

# Brain drain or brain circulation? Career paths of international students

Swiss scholarships for international students  
at ETH Zurich and the University of Zurich

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# Preface

ETH Zurich and the University of Zurich have a long tradition of receiving students from developing countries and emerging economies. Since the 1960s, the major instrument for supporting students from abroad at both institutions has been the Swiss Government Scholarships known as “Bundesstipendien”. Until today almost two thousand students have been hosted at the two universities through this programme.

In 2012/13 several funding instruments from both the Swiss Federation and ETH Zurich were terminated or underwent substantial changes. This seemed to be a good moment to reflect on the impact of scholarships for students from developing countries, not only with respect to research results and their implementation, but also with respect to the capacity development dimension. Since a larger sample would lead to more significant results and more valid potential conclusions, it was decided to include a broader set of scholarship programmes and to cover both ETH and the University of Zurich. In addition, this approach allowed broadening the disciplinary scope of the study. Joining forces between the two universities also provided a significant added-value by tapping into specific expertise on academic migration.

For these reasons the career tracking study at hand was designed to include the Swiss Government Scholarships at ETH Zurich and at the University of Zurich, the programmes funded by the Swiss Agency for Development and Cooperation (SDC) at ETH Zurich, the scholarships for doctoral students from developing countries of the University of Zurich as well as the rather new “Excellence Scholarship and Opportunity Programme” at ETH Zurich.

We are pleased to present a report that reveals insights which have never before been systematically explored at our universities. The results shed new light on the multi-faceted benefits of scholarships to the individual recipients, the host universities, and the societies in the countries from which the fellows originate and where they currently live and work.

We thank the authors and co-authors, the fellows who enthusiastically participated in the survey, and all colleagues in the university administration who willingly shared their insights in the management of and experiences with the various scholarship programmes. Without their effort and dedication this important study would not have been possible.

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# Executive summary

The career tracking survey of foreign students at ETH Zurich and the University of Zurich reviews several scholarship programmes for students from developing and transition countries. The study aims to present career paths of scholarship recipients with a focus on their current employment situation, analyse their mobility patterns and their transnational networks. The study highlights specific aspects of each scholarship programme, and presents the respondents' interest in alumni networks of the hosting universities.

First, the **academic debate on student mobility** is introduced to give an overview of the current discourse and outline research gaps. As student mobility increases, both in numbers of migrants and in numbers of countries of origin and host countries, the question of return and the relevance of physical presence in the home or host country receives increased attention, often framed in the normative context of "brain circulation". This study addresses quantitative and qualitative aspects of student mobility.

Second, the **selected scholarship programmes** are described. The programmes covered are (i) the Swiss Government Scholarships ("Bundesstipendien") at ETH Zurich and at the University of Zurich; (ii) the Research Fellow Partnership Programme (RFPP) and (iii) the programme of the Swiss Centre for International Agriculture (ZIL), both funded by the Swiss Agency for Development and Cooperation (SDC) at ETH Zurich, covering the period from 1996–2012, which was used as reference time period for this study; (iv) the scholarships for doctoral students from developing countries of the University of Zurich as well as (v) the rather new Excellence Scholarship and Opportunity Programme (ESOP) at ETH Zurich.

These programmes either mainly target students from developing and transition countries, or are thematically closely related to the Global South – attracting both, candidates from the Global South and North – or they have no thematic or geographic focus but are open to applications worldwide. The main selection criterion for this study was to include

scholarship recipients from least developed countries to upper-middle-income countries (according to the OECD DAC List 2012/2013), who received the scholarships in the period 1996–2012. In total, this resulted in a sample of almost 450 people.

The overview of **methods** specifies the data collection and analysis. The main data collection was conducted through a quantitative survey sent out to former scholarship recipients, with a response rate of 80%. The quantitative sample represents a total of 304 individuals who all received a Swiss scholarship for a shorter or longer period of time at either ETH Zurich or the University of Zurich. In addition to the quantitative survey, qualitative in-depth interviews were conducted with a representative sample of selected candidates.

The third chapter presents the sample and the **results**. Respondents included in the study come from 57 different countries with a wide geographic distribution. Using the Human Development Index (HDI) as a proxy of a country's development status, the large majority (75%) originate from countries belonging to the "medium" or "high" HDI categories. Over 50% of the respondents conducted their studies in the fields of engineering or environmental systems sciences. 33% hold a Master's degree and 54% a PhD degree.

The chapter on **employment** sheds light on employment mobility, employment sector and position. Almost 60% of respondents are employed in research or higher education, while 20% work in the private sector. The respondents' employment situation was analysed according to the professional position that they have achieved. Almost 20% of the total sample holds a position in upper management (e.g. professor or director) while more than 40% of respondents had obtained a position in middle management. The longer ago a person has had the Swiss scholarship and the more employment stays abroad he or she has experienced, the higher is the current employment position. The more interesting finding, however, is that the respondents' current

country of residence determines their position: almost 30% of respondents in less developed countries (Low, Medium and High HDI) hold a position in upper management, while this number is only about 5% for those residing in Very High HDI countries. A further interesting finding is that the younger generation is geographically more mobile (both for employment and education), pointing towards the internationalisation of education and work.

95% of the respondents indicated that the scholarship facilitated their career development. High quality support from supervisors and access to national and international networks was considered the most important asset, however also non-academic skills, such as language, international experience, intercultural communication skills and new attitudes were important.

The section on **transnational networks and the question of return migration** presents respondents' residential status and their motivation to return; in addition, it outlines the contacts with the country of origin. 50% of the respondents reside (back) in their country of origin. Those currently residing abroad are concentrated in highly developed countries, a fact that would indicate a tendency towards "brain drain". However, of those abroad, more than half maintain considerable professional contacts with their countries of origin, potentially ensuring a flow of knowledge and skills. Furthermore, 36% of the respondents sent back remittances during their scholarship studies in Switzerland. The main reasons for return were (i) the desire for a professional contribution to the country of origin, (ii) longing for family and friends and (iii) a higher social status in the country of origin.

