

Building Sovereignty or Dependency?

Two Decades of Swedish Research Capacity Building for Developmental Universities in Bolivia

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Abstract: Despite its relevance for developmental universities operating in resource-constrained settings, the role of international collaboration in shaping their practices remains underexplored. This study examines how two Bolivian public universities – Universidad Mayor de San Andrés and Universidad Mayor de San Simón – position themselves within international research cooperation, specifically in the realm of research capacity building financed by Sweden’s Development Aid Cooperation Agency (Sida). It investigates how these universities navigate the dual imperatives of

engaging in international scientific networks while conducting research that addresses local challenges. The study explores agenda-setting processes across the Sida-supported pillars: research governance, infrastructure support, PhD education, innovation programs, and collaboration with Swedish universities. Our findings highlight a gradual shift from dependency toward more interdependent sovereignty over more than two decades of cooperation.

Keywords: Research capacity building; international collaboration; developmental

universities; academic dependency;
technology sovereignty.

INTRODUCTION

Alongside climate change and environmental degradation, rising global inequality ranks among the most urgent challenges of our time (Brundenius, 2017). This issue operates on a global scale and is closely tied to dominant models of economic development. As Arocena (2024) argues, addressing inequality requires a transformation toward more inclusive and sustainable modes of production – something that is not achievable without rethinking the current role of advanced knowledge. This perspective opens the door to exploring how learning processes across different sectors of society can contribute to such a transformation.

Several scholars propose knowledge democratization as a strategy for sustainable human development in the Global South, with particular emphasis on the contributions that can arise from public universities, i.e. Trojer et al. (2014), Acevedo et al. (2017), Arocena (2017) and McCowan (2019) among others. The democratization of knowledge is presented as an ideal to guide a necessary agenda for transformation, one that promotes the agency of diverse social groups and the expansion of their capabilities (Sen, 1999). This strategy is grounded in a conception of power that emphasizes the interactions between technology and organizational structures, fostering the enhancement of capabilities and the agency of multiple social groups (Arocena, 2024).

In this context, developmental universities – self-proclaimed or externally attributed – are institutions whose mission is to foster inclusive and sustainable development through the democratization of knowledge, including the democratization of research agendas and knowledge diffusion, amongst others (Arocena et al., 2018). It is commonly acknowledged that developmental universities cannot fulfill this mission in isolation but need partners in society to successfully contribute to inclusive and sustainable development (Acevedo, 2018). While collaboration within the national context is an integral part of the concept, the relevance of international collaboration for developmental universities remains largely unexplored.

Generally, universities in the context of development need foreign partners to develop their capacities to conduct research and to make knowledge useful to society (Acevedo, 2018). There are various reasons for that. Historically, local research has not enjoyed a high social or political status in Latin America (Sutz, 2003) and continues to receive little financial investments (World Bank, 2025). There is less demand for university-generated knowledge in Latin American countries, resulting from fewer ties with the local industry and a lack of demand and confidence in local universities to solve problems. Globally, resources to conduct scientific research are distributed unequally, implying that universities in the Global South have to work with more scarce resources than universities in the Global North (Srinivas & Sutz, 2008). Against this backdrop, universities and funding agencies in the Global North can be crucial partners for

universities in the Global South to achieve their mission of contributing to inclusive and sustainable development. Universidad Mayor de San Andrés in La Paz and Universidad Mayor de San Simón in Cochabamba in Bolivia exemplify cases of developmental universities that cooperate with international partners, most notably from Sweden, in building their research and innovation capacities (Acevedo et al., 2018).

While international collaboration can offer many opportunities, it potentially creates tensions which should be considered in the strategies of developmental universities. Frequently, universities in Latin America find themselves in a tension between the need to address local problems and the need to establish links to the international research community (Sutz, 2003). This needs to be seen in the context of the colonial history and ongoing Eurocentrism of science in Latin America (Quijano, 2000).

Bolivian public universities are challenged to simultaneously build capacity in two relatively different dimensions; to link research activities and real-life problems in the country, while also complying with the traditional academic goals of global research like international recognition and prestige (Acevedo, 2018). Hence, their researchers are civil servants of a national public body at the same time that they are members of the international scientific community establishing epistemological agendas (Thoenig & Paradeise, 2016). While not always conflictive, there can be tensions between the demands of international science including forms of assessment and provision of research resources, and local

experiences and knowledges (Acevedo, 2018).

Knowledge has become a major source of inequality in power relations (Arocena et al., 2015). This applies both within countries between different groups and additionally affects research collaboration between countries with unequal access to resources. Questions surrounding whose knowledges and capacities are prioritized, who defines research agendas, and how resources are distributed are frequently asked in this context (Gyberg, 2023).

