, communicate and implement improved templates and guidelines for financial management and reporting, for conducting local audit, and for increased transparency and accountability in research governance and management

Expected outcome: Less dependency of supported partners on ISP's administration.

---

<sup>2</sup> As laid down in ISP's Counter Corruption Policy 2019

<sup>3</sup> The percentage should be indicated and which kinds of costs are covered, as well as information about at which administrative level the percentage has been decided.

### *Exit strategy*

Background: Once the achievements and quality attained by ISP's partners allow for successful competition and attraction of other funding, permitting continued development independent of ISP support, ISP will consider phasing out its support. Usually, a three-year final "bridging" grant has been awarded.

In the previous period, the fate of 49 research groups and eight scientific networks phased out of support in the period 2003-2011 was investigated (Andersson & Sundin, 2017). A large majority (44; 77%) of these groups and networks was phased out due to external factors, most of them because countries raised to a development level "exceeding ISP's mandate of support" (29), and the remaining 15 because of the Swedish policy change in 2007 (see 3.2.2). Nine were phased out of support because they had reached sustainability and four because of lack of progress.

However, 30 of those 44 phased out of support because of "raised country development level" proved to have reached sustainability, and had continued research activities on other funding. Regarding those 15 phased out of support because of the Swedish policy change in 2007, ten are now back on ISP support, partly using Stockholm University funding. The remaining five of those are still active in research to various degrees, resting on other funding.

Considering the 47 partner groups and networks phased out of support, and not brought back on ISP funding, 37 were continuing activities when contacted in 2016, whereas one network had ceased activities because its objectives were fulfilled. Thus, totally 81% of partners that were completely phased out of ISP support 2003-2011 were "cases of success".

Current situation and proposed development: According to the 2013-2017 strategic plan, ISP decided to recognize the achievements of the partners phased out of support by introducing a "certificate of collaboration," a document that might help in facilitating the attraction of new funding. ISP also expressed the ambition to continue collaboration with groups and networks no longer supported, as scientific partners and resources, contributing to the development of activities still supported.

In the previous period, the distribution of certificates of collaboration was accomplished, and the practice will continue as part of ISP's regular operation. However, a structured approach to continue collaboration with groups and networks no longer supported is still lacking, and therefore important to develop in the coming period (see Section 3.3.5).

Another urgent need is to establish criteria to guide the phase-out process, as stressed by Andersson & Sundin (2017). Only in nine cases phase-out of support was decided because sustainability was reached (and, in one case, because the objectives were attained). Such appraisals have hitherto been made by the responsible program director in consultation with the reference group, and have been based on experience with the program and a profound knowledge of the partner's development and activities. This procedure might be seen as arbitrary and not enough transparent. Consequently, a more structured approach to the assessment of partners' ability to sustain by competing for grants – which is the ultimate aim of ISP support – needs to be put in place, and a guideline to be developed for that purpose, including milestone criteria or some corresponding notion. Factors to consider might be the reinforcement of partners' competence by raising the numbers of PhDs in the staff, a high rate of graduation of MScs and PhDs of high quality in well-established local training programs, and a high rate of dissemination of research results in quality journals and at international conferences, and sufficient attraction of other research funding to allow for continued activities.

Such a guideline, paired with the appropriate documentation, will be of great value in support of the appraisal of the program directors and the reference groups, considering the overall conditions and context with each partner approaching sustainability.

Strategy: Develop and implement guideline criteria for the phase out of ISP support.

Action: Communicate and apply criteria at field visits and meetings, in particular Scientific Reference Group meetings, and link to the strategies proposed in Sections 3.3.1 and 3.3.2.

Expected outcome: A better structured procedure for phasing partners out of support once they are considered ready to sustain activities on other funding.

### **3.2.4 Systematic Approach to Monitoring, Follow-up and Evaluation**

ISP has since the beginning of the 1990's monitored a number of result and performance indicators (Lindqvist, 2001). The indicators have included numbers of Master's and PhD graduations, publications, and contribution to and the arranging of scientific meetings. The gender distribution of staff/students has been monitored. Expenditures of supported groups and networks, information about collaboration partners, and exchange and training of staff and students have been registered.

The monitoring system has been stepwise modified and refined. New guidelines for annual reporting, provided by Sida in 2009, have been applied starting with the Annual Report 2010.

Current situation and proposed development: In the Strategic Plan 2013-2017, ISP adopted the strategy to apply a Results Based Management (RBM) approach to an improved monitoring and evaluation system. ISP also expressed the ambition to conduct regular evaluations of activities, and of the quality of results. Furthermore, it was intended that tracing of alumni would be carried out systematically, and that impact studies should be done in collaboration with social scientists.

A RBM approach to monitoring was indeed introduced, and a number of new indicators were developed (ISP, 2013; ISP, 2016). The value of this system, in terms of the performance indicators, has recently been evaluated, internally and in consultation with Sida. As a result, it is suggested that for yearly monitoring the following indicators are continued:

- 1) ISP scientific reference group rating of received applications.
- 2) Expenditures in relation to final yearly budgets.
- 3) Number of admitted PhD students remaining or graduating/year.
- 4) Duration of study of graduating PhDs.
- 5) Number of yearly Doctoral graduations.
- 6) Number of yearly Master's graduations.
- 7) Total number of yearly scientific publications, and proportion in indexed journals.
- 8) Total number of yearly conference contributions, and proportion international.
- 9) Gender proportion of staff.
- 10) Gender proportion of postgraduate students and graduates.
- 11) Yearly amount of funding granted from other sources than ISP.

A refined RBM framework (Appendix 2) takes the starting point in the specific objectives, and listing important expected outcomes linked to the corresponding yearly performance indicators as given above. In some cases, expected outcomes are more of long-term nature and will be followed up at longer intervals.

Consequently, as a quality measure of PhD programs, publications before and after dissertation will continue to be followed, although not on a yearly basis, and – as already practiced – using bibliometric methods. Previously used indicators of policy influence, outreach activities, awards and honors, and use of research results and staff skills, will be abandoned as yearly quantitative indicators, but the data will continue to be collected and might be selectively and qualitatively presented in the annual reports and subject to evaluation. Furthermore, the relation of the research work and results of ISP's partners with the Sustainable Development Goals will continue to be monitored.

The selected yearly indicators will continue to be presented as aggregated data in annual reports, but more of longitudinal analyses, of individual partners' performance over the years, will be carried out and reported.

ISP has embarked on several evaluation and impact studies. Most notably are a review of former collaboration in Sri Lanka and Thailand (Andersson & Zdravkovic, 2017), the review of phased out groups and networks accounted for in Section 3.2.3 (Andersson & Sundin, 2017) as well as externally assigned evaluations of the networks EAUMP (Singul *et al.*, 2017) and MSSEESA (Beenken *et al.*, 2018). The experiences of the EAUMP and MSSEESA evaluations provide the foundation for general terms of reference for evaluation of supported activities, although it is recognized that specific terms need to be considered in each individual evaluation.

