25 years  Scientific co-operation between Eastern Europe and Switzerland
SCOPES programme: Eastern European partner countries of Switzerland
25 years of scientific co-operation with Eastern Europe: a benefit to both sides

The Berlin Wall fell on 9 November 1989. Once the borders had been opened, a period of intensive scientific co-operation with Eastern Europe began. For a quarter of a century, the research programme ‘SCOPES’ has been supporting scientific collaborations between Switzerland and countries in Eastern Europe to build research capacities and network with Swiss research institutions.

It’s been 25 years since the fall of the Iron Curtain that for decades divided Eastern Europe and the Soviet Union from the West. It was a historic moment, and the beginning of a difficult process for the former communist countries. From one day to the next they were subjected to the conditions of a market economy. Their industries suddenly had to cope with global competition. This led to economic breakdown in most of the Eastern European countries.

The Federal Council approved the first credits for humanitarian aid in Central and Eastern Europe. Since 1990 Parliament has earmarked funds to support political, economic, and social transformation in Eastern Europe and the Commonwealth of Independent States (CIS) through framework credits. The objective is to support building pluralistic democracies as well as socially and environmentally orientated market economies.

The idea to support scientific collaboration between Switzerland and Eastern Europe arose early. The SCOPES (Scientific Co-operation between Eastern Europe and Switzerland) programme was launched in 1990 and financed by the SNSF and the Swiss Agency for Development and Cooperation (SDC).

I ideological slant
“SCOPES started on a very small scale”, says Evelyne Glättli of the SNSF. Until 1995 it was supporting numerous small research projects, personnel exchanges and conference visits. The programme was initially financed by the SDC alone. From the mid-1990s onwards, however, interest in the programme grew considerably and it got bigger accordingly – in the last phase from 2013 to 2016 it is financed by the SNSF and the SDC together, half-and-half. The range of support on offer has also broadened. Today, two funding schemes receive most of the funding: joint research projects that bring Eastern European and Swiss scientists together, and institutional partnerships in which Swiss researchers support colleagues in Eastern Europe who promote the modernisation of research and teaching.

Enriching partnerships
Eastern Europe always had excellent researchers. Russia, for example, has a long tradition as a scientific world power. “That is why joint projects with Eastern European colleagues are also interesting for researchers from Switzerland”, says Glättli. In the natural sciences and engineering particularly it can be rewarding to work with researchers in Eastern Europe, where there are many talented young people. But there are also other reasons that the SCOPES programme is of interest to Swiss researchers. For example, it enables them to engage in research that cannot be carried out otherwise. In Eastern Europe there are specialists, collections and archives, ecosystems and samples that simply do not exist in Switzerland.

SCOPES projects often emerge out of existing contacts or networks between individual researchers in Eastern Europe and Switzerland. There are quite a few researchers among the Swiss project partners who originally came from Eastern Europe themselves and who still maintain contact with their countries of origin. One example is Mikhail Shaposhnikov, who is now at
Glättli confirms that SCOPES projects are financially less attractive to Swiss researchers. “The larger part of the money allocated goes to the project partners in Eastern Europe”, she says. Swiss researchers are only paid to cover extra costs such as travel expenses. All the same, SCOPES has proven very popular – last year alone some 350 applications were received. “We reckoned on about 200”, says Glättli. As a result, less than 20 percent were approved, and many good projects had to be turned down. In comparison to other funding schemes, SCOPES stands out because of the unusually high number of countries involved. Many EU countries restrict their projects to one country or region, e.g., Central Asia. In the course of the past 25 years, the SCOPES focus areas have continually shifted. Some years ago, the Balkan states joined in, along with South Caucasus and the Central Asian countries. Today Serbia and Georgia are among the most frequent SCOPES partners, alongside Russia, Ukraine, Bulgaria and Romania. “Serbia seems to have realised how important research is for the development of a country”, says Glättli. Serbian researchers who get support from SCOPES are given extra funding by their own state as a ‘reward’.

In the last 25 years, hundreds of SCOPES projects have helped science advance in Eastern Europe and the former Soviet Union. It’s now a matter of getting research in Eastern Europe into the right shape so that the researchers there can participate in EU programmes, says Glättli. Not all scientists are accustomed to filling out the necessary applications and to getting their results published in scientific journals. And even a quarter of a century after the fall of the Wall, the research structures in many countries bear no comparison with those in Western Europe. “The teams we support form a kind of germ cell that instigates change”, says Glättli. And every successive project can offer ideal conditions for strengthening local skills and establishing better networks.