This study examines the case of long-term, institutional research capacity building between the Swedish International Development Cooperation Agency and the Universidad Mayor de San Andrés and Universidad Mayor de San Simón in Bolivia, seen under the light of the developmental university ideal. It looks back on the evolution of bilateral cooperation over the past two decades. This study seeks to advance the concept of developmental universities by foregrounding the critical role of international collaboration as a key dimension in their evolution and impact. In particular, we examine how developmental universities manage the delicate balance between advancing local interests and engaging with foreign partners, as they strive for sovereignty without succumbing to dependency. In doing so, developmental universities fulfill their mission of knowledge democratization nationally, while also advancing global knowledge democratization by integrating marginalized perspectives into international science networks.

LITERATURE REVIEW

In the context of an unequal distribution of resources in global science, collaboration can be a means to redistribute resources. Even more so, research capacity building can be understood as the conscious attempt to address the unequal distribution of resources, potentially leading to more equal research partnerships. In the context of unequal research capacities between countries, research aid refers to the support of higher-income countries like Sweden to development research and research capacity building in lower-income countries like Bolivia (Gyberg, 2023). Research aid describes activities financed under the development aid budget specifically with the aim to generate, direct, and spread scientific knowledge (Nilsson & Sörlin, 2017). In that sense, research capacity building places great emphasis on equipping actors with the tools to address their challenges independently, in this case, by means of science and technology.

However, the practice of research capacity building has also received critiques (Mormina & Istratii, 2021). Increasingly, scientific relations between countries in the Global South and North are challenged for not being critical of neo-colonial structures, power relations, a lack of local ownership or a short-term focus in funding initiatives. Research capacity building can be a threat to knowledge democratization when the ideas of development as a goal and science and technology as the way to reach the goal are shaped by normative ideas of modernity (Vessuri & Cancino, 2018). In integrating into international knowledge networks, the

adjustment and denial of local knowledge traditions has been observed and criticized. Another threat which the integration of developmental universities in international science networks could pose to them, is that of academic dependency (Alatas, 2003; 2022). Academic dependency refers to the influence that high-income countries have over research agendas, including the definition of problems, methods, and standards. This dependency manifests in various ways, such as the dominance of theories produced in wealthier countries, limited representation of lower-income countries in scientific publications, reliance on higher-income countries for educational technology, aid, and recognition. These mechanisms reinforce the power of dominant countries while hindering the growth and autonomy of dependent ones.

It is evident that resources available to countries to invest in science and technology exhibit large disparities. Investments in science, technology, and innovation are seen as a major key to achieve development that results in inclusive and sustainable development. While the “Sovereignty for Scientific and Technological Production with Identity” in prioritized and critical areas is stated as an explicit goal in the Bolivian National Development Agenda (Acevedo, 2018), the national investment in research remains one of the lowest in the Latin American region. In Bolivia, expenditure on research and development amounted to 0.06% of GDP in 2021, according to the Vice Ministry of Science and Technology (2023).

Technology sovereignty has been defined as “the ability of a state or a federation of

states to provide the technologies it deems critical for its welfare, competitiveness, and ability to act, and to be able to develop these or source them from other economic areas without one-sided structural dependency” (Edler et al., 2020, p. 2). This definition directly contrasts sovereignty and dependency. At the same time, sovereignty is generally not understood as complete autarky or the isolation from international collaboration, but rather as something that can be developed in the realm of international interdependencies (March & Schieferdecker, 2023). In that sense, technology sovereignty is seen as the continuous striving to gain, regain, or retain capacities – and thus agency – in the context of international cooperation (Edler et al., 2023). Sovereignty is crucial in areas such as food security and natural resources, on whose export many Latin American countries continue to depend (Galeano, 1971).

While the understanding of threats of academic dependency is crucial, some developmental universities may lack alternatives to international collaboration in aiming to build scientific capacities and follow with their mission. This raises the question of whether, in the absence of support from national partners, developmental universities can leverage international collaboration to gain sovereignty without falling in the trap of academic dependency.

In balancing local and foreign interests, a key question concerns who sets the agenda in research partnerships and in the broader realm of research capacity building. Intellectual ownership is closely tied to the

source of funding, making this a critical issue. From the Swedish side, local ownership of capacity-building efforts is a consistent priority. Sida emphasizes the importance of developing research agendas through dialogue between donor and recipient countries, and Sweden has been recognized as a pioneer in granting significant responsibility to partners in lower-income countries (Nilsson & Sörlin, 2017). Nevertheless, there remains a persistent risk of creating, maintaining, or deepening dependencies through research aid (Gyberg, 2023). On the Bolivian side, the Concept Note for Science, Technology and Innovation serve as the primary framework for aligning the National Development Agenda with the university's priorities, forming the foundation for strategic collaboration with Sida and Swedish universities.