The sub-section on **networks** points to the importance of scholarship recipients' stay in Switzerland for the establishment of contacts; 93% of those with a professional network with Swiss institutions established these contacts during their scholarship time. Regarding the creation of international networks, the results suggest that there might be

barriers to those from less developed countries in forming wide international professional networks, indicating that long-term collaboration is more likely to develop between partners with similar academic standards or facilities. The section on specific aspects of different scholarship programmes looks at target groups, migration status as well as employment-related findings. While some scholarship programmes seem to be well accessible to candidates originating from low or lower middle class backgrounds and families with less academic education, particularly in less developed countries, the target group of other programmes is more focussed on upper middle class students from more well developed countries.

Respondents' interest in alumni networks is very high; 90% want to know more about the alumni organisation of their respective host university, both to network on professional issues and to promote the host university abroad.

The final section of the report **summarises the findings** on respondents' career development, mobility and networks. The results on employment status and the respondents' high satisfaction with their scholarships indicate the importance of the scholarship programmes on an individual level; the scholarship was the respondent's "entry ticket" to accessing an outstanding education at ETH Zurich or the University of Zurich, which was considered a great asset. Although figures of student mobility point towards a concentration in highly developed countries, there is reason to believe that this is not primarily "draining" the talent pool of the countries of origin, but creating networks between individuals in different locations. Nevertheless, it is important to monitor mobility patterns and the creation of networks to assess tendencies and estimate consequences, and draw conclusions on multiple levels. This will allow ensuring the relevance of future scholarship programmes and creating added value for all actors involved, from students to university supervisors, host institutions and even on the national level, both in sending and receiving countries.

# Global career tracking

## 1. Introduction

### 1.1 Student mobility and scholarships

With increasing internationalisation of higher education and research, the competition for talents is taking place on a global level. Countries and institutions able to offer favourable conditions and opportunities for education and research are attracting knowledgeable and skilled people. Knowledge and skills are assumed to be crucial for personal advancement and well-being and for the development of knowledge-based economies both in countries where students go to as well as where they are coming from. Furthermore, student and researcher mobility can support development efforts in their respective countries of origin through tangible benefits such as remittances and investments, and more indirect advantages such as expanded international networks, technology, and skills transfer. Understanding the dimensions of international mobility of university graduates at institutional, national and international level is therefore highly relevant, as both the size and importance of student and researchers mobility are growing.

Switzerland is currently the country with the highest percentage of immigrant scientists worldwide (FRANZONI et al. 2012) and ETH Zurich and the University of Zurich are among the most attractive research and education institutions in Switzerland. University graduates move on to careers within or outside academia, both in Switzerland and abroad, and contribute to scientific and economic progress as well as expanding the networks of the respective universities. This is also the case regarding students supported through funding opportunities open to or explicitly targeting students from developing and transition countries. Initially, these funding instruments aimed at facilitating students and researchers from developing countries to access high quality education opportunities not present in their countries. Although

accessibility and quality of education in many countries have improved considerably, ETH Zurich and the University of Zurich remain committed to educating talented students and researchers from less privileged regions, thereby contributing to intellectual and academic capacity development worldwide. However, the wider implications of these funding opportunities are, at best, vaguely known.

The core objective was to evaluate and analyse the outcomes of existing scholarship programmes from the University of Zurich and ETH Zurich which have a specific focus on funding students from developing and transition countries. With this, the study aims to:

- Identify current funding instruments for students from developing/transition countries at the University of Zurich and ETH Zurich.
- To analyse career paths of scholarship recipients with a focus on current place of residence and employment situation, and the role of mobility and transnational networks for their status quo.
- Evaluate specific aspects of each scholarship programme.
- Map and describe the Swiss and international networks of scholarship alumni of the University of Zurich and ETH Zurich.

## 1.2 Student mobility: academic debates

Student mobility has long been a relatively under-researched field but has drawn increasing attention over the last years (e.g. BROOKS & WATERS 2009, FINDLAY 2011). In their comprehensive contributions on the topic, FINDLAY (2013), RAGHURAM (2013) and KING & RAGHURAM (2013) identify the following aspects of how student mobility has been looked at so far: demographically as stocks and flows (KING et al. 2011), institutionally through the internationalisation of higher education and its role for student mobility (e.g. SIDHU 2006), and as a form of cultural, human, and/or social capital (BALÁZ & WILLIAMS 2004, FINDLAY et al. 2006, WATERS 2006 & 2009).

Researchers acknowledge two main trends of international student mobility: on one hand this is a South to North or an East to West phenomenon (mainly towards North America, Western Europe and Australia). On the other hand, it is also a North to North, intra-European, phenomenon due to EU-assisted schemes such as Erasmus, Socrates, Tempus or Leonardo (KING & RUIZ-GELICES 2003; BALÁZ & WILLIAMS 2004: 218). Much less recognized is the mobility of students within regions other than Europe, for example, in Kyrgyzstan, where one finds a range of students from other Central and South Asian countries, particularly for medical studies (THIEME et al. 2013; THIEME forthcoming), or within South Asia, where there is a high mobility of students for example towards India.