The story is similar for Thomas Breu from the Centre for Development and Environment (CDE) at the University of Bern, as his existing contacts also led to a SCOPES project. He worked for several years with partners from Tajikistan and Kyrgyzstan at the National Centre of Competence in Research (NCCR) ‘North-South’. This offered him the opportunity to cement these partnerships through a project in which researchers from these two Central Asian countries were trained to use geographical information systems. “We profited from it too”, he says. For example, Swiss students learnt a lot about the local challenges in these countries. And with projects like that, you can maintain a presence on the ground and access up-to-date information. However, it has to be said that such projects don’t cover the costs on the Swiss side, Breu admits.

The Laboratory of Particle Physics and Cosmology at EPFL. Originally from Russia, he has already run two SCOPES projects with colleagues from his former homeland and Eastern European countries. He conducted research in the Soviet Union until 1991 and still knows lots of scientists from his time there. And because Eastern European countries also carried out excellent research in his field, he says, it was “quite natural” that he should get back in touch with his former colleagues and set up SCOPES projects, which he qualifies as “very successful”. The financial support from SCOPES was also important to his Eastern European partners. “Postdocs and researchers earn so little in Russia, Ukraine and Georgia that they can barely live from their salaries and often have to take on a second job. Thanks to SCOPES, the postdocs participating in the projects were able to concentrate fully on their science”. For the Swiss project partners it was interesting “to have enthusiastic young researchers here to work with us”.

Costs not covered

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Unique skull find

In a SCOPES project funded by Switzerland, anthropologists from Georgia and Switzerland have uncovered an intact early human skull in Dmanisi. This discovery suggests that the diversity of our species two million years ago was far smaller than previously thought, the researchers write in *Science*.

Four well-preserved skulls of early humans and some skeleton parts from Dmanisi were already known. An international team led by David Lordkipanidze of the Georgian National Museum and Christoph Zollikofer of the University of Zurich recently found a fifth skull. It is the best-preserved fossil find from the prehistoric era of our species to date. The fact that the skull displays a combination of features that were previously unknown is intriguing. It has the biggest face, the largest jaws and teeth and the smallest brain within the Dmanisi group.

**Beginnings of the Homo species**

Since the skull is fully preserved, various questions can be clarified that had previously been open to a wide range of speculation. No less than the evolutionary beginnings of the Homo species in Africa two million years ago at the start of the Ice Age, also called the Pleistocene, are at stake here. Did several specialised Homo species exist in Africa back then, of which at least one asserted itself outside Africa? Or was there only one species able to prosper in the most varied ecosystems?

Palaeoanthropologists often tacitly assumed that the fossil they had just found was representative of the species, i.e. that it characterised the species well. “Although this is statistically not very likely, there are about as many classifications into species as there are scientists working in this area,” says Zollikofer.

**Diversity within the species instead of species diversity**

According to Zollikofer, what makes the fifth skull so important is that it combines features that were previously used as arguments to characterise various African species, in other words: if cranium and facial bones of the Dmanisi find had...
The SCOPES programme enables cutting-edge research

been discovered as individual parts, they would have most likely been categorised as two different species. The unique constellation of this find allows researchers to compare the diversity in Dmanisi with the diversity within contemporary populations of humans and chimpanzees.

“The five Dmanisi individuals indeed differ strongly from one another, but to no greater extent than five random people or five random chimpanzees from a contemporary population”, says Zollikofer. Diversity within one species is therefore the rule and not the exception. This requires a change of perspective: the African fossils from the period about 1.8 million years ago are probably representatives of the same species, which should best be designated as Homo erectus. Homo erectus therefore emerged about two million years ago in Africa and soon spread via Eurasia all the way to China and Java, where the first fossil finds of the species date back 1.2 million years. A comparison of the diversity in Africa, Eurasia and East Asia allows researchers to draw conclusions on the population biology of this first global human species.