Despite its clear relevance for institutions operating in resource-constrained settings, the role of international collaboration in the context of developmental universities remains underexplored. This study aims to investigate how two public universities, UMSA and UMSS, seen from the lens of the developmental university ideals, position themselves in the realm of international collaboration. It focuses on how these institutions balance the dual imperatives of engaging with local issues of inclusive and sustainable development while participating in international research networks. Particular attention is given to the processes through which research agendas are established within bilateral partnerships and capacity-building initiatives.

METHODOLOGY

Our study is based on an in-depth case study of Swedish research and innovation capacity building in Bolivia. The data collected include document analysis, interviews as well as ethnographic observations. We adopt an abductive research approach to generate innovative theory concerning the dimension of international collaboration for developmental universities, characterized by an iterative cycle of engagement between theory and evidence (Timmermans & Tavory, 2012). The primary goal of our abductive research strategy is to closely integrate data and theory, finding a balance between study participants' vocabulary of their lived experiences and the development of appropriate and innovative theoretical language (Gioia et al., 2013).

Documents included in the analysis encompass policy and strategy declarations at the level of the Plurinational State of Bolivia, the universities Universidad Mayor de San Andrés and Universidad Mayor de San Simón, the Swedish government, principally the Ministry of Foreign Affairs, and the Swedish International Development Cooperation Agency as well as external evaluations of the cooperation program.

The interviews have been sampled to cover a broad range of stakeholders engaged with the program since its beginning in 2000 with the aim of covering the more than twenty years of evolution as well as a plethora of perspectives. While not a longitudinal study in the sense of collecting data at multiple points in time, this research traces a long-term evolution through the accounts of participants – many of whom have been

involved for decades or many years ago. By drawing on their stories that reflect different phases of the cooperation, we are able to reconstruct a trajectory of change over time. Stakeholder groups include responsables in the functions of:

- I. policy makers at Vice Ministry of Science and Technology, Bolivia,
- II. university policy makers at UMSA, La Paz, and UMSS, Cochabamba,
- III. Sida program coordinators for Bolivia,
- IV. decision makers at the Swedish embassy in Bolivia,
- V. sub-program coordinators, researchers at the universities of UMSA and UMSS as well as at the Swedish universities.

Many of the interviewees could speak for more than one of these roles in the different phases of the cooperation. Sixteen interviews were conducted between May and August of 2024 in Cochabamba, La Paz, and virtually. All but two interviews were conducted by both investigators, in Spanish or English at the preference of the interviewee and lasted between thirty minutes and two hours. Consecutively, the recorded interviews were transcribed and analyzed.

Additionally, data was collected through ethnographic observation. Ralfs, a doctoral student in Research Policy at Lund University, brought an outsider's perspective (Gioia et al., 2013) to the practice of research capacity building during her two-month research stay at the Unit of Technology Transfer (UTT) at UMSS. Her research visit included joining daily routines and meetings

as well as visits to research centers and field sites, both at UMSS and UMSA. Acevedo provided an insider's perspective to the Sida-financed research capacity building, having been involved with the program in various roles. He was a PhD student at Blekinge Institute of Technology and UMSS between 2013 and 2018, and since 2018, he has been responsible for the UTT. Additionally, he has supervised PhD and master's theses in the program and designed and taught courses for Bolivia-based PhD education. We acknowledge that our respective identities as researchers contribute to the social interactions constructed in interviews or during visits.

CASE

First, we aim to provide a general understanding of the history and arrangement of the bilateral cooperation between Sweden and Bolivia. While formerly part of a separate authority, the Swedish Agency for Research Cooperation with Developing Countries (SAREC), it is nowadays administered through the Sida. Building research capacity in universities is embedded in Sweden's overall development aid for Bolivia.

The Swedish bilateral research cooperation with Bolivia was formally established in 2000, focused on two universities: Universidad Mayor de San Andrés in La Paz and Universidad Mayor de San Simón in Cochabamba. The cooperation aims to boost the local production of advanced knowledge, increase the number of highly qualified researchers and improve the analytical capacity in university labs. More

recently, since 2007, the cooperation also fosters innovation capacity building within the context of an emerging inclusive innovation system.

Prior to this long-term, institutional arrangement, there have been smaller-scale, isolated collaborative research projects between researchers in Sweden and Bolivia. To some extent, these early collaborations with Swedish and other international partners in the 1990s determined the pre-conditions of pockets of infrastructure and expertise present in the country which were later built on in the institutional bilateral cooperation. The cooperation is currently in its fifth phase and has undergone various modifications throughout its evolution.

Actors on both sides have articulated their goals for the cooperation in policy documents at various levels. From the Swedish side, the goals for Sida-supported research capacity building include:

- I. enhanced research capacity and sustainable research environments,
- II. enhanced global, regional and national research that is of relevance to the least developed countries and regions, and
- III. enhanced impact of research that is of relevance to poverty reduction and sustainable development.