A similar research gap exists on the processes of return, knowledge transfer, and integration into the labour market of the country of origin. A common assumption is that knowledge acquisition is seen as a fundamental source of well-being and progress for a country's development (UNESCO 1998; TEJADA GUERRERO & BOLAY 2005: 2). These expectations are true for all sectors of education, but students who have been educated abroad promise even more. Although this is not exclusive to migrants, former student migrants are generally expected to acquire and transfer new knowledge by

crossing boundaries and building bridges between different knowledge communities (WILLIAMS 2007: 41–42). Discussion on knowledge transfer can also be connected with concepts of “brain drain, brain gain and brain circulation”. Brain drain debates have their roots in the 1960s/70s on student and skilled labour mobility from the global South to the global North. Brain gain and circulation debates have gained momentum since the 1990s when researchers as well as policy makers began acknowledging that emigration (for education) does not necessarily mean an abrupt disconnection from the home country, but rather that migrants would foster connections between countries. Thereby, migrant students and labourers could potentially gain knowledge and experience which would be utilized upon return or, even without returning, through maintaining linkages and fostering exchange between countries (for an overview see LOWELL et al. 2004; WOLFEIL 2012: 35–56).

Lastly, the research presented connects to wider debates on return migration, showing that a complex web of professional, societal, economic and social factors influence return migration. Return can be also imagined or provisional, encompassing various short-term visits such as holidays, and may not necessarily be to the specific place of origin but elsewhere in one's home country. Student migrants can also be torn between staying in their country of study or returning to their country of origin (also ALBERTS & HAZEN 2006; KING & CHRISTOU 2011; MOSNEAGA & WINTHER 2013; THIEME forthcoming).



## 2. Methods

### 2.1 Tracking methods

The alumni-tracking study comprised a quantitative online survey as well as qualitative in-depth interviews; however, the report mainly covers the quantitative survey.

In coordination between ETH Global and the International Relations office of the University of Zurich, five scholarship programmes were selected. The selected scholarships either mainly targeted students from developing and transition countries, or were thematically closely related to the Global South – attracting candidates from the Global South and North – or they had no thematic or geographic focus but were open to applications worldwide.

The main selection criterion for the study was to include scholarship recipients from least developed countries to upper-middle-income countries, covering the period 1996–2012. In total, this resulted in a number of almost 450 people.

The existing data bases of ETH Zurich and the University of Zurich contained 144 e-mail addresses of former alumni. They were validated by asking for a response (104 replies). Subsequently, former scholarship recipients were searched in the internet with the information available (field of study, name and nationality). Platforms used were: Google, Google Scholar, Facebook and LinkedIn. Furthermore all scholarship recipients who confirmed their addresses were asked if they had further contact addresses of other scholarship recipients or if they would forward the e-mail to other alumni. Previous supervisors at the University of Zurich and ETH Zurich were also asked for further information on their former scholarship recipients. For smaller scholarships such as the Excellence Scholarship and Opportunity Programme, almost 100% of addresses were found, for the Swiss Government Scholarships the rate was lower, on average 85% of

scholarship recipients in the selected sample confirmed their addresses. However, scholarship recipients from China, North Korea and Ukraine were particularly difficult to find. For example, in the internet search, Chinese names in combination with the study subject often generated a very large number of hits. In total, the invitation to participate in the online-survey was sent out to 375 confirmed addresses. The number of qualitatively good (with the main questions of the questionnaire completed) responses was 304, equivalent to a considerably high response rate of 80%.

In developing the questionnaire, the authors referred to existing alumni-tracking studies and questionnaires (FRANZONI et al. 2012, HEIM et al. 2012; DAAD 2013; EPFL et al. 2013), and received feedback from scholarship management divisions, the alumni organisations, and Finance and Controlling of ETH Zurich. The questionnaire was pre-tested with five scholarship recipients from different scholarship programmes and different career lengths to improve the quality and the user-friendliness of the questionnaire. The questionnaire was in English only but answers for “open questions” were possible in multiple languages (French and German speaking persons made use of this). In total, the questionnaire contained 60 questions and was implemented as an online survey through Select Survey (Annex C). Personalised invitations and links were sent out to participate, followed by reminders. The survey took place during five weeks in June and July 2013.

The quantitative analysis of data comprised multiple regression analyses and descriptive statistics on migration and mobility, employment sector and position, network creation, and programme feedback. All statistical analysis was performed using the SPSS package.

Scholarship recipients could indicate their interest in an in-depth interview. 19% of ETH respondents and 17% of UZH respondents agreed to be available for in-depth interviews. Ultimately, in-depth interviews were conducted with nine

ETH and six UZH scholarship recipients. They were chosen based on the quantitative findings considering categories such as nationality, migration patterns, academic qualifications and field of study, timing and kind of scholarship programme, gender and age. Information from those interviews is used to illustrate the findings from the quantitative survey. All responses are anonymised by replacing names with fictive ones, naming regions instead of countries, and through only indicating the interviewee's job position but not the subject.

## 2.2 Context and description of scholarship programmes

At ETH Zurich<sup>1</sup> 36% of all students and 65% of doctoral students are foreigners while at the University of Zurich 18% of all students including PhDs and more than 35% of PhD students have a foreign nationality. Both the strategic priorities of ETH Global and the mission statement of the University of Zurich pronounce the broad responsibility for education and networking globally:

The intention of the selected scholarship programmes is enabling students from less privileged regions or backgrounds to obtain an education from or to conduct research in cooperation with the institution in question. It should however be noted, that no attempts were made to quantify the impact of the selected scholarship programmes or compare them with other scholarships schemes (such as e.g. from the Swiss National Science Foundation).

The five scholarship programmes included in this study were the Swiss Government Scholarship Programme granted by both universities – ETH and University of Zurich, two types of “research for development” scholarships – the Research Fellow Partnership Programme (RFPP) and project of the Swiss Centre for International Agriculture (ZIL), the

Excellence Scholarship & Opportunities Programme (ESOP), and Scholarship for doctoral students from developing countries (“Entwicklungsstipendien”). The main selection criterion<sup>2</sup> for the study was to include scholarship recipients from least developed countries to upper-middle-income countries<sup>3</sup> who received the scholarships in the period 1996–2012. This time period was selected for comparison, as two of the scholarships (RFPP and ZIL) started in 1996.