Research and development cooperation with strong leverage

The remarkable research findings on Dmanisi are based on a long-lasting scientific cooperation between the Anthropological Institute of the University of Zurich and the Georgian National Museum in Tbilisi. The Dmanisi project is supported by the SCOPES (Scientific co-operation between Eastern Europe and Switzerland) research programme, which is financed jointly by the Swiss National Science Foundation and the Swiss Agency for Development and Cooperation (SDC). This research tool has a comparatively modest budget, but has a strong and positive impact on the research landscape in the cooperating countries.

David Lordkipanidze, Marcia S. Ponce de León, Ann Margvelashvili, Yoel Rak, G. Philip Rightmire, Abesalom Vekua, and Christoph P. E. Zollikofer.

Access to resources in Eastern Europe

Drawn to the magic of roots

Few people know as much about root cultures as the biologist Inna Kuzovkina. And the plant cells she and her colleagues from Kyrgyzstan are growing in Moscow and Bishkek might soon play an important role in the fight against cancer. Joint projects with Eastern partners such as Inna Kuzovkina are of interest to Swiss researchers as they give them access to specialists and know-how as well as unique collections and archives, etc.

Most people can’t imagine how beautiful roots are! At our Institute of Plant Physiology they grow in glass flasks. They are very sensitive cultures, so you need good eyes and careful hands to look after them – and a lot of devotion too. Sometimes, when I’m really happy at work, I also talk to them.

Outside the lab, the roots and their buds form a unity – the bud is the part of the plant that emerges above ground. It was a big surprise, a triumph really, back in the 1980s in the Soviet Union, when we succeeded for the first time in cultivating isolated roots in our laboratory. We use different natural strains of a soil-dwelling microbe by the name of agrobacterium rhizogenes that infects roots and induces them to grow. Under its influence, the roots constantly form delicate lateral roots, and they continue developing if you keep an eye on them and regularly replant small pieces of root in a fresh culture medium. Some of our cultures have been thriving for over twenty years.

As part of the recent SCOPES project with colleagues from Kyrgyzstan and Switzerland, we created root cultures of medicinal plants of the genus Scutellaria. There are 32 different types of this genus found in Kyrgyzstan, of which 17 are endemic. They grow only there, and nowhere else on earth. Many of these species are increasingly endangered because their having a medicinal nature means they’re simply plucked out, unchecked. We hope that our cultures will make a contribution to the biotechnological conservation of Kyrgyzstan’s plant diversity.
Many colleagues at my age are still interested in science and are continuing with their work – just like me. That way, we can improve our small pensions a little. In my case, my pension is worth only a third of my salary. But what’s more important: we old people want to pass on our experience. I would like to know that my root cultures will be in good hands one day.

Scutellaria baicalensis, the ‘Baikal Skullcap’, is used intensively, not least because it’s regarded as the second-most important plant in Chinese medicine. Even in the West, it has been the subject of increasing interest since it became known that it contains substances such as the flavone wogonin. A few years ago this flavone was proven to be harmless to healthy cells but deadly to certain cancers. Wogonin gathers exclusively in the root – just like many other plant metabolites – and this makes our cultures of great interest to the pharmaceutical industry.

They’re especially interested because, besides our root cultures, we’ve also been able to establish calluses of the endangered skullcap genus scutellaria andrachnoides, which is endemic to Kyrgyzstan too. Calluses are accumulations of cells that have regressed to an earlier, as yet undifferentiated state and which then reproduce as a kind of plant stem cell. In contrast to root cultures, calluses do not form any proper roots, but simply grow as clusters of cells.

Together with our doctoral students, we did a biochemical analysis of the content of these cells, and we found to our astonishment that while our root cultures contained several different flavones, the calluses contained almost nothing but wogonin. This could considerably reduce the effort needed to isolate this potential cancer drug.

I am 75 years old and I don’t find travelling as easy as I used to. That’s why my colleagues from Kyrgyzstan visit us in Moscow more often than my group goes to Bishkek. Many years ago, my colleagues and I jointly supervised Anara Umralina, who is now the head of the plant physiology lab at the Kyrgyzstan National Academy. We’ve been good friends ever since. But without the generous financial assistance from Switzerland – for which our Russian-Kyrgyz collective is extremely grateful – this project would never have come about.
Collisions close to the speed of light

Many a particle physicist dreams of doing research at CERN, but not all of them can afford to pay for this privilege. To form a strong and competitive cluster of institutes, the ETH Zurich’s Günther Dissertori, already a well-established researcher at CERN, called particle physicists from Serbia and Hungary to CERN for long-term collaboration on a SCOPES project.