It is further acknowledged that research with developing countries "contributes to the internationalization of Swedish research, Swedish universities, and higher education institutions, and builds the foundation for

broader relations through research cooperation beyond aid” (Utrikesdepartementet, 2022, p. 3). Within their strategy, Sida strongly and consistently emphasizes local ownership of research as part of its research capacity building support. A broad group of Swedish universities, including institutions like Stockholm University and Karolinska Institutet, have collaborated with UMSA and UMSS throughout different phases of bilateral cooperation.

From the Bolivian side, the goals of the research capacity building are defined by each autonomous university in a Concept Note document for Science, Technology and Innovation. This document considers guidelines from the Constitution of the Plurinational State, the Plan of National Development, the Plan of Science, Technology and Innovation, and their own Institutional Strategic Plans. Institutional Strategic Plans and Concept Notes define the overall visions of the universities which more specific research lines are derived from.

In Bolivia, investments in research are very limited and overwhelmingly stem from international cooperation and Direct Tax on Hydrocarbons (IDH), which depend on foreign demand in volatile international markets. Both UMSA and UMSS collaborate in research with international partners across North America, Europe, and Latin America, mainly. In addition to individual collaborative projects, there were similar initiatives focused on building research capacity, particularly through Belgian and Swiss cooperation. While following

comparative approaches, these initiatives are smaller in scale compared to Swedish cooperation.

The Swedish-Bolivian cooperation for PhD training focuses on prioritized research areas independently identified by UMSA and UMSS, based on national or regional relevance to inclusive and sustainable development, as well as scientific significance. These areas included a diversity of fields, like Food Technology, Biotechnology, Chemical Technology, Non-Metallic Materials, Energy, Sustainability, Climate Change, Innovation and Innovation Systems, Water Resources, Health, Epidemiology, Agronomy, Economy, Habitat, Social Sciences, Gender Studies, Humanities and others. In the so-called sandwich model, PhD candidates spend part of their time at Bolivian and Swedish institutions and have supervisors in both locations. Moreover, part of the budget is also allocated to small competitive funds within the two universities that researchers from any discipline can apply to, in order to stimulate direct impact and collaboration with local social and productive partners.

The cooperation encompasses several key pillars, including support for:

- I. research governance,
- II. infrastructure,
- III. PhD education,
- IV. innovation programs, and,
- V. collaboration with Swedish universities.

The next section will illustrate the preliminary findings related to each of these pillars.

PRELIMINARY FINDINGS & DISCUSSION

Our analysis examines how UMSA and UMSS, seen as developmental universities, navigate the process of building scientific and innovation capacities with foreign partners, and how, in that process, local and foreign interests are negotiated in the defining of research agendas. Overall, the evolution of bilateral cooperation between Sweden and Bolivia over the past two decades shows a shift from higher dependency to increasing interdependency. As both universities strengthen their research capacities in prioritized areas, Bolivia-based researchers play an increasingly active role in shaping research agendas, which over time become more closely aligned with local societal challenges. This can be observed in the interrelated pillars of research capacity building.

RESEARCH GOVERNANCE

The goal of developmental universities is to prioritize issues of relevance for inclusive and sustainable development in their research agendas. Effective research governance and transparent resource allocation processes are seen as essential for shaping and executing research agendas and priorities. This is even more important as developmental universities may receive funding from diverse and frequently foreign sources. Developing organizational capabilities including a research governance system can be helpful for universities in not losing sight of their priorities amidst the diversity of interests of internal and external actors (Thoenig & Paradeise, 2016).

According to those responsible, fostering research governance and management was a key component of Sida's research capacity building at public universities in Bolivia, especially in the early phases. Both UMSA and UMSS have restructured their research administration to better support research proposals and funding. This restructuring, mandated by Sida, aimed to ensure transparency and improve the efficiency of financial resource allocation of funds provided by Sida directly to both universities. It included guidelines for procurement, equipment use, and the employment of returning PhDs. The restructuring was seen as crucial for managing resource distribution within projects and overseeing Sida's competitive funds at both universities.

A Sida representative describes initial resistance to the restructuring but also highlights the challenge of balancing accountability to the Swedish government with the autonomy granted to UMSA and UMSS in managing their funds.

"So when I arrived, we had to, I don't want to say clean up, but we had to do a lot of restructuring. And not many people were very happy. I mean, we also have to report to the [Swedish] government and we have to make sure that we check funding. We have to [...] Sida never had a top-down policy to say, do things this way. We had agreements, very specific agreements that said, this fund is for that. In order to be able to, and also the Ministry of Science and Technology, to comply with those agreements, then they had to restructure a few different things." (Interview 14, Sida responsible, August 2024).

Despite initial resistance to the new research governance system, university officials at UMSA and UMSS now view the restructuring positively. Interviewees from the respective administrative units at both universities report satisfaction with the new system and improved efficiency in administrative processes. Originally introduced for Swedish cooperation, the research governance processes are now also used to manage resources from national funds like IDH and other international partners.