### **Strategic priorities of ETH Global, 2012**

*1.3 ETH Zurich contributes to the intellectual and academic capacity development worldwide.*

*3.3 ETH Zurich strengthens its worldwide network with academia, the public and private sector, and civil society as an investment in long-term relations between Switzerland and the international community.*

### **Mission statement UZH, 2012**

*“International character: UZH is a university with an international reputation for excellence. UZH recruits outstanding researchers from throughout the world, fosters international collaboration in research and teaching, and promotes student exchange.”*

### **Mission statement International Relations, UZH, 2006**

*“North/South Dialogue: The University of Zurich works together with selected universities from developing and emerging countries. The aim is reciprocal exchange in teaching, research and administration, to the benefit of both parties.”*

<sup>1</sup> Where not otherwise noted, findings for UZH and ETH Zurich are very similar.

<sup>2</sup> Except for scholarship recipients included in the research for development scholarships RFPP and ZIL.

<sup>3</sup> according to the OECD DAC-List 2012/2013

**Table 1: Sample of scholarship programmes**

Scholarship programme	Target group	Duration	Funding	Number of respondents (response rate)
Swiss Government Scholarship (Bundesstipendium), ETH Zurich	“research student”, Master, PhD, Post-doc	since 1961	SERI <sup>b</sup>	140 (74%)
Swiss Government Scholarship (Bundesstipendium), University of Zurich	“research student”, Master, PhD, Post-doc	since 1961	SERI	69 (73%)
Research Fellow Partnership Programme (RFPP), all Swiss Universities (mainly ETH Zurich)	PhD & Post-doc (R4D)	1996–2015	SDC <sup>c</sup>	40 (81%)
Excellence Scholarship and Opportunity Programme (ESOP), ETH Zurich	Master	since 2007	ETH Zurich/ETH Zurich Foundation	25 (86%)
Swiss Centre for International Agriculture (ZIL), ETH Zurich	PhD & Post-doc (R4D)	1996–2011	SDC	20 (77%)
Scholarships for doctoral students from developing countries (Entwicklungsstipendien), University of Zurich	PhD (part) (R4D)	2003–2007	UZH	10 (100%)
<b>Total</b>				<b>304 (81%)</b>

<sup>a</sup> Mainly used as pre-doc or so called “sandwich”, as a part of doctoral studies

<sup>b</sup> State Secretariat for Education, Research and Innovation

<sup>c</sup> Swiss Agency for Development and Cooperation

The objectives and selection processes of the scholarship programmes’ are shortly described below:

**Swiss Government Scholarship (Bundesstipendium):** The aim of the scholarship programme is to support diplomatic relations between Switzerland and the countries eligible for support, through capacity development of talented students. The scholarship is funded by the Swiss State Secretariat for Education, Research and Innovation and awarded by the Federal Commission for Scholarships for Foreign Students (FCS). The Swiss Government Scholarships have been awarded since 1961, both through university and arts scholarships. Currently the scholarships are awarded to

pursue (usually a part of) doctoral or postdoctoral research in Switzerland at one of the publicly funded universities or recognised institutions. Interested students apply to the Swiss Embassy in their country of origin, after a pre-selection the applications are forwarded to Berne. Thereupon, the candidates are selected by the FCS (one representative per Swiss university) according to country quota and funds available. China however, presents a particular case, as the Chinese Scholarship Council, in collaboration with the Swiss Embassy, is responsible for the pre-selection of candidates. Hence, the Chinese scholarship recipients have significantly differing profiles, compared to scholarship recipients from other countries (see 3.1.1).

**Excellence Scholarship and Opportunity Programme (ESOP):** The ESOP scholarship programme is currently funded through the ETH Foundation and aims to support excellent Swiss and foreign students to pursue a Master's degree at ETH Zurich. The programme started in 2007. The applications for Excellence Scholarships are evaluated by the Admissions Committees of the respective Master programmes. The final decision rests with the Rector of ETH Zurich. The number of annual scholarships depends on the availability of funds. In 2013, 38 scholarships were awarded.

**Research Fellow Partnership Programme for Agriculture, Forestry and Natural Resources (RFPP):** The Research Fellow Partnership Programme for Agriculture, Forestry and Natural Resources has been funded by the Swiss Agency for Development and Cooperation (SDC) since 1996, the last projects will end in 2015. The overall objective of the RFPP is to enhance the human resource base in international development. The programme aims at training young scientists, both from developing countries and Swiss citizen (or well established Swiss residents), generating development relevant knowledge and establishing research partnerships. The selection of the PhD and Post-doc fellows was undertaken by an external committee after scientific reviews.

**The programme of the Swiss Centre for International Agriculture (Zentrum für internationale Landwirtschaft, ZIL at ETH Zurich):** The ZIL programme at ETH Zurich was funded by SDC from 1996–2011 and focussed on development relevant issues in agricultural research. The ZIL programme was organised in projects, thus research topics rather than individuals were funded. PhD or Post-doc students from developing countries as well as from Switzerland and other Western European countries conducted the research. Selection of the research projects was undertaken by an ETH committee with external experts after scientific reviews.

**Scholarships for doctoral students from developing countries (Entwicklungstipendien):** The scholarships for

doctoral students from developing countries targeted PhD students from developing countries to spend ten months of their PhD studies at the University of Zurich, or, to prolong a current stay. The scholarship recipients were selected by an internal committee of the University of Zurich.