At CERN, the European Laboratory for Particle Physics, physicists and engineers are probing the fundamental structure of the universe. They use the world’s largest and most complex scientific instruments to study the basic constituents of matter – the fundamental particles. The particles are made to collide together at close to the speed of light. The process gives the physicists clues about how the particles interact and provides insights into the fundamental laws of nature.

CERN offers a unique infrastructure, and doing research there is a privilege. The SCOPES programme gives researchers from Eastern Europe access to infrastructures in Switzerland by supporting collaborations with Swiss teams that are already using the infrastructures.

Thanks to the SCOPES programme, researchers from Hungary and Serbia can do research in situ at CERN. ”Especially for large-scale collaborations, it is of vital importance to participate actively in experiments and in the meetings and scientific discussions at CERN. This gives the groups a lot more visibility, which is very important for their young scientists”, says Günther Dissertori.

For Serbia, which has filed an application for CERN membership, the SCOPES project has an even greater significance. ”A candidate for accession to CERN membership should have an experienced and well-trained research team already involved in CERN projects. The SCOPES project certainly helped Serbia to start negotiations with the CERN management concerning membership”, says Petar Adzic from the University of Belgrade.

Thanks to the funding provided by SCOPES, researchers from Hungary and Serbia can benefit from regular research stays at CERN.”

Günther Dissertori, ETH Zurich
Reliable collaboration

Dissertori’s project brings together physicists from Serbia, Hungary and Switzerland who are all involved in the Compact Muon Solenoid (CMS) experiment and make theoretical predictions with regard to the processes to be measured at the Large Hadron Collider (LHC). These groups have successfully worked together before in a previous SCOPES project. In the course of that collaboration, hardware components produced in Hungary and Serbia were installed at CERN.

The ETH and Belgrade groups are specifically responsible for the detector control system of the electromagnetic calorimeter of the CMS experiment. They will carry out important maintenance work on the system before it is re-started in 2015. The groups from Hungary will again play a leading role in the analysis of data from heavy ion collisions and in track reconstruction. They also specialise in theoretical predictions of complicated processes involving heavy top quarks.

Searching for the unknown

CMS is one of the large-scale experiments being carried out at CERN’s LHC accelerator. The accelerator will be re-started in 2015 after a maintenance phase. Researchers are hoping that the analysis of new data will lead to new insights and enable them, e.g., to measure the properties of the recently discovered Higgs boson more accurately, or to search for new particles.
Seismic studies

With a detailed map of the tectonics of the Greater Caucasus, it should be possible to predict earthquakes.

The peaks of the Greater Caucasus are of rare beauty. They also contain the highest summits in Europe. Mount Elbrus (5,642 m) is considerably taller than Mont Blanc, as is Mount Kazbek (5,033 m). But the region is also known for its instability: not only political instability – given the many regional tensions and the relative difficulty in crossing borders – but also seismic instability. Some areas of the Caucasus Mountains are prone to frequent, violent earthquakes. These tremors have brought with them uplift in several parts of the range, greater even than in the Alps.

“"We have a common interest in the geology of this region which prevails over any political disputes.""

Jon Mosar, geologist

“Our work is to understand better what is happening in the region: what the precise result of collisions between the Arabic and Eurasian tectonic plates is, how seismicity is related to the complex system of major fault lines, how these fault lines have influenced the topography and of course how the various tectonic elements organised themselves during the fold and thrust process”, says Jon Mosar. It’s been 12 years since the first scientific expedition of Jon Mosar, a professor of geology at the University of Fribourg. That was to Azerbaijan. “Today our team is made up of Azerbaijanis, Georgians and Russians. We have a common interest in the geology of this region which prevails over any political disputes. Thanks to this SCOPES project, we can apply our measure of support to research, cruelly in need of funding in these countries.”
Like the Alps, the Caucasus Mountains are geologically young, dating back some 5–15 million years. The Alps, however, emerged following the subduction of the African plate under the Eurasian plate, whereas the Caucasus Mountains are the result of a collision with the Arabian plate. Another difference is that, while the Lesser Caucasus were a direct result of this subduction, the formation of the Greater Caucasus also involved the closure of a huge sedimentary basin more than one hundred million years old. The geologists are particularly interested in this tectonic unit. They are trying to map what happened to it and how it become part of the range, so as to better understand how the range itself formed.