“I believe that the influence has been very good. Moreover, [...] the country’s IDH that it gives to the municipalities and to the universities here is managed in the same way as Sida was managed. In other words, there is the money and what do we do with the money? [...] Yes, here we have formed a project review committee. We have commissions.” (Interview 7, University policy maker, July 2024).

At UMSA, the Department of Research, Graduate Studies and Social Interaction (DIPGIS) oversees research, postgraduate activities, and innovation activities. With Sida’s support, DIPGIS has restructured its research management processes, adding innovation as a new pillar to better align with societal needs. At UMSS, the Directorate of Scientific and Technological Research (DICYT) manages the evaluation of projects and allocation of resources, including financial and time budgets for research centers. A key goal of this unit is to reduce administrative burdens on scientists, allowing them to focus more on research and innovation, while also streamlining administrative processes. The new research

governance approach also incorporates quality management processes.

This example illustrates that stronger integration of developmental universities into international networks – particularly through foreign funding – often requires adherence to international research governance practices. However, the approaches taken by UMSA and UMSS show some flexibility, reflecting what Sida understands as local ownership. The ongoing development of their organizational capabilities can help these universities to align their research with their goals of inclusive and sustainable development. This, in turn, strengthened their autonomy in managing resources according to their prioritized research agendas, financed with national or international resources. Sovereignty in research governance can foster interdependent relationships with national and foreign partners, including universities and funding agencies.

INFRASTRUCTURE

For developmental universities to contribute to the democratization of knowledge, they must be capable of generating valuable advanced knowledge. However, universities in resource-constrained contexts often lack essential infrastructure, such as laboratories and equipment, needed for scientific research, especially in technological fields and basic science. To overcome these challenges, developmental universities may rely on foreign aid. As part of its model, Sida funding was used to finance technological infrastructure and equip laboratories at both UMSA and UMSS.

In the early years of the program, laboratories at both universities were either non-existent or insufficiently equipped for material analysis, requiring study materials to be transported to Sweden for analysis. Researchers educated in the early phases report the barriers they faced in conducting their research in Bolivia:

“I mean, we have built it from the first brick, because [research center] did not have the infrastructure for research.” (Interview 16, Bolivian researcher, August 2024).

“The equipment part has also been a quite drastic change, quite strong, because as I said, at the beginning the equipment part was really very weak, we had very few resources to work with and conduct research, for that reason in those first two phases there were sandwich doctorates, but most of the time we spent there [in Sweden].” (Interview 4, Bolivian researcher, July 2024).

“For example, it was nothing more than this, and the permanent environment that we have here at the institute was very small, with very, very, very old equipment, let's call it that, and the lines of research were not very well defined.” (Interview 12, Bolivian researcher, July 2024).

Over time, investments in technological infrastructure in prioritized scientific fields have enabled researchers at UMSA and UMSS to advance their research and conduct necessary analyses on-site. A significant portion of the laboratory equipment was funded by Sida, although UMSA and UMSS were required to co-finance it, often using IDH funds. Researchers portray the development of laboratories and

infrastructure over time, which they perceived as drastic:

“And then there was a very strong change in the infrastructure, the laboratory grew considerably, and this has happened in general in all the laboratories and programs that have been involved with Sweden.” (Interview 4, Bolivian researcher, July 2024).

“[PhD student] at the time, in their time, we saw, they could stay longer here than there. However, the advising was what was failing us, because [Swedish supervisor]’s head is [Swedish supervisor] ... So that was failing us a little bit. And in the beginning, when I was doing my experiments here in Bolivia, [Swedish supervisor] made me repeat everything in Sweden. When he came later, he started to trust us and he said this is validated, it's good.” (Interview 16, Bolivian researcher, August 2024).

Nowadays, the instruments enable collaboration with local companies, offering services like food testing to meet international export standards, thus strengthening collaboration with national actors. This provides companies access to specialized equipment they cannot afford and generates income for the universities, although it is not directly reinvested in the specific research centers. Additionally, researchers and administrative staff aim to optimize equipment use through better coordination between the universities and with other institutions in Bolivia. Current challenges at UMSA and UMSS include maintaining technological infrastructure due to a lack of funding and reliance on imported spare parts.

The gradual development of research infrastructure at the Bolivian universities has empowered researchers to take a more active role in other pillars of research capacity building, such as PhD education and collaboration with Swedish researchers. With functioning research facilities, developmental universities can engage in international science by conducting contextually relevant research, either independently or in partnerships with foreign counterparts. This is the fundamental prerequisite for their sovereignty and contribution to the democratization of knowledge. Research equipment plays a crucial role in shaping research agendas, particularly in the prioritized highly technological areas. These agendas often follow a path dependency, as the types of analyses possible are directly influenced by the availability of the necessary equipment.