Tracing of PhD graduates from supported research groups and networks has been introduced and will continue. A first report of graduates 2008-2013 (Andersson & Sundin, 2016) and a second of graduates 2014-2017 (Andersson, 2018) indicated 92% and 95%, respectively, of retention and employment in home countries and region.

There are, however, additional improvement markers that are justified to be monitored, such as an increasing skill set of supported partners in terms of human capacity available for research and postgraduate supervision, and a strengthened academic planning and a culture of scientific research. The importance of these factors is accounted for in Section 3.2.3 ("Quality enhancement of research activities"), and is at ISP supported by a body of anecdotal evidence. However, these markers have so far largely evaded capture in the program monitoring. During 2020-2024, efforts will be made to develop routines to collect such data

A Theory of Change (ToC) approach to program planning and evaluation, as suggested in the recent evaluation of ISP (Pain *et al.*, 2018), is presented in Appendix 1 and conceptualized in the summary.

Strategy: To continue operating ISP's monitoring and evaluation system, and refine it further to better show the results and the efficiency of the program.

Action: A stronger emphasis on the development of individual RG and SN partners based on the listed indicators, and further refining the monitoring and evaluation system to better illuminate the strengthening of research capacity also in terms of increasingly skilled staff and academic and scientific research culture.

Expected outcome: An improved system for yearly monitoring and reporting, and a better basis for longer term follow up and evaluation of program results and performance.

### 3.2.5 Gender equality promotion

Background: The gender distribution of staff and students in supported groups and networks has been monitored throughout the history of the program, and the information has been introduced in the Annual Reports. In the chemistry program, as an example, the women participation in postgraduate studies increased from about 4% during 1970-1984 to about 22% during 1985-1995, and during 2016 to 2017 was about 40% (Sundin, 2013; ISP, 2018).

During 1998 to 2011, in the program as a whole, there were only about 11% women leaders, 14-30% women group/network members, 26% women PhD students, and 32% women MSc students – with no improvements during these fourteen years (ISP, 2013).

Current situation and proposed development: For 2014-2017, the gender equality promotion strategy included an increased focus on obstacles to women participation, and a working group with expertise also from social sciences was set up to elaborate a comprehensive gender strategy.

During 2014 to 2017, the average women PhD student participation was at 35%, 17%, and 20% in the chemistry, physics, and mathematics programs, respectively, and for MSc students 42%, 24%, and 24% (ISP, 2018). The proportions of women students are close to



satisfactory in the chemistry program, while they are considerably lower in the mathematics and physics programs. However, during 2014 to 2017 the women student participation in the mathematics and physics programs (ISP, 2018) has increased. Those improvements might to an extent be attributable to the intensified efforts by ISP to increase women participation.

In 2015, opportunity was opened to apply for additional funding by mathematics and physics partners to implement gender equality promoting activities locally. Due to the dynamical development of activities and the very ambitious goals of the many applicants of these first grants, ISP recognized the need to introduce a recurring grant system for promoting gender equality and balance in a long-term perspective. From 2017, research groups and networks in mathematics and physics got the possibility to apply for ear-marked funds for gender promoting activities. As a result of evaluation of the latest three-year applications all the groups and the networks in mathematics are at the moment supported, and twelve of 27 research groups and networks in the physics programs have been awarded these additional gender equality promotion grants. The grants are applied for and reported separately from the project funds, allowing ISP to follow the development and to share the experiences and the lessons learned from the different groups/countries.

Considering the cultural and local aspects of the gender gap in science and technology, and realizing that the activities, the goals and the methods to address the gender equality should be decided and run locally, ISP assisted a very promising development in 2017. In Uganda, Dr. Betty Nannyonga, an ISP graduate and previous ISP gender grantee, succeeded to gather mathematicians, gender researchers and physicists from Uganda, Kenya Zambia and Tanzania to a meeting in Uganda resulting in the initiation of the Eastern Africa Network for Women in Basic Sciences (EANWoBAS), a regional network of women scientists, mainly mathematicians and physicists. ISP invited the network to apply for funds and it is supported from 2019.

Strategy: Continued provision of gender equality promotion grants and opportunities, and continued work to raise consciousness about the importance of gender equality, mainstreaming and equal opportunities, among supported partners.

Action: ISP will continue to focus on collaboration with other organizations and social scientists for further developing the work to promote gender equality. Education, information and awareness about the gender bias and the importance of gender equality will be the focus of activity targeting research groups /network leaders.

Expected outcome: Improved gender equality among staff and students of ISP's partners.

### 3.2.6 Communication Strategy

In the Strategic Plan 2013-2017, the ambition was to improve ISP's communication in several ways, including establishing a communication plan and to appoint an "information officer".

Current situation and proposed development: An information officer has been appointed and a communication plan has been drafted. Communication activities have been conducted in alignment with fund-raising efforts, and an ISP "case statement" has been developed.

Both internal and external communication has continued to be actively developed. Internal communication (within ISP) is presently developing according to previously identified needs. The annual reports remain a major, yearly communication, and is – together with internally initiated reports and evaluations – provided at [www.isp.uu.se/publications](http://www.isp.uu.se/publications). External communication (within and outside UU) continues to be conducted on request and at selected strategic venues such as conferences, seminars, workshops, and other events related to development support in the field of science and research.

ISP's webpage is an important communication tool, which has been completely redesigned during 2013-2017 to match Uppsala University's graphical profile. To make the results of ISP's work more visible and easily accessible, ISP's webpage now has a section showcasing the results of the work including indicators, impact studies, interviews with

partners, a video on an example of sandwich PhD training (published in 2014), and information about the activities of ISP partners in relation to the SDG.<sup>4</sup> ISP's Facebook page is another important communication tool, complementary to the webpage, used to share and spread information about program activities, results of the support and other information of importance to followers, for example about external funding opportunities. The number of Facebook followers has since 2014 increased from 500 to more than 2,300, and the increase continues. The website itself has had about 55,000 visits from 157 different countries.

Strategy: To continue increasing the visibility of the program and provide information about ISP at available venues.

Action: Identify and make use of visibility, information and communication opportunities, identified by invitations, internet search, webpage and social media, and continue develop information both physically and online.

Expected outcome: To make ISP better known within and outside UU. To demonstrate and spread information about the success of ISP's work and model and as a result – in the best possible case – eventually contribute to the attraction of supplementary funding.

### 3.2.7 Collaboration Strategy

Background: **Sida** remains ISP's main cooperation partner, particularly in the bilateral programs of research development support in Cambodia, Ethiopia, Mozambique, Rwanda, Tanzania and Uganda, where ISP has been assigned a coordinating role at the Swedish side. In Ethiopia, Rwanda, Tanzania and Uganda, ISP also provides direct, core support complementary to the projects funded within Sida's bilateral program.