To do this, they are combining new surveys with compilations of earlier work led independently by the individual countries. This tectonic synthesis represents the core of Jon Mosar’s project. He is currently recruiting master and doctoral students to carry out the painstaking homogenisation of data acquired from different partners. “The result will be the most precise tectonic map ever published for the area”.

This map will also highlight all the major fault lines that scar the area. And this will be valuable information for those interested in the prevention of geological hazards, especially given the high seismicity of the territories concerned.
Moldova wants its researchers back

The fall of the Berlin Wall and the subsequent opening of borders triggered a brain drain in Moldova. How can it be countered? A Moldovan-Swiss research team has studied this question in depth.

Moldova has seen its brightest minds leave the country in droves. Only 5500 people currently work in the education and research sector in the former Soviet republic, a fourth as many as in 1990. Realising the gravity of the situation, the Moldovan government is attempting to redress the balance. Researchers from EPF Lausanne are working together with their Moldovan colleagues in a SCOPES project funded by the SNSF and the Swiss Agency for Development and Cooperation, with support from the Academy of Sciences of Moldova (ASM). Their aim is to probe whether the highly qualified migrants could help to put Moldovan research back on its feet.

Regular contacts with the homeland
A research team led by Jean Claude Bolay, Gabriela Tejada and Vitalie Varzari tracked down approximately 200 Moldovan emigrants and interviewed them. The results show that most of them still maintain regular contacts with their homeland. Over 40 percent send their relatives money to help them make ends meet. Many emigrated researchers have conducted joint projects together with colleagues in Moldova or participated in conferences there. However, many of them simply do not have the time to do more for the development of science in their country. And many are of the opinion that it is the government’s job to give stronger support to research. Most of them would like to go back to Moldova – but few believe that their career prospects there will be acceptable given the precarious financial situation and the lack of infrastructure.

Emigration cannot be avoided, but …
Moldova’s scientific community was particularly hard-hit during the first years of independence, when scores of professors and researchers emigrated to Israel, Russia, Germany and the USA. Given the massive differences between salaries in Moldova and these destination countries, there is little policy can do to stimulate permanent return or to prevent people from leaving. However, successful mobilisation of the Moldovan diaspora’s intellectual capacity can help realise Moldova’s science plans despite an academic/scientific infrastructure that is crumbling under the influence of the mass exodus. Emigration from Moldova cannot be avoided, but its negative impact on development may be attenuated by identifying and designing measures aimed at connecting high-skilled Moldovan migrants to science and economic development in Moldova.

“The government needs to implement a comprehensive brain gain strategy assisted by the scientific community.”

Gabriela Tejada and Vitalie Varzari
Strong desire to contribute
One objective of the project was to identify a feasible mechanism of interaction between scientific diaspora members and their colleagues at home. The foundations for this have already been laid: skilled Moldovans abroad cultivate strong transnational ties with colleagues from the home country and feel a strong desire to contribute to the development of the S&T sector in Moldova through knowledge and experience sharing. Despite the fact that highly skilled Moldovans living abroad have negative perceptions about the socio-economic situation in Moldova, some may choose to return to Moldova in the near future if they are provided with support and proper conditions for implementing projects.

Keeping contact
Eager to stay in contact from a distance, members of the scientific community in Moldova and the Moldovan diaspora capitalise on information and communication technology tools. But the empirical evidence suggests that launching concrete joint research and development projects in key areas is considered the most efficient means of sharing knowledge and expertise. Some of the respondents clearly indicated that they have already started this kind of initiative by launching joint research projects, drafting joint scientific publications, delivering seminars to students, organising joint scientific events in Moldova, etc.

A comprehensive brain gain strategy is needed
In order to provide the highly skilled diaspora with enabling instruments that would facilitate the transfer of knowledge and expertise through transnational activities, the research suggests that the Government, assisted by the scientific community, should elaborate and implement a concrete and comprehensive brain gain strategy that would meet the diaspora and home country demands for knowledge and innovation.