PHD EDUCATION

One of the most central pillars of research capacity building for developmental universities is PhD education, or the formation of researchers. Several interviewees emphasized this pillar as the most important. The education of Bolivian PhDs has been set up as a joint effort between their home departments in Bolivia and a partnering department at a Swedish university. Like the other pillars of bilateral cooperation, the Sida-financed PhD education has evolved toward increasingly strong ownership on the Bolivian side.

In the early phases of the program, most of the PhD education took place in Sweden, as UMSA and UMSS lacked well-equipped laboratories and a sufficient number of PhD-

educated supervisors in the relevant research areas. Time spent at the Bolivian universities primarily focused on data collection and material gathering. The descriptions provided by interviewees from the early phases offer insight into the challenges researchers faced at the time, particularly the lack of experience needed to establish local PhD education.

“At that time, we didn't have any trained doctors, they were all staff engineers and we started with those, with the cooperation part.” (Interview 4, Bolivian researcher, July 2024).

“So, I and almost most Bolivians have taken something exotic to study, basically. And no, we maybe didn't have the scientific background to know what to do with that. [...] In the first stage we have done that. Basically, we have studied something that the Swedes have proposed, and we have followed the line.” (Interview 16, Bolivian researcher, August 2024).

Gradually, PhD students began spending more time at the Bolivian universities, often supervised by PhD graduates from earlier phases of the program and utilizing the improved laboratory equipment. Researchers in the early phases of cooperation highlight the tensions they perceived between complying with the requirements of international science, while questioning the usefulness of their research in addressing social problems in Bolivia.

“Because in all aspects, if there were scientific articles and so on, and in Sweden it was fine, you could go to conferences or whatever, but not in Bolivia. I have a colleague who asked us “How am I going to

eat that? And how am I going to eat that?” I was tortured by that in my head, because what did Sida really want to do? To help people, well, through science, but to help people, but we did not reach people.” (Interview 16, Bolivian researcher, August 2024).

Sida gradually adjusted its program, particularly with the introduction of the innovation program. As a result, the topics of Sida-funded PhD projects have progressively built upon one another, becoming more scientifically complex while also aligning more closely with local needs in Bolivia. The increasing scientific expertise at Bolivian universities has fostered research agendas that are not only more scientifically advanced but also more tailored to local challenges of inclusive and sustainable development.

“So, the next doctorates that were to come had to have a lot of social interaction, a lot of social impact and they also had to have innovation in making functional foods, that is to say, they had to have not only the scientific article, but also a quinoa bread that really nourishes the children.” (Interview 16, Bolivian researcher, August 2024).

Over time, as a critical mass of PhD-educated researchers was reached in prioritized research centers, Bolivian supervisors took on a greater role in the educational aspect of research capacity building, initially in Sida-funded master's programs and later in Sida-funded local PhD programs at UMSS. While co-supervision of master's and PhD students between Swedish and Bolivian researchers sometimes leads to disagreements, it also

highlights the growing involvement of Bolivian supervisors and, overall, an increasing trust in their expertise.

“Now the supervisors were us, the Bolivians, and they [the Swedes] were the co-supervisors, and they made it very clear ... “You have to decide, you have to decide”. It was difficult.” (Interview 16, Bolivian researcher, August 2024).

From 2019 onwards, the first Sida-financed local PhD programs were launched at UMSS in Cochabamba. The first PhD students have graduated from the local program in Chemistry Technology, while the PhD programs in Energy and Social Sciences are in earlier stages. Although PhD education can now be conducted at UMSS in collaboration with Swedish professors, the programs still include research stays at Swedish universities. These stays are seen as valuable for fostering connections and familiarizing PhD students with international research environments. Administrative processes related to the awarding of doctoral degrees at UMSS remain to be solved. This evolution of PhD education is seen as symbolic of the overall trajectory of the cooperation.

“If we compare now from the first phase to this last one, the fifth phase, the change has been quite radical because now we have managed to reach a sufficient critical mass of professionals trained with a doctorate degree to do a doctorate here in the faculty. We have managed to create a doctorate in chemistry technology that interestingly has involved the biotechnology center, the agrochemical center, the food center and the non-metallic center, which have all been

participating since almost the initial stage of cooperation with Sida.” (Interview 4, University policy maker, July 2024).

A key challenge in the PhD education process has been the integration of graduates into stable employment at the Bolivian universities. UMSA and UMSS have adopted different strategies to address this issue. Sida officials acknowledged the difficulties associated with integrating PhD graduates and, while refraining from imposing top-down policies, strongly emphasized the benefits of ensuring stable employment for these graduates.