## 3. Results

### 3.1 General sample description

#### 3.1.1 Composition of the sample

The students from the selected scholarship programmes are mainly from developing or transition countries and compose a rather heterogeneous group. They all have in common that they, for a longer or shorter period of time, received a scholarship and, with very few exceptions<sup>4</sup>, were conducting research or engaging in education at either ETH Zurich or the University of Zurich.

Considering the sample size and the high response rate of 80%, the sample is roughly representative of the population of scholarship recipients at ETH and UZH. However, for the sake of completeness, the following biases and potential errors should be mentioned: 1) Scholarship recipients not found in the 'people search' comprises an unknown group and there is a slight country bias as scholarship recipients from certain countries, e.g. China (large population to search for scholarship recipients) and North Korea (censoring, political restrictions), proved particularly difficult to find. 2) A number of scholarship recipients confirmed their e-mail address but did not reply. This might be due to several reasons: e.g. lack of interest, lack of time or no access to internet or other technical difficulties. The latter issues were addressed through sending out word-versions of the most important questions, however, this was only marginally made use of. 3) Incomplete answers, as not everyone replied to all questions, visible in the variability of the sample size. Furthermore, incorrect answers possibly occur (e.g. falsely clicked options in drop-down lists), however, these are expected to be randomly distributed and not systematic. Thus, there are no major concerns questioning the quality of the survey data.

The Research Fellow Partnership Programme for Agriculture, Forestry and Natural Resources (RFPP) and the programme of the Swiss Centre for International Agriculture (ZIL) were defined by a thematic focus on development related research and both targeted researchers from developing countries and researchers from Switzerland. As the study focused on international fellows from developing and transition countries and their career paths and mobility since the scholarship, candidates from Switzerland and Western European countries were not directly relevant for the survey as the main questions target return migration, related professional career paths, and linkages with countries of origin. However, as their responses provided a good comparison regarding mobility patterns, employment positions and scholarship programme feedback, this data was also included in the sample. Furthermore, China was excluded from the analysis regarding return migration due to the fact that scholarship recipients from China showed an exceptionally high return rate to their country of origin. The main reason for this immediate return is the scholarship selection procedure (see 2.2), which explicitly targets already well-established scientists (e.g. often Post-docs with contracts as researcher/lecturer at a Chinese University), who are married and have children and thus comparably high incentives to return.

#### 3.1.2 Countries and regions of origin of scholarship recipients

In the sample, 57 different countries of origins are represented (see list of countries and their HDI-status in Annex A). The most frequently occurring countries are China (46), India (39), Switzerland (15)<sup>5</sup>, Ukraine (13), Colombia (12), Serbia (11), and Argentina (10).

To categorise the countries into groups, the Human Development Index was applied. The Human Development Index (HDI) is a composite indicator of life expectancy, education, and income indices used to rank the development of countries introduced by the United Nations Development

<sup>4</sup> The RFPP scholarship initially allowed projects with all Swiss universities. From 2008 on, only projects with a supervisor at ETH Zurich were accepted.

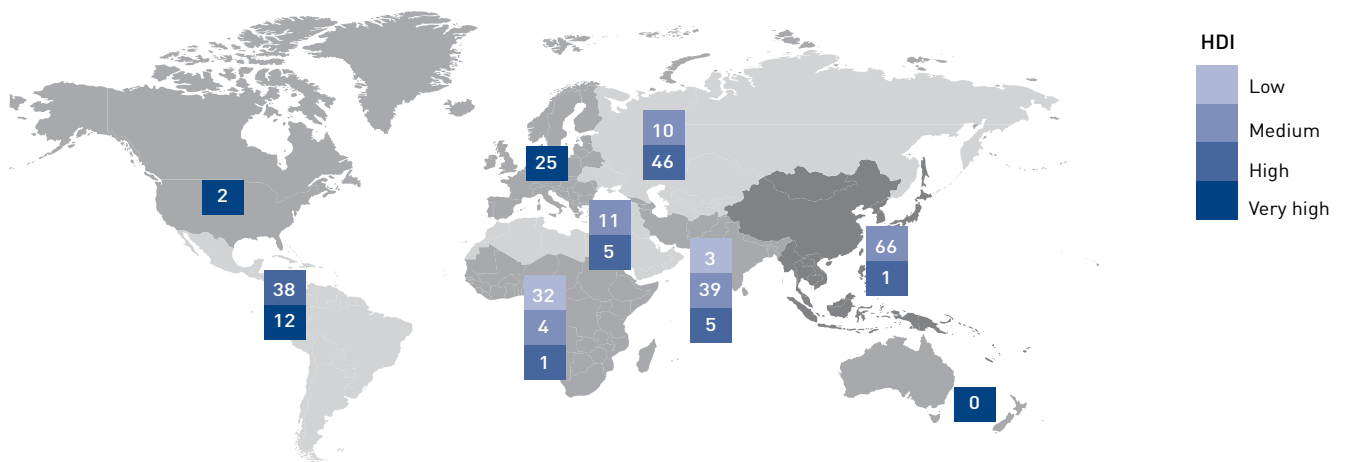
<sup>5</sup> As mentioned in 2.2. two scholarships (ZIL, RFPP) aim at training young scientists, both from developing countries and Swiss citizens (or well established Swiss residents), generating development-relevant knowledge and establishing research partnerships.

Programme (UNDP) in 1990. Rankings are published annually in the Human Development Report. The ranking is divided in the categories Very High, High, Medium and Low Human Development (UNDP, 2013).

Most countries included in this study fall into the categories of High or Medium HDI. Regarding the regional distribution of the scholarship recipients, the regions were summarised using the World Bank Geographic Regions. The figures on this page show the number of respondents (by regions of birth) as well as the countries' HDI categories.