Historically, ISP has been engaged in coordination tasks also in previous phases of Sida bilateral support in Ethiopia, Sri Lanka, Tanzania and Uganda. The synergies between Sida bilateral and ISP core support to chemistry in Sri Lanka in particular, have been accounted for in detail in Karunanayake (2005) and in Andersson & Zdravkovic (2017)

*In Ethiopia*, besides other supported partners in chemistry, mathematics and physics, two chemistry research groups are led by PhD graduates of earlier phases in the Sida program, both in fields of science not presently included in the bilateral program. In addition, the support to seismology, which started in 2005 by the physics program, builds on previous Sida/(SAREC) support during 1985 to 2000. After termination of Sida support the idea was that the Ethiopian part would slowly take over the built capacity but that didn't happen, and Sida's investments and the future development of this important activity has been safeguarded by ISP.

*In Rwanda*, support to research groups in chemistry and physics at University of Rwanda (UR) will continue, because their research activities are not included in the next phase of the bilateral program starting 1 July 2019. At UR, the Department of Mathematics at, which is included in Sida's bilateral program, also receives support from ISP via the network EAUMP, primarily to allow for participation in regional activities.

*In Tanzania*, similarly, the Department of Mathematics at University of Dar es Salaam (UDSM), receives support from ISP via the network EAUMP. The chemistry program has provided support from 2004 to a group working in the field of environmental chemistry at the UDSM Department of Chemistry. The group had previously been supported through the Sida bilateral program, 1996-2003. The ISP support was terminated in 2008 because of the terms of the two-year Sida-ISP agreement, 1 July 2008 to 30 June 2010, with the intention that the group should be taken up in the next phase of the Sida-UDSM bilateral collaboration, 2010-2014. Together, ISP and Sida arranged for interim support to the group in 2009, using surplus funds in the Sida program, and the group was then included in the bilateral program during 2010 to 2014, in one of three thematic areas of a food security project. The budget, however,

---

<sup>4</sup> <http://www.isp.uu.se/results-of-our-work/>

seemed to be insufficient for keeping the analytical instrument capacity working adequately, and has impaired the group's contribution. The Department of Chemistry did not qualify to participate with continued work in the Sida-UDSM 2015-2019 agreement phase, further hindering its development. ISP therefore proposes to resume support to this group in order to stabilize its development until it is sustainable.

The Materials Science group at the Department of Physics at UDSM similarly got support under the umbrella of the Sida bilateral program between 2010 and 2014. Direct support from ISP was concluded in 2008, for the same reason as for the chemistry group. Since 2008, however, the group has had difficulties in developing further. Hence, in 2017, they were invited to apply again, for a pilot grant in 2018, and from 2019 the group is again fully supported by ISP.

*In Uganda*, support in chemistry and physics at Makerere University continues in parallel with Sida's bilateral program, because these scientific fields are not included there. Also at Makerere, the Department of Mathematics is part of the bilateral program but receives supplementary support from ISP via the network EAUMP.

*In Cambodia*, from July 2018, ISP has nominally stopped supporting research groups in chemistry and physics at the Royal University of Phnom Penh (RUPP), because of Sida's planned start of a new bilateral program there. However, the groups have received some funds to continue support to students started on previous ISP contributions, and the ISP physics program has provided supplementary funding for the procurement of expensive equipment. The Sida first "pilot" bilateral phase was eventually launched from 1 January 2019, and comprises Faculty of Science (based on ISP's previous support including mathematics, and also biology and environmental science), Faculty of Engineering and the Department of ICT. Sida's engagement in this case builds on ISP's experience of collaborating with RUPP since 2005.

ISP plans to continue reinforcing the capacity of physics, chemistry, and mathematics also at institutions subject to Sida bilateral programs, in case these disciplines are not included in the bilateral support. Moreover, ISP will strive to promote regional cooperation that may include institutions subject to Sida bilateral support.

Another example of Sida-ISP collaboration is the network meetings in mathematics arranged for students and postgraduates organised by ISP and the Sida bilateral programmes together. The first two were held at Sida Headquarter in Stockholm, and the third in Entebbe in Uganda. The third meeting had the theme "Strengthening Research and Postgraduate Training in Mathematics in Universities in Africa", more precisely by forming research groups in different areas of mathematics. The meeting in Entebbe had more than 100 participants, mainly from Ethiopia, Kenya, Mozambique, Rwanda, Tanzania, Uganda, Zambia, West Africa, Finland and Sweden. A fourth meeting will be held in Debre Zeit in Ethiopia, 5-9 August 2019. The objective of this fourth meeting is to provide a forum for interaction between PhD students, postdoctoral fellows, mentors, supervisors and researchers in mathematics with the objective of creating sustainable research groups and networks. Following this, one focus of the meeting will be training on how to attract research funding, with application writing.

In 2010, the Faculty of Science at **Stockholm University** took the initiative to a consolidated cooperative relationship with ISP, as suggested by late professor Michael Passare, a former member of ISP's Board. In 2011, a five-year agreement was established, implying a yearly contribution to the operation of the program. Following evaluation in 2015, a second five-year phase was agreed, until 2020. This important collaboration has allowed ISP to continue support to research groups at National University of Laos in Vientiane, otherwise scheduled for phase-out in 2011 following the Swedish policy change in 2007.

In 2011, ISP was assigned by Uppsala University to coordinate an agreement between the Faculty of Science and Technology at UU and the Faculty of Science at **Al Baha University** (ABU), Saudi Arabia. The cooperation was initiated through the Head of the International Office at ABU, who is a graduate of the physics program, from an earlier phase of support to research groups in Sudan. The ABU request for academic support had a particular emphasis on promoting women staff and students, and is financed entirely from the

Saudi side. The agreement expired in 2017, but a non-cost extension was requested. In September 2018, a first ABU PhD student graduated at the Department of Mathematics UU, being a women staff member at ABU. Two men PhD students are still in the program, one in computer science at UU, and one in mathematics at Mälardalen University College.

In 2015, ISP together with Sida signed an agreement with the **Thailand Research Fund** (TRF) and the **Thailand International Cooperation Agency** (TICA) on common PhD fellowships for students from Cambodia, Bangladesh, Laos, Myanmar, Nepal and Vietnam. The agreement implies awarding up to three fellowships yearly for training in Thailand (2 years) and Sweden (1 years), where TRF/TICA bear the costs for the training in Thailand and ISP the costs for training in Sweden, using Sida's contribution to the core program. So far, five grantees have been admitted, all of them from Myanmar. In 2019, the country scope of the program is extended to include Bhutan and Sri Lanka.