Research co-operation against the brain drain
The SCOPES programme is trying to stem the brain drain from Eastern European countries. By funding research projects over several years, it offers researchers in these countries good prospects in the medium term. SCOPES supports whole teams rather than individuals in order to prevent the loss of specific know-how when a researcher leaves the country.

What is more:
Quite a few Swiss coordinators of SCOPES projects originally come from Eastern Europe – a clear sign that the desired co-operation of migrants with the home country has already become a reality in the context of SCOPES.
Did you know?

**Famous scientists from Eastern Europe**

In the course of history, the centres for art, culture, science and research have shifted geographically several times. Ever since Peter the Great founded the Russian Academy of Sciences in St. Petersburg, Eastern European researchers have repeatedly made significant contributions to science.

**Gregor Mendel** (1822–1884)
is known as the founder of the modern science of genetics.
He was a German-speaking scientist and Augustinian monk from Silesia (a historical region that is now in south-western Poland) who gained posthumous fame as the founder of the modern science of genetics. Though farmers had known for centuries that crossbreeding of animals and plants could favour certain desirable traits, Mendel’s pea plant experiments conducted between 1856 and 1863 established many of the rules of heredity, now referred to as the laws of Mendelian inheritance.

**Marie Skłodowska-Curie** (1867–1934)
from Poland was the first woman to win a Nobel Prize, the only woman to win in two fields, and the only person to win in multiple sciences.
She was a Polish and naturalised-French physicist and chemist who conducted pioneering research on radioactivity. She was also the first woman to become a professor at the University of Paris. She shared the 1903 Nobel Prize in Physics with her husband Pierre Curie and with physicist Henri Becquerel. She won the 1911 Nobel Prize in Chemistry.
George Emil Palade (1912–2008) was a Romanian cell biologist. He has been described as “the most influential cell biologist ever”. In 1974 he was awarded the Nobel Prize in Physiology and Medicine, together with two other scientists. The prize was granted for his innovations in electron microscopy and cell fractionation which together laid the foundations of modern molecular cell biology. The most notable discovery being the ribosomes of the endoplasmic reticulum – which he first described in 1955.

Eastern Europe also attracted researchers from the West

Leonhard Euler (1707–1783) is considered to be the pre-eminent mathematician of the 18th century and one of the greatest mathematicians to have ever lived. Euler was a pioneering Swiss mathematician and physicist who made important discoveries in various fields. Much of the modern mathematical terminology and notation was introduced by him. He is also renowned for his work in mechanics, fluid dynamics, optics, astronomy, and music theory. Euler spent most of his adult life in St. Petersburg and Berlin.
Scientific cooperation is of mutual benefit to Eastern Europe and Switzerland

In the first half of 2014, a survey was conducted among the grantees of the SCOPES programme 2009–2012. The responses show that the cooperation is of mutual benefit to all partners in Eastern Europe and Switzerland. Even though substantial results and outcomes have been achieved, many challenges remain for the Eastern European science community.

Background

The scientific cooperation programme with Eastern Europe (SCOPES) started in 1990 on a small scale. It is organised in four-year phases and jointly funded by the Swiss Agency for Development and Cooperation (SDC) and the Swiss National Science Foundation (SNSF). Though rather unusual, this cooperation between a research funding organisation and a development agency has proven fruitful in view of pursuing the dual goals of scientific excellence and developmental support.

Methodology

The aim of the survey was to collect information on outputs and outcomes of the SCOPES programme as this is not included in the final scientific reports of the individual projects. Two separate questionnaires were compiled, one for the Eastern European team leaders, another for the Swiss project coordinators. For the SCOPES programme phase 2009–2012, 59 JRPs and 40 IPs were funded, each with a Swiss main applicant and an average of 2.21 teams in Eastern European countries.

The survey was addressed to slightly more than 300 people in Eastern Europe and Switzerland, of whom roughly two-thirds responded. Two-thirds of the respondents were involved in a JRP, one-third in an IP.
Funding situation

The research funding situation has not improved significantly in the Eastern European countries. Relatively few teams were able to acquire additional funding besides the SCOPES project (only one-third). The main funding sources for researchers in Eastern Europe are, on the one hand, competitive national research funding and, on the other hand, university/academy funding. Funding from international sources lags behind and bilateral programmes, in particular, are considered to bring limited funding only. A quarter of the respondents mention that they were able to acquire funding from European sources.