**Table 2: HDI categories and number of respondents**

HDI category	Range (on a scale from 0.000 to 1.000)	Number of Respondents	%
Low	0.0–0.534	36	12
Medium	0.535–0.710	130	43
High	0.711–0.799	96	32
Very High	0.800–1.0	39	13
<b>Total</b>		<b>301</b>	<b>100</b>



**Figure 1: Number of respondents by geographical region (according to the World Bank classification) and HDI rank of their countries of birth (N=301)**

The numbers on the map refer to the number of respondents per World Bank Region: East Asia and the Pacific, Eastern Europe and Central Asia, Latin America and the Caribbean, Middle East and North Africa, South Asia, Sub-Saharan Africa, Western Europe, North America, Australia and New Zealand.

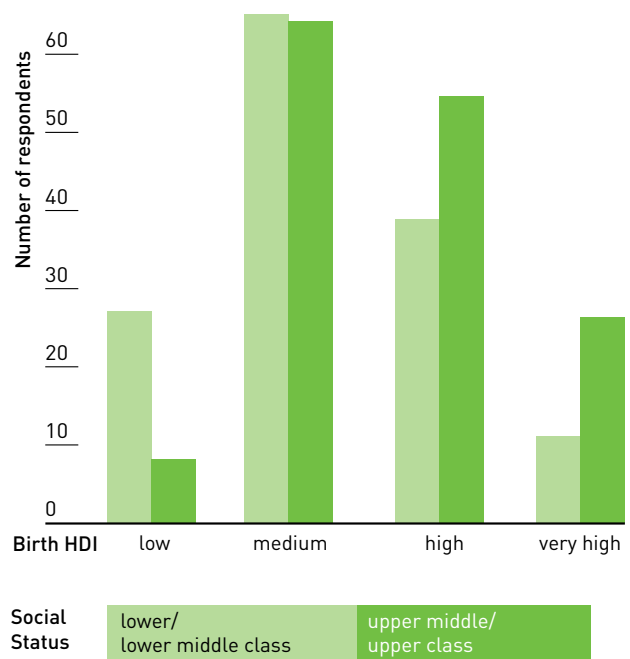
**Table 3: Birth HDI and specific geographic environment of birth**

Environment	Low HDI	Medium HDI	High HDI	Very High HDI	Total
Rural	14	30	5	5	54
Semi-urban	8	33	17	14	72
Urban	13	64	71	18	166
<b>Total</b>	<b>35</b>	<b>127</b>	<b>93</b>	<b>37</b>	<b>292</b>

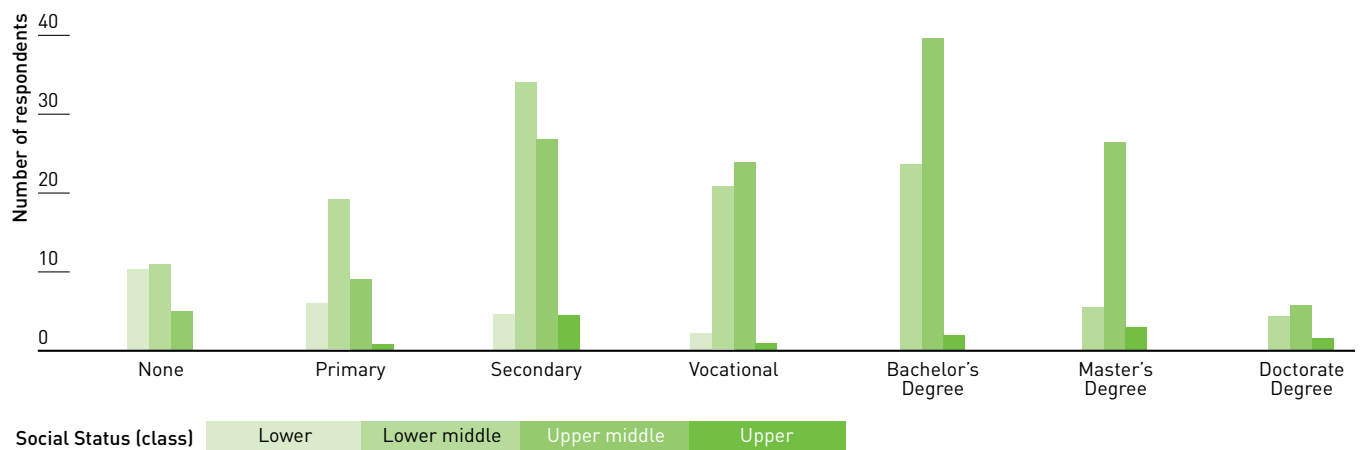
### 3.1.3 Socio-economic background

Regarding the distribution of the sample by social status (self-reported information on parental social status), 56% of scholarship recipients from Low and Medium HDI countries are from Low or Lower Middle Class backgrounds, while 62% of High and Very High HDI countries are from Upper Middle or Upper Class backgrounds. This difference is statistically significant ( $p = 0.003$ ).

As a further indicator of respondents' socio-economic backgrounds, their mothers' education was included in the analysis. This had several reasons, firstly the number of responses on this question was considerably higher (due to a structural factor in the survey design; respondents answered mother's education first), secondly this indicator showed a greater variance than father's education. This is useful to differentiate among levels of parental education, which might be partly obscured in father's education and, in addition, leads to stronger and clearer statistical results. When comparing social status and mother's education, these factors are strongly ( $0.35$ ) and significantly ( $95\%$  level) correlated, but not entirely collinear. Thus, we argue that



**Figure 2: Social status of respondents by category of birth HDI (N = 292)**



**Figure 3: Highest level of mother's education (N = 301)**

including mother’s education adds a further dimension to respondents’ socio-economic background. While 40% of the respondents originating from Low and Medium HDI countries have a university educated mother, 56% of respondents originating from High and Very High HDI countries have a university educated mother. This difference is statistically significant ( $p = 0.009$ ).