Since 1999, ISP has an informal agreement with **American Institute of Physics** (AIP) about the books that they receive from various publisher for review in the AIP journal "Physics Today". AIP collects these (new) books and sends them in batches to different departments of physics indicated by ISP. ISP pays the shipping charges. A typical batch contains about 300 books. Since 1999, 75 such batches have been sent to 35 different institutes.<sup>5</sup>

Current situation and proposed development: In the Strategic Plan 2013-2017, it is written that "*ISP strives to increase the fitness of basic sciences departments to contribute to applied science through developing skilled staff that supply courses and supervision, and by developing technical resources and competence that can be shared. In doing so, ISP will seek more discussion about complementarity and synergies, with Sida as well as with other organizations providing support cooperation.*" In particular, where ISP can work in parallel with Sida's bilateral agreement in a country, the priority indicated was to reinforce the capacity of physics, chemistry, and mathematics, should these not be supported under the bilateral program, and to increase the possibilities of basic sciences departments to be included in future bilateral agreements, in which case ISP funds could be invested elsewhere.

Strategy: Continue supporting research groups in complementarity with Sida's bilateral programs, as long as there is a need and they are not supported through Sida's intervention. Continue facilitating regional cooperation between scientists in Sida bilateral programs, and including ISP-supported RGs and SNs. Continue collaboration with other organisations that is of benefit to the program.

Action: Keep informed and engage in open discussions with Sida about the situation in and the development of Sida's bilateral programs in relation to ISP core support, in meetings and collaboration with Sida's unit for Research Cooperation, and with Sida's Development Cooperation Units at the concerned Swedish embassies. Provide information about possibilities for regional cooperation. Engage in continued collaboration with other organisations.

Expected outcome: Increased capacity for research and higher education at ISP-supported partners to a level permitting them to successfully participate in programs funded by other organizations. Increased participation of scientists in Sida bilateral programs in regional cooperation. Deepened experience at ISP of collaboration with other organisations.

### 3.2.8 Funding and Extension of the Program

Background. ISP has always received its main funding through the Swedish government's budget, since 1965 basically from Sida. Uppsala University, initiator and owner of the

---

<sup>5</sup> <https://www.aip.org/news/2014/physics-today-uppsala-university-books-partnership>

program, has provided important, long-term supplementary funding. Since 2011, also Stockholm University supports the core program.

For 2013-2017, ISP had the strategy to invite collaborating Swedish universities to contribute financial support, as well as other organizations that may recognize the importance of supporting basic sciences in low-income countries. In addition, recognizing the fact that the ISP model could be applied to other disciplines, ISP adopted the strategy to promote the possible application of its methodological model to other fields within Uppsala University.

Current situation and proposed development: Probing contacts with a number of Swedish universities gave clear indications that such a path to additional financial contributions would require far more efforts than would be the value of possible, positive outcomes. Already when the Stockholm University yearly contribution was gratefully established, the Executive Committee to the Board pointed at the risk that the management of grants of the similar order of magnitude from several contributing universities would require administrative efforts out of proportion with the financial gain.

During 2014-2017, particular efforts and resources were devoted to identifying possibilities of more substantial supplementary contribution, and an external consultant was engaged to assist. The conclusion of these efforts was that first ISP has to become better known in the environments were potential contributors move, requiring investment of substantial time. In meetings with the consultant it was indicated than far more than 50% of the working hours of the head of ISP, and the staff members dedicated to the task, might be required – and the outcome would still be uncertain. Not to jeopardize the current operation of the program, the idea of scaling up the efforts to such a level therefore had to be abandoned. The consultant provided three additional options.

- 1) To stop fundraising activities but to inform the central fundraising office at Uppsala university about the fundraising needs, and passively await a potential donor.
- 2) To convince the UU management to select ISP as a strategic fundraising priority and allocate the resources needed for this.
- 3) To arrange seminars and similar activities aimed at specific target groups with interest in the long-term development of non-OECD countries and present the impact of ISP-funded research.

The first option has been executed already at an earlier stage, but so far with no results.

The second option was tried in the beginning of 2018 when the UU vice chancellor asked the faculties for strategic fundraising priorities. ISP submitted a proposal to the faculty and was among those shortlisted. In the final selection, however, activities with a more direct potential for research and innovation outcomes were prioritized instead of ISP and that option was thereby exhausted, at least for the time being.

The third option remains and, already in 2018, a number of such possibilities have been probed, and efforts are planned to continue.

Regarding the strategy to promote the possible application of ISP's methodological model to other fields within Uppsala University, such an endeavor would still be dependent of external funding to be realized, and is therefore not planned to be actively pursued in the next period.

Strategy: To arrange seminars and similar activities aimed at specific target groups with interest in the long-term development of non-OECD countries and present the impact of ISP-funded research, in order to increase the knowledge and interest in ISP

Action: Review and contact possible target groups by internet search, conference and seminar participation and other meetings, and invite for seminars.

Expected outcome: Increasing knowledge of ISP, to better situate the program to facilitate possible, future attraction of supplementary funding.

### 3.3 New strategies 2019-2024

#### **New strategies 2019-2024**

- To develop and implement an instrument for systematic baseline assessment and chronology of capacity development stages with supported partners.
- To develop an instrument for periodical planning of progress expectations with supported partners over a number of support agreement cycles.
- To further develop the Terms of Reference for and operation of the Scientific Reference Groups to obtain a more coherent scientific review and support process.
- To clarify the possibility to budget postdoctoral activities within awarded allocations.
- To increase the use of capacity built in research groups and networks to facilitate the strengthening of more recently introduced partners.

The evaluation of ISP by Pain *et al.* (2018) points to a number of additional areas where ISP could potentially improve. They are proposed as a result of discussions with ISP staff and associates regarding development needs of the operational model. Corresponding strategies are outlined in this section.

#### 3.3.1 Baseline analysis and development chronology

Background: A baseline analysis is always done when initiating a collaboration. Both in ISPs traveling reports and in the applications of research groups and networks. The current situation, the needs and the context are described. However, there is potential for improving the systematic assessment and documentation of capacity gaps, and to develop specific strategies for the work with each supported partner.

Current situation and proposed development: Pain *et al.* (2018) expresses that “*ISP does not specify what the capacity gaps are for each RG or SN, or establish baselines of capacity at the time that funding starts to a RG or SN, or set out specific strategies that will be used to address these.*” Further, “*ISP needs to develop for each RG/SN that it supports a baseline and chronology of capacity development stages which must be assessed and monitored over time by the Reference Groups. These should contain a clear timetable of change.*”

To improve the modality of operation in this respect, an instrument for systematic baseline assessment and chronology of capacity development stages will be introduced in the next Sida-ISP agreement period. For each intervention, specific targets may be set and – besides the general indicators listed in Section 3.2.4 – complementary indicators may be added in each specific case.

Strategy: Develop an instrument for systematic baseline assessment and chronology of capacity development stages with supported partners.

Action: Initiate the development of the required instrument at internal meetings, in discussions and consultations with Sida, and with ISP’s Scientific Reference Groups, the Board and its Executive Committee, and start applying it.

Expected outcome: A baseline and chronology of capacity development stages for each supported partner.