Difficulties during the project

Besides smaller problems with communication, visa application issues, and others, managing the projects – especially the financial reporting – was quite challenging for the Swiss project coordinators.

Challenges for the future

In the last 25 years, many aspects of the science sector in Eastern Europe have improved, but much still remains to be done. Research funds remain rather low, further reforms of the research system are needed to increase transparency and efficiency, and the general policy framework has to be improved. Salaries in academia cannot compete with industry and there is insufficient support for research careers. In addition, research infrastructures require further investment.

Conclusion

SCOPES appears to provide efficient instruments and mechanisms for encouraging joint research on issues of common interest and for promoting institutional development. Eastern European and Swiss researchers taking part in SCOPES are partially motivated by the additional funding for research and networking, but the main motivation is the scientific competence of their partners. The joint research experience strengthens capacities and networks on both sides. Although the funding level is relatively low per research project (especially on the Swiss side), the grants have proven to be sufficient to initiate and maintain a successful collaboration.

Capacity building

During a JRP with a duration of 24–36 months, an average of nine persons per Eastern European team received financial support or benefited in other ways from the project (in IPs even more). Of the Eastern European researchers who worked on SCOPES projects, 75% stayed on in academia in their own country after the completion of the SCOPES project. Sixteen per cent changed to another sector in the same country, while 8.4% left to work abroad.

Main outputs

Most of the JRP led to publications in peer-reviewed journals (on average four publications per JRP). The respondents reported considerable improvements within the research institutions in terms of research equipment, information and communication technologies and, to a lesser extent, basic infrastructure, services, libraries and teaching equipment. A large proportion of researchers from Eastern Europe say that their handling of new methodologies and approaches in research improved considerably or even to a very great extent. Fifty per cent are of the opinion that higher education and research have strengthened ties between researchers and led to closer cooperation.

All in all, the Eastern European partners had the impression that the project management skills in their departments had clearly improved, especially communication skills, dissemination of research results, project coordination, reporting and building of networks. A large majority said that their research portfolio had become broader.

The researchers from Eastern Europe feel that their participation in the SCOPES project has had a very positive impact on the way their institution/department is perceived in their respective countries as well as in other Eastern European countries. (This view is slightly less pronounced in Western European countries.) They also consider that SCOPES has had a positive impact on their professional network, especially with researchers in their own countries and researchers in Western Europe.

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In the last 25 years, many aspects of the science sector in Eastern Europe have improved, but much still remains to be done. Research funds remain rather low, further reforms of the research system are needed to increase transparency and efficiency, and the general policy framework has to be improved. Salaries in academia cannot compete with industry and there is insufficient support for research careers. In addition, research infrastructures require further investment.

Conclusion

SCOPES appears to provide efficient instruments and mechanisms for encouraging joint research on issues of common interest and for promoting institutional development. Eastern European and Swiss researchers taking part in SCOPES are partially motivated by the additional funding for research and networking, but the main motivation is the scientific competence of their partners. The joint research experience strengthens capacities and networks on both sides. Although the funding level is relatively low per research project (especially on the Swiss side), the grants have proven to be sufficient to initiate and maintain a successful collaboration.
Since 1990 SCOPES has been funding research partnerships between Switzerland and Eastern European countries.

**The SCOPES programme in figures**

<table>
<thead>
<tr>
<th>Year Range</th>
<th>Partner Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990–1992</td>
<td>Russia, Ukraine</td>
</tr>
<tr>
<td>1993–1995</td>
<td>Romania, Bulgaria</td>
</tr>
<tr>
<td>1996–1999</td>
<td>Georgia, Hungary</td>
</tr>
<tr>
<td>2000–2004</td>
<td>Poland, Moldova</td>
</tr>
<tr>
<td>2005–2009</td>
<td>Armenia</td>
</tr>
<tr>
<td>2010–2012</td>
<td>Czech Republic (since 1993), Croatia</td>
</tr>
</tbody>
</table>

**Overall budget (CHF m)**
1990–2016

**Number of grants (thereof research projects)**
1990–2012

**Eastern European research teams involved in research projects**
1996–2012

**Distribution of research funds by partner country**

The number of countries entitled to participate in SCOPES increased with each programme phase.