In sum, the PhD education model has shifted from being predominantly hosted at Swedish universities during the early stages of the program to an increasingly strong involvement of Bolivian universities, once a critical mass of PhD-educated scientists had been established in prioritized research centers in Bolivia. This shift has also been accompanied by a growing influence of Bolivia-based scientists in shaping research agendas and tailoring them to local issues of inclusive and sustainable development. However, the case also highlights that experience and knowledge in highly specialized scientific fields are prerequisites for conceptualizing research studies in the first place. For developmental universities to contribute to the democratization of knowledge, they must build scientific capacities and engage researchers that are both, internationally linked and aware of the local context of application and impact. Often, universities in resource-constrained contexts rely on foreign partners to build these capacities, which can create

dependencies. Yet, the case demonstrates that over time, as capacities grow at both individual and institutional levels, the universities gain greater sovereignty, making it easier to align research with local priorities.

INNOVATION PROGRAMS

In Bolivia, as in many Latin American countries, public universities like UMSA and UMSS concentrate most of the national research capacities. Their local context is marked by a weak connection and collaboration with the productive sector, within incipient efforts to promote a National Innovation System (NIS). Sutz (2012) argues, this situation can be seen as an “innovation as learning” systemic failure due to the relative weakness of innovation process in developing countries and the lack of opportunities to learn through such processes. This failure is systemic, as it is embedded in the productive specialization of most developing countries, where the learning content of economic activities tends to be weak. In such circumstances, universities can play a key role in learning and innovation but the specific position and functions of universities and their mechanisms of interactions within NIS of developing countries are not clearly defined. They are mostly defined as a result of the NIS context dependency.

At both UMSA and UMSS, researchers navigated this challenge producing isolated efforts of collaboration with the productive sector, reaching relatively satisfactory results but sporadic. Generally, most efforts in both universities derived from an offer-driven innovation approach. Strategies coming from that perspective failed due to

the low effective demand of advanced knowledge and weak absorptive capacity in the productive side. Other institutional initiatives centered its focus on allocating research competing funds to fostering the inclusion of social and productive partner organizations as beneficiaries. This strategy reached few satisfactory results because partner organizations were usually included only at the beginning of the project to identify the problem and at the end to present results.

In 2007, the UTT at UMSS introduced a new sub-program to the Swedish bilateral cooperation agenda: the Program of Innovation and Technology Transfer. This initiative aimed to develop institutional competencies and capabilities at UMSS to study, promote, and actively engage in innovation systems and processes at the local, regional, and national levels.

The program fostered new competencies at UMSS, positioning the university as a facilitator of inclusive innovation systems in the Cochabamba region. Its main strategy involves creating open, interactive learning and innovation spaces within prioritized sectors, where academics, entrepreneurs, policymakers, and social representatives collaborate and build mutual trust. These spaces are locally known as SME Clusters and include the Food Cluster and the Green Technology Clusters. Together, the clusters engage over 200 local SMEs and around 40 researchers from various disciplines and faculties, co-creating science-based solutions and societal value. The actors and dynamics within these spaces can be viewed

as seeds for emerging inclusive innovation systems.

Supported by Sida, the UTT is responsible for facilitating innovation processes, promoting learning cycles, and balancing power relations among the various actors involved. PhD training is an integral part of this program; it both accompanies and critically reflects on the diverse dimensions of local innovation processes. Within this framework, the democratization of knowledge is promoted as a key strategy for institutional transformation. More recently, the concept of the developmental university was incorporated into UMSS's strategic plan (2020–2025), shaping its vision of transformation and participation within inclusive innovation systems.

COLLABORATION WITH SWEDISH UNIVERSITIES

As developmental universities integrate into international science networks, they frequently collaborate with foreign partners. In addition to PhD education, the ongoing and general collaboration between Swedish and Bolivian researchers has been considered a crucial pillar of research capacity building, with mutual interest for both countries highlighted in policy documents.

In the early phases of the program, research proposals developed through collaborative processes at UMSA and UMSS and approved by Sida were shared as open calls among Swedish universities to find relevant collaborators. However, as research lines and collaborations became more established, many research proposals in

later phases were co-developed between Bolivian and Swedish researchers, often building on previous projects. Over time, the relationships between Swedish and Bolivian researchers have become not only closer and more trusting but also more collaborative and equitable.

“First the history, there has been a dependence, we depended and the main factor was money. [...] And back then that concept of cooperation was more of an aid concept. [...] There comes a time when you are a partner, that is the other concept. We are partners. So you are my academic partner, you are my research partner, you are my financial partner. And the relationship is one of partners.” (Interview 7, Policy maker at the Bolivian Viceministry of Science and Technology, July 2024).

The collaboration between the Bolivian and Swedish universities and researchers has evolved from a relationship characterized by dependency and a “parent–child” dynamic to one of interdependency with an “older sibling–younger sibling” dynamic (Interview 8, University policy maker, July 2024). Both UMSS and UMSA have developed capacities in selected prioritized research areas – often strategically focused on local needs and the unique conditions of Bolivia – that enable them to produce research at international standards. While many of the initial supervisor–supervisee relationships with Swedish scholars persist beyond their initial arrangements, Bolivian researchers have also proceeded to publish independently or

in collaboration with other international and Latin American partners.