#### 3.3.2 Introducing a more clearly time-bound modality of support

Background: ISP provides long-term support, because it cannot strictly influence the chronological sequence or time course among supported partners in the process of strengthening the capacity to carry out higher education and research, and reaching a stage of potential sustainability when ISP funding is no longer required for activities to continue (see



also 3.2.3 Exit Strategy). The time bound modality of ISP support is at present restricted to the, at most, three-year funding cycle, each of which may be followed by a next one after due assessment by the Scientific Reference Groups.

Current situation and proposed development: In Pain *et al.* (2018), it is suggested that “*The current model of operation provides the basis for continuation, albeit within a phased and time bound modality. A time horizon for support to RGs/SNs should be defined at the outset, linked initially to five three-year cycles of funding. This would then be subject to external review if a case was to be made to extend funding for a further defined period. This would encourage more systematic monitoring of capacity changes and joint assessment by ISP and the concerned RG/SN of progress towards sustainability. This would take account of both baseline conditions in the institutional environment as well as any subsequent changes.*”

In line with the strategies proposed in 3.2.3 and 3.3.1, ISP finds it important to improve the structure in its support modality in line with the evaluators’ suggestion. A possible modality would be to plan for a fifteen-year period of support, when initiated, consisting of five three-year agreements. The planning instrument should include an expected time-line of the intended development, and may be designed with a Theory of Change approach.

Besides progress evaluation at the end of each three-year agreement period, a deeper evaluation should then be done after twelve years (in the fourth three-year agreement) to determine whether there is need for additional support beyond the fifteen years, that is, to initiate another, limited number of three-year agreement periods before the next, deeper evaluation. A protocol for that will be developed during the next Sida-ISP agreement period, and will link to the instrument for systematic baseline assessment and chronology of capacity development stages with supported partners, as indicated in 3.3.1.

Strategy: Develop an instrument for periodical planning of progress expectations with supported partners over a number of support agreement cycles.

Action: Apply the instrument for systematic baseline assessment and chronology of capacity development stages (3.3.1) in time-bound modality perspective, and consider adjusting presently supported activities accordingly.

Expected outcome: A more systematic monitoring of capacity changes of supported partners in their progress towards sustainability.

### 3.3.3 Improved procedures for the Scientific Reference Groups

Background. The origin of the Scientific Reference Groups (SRG) is given in Section 3.1.4, and their significance is further indicated in Section 3.2.3, “Quality enhancement of research activities.”

Current situation and proposed development: As a result of the 2011 evaluation (GHD, 2011), the operation of the SRG was reformed, including establishing formal terms of reference (ToR) for the work, and introducing a time-limit for membership (3 x 5 years). To better structure the assessments of applications by the reference group members, a harmonized assessment template was introduced to be used by all three subprograms, chemistry, physics, and mathematics, with emphasis on eleven assessment parameters to consider.

Pain *et al.* (2018) conclude that the “*performance management of the Reference Groups remains underdeveloped*” and that “*the Reference Groups are not playing a sufficient and systematic role in evaluating progress reports and outcomes and evaluating new research proposals*”. Furthermore, “*The Reference Group procedures are not consistent across the programmes and do not appear to consistently review and assess research grant applications. More formal procedures for the Reference Groups need to be implemented, including more structured review processes whereby judgements are supported by argument and recommendations followed up.*”

In the next Sida-ISP agreement period, the assessment template and parameters will be revised to better facilitate the process, and the SRG ToR clarified with regard to the use of the assessment template and the composition of the assessment report. The SRG members will specifically be requested to motivate their assessment regarding each parameter. Besides the applications, to facilitate the process, the new instrument for systematic baseline assessment and chronology of capacity development stages will be provided to the SRG members for each applying partner, along with previous application assessment summaries. These summaries may become an integrated part of the new instrument and the SRG meetings will become an opportunity to review the development of each partner in perspective of its individual goals and challenges.

Strategy: To further develop the Terms of Reference for and operation of the Scientific Reference Groups to obtain a more coherent review process.

Action: Initiate review of the assessment template and introduce clear assessment guidelines in the Terms of Reference, to be implemented in coming Scientific Reference Group meetings.

Expected outcome: A more systematic and coherent scientific reference group review process, still embedded in the framework of the basic peer review system for research performance evaluation.

### 3.3.4 A post-doctoral scheme

Background: A possible need for a postdoctoral scheme has previously been considered within ISP, and the mathematics program has made a pilot round of a postdoctoral fellowship program.

In addition, in 2016, ISP agreed with the African Academy of Science to partner in a program dedicated to post-doc fellowships in Africa. The program was granted funding by Carnegie Corporation of New York (CCNY) and a first call was opened 2018.

Sida, in its bilateral programs to support research capacity development, has also introduced post-doctoral programs, in more recent cases where new bilateral agreement phases have started.

Current situation and proposed development: In Pain *et al.* (2018), it is suggested that “*ISP could consider moving its support a little more upstream and provide selective support to a post-doctoral scheme*”.

Introducing a separate, selectively supported post-doctoral scheme would, however, imply that another support modality is opened, besides supporting research groups and scientific networks – and besides that introduced with the gender equality promotion grants. In the case of postgraduate fellowships, this would in fact imply that ISP returns to providing direct support to individual scientists. It would be expected to complicate the operation and administration of the program, because needs would arise to operate additional application, review, admission and monitoring procedures. For ISP, a more feasible option should be to better clarify the possibility to budget postdoctoral activities within the allocations provided to research groups and networks. Still, for a transparent process, external review would be required, probably through ISP’s SRG. The experience of ISP’s mathematics program will be taken as starting point in developing guidelines for including postdoc opportunities in the support to research groups and scientific networks.

Strategy: Clarify the possibility to budget postdoctoral activities within awarded allocations.

Action: Introduce new sections in application and budget forms and guidelines. Inform partners at Reference Group Meetings or similar gatherings. Engage the Scientific Reference Groups in the review of candidates.

Expected outcome: An increase in postdoctoral opportunities for ISP's partners, leading to an increasing number of more competent senior staff, in particular in supported research groups.

### 3.3.5 Making better use of previously supported partners

Making better use of previously supported partners has since long been an ambition of the program, but it has not been widely and systematically implemented. Previous partners can contribute as hosts for sandwich students, and as scientific collaborators and mentors.

Current situation: Incidentally, previous partners are engaged, primarily as scientific collaborators and mentors to supported partners, and in some cases as hosts for sandwich students from supported RG. Also, well-established partners who are still supported, and have well developed activities, are engaged in such a way with newer, less established supported partners.

In the chemistry program, this is the case with the engagement of the environmental and food contamination chemistry group at Dhaka University, Bangladesh, with more needful groups in the Departments of Chemistry at National University of Laos and at Royal University of Phnom Penh. To better structure the relationship, they have formed the Asian Network for Research on Food and Environment Contaminants (ANFEC).

Still, the need remains to explore the possibilities to introduce a more systematic approach to promoting such collaboration.