**3.1.4 Gender, relationship status and age**

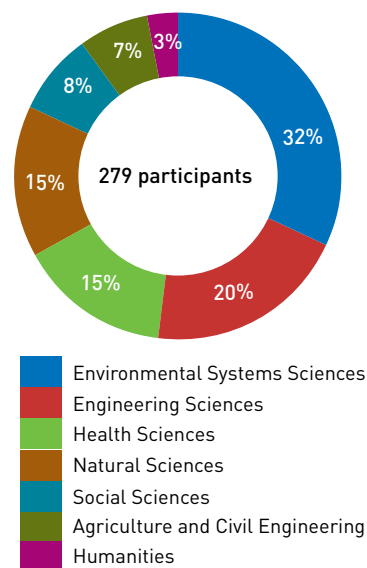
1/3 of the total sample is female and 2/3 male. This number varied between the universities. The University of Zurich exhibited a higher number of female scholarship recipients (38%) compared to 29% at ETH Zurich. While the gender ratio of the ETH scholarships nearly represents the overall proportion of female and male students of ETH Zurich (31% female students<sup>6</sup>), the overall percentage of women studying at the University of Zurich (57%)<sup>7</sup> is higher than the 38% female scholarship recipients.

The majority (62%) of scholarship recipients was single during their studies. The mean current age of former scholarship recipients at the time of the survey is 36 years (range 23–65 years). The mean age at the time of scholarship was 28 years (youngest in sample 21 years, oldest 48 years).

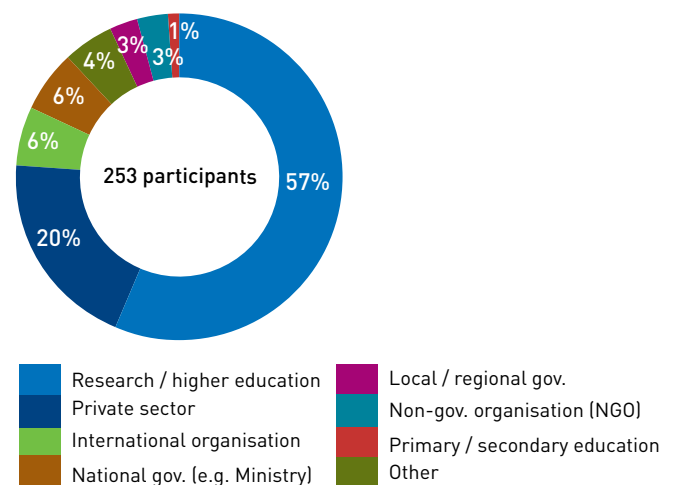
The mean time elapsed since the end of the scholarship is 5.2 years and the median is 4 years, i.e. around half of the sample finished their scholarship within the last four years. This can be explained by the increasing numbers of students supported by the largest scholarship programme (Swiss Government Scholarship) in the past few years as well as by the fact that recent scholarship recipients were easier to find in the “people search”.

**3.1.5 Academic background and current profession of scholarship recipients**

While most respondents studied or did research in the field of environmental sciences (33%), engineering sciences (20%, mainly at ETH Zurich), health sciences (15%, mainly



**Figure 4: Field of study (N = 279)**



**Figure 5: Current employment by sector (N = 253)**

<sup>6</sup> ETH Zurich (2013): *Annual Report 2012*. Zurich.

<sup>7</sup> University of Zurich (2013): *Jahresbericht 2012*. Zurich.



medicine at University of Zurich) and natural sciences (15%) were also common fields of study.

Combining the field of study with the region of birth, it became apparent that scholarship recipients from South Asia were strongly represented in engineering sciences; further particularities could not be found. 33% of the respondents held a Master's degree at the time of the survey with a certain proportion<sup>8</sup> of them currently working on their PhD, while 54% of the respondents had a PhD already, leading to the conclusion that the respondents present a group of highly qualified individuals.

The most common employment sectors of scholarship recipients were research and higher education (57%) and the private sector (20%). Analysing the positions by sector shows that the highest proportion of respondents working in upper management prevails in research and higher education; 20% of scholarship recipients in this sector are currently professors (or directors).

By field of study, Environmental Systems Science, Health Sciences, and Social Sciences graduates have the highest position on average (combining upper and middle management), while graduates in Engineering Sciences have the lowest positions. The latter could be explained by a high proportion of these students still in PhD-positions.

## 3.2 Educational and employment mobility

For analysing the relationship between the scholarship stay in Switzerland and general mobility, **educational mobility** is defined as the number of distinct countries that scholarship recipients visited and stayed in (for at least three months) for educational or academic purposes (such as BSc, MSc degrees, or shorter stays for study, research, trainings or internships). **Employment mobility** is defined by the total

number of countries that scholarship recipients had worked in or stayed for employment purposes for at least three months<sup>9</sup>. For reasons mentioned above (see 3.1.1), Swiss and Chinese students were not included in the sample<sup>10</sup>.

### 3.2.1 Educational mobility

35% of the respondents had only been to Switzerland as a foreign country for educational purposes, while 12% had been to four or more countries for education. Scholarship recipients in the environmental field and humanities displayed the highest rate of educational mobility.

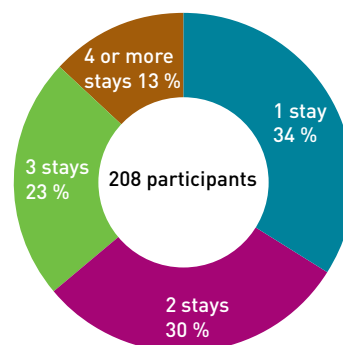


Figure 6: Number of stays in different countries for educational purposes (N = 208)

<sup>8</sup> Due to rather broad employment categories, it cannot be verified how many of the respondents are currently PhD students.