Reciprocity and mutual learning have been important in the collaboration between Swedish and Bolivian researchers. For Swedish researchers, this has involved learning new ways of conducting science with limited resources on one hand, and a greater emphasis on solving urgent problems on the other. For many scientists at UMSA and UMSS, engaging with non-academic stakeholders is an integral part of their work. This might include participating in rural community assemblies to build trust before conducting research or collaborating with NGOs to address issues like water filtration when their research uncovers contamination. Swedish researchers also valued the learning opportunities that arose from being exposed to new and unfamiliar cases.

“When you build this, I think, research sovereignty is needed. We have particular things that for Sweden were just new. [...] And Chuño¹. I mean, [Swedish professor] was amazed with it because we went with him, to show how they produce it. For him it was something really fantastic that this was research from ancient times.” (Interview 12, Bolivian researcher, July 2024).

Regarding the risks of academic dependency in the context of research capacity building, it is noteworthy that this form of aid aspires to strengthen the sovereignty of universities. While the extent to which this goal is

¹ Chuño is a preserved potato product traditionally made by Quechua and Aymara communities of Bolivia and Peru.

successfully executed or ultimately achieved may be questioned, the underlying intention appears consistent. According to program responsables, at the heart of research capacity building – particularly when characterized by strong local ownership – lies the ambition of scientific cooperation to establish the necessary conditions for a transition from dependency to interdependency.

“I think after many, many years of working in this field, I always think of that scientific research cooperation as paramount. [...] Because if you don't have local knowledge and your own research as a country, you're always going to be buying it from someone else. You're always going to be looking after what the Americans are doing, what the Brazilians are doing, what the Europeans are doing.” (Interview 14, Sida representative, August 2024).

Above all, the case of Sida-financed research capacity building in Bolivia illustrates the dynamic and evolving nature of the cooperation. On one side, UMSA and UMSS have continuously developed and expanded their scientific capacities; on the other, Sida has adapted its approach over time, responding to contextual needs.

“Developmentalism has passed, [...] but I believe that this instrument must be used, that it should not be lost as a concept and as training. There are things that no one has read in a book, no one has read in management journals, [...]. This is learned in life and that's what has happened.” (Interview 7, Policy maker at the Bolivian Viceministry of Science and Technology, July 2024).

Research capacity building presents a particularly compelling case within the broader discourse on academic dependency. While it is undeniable that foreign support entails a high degree of external influence – accompanied by expectations to conform to donor standards – research capacity building stands out in its goal to reduce structural dependencies over time. By strengthening the institutional and scientific capacities of recipient universities, it aims to enable a transition toward interdependent sovereignty. For developmental universities seeking to align their research agendas with goals of inclusive and sustainable development, clearly defining strategies for international collaboration is crucial in the face of scarce local partners. Doing so allows them to leverage external partnerships in ways that enhance, rather than compromise, their sovereignty.

CONCLUSION

The case underlines that research capacity building is a long-term and gradual process. The Swedish model of bilateral research cooperation stands out with its long-term, broad institutional process with emphasis on local ownership in several, strongly interrelated pillars. The public universities of UMSA and UMSS engage with the Swedish partners to build the research capacity to conduct research at international standards, while continuing to place a strong emphasis on their contribution to the inclusive and sustainable development in the country.

Regarding the question of who defines research agendas, the case exemplifies the

complexity and multitude of factors that have led to the shaping of the research profiles of UMSA and UMSS. The efforts of research capacity building are strongly concentrated in prioritized research areas. The choice of these areas is rooted in collaborative ties and pockets of expertise and infrastructure at UMSA and UMSS that were existent prior to the start of the bilateral, institutional cooperation in 2000. Moving forward, they have been developed in dialogue between Bolivian and Swedish partners. Some degree of path dependency appears inevitable in this process as investments in specialized infrastructure and the specialization of researchers shape the range of possible future research lines. As more scientific capacity had been built in the Bolivian universities, local researchers could engage more actively in the process of agenda setting, tailoring it to needs and specificities of the Bolivian context. This includes addressing challenges related to food security, energy, or pollution, just to name a few.

The stronger integration of a scientifically peripheral country into international science networks comes with a pressure to adhere to international norms and can lead to academic dependency. Yet, over time and with increasing capacity to shape research agendas and conduct research more independently, there is simultaneously potential for a greater democratization of knowledge on a global scale as research conducted in developmental universities in Latin America can add new perspectives and grant visibility to commonly neglected topics. Having the scientific and organizational capacities to conduct and

contribute their own research provides them with more opportunities to shape the discourse around matters of relevance to their context.

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