Strategy: Increase to use of capacity built in research groups and networks to facilitating the strengthening of more recently introduced partners.

Action: Clarifying the possibilities for such engagement within the frame of allocation awarded to currently supported partners. Discuss the matter with currently and recently supported partners, introducing and promoting the concept also with well-established groups still supported.

Expected outcome: An increased engagement of formerly supported partners in the support of currently supported partners.

## 4 References

- Andersson, Rebecca (2017). The Sandwich Model – A Successful Case of Capacity Building". *Internationalisation of Higher Education – A Handbook*, 1(2017)53-66.
- Andersson, Rebecca (2018). *Tracing ISP graduates 2014-2017*.
- Andersson, Rebecca & Peter Sundin (2016). *Tracing ISP graduates 2008-2013*.
- Andersson, Rebecca & Peter Sundin (2017). *Phased out groups and networks 2003–2014 - Experiences and continued activities*. [http://www.isp.uu.se/digitalAssets/504/c\\_504316-l\\_1-k\\_phased-out-groups-and-networksfinal.pdf](http://www.isp.uu.se/digitalAssets/504/c_504316-l_1-k_phased-out-groups-and-networksfinal.pdf)
- Andersson, Rebecca & Marta Zdravkovic (2017). *The International Science Programme in Sri Lanka and Thailand: Three decades of research cooperation*. Acta Universitatis Upsaliensis, C. Organisation och Historia 110, Uppsala University Library, Uppsala, Sweden.
- Beenken, Wichard J.D., Daniel A.M. Egbe & Stefan Skupien (2018). *Evaluation Report for the Materials Science and Solar Energy Network for Eastern and Southern Africa (MSSESA) in the period 2009-2017*
- GDH (2011). *Report on the Evaluation of the International Science Programme*, 30 September 2011.
- Hasselgren, Lennart & Åkerblom, Malin (2001). *Today and Tomorrow*. In Lindqvist (2001).

- Honig, Dan (2018). *Navigation by Judgment: Why and When Top Down Management of Foreign Aid Doesn't Work*. Oxford University Press.
- ISP (2003). *Strategic Plan 2003-2007*.
- ISP (2013). *Strategic Plan 2013-2017*.
- ISP (2014). *ISP Annual Report 2013*.
- ISP (2016). *ISP Annual Report 2015*.
- ISP (2018). *ISP Annual Report 2017*.
- Karunanayake, Eric (2005). *Two Decades of Capacity Building in Molecular Life Sciences in Sri Lanka: A Personal Account*. Colombo, Sri Lanka. Java Graphics (Pvt) Ltd.
- Kiselman, Christer (2011; Ed.). *International Conference on Regional and Interregional Cooperation to Strengthen Basic Sciences in Developing Countries, Addis Ababa, Ethiopia, 1-4 September 2009*. Acta Universitatis Uppsaliensis, C:88.
- Lindqvist, Torsten (2001, Ed.) *International Science Programme, Uppsala University 1961-2001. Historical review and Participants' Experiences*". Acta Universitatis Uppsaliensis, Skrifter rörande Uppsala universitet, C. Organisation och Historia, 71. Elanders Gotab, Stockholm.
- Mosihuzzaman, Mohammed (1961). *Natural Products Research in Bangladesh*. In Lindqvist (1961).
- Pain, Adam, Trish Silkin & Gonçalo Carneiro (2018). *Evaluation of the Sida supported "International Science Programme 2014-2018"*, Sida Decentralised Evaluation 2018:18.
- Singull, Martin, Balázs Szendrői & Antonella Zanna (2017). *Evaluation Report of the Eastern Africa Universities Mathematics Programme*.  
[http://www.isp.uu.se/digitalAssets/504/c\\_504316-l\\_1-k\\_report\\_2017\\_final.pdf](http://www.isp.uu.se/digitalAssets/504/c_504316-l_1-k_report_2017_final.pdf)
- Sundin, Peter (2011). *Support to the Basic Sciences in Developing Countries: Importance of Scientific Networks*. *Asian Biotechnology and Development Review*, 13(3)125-129.
- Sundin, Peter (2013). *The International Programme in the Chemical Sciences (IPICS): 40 Years of Support to Chemistry in Africa*". In A. Gurib-Fakim and J.N.Eloff (eds.) *Chemistry for Sustainable Development in Africa*, DOI: 10.1007/978-3-642-29642-0\_11, Springer-Verlag Berlin Heidelberg.

## Appendix 1. ISP in a Theory of Change Perspective

An ISP “Theory of Change” model, and the position of ISP’s intervention in an overall university development perspective, is presented.

The Theory of Change<sup>6</sup> (ToC) model has previously not been applied in ISP’s operation. Since 2009 the requirement by the main financial contributor, Sida, has been to apply the Results Based Management (RBM) approach as a framework of ISP’s operational modality (ISP, 2013; ISP, 2016).

Presently, Sida does not anymore require RBM as a compulsory tool for planning and follow-up. In the recent evaluation of ISP (Pain *et al.*, 2018), it is recommended that ISP is much clearer about the research capacities that it can contribute to and designs a Theory of Change, and provides a results framework consistent with this.

Pain *et al.* (2018) has proposed a working ToC “*to focus on the first generation of capacity development issues.*” Moreover, they express the opinion that if “*ISP can demonstrably contribute to achieving Intermediate Outcomes 2, and within a time bound period, then it has been effective.*”

Taking a starting point in the ToC proposed by Pain *et al.*, an amended version has been developed to situate ISP’s strategy, vision, mission, specific objectives. Also, corresponding performance indicators have been selected for continued use (see 3.2.4), and to better explain the position and potential longer-term impact of the ISP intervention (Table 1). A correspondingly updated program logic has also been developed (Appendix 2).

ISP acts on the “Outputs” level (Table 1), resulting in achievements at the “Intermediary Outcomes 1” level, as guided by specific objectives 1a-c, 2, and 4. These outputs and intermediary outcomes 1 generate progress at the “Intermediary Outcomes 2” level, which is confirmed using the selected, general indicators, employed already from the start of the intervention. The activities are still guided by the specific objectives 1a-c, 2, and 4, but specific objective 3 becomes gradually more important as increasing research capacity develops. For each individual RS and SN, a set of complementary, specific indicators may be decided (see Section 3.3.1). The “Longer Term Outcomes”, as outlined by Pain *et al.* (2018), aligns with ISP’s overall vision, that “*development challenges are efficiently addressed in partner countries through increasing scientific knowledge*”, and may be followed up in evaluation and impact studies, as guided by specific objective 1d.

The time frames indicated in the bottom row of Table 1 exemplify the time scales that may be required to reach the stage where Longer Term Outcomes can be expected, under a supportive and receptive national context and institutional environment, A) at more favourable starting and development conditions, and B) at more challenged starting and development conditions. Nominally, ISP would phase out support once an adequate degree of sustainability and self-sufficiency is reached under intermediary outcomes 2 (a process to be better elaborated as outlined in Section 3.2.3, “Exit strategy”).

It should be emphasized that in ISP’s support to institutionally based research groups and scientific networks, the efforts to strengthen capacity for scientific research and higher education is focused on the institutional level, with gradually less of influence on higher levels, that is, faculty, university top management, and government research and higher education policies and their implementation (Table 2).

ISP operates at the research group and department level, and may introduce support collaboration at the “Worst case” starting point or at an early “Intermediary outcome” stage. However, there is still a degree of influence on higher levels. At the stage when the “Longer Term Outcome” have been achieved, ISP has already phased out support and directs its resources to more needing institutions that are still at the preceding stages

<sup>6</sup> [https://en.wikipedia.org/wiki/Theory\\_of\\_change](https://en.wikipedia.org/wiki/Theory_of_change)

Table 1. A Theory of Change for ISP support, modified from Pain *et al.* (2018). Within square brackets: performance indicators listed in section 3.2.4 of the Strategic Plan 2019-2024

<p><b>Outputs</b>, aligning with ISP’s mission, to strengthen the scientific knowledge, research capacity and postgraduate education in the basic sciences chemistry, mathematics and physics in countries where such capacity is non-existing or weak</p>	<p><b>Intermediate Outcomes 1: Initial ability to produce scientific outputs (1<sup>st</sup> generation Capacity Development)</b>, aligning with ISP’s specific objectives</p>	<p><b>Intermediate Outcomes 2: Increased ability to produce scientific outputs (1<sup>st</sup> generation CD)</b>, aligning with ISP’s specific objectives</p>	<p><b>Longer Term Outcomes (2nd generation CD)</b>, aligning with ISP’s vision: <i>development challenges are efficiently addressed in partner countries through increasing scientific knowledge.</i></p>
<p>“Staff is being research trained with assistance from ISP, and begin to practice those skills, including development of postgraduate programs, and:</p> <ul style="list-style-type: none"> <li>- Improved conditions for postgraduate education</li> <li>- Better equipped departments</li> </ul> <p style="text-align: center;">▲</p> <p><b>Activities</b></p> <ul style="list-style-type: none"> <li>- Funding</li> <li>- Training</li> <li>- Mentoring</li> <li>- Meetings</li> <li>- Coordination</li> </ul> <p style="text-align: center;">▲</p> <p><b>ISP &amp; collaborating partners’ core organisational functions, applying the actions given in the Strategic Plan.</b></p>	<p>»</p> <p>Staff members are trained to MSc and PhD levels, scientific results are disseminated. Department staff includes an increasing number of PhD and MSc holders, undergraduate students do thesis work by research.</p> <p>Available skilled scientists act in a framework of research groups and scientific networks</p> <p>Improved conditions for carrying out scientific research</p> <p>The development of relevant research and networking activities</p> <p>Research leadership and management improved</p> <p>Academically strong Masters and PhD programmes develop</p> <p>Improved gender balance</p> <p style="text-align: center;">▲</p> <p><b>Continued activities</b></p>	<p>»</p> <p>Improved quality of research grant applications [1]</p> <p>Increased numbers of postgraduates [10,11]</p> <p>More quality research publications [8], more of quality conference contributions [9]</p> <p>Increase in non-ISP funding [3]</p> <p>More qualified women scientists [4,5]</p> <p>Stronger research groups, with a higher share of PhD students continuing to graduation [6] within reasonable time [7]</p> <p>Increased management skills [2]</p> <p style="text-align: center;">▲</p> <p><b>Continued activities within the frame of increasingly supportive institutional environments, ISP support eventually phased out</b></p>	<p>»</p> <p>The capability to self-organise and act (= <i>become independent of ISP</i>)</p> <p>The capability to establish supportive relationships (= <i>develop collaboration, contribute to society</i>)</p> <p>The capability to adapt and self-renew (= <i>change research direction and competence with new findings and changing external conditions</i>)</p> <p>The capability to achieve coherence (= <i>to develop and share strategies and visions; balance control, flexibility and consistency; Integrate and harmonise plans and actions in complex, multiactor settings; and cope with stability and change</i>)</p> <p style="text-align: center;">▲</p> <p><b>Supportive and receptive national contexts and institutional environments. ISP has phased-out support but may carry out tracer and impact studies.</b></p>
<p>Specific objectives 1a-c, 2, 4</p>	<p>Specific objectives 1a-c, 2, 4</p>	<p>Specific objectives 1a-c, 2, 3, 4</p>	<p>Specific objective 1d</p>
<p>Typical timeframe A) Years 0 – 10 B) Years 0 – 15</p>	<p>Typical timeframe A) Years 5 – 15 B) Years 10 – 30</p>	<p>Typical timeframe A) Years 10 – 25 B) Years 15 – 40</p>	<p>Typical timeframe A) Years 22 – ∞ B) Years 35 – ∞</p>



Table 2. The position of ISP’s intervention in an overall university development perspective

Organizational level	"Worst case" starting point	Intermediary Outcomes 1 and 2 (1 <sup>st</sup> generation Capacity Development)	Longer Term Outcomes (2nd generation CD)
Research Group	No research groups exist.	Research groups are formed, members become trained to MSc and PhD levels, scientific results are disseminated.	Research groups are well established, members are distinguished professors, PhD graduates, and PhD and MSc students in training.
Department	Department staff with BSc and MSc degrees carry out undergraduate training only.	Department staff includes an increasing number of PhD and MSc holders, undergraduate students do thesis work by research.	Staff members are distinguished professors and PhD graduates; there is continuous training of PhD and MSc students.
University	University governance focus on mission to carry out undergraduate training only.	University governance increasingly recognizes importance of research and higher education with external collaborators, it provides incentives and in-kind support.	The university’s good reputation as an excellent educational and research institution attracts students and skilled scholars from world-wide.
Country – issue 1	There are only training universities focusing on undergraduate education.	There are universities developing research and postgraduate programs.	There are research universities attractive to post-doctoral researchers.
Country – issue 2	Government sees “no point” in allocating funding for higher education, or “cannot afford” it. There is no funding at all to scientific research.	Government gradually realizes importance of research and postgraduate education, but “cannot afford” allocating money to developing that. There is funding of research and development of postgraduate programs by external collaborators and development support agencies (such as ISP), complemented, eventually with an increasing share of national and external funding acquired on a competitive basis.	Government fully realizes importance of academic skills and scientific research to develop the country, and allocates a significant part of the national budget to research funding. There is substantial research funding through well administrated national research councils, complemented with grants from external funding agencies, all acquired in response to competitive calls.

Color legend to Table 2.

ISP is a main enabler.	ISP may enable to some degree.	ISP doesn’t enable.	ISP is not needed anymore.
------------------------	--------------------------------	---------------------	----------------------------

## Appendix 2. Logical Framework for ISP

The program logic is based on the specific objectives given in the strategic plan 2019-2024.

The logical framework is outlined using the previously adopted results based management approach (ISP, 2013; ISP, 2016). The *outputs* by ISP is elaborated in detail in the strategic plan 2019-2024. The expected *outcomes* represent what needs to be attained for the *specific objectives* to be reached, and that can be measured using the selected *performance indicators*, but doesn't constitute the full range of possible outcomes that may be necessary to reach the objectives. The expected changes that are intended to take place as a result of ISP support are time framed in a Theory of Change perspective in Appendix 1. Yearly reported performance indicators are numbered [#] according to Section 3.2.4 of the strategic plan. Longer term outcomes related to specific objectives 1b and 1d are not measured by yearly recorded performance indicators, but subject to other means of data collection and review.

Specific objective 1: To improve supported partners' ability to

- a) **plan, manage, and carry out high-quality scientific research,**
- b) **train high-quality postgraduates at the Masters' and PhD levels,**
- c) **disseminate research results at high-quality venues,**
- d) **on a longer term, to use research results and acquired skills and engage in outreach activities having a favorable impact on society.**

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
<b>Specific Objective 1a: To improve supported partners' ability to plan, manage, and carry out high-quality scientific research</b>					
ISP inviting activities to apply for funding and providing mentoring and feed-back	Applications of increasing quality over time are submitted to ISP.	<b>[1] ISP scientific reference group rating of received applications</b>	ISP scientific reference group records	Yearly under ISP administrative routines.	Application procedures are manageable and understood by those invited.
ISP providing training and mentoring for research management, and financial planning and accounting	Awarded grants are used as planned.	<b>[2] Expenditures in relation to final yearly budgets</b>	a) Records of allocations, balances brought forward, and expenses. b) Annual financial report.	a) Quarterly follow-up of expenses. b) Yearly compilation of financial reporting by ISP.	Approved budgets are realistic under prevailing conditions.
<b>Specific Objective 1b: To improve supported partners' ability to train high-quality postgraduates at the Master and PhD level</b>					
Funding, coordination, and mentoring by ISP and associates.	Increased retention of PhD students and completion of degrees	<b>[3] Number of admitted PhD students remaining or graduating/year.</b>	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Conditions for research and training at supported unit improve.

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
<b>Specific Objective 1b: (continued)</b>					
Funding, coordination, and mentoring by ISP and associates. <sup>7</sup>	PhD completion times remain reasonable, 4-5 years	[4] Duration of study of graduated PhDs	Annual activity reporting to ISP.	Yearly review of PhD graduated students.	Conditions for research and training improve.
Funding, coordination, and mentoring by ISP and associates.	Increasing graduation of PhDs	[5] Number of yearly Doctoral graduations.	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Conditions for research and training improve.
Funding, coordination, and mentoring by ISP and associates.	Increasing graduation of MScs	[6] Number of yearly Master's graduations.	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Conditions for research and training improve.
Funding, coordination, and mentoring by ISP and associates.	Increasing quality of PhD and MSc thesis	(Publication in quality scientific journals of PhD and MSc thesis results) <sup>8</sup>	Annual activity reporting to ISP paired with web-based publication data.	Bibliometric review paired with review of activity reporting to ISP.	Increasing quality of research and training at supported unit.
<b>Specific Objective 1c: To improve supported partners' ability to disseminate research results at high-quality venues</b>					
Funding, coordination, and mentoring by ISP and associates.	Increasing number of publications in scientific quality journals.	[7] Total number of yearly scientific publications, and proportion in indexed journals.	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Increasing quality of research and training at supported unit, and awareness of the importance of publication in quality venues.
Funding, coordination, and mentoring by ISP and associates.	Increasing number of contributions to scientific conferences, in particular international.	[8] Total number of yearly conference contributions, and proportion international.	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Increasing quality of research and training at supported unit, and awareness of the importance of contribution to scientific conferences.
<b>Specific Objective 1d: To improve supported partners' ability to use research results and acquired skills and engage in outreach activities having a favorable impact on society</b>					
Funding, coordination, and mentoring by ISP and associates	Increasing use of results and acquired skills.	(Instances and nature of use of results and graduate skills) <sup>8</sup>	Annual activity reporting to ISP.	Review of activity reporting to ISP at suitable intervals.	Increasing awareness of the importance of using results and acquired skills.
Funding, coordination, and mentoring by ISP and associates.	Increasing number of contacts and quality of engagement with relevant stakeholders and policy makers, based on acquired skills and research results.	(Instances and nature of outreach activities and their impact) <sup>8</sup>	Annual activity reporting to ISP.	Review of activity reporting to ISP at suitable intervals.	Increasing awareness of the importance of outreach to society.

<sup>7</sup> Associates are scientific collaborators, ISP's scientific reference group members, etc.

<sup>8</sup> Not a yearly performance indicator, but subject to assessment at longer intervals

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
<b>Specific Objective 1d: (continued)</b>					
Funding, coordination, and mentoring by ISP and associates	Increasing relevance of, results, outreach and graduate skills for the Sustainable Development Goals (SDGs).	<b>(Instances and nature of results, outreach and graduate skills for the SDGs)<sup>8</sup></b>	Annual activity reporting to ISP.	Review of activity reporting to ISP at suitable intervals in relation to relevance to SDGs.	Increasing awareness of the strategic relevance to link activities and results to the SDGs.

**Specific objective 2: To improve the gender equality in supported research groups and scientific networks.**

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
ISP providing gender equality promoting mentoring and activities.	Increased gender equality among staff of ISP’s supported partners.	<b>[9] Gender proportion of staff.</b>	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Increasing awareness of the importance of gender equality and the obstacles that have to be removed to attain it.
ISP providing gender equality promoting mentoring, activities and grants.	Increased gender equality among students and graduates of ISP’s supported partners.	<b>[10] Gender proportion of postgraduate students and graduates.</b>	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Increasing awareness of the importance of gender equality and the obstacles that have to be removed to attain it.

**Specific objective 3: To increase supported partners’ financial independence of ISP, with the ultimate goal of becoming self-sufficient and sustain on grants awarded in open competition.**

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
ISP providing training and mentoring for scientific writing and research grant applications.	Increased funding for research from other sources than ISP.	<b>[11] Yearly amount of funding granted from other sources than ISP</b>	Annual activity reporting to ISP.	Yearly compilation of activity reporting by ISP.	Other research funding is available.

**Specific objective 4: To make better use of previously supported partners in the development of new support.**

Type of Output	Outcome	Performance Indicator	Data Source	Data Collection Strategy	Assumptions
ISP providing information.	An increased engagement of previously supported partners in the support of currently supported partners.	<b>(Increased collaboration of ISP supported partners with former ISP partners phased out of support)<sup>8</sup></b>	Field visits, and annual activity reporting to ISP.	Review of field reports and activity reporting to ISP at suitable intervals.	Former ISP partners are prepared to contribute to the capacity strengthening of supported partners.