<sup>9</sup> The highest amount of stays abroad was nine

<sup>10</sup> The argument here is that employment mobility for both Swiss and Chinese would be biased as migration mobility and employment mobility are inherently linked. Furthermore, we intended to use the same sample for all mobility analysis. For educational and employment mobility, all alumni who finished their degree until 2012 were included in the sample (in contrast with the sample for analysis on migrational status, where only alumni who finished until 2011 were included.)

When analysed in a regression analysis, no significant predictors of educational mobility appear<sup>11</sup>. As financial resources are often assumed to be important to study abroad this itself is an interesting result. Indeed, scholarship recipients from the Very High HDI category do have higher levels of educational mobility (though not significant) and educational mobility among those with higher social status and higher parental education was marginally higher compared to other groups. Yet, this difference is not significant either.

### 3.2.2 Employment mobility

In contrast to educational mobility, several factors emerge as significant predictors of employment mobility in a regression analysis: gender, age and social status.

With respect to **gender**, women are less likely to be mobile for employment but also for educational purposes. Some explanation for this can be found in the interviews, where women indicated that their parents did not like them to go abroad and the students in question had to be persistent on their intention to go abroad:

*“The parents don’t like to send female children abroad ... and they were afraid how can I manage alone, but after everything, they said ‘ok, it’s your decision’.”*

(Selma, Professor, Eastern Europe)

We also find **age** to be a significant predictor of employment mobility. The younger one is, the more employment mobility he/she is likely to have had, controlling for the age at time of scholarship. In other words, given two people received their scholarship at the same age, the one who is younger now (i.e. a person of a younger generation) is more likely to have higher employment mobility. Thus, despite the fact that the older generations had more time to develop their employment mobility, the younger generations have already exceeded the older ones in terms of employment mobility.

This might be an indication for on one hand increased opportunities to study and work abroad but on the other hand an increasing pressure to be mobile, related to the comparative advantage of having international experience when applying for a job.

Further, **social status** also significantly predicts employment mobility; higher social status corresponds to greater employment mobility. This could supposedly be linked to greater economic, social, and cultural capital of scholarship recipients, which opens up job opportunities. Contrasting, higher parental education (mother’s education) is significantly but negatively associated with employment mobility. Thus, holding all else equal, higher mother’s education corresponds to lower employment mobility. This seems contradictory to the result on social status where it was found that higher status corresponds to higher employment mobility<sup>12</sup>. It could be argued, that those with higher parental education have greater employment opportunities at home or may not feel a push to seek employment abroad as a means of social mobility. However, the interpretation of this issue has not been supported by further findings from the interviews and would rather lead into new research hypotheses about linkages of mobility of people of higher and lower strata and educational and economic status of parents.

Although the **HDI category of one’s country of origin** did not emerge as highly significant, it does seem to play a role. The findings point to higher employment mobility for those from Very High HDI countries, which support the continuing theme of higher mobility for higher HDI categories and might suggest barriers to mobility for those from lower HDI countries, or greater incentives to stay in the country of origin.

<sup>11</sup> Furthermore, the regression models themselves do not prove to be significant.

<sup>12</sup> It is likely that mother’s education levels (as operationalized in the survey with 7 levels) is a more nuanced indicator of social position than “social status” which only has two categories (lower and upper).

### 3.3 Current employment position and importance of the scholarship

Respondents' current employment position was analysed with regard to structural factors which might have influenced their position. Here we found employment mobility, gender, age and social status as well as their country of current residence strongly intersecting. To allow some time for a potential career to develop only scholarship recipients whose scholarship ended before 2011 were included in the analysis.

The employment status of the respondents is described by the current job position of the respondents as well as sector of employment. The current job position was assessed by providing six categories in the survey: Intern/trainee, operational staff non-academic and academic (including PhD students), middle management (e.g. group/team leader), upper management (e.g. professor/director), consultant and "others".

#### 3.3.1 Determinants of current employment position

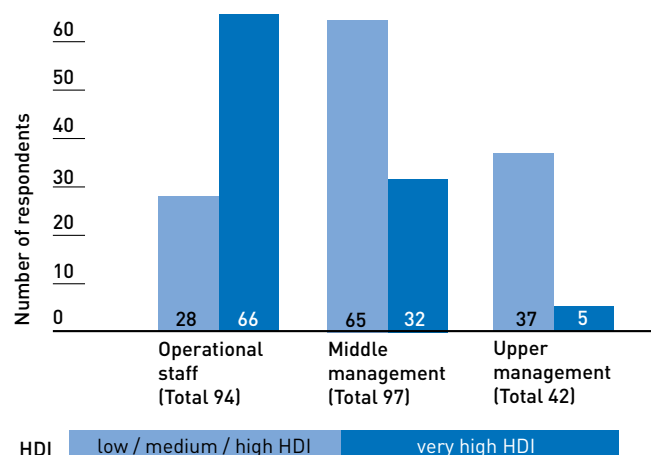
Regarding employment status, the **time elapsed since the end of the scholarship** was found to be an important determinant for position: the longer ago one's scholarship ended, the higher the position one was likely to have.

Taking current age as a control factor shows that for two people of the same age, holding all else equal, if one had the scholarship earlier, i.e. at a younger age, he or she would be more likely to hold a higher position. Thus, it seems that age directly is not a predictor of position, rather age is only relevant insofar as it is linked to how long ago one finished one's studies. This seems to point to the importance of the scholarship to provide access to education which advances the scholarship recipients' careers. However using this as an argument for the impact of the scholarship might be daring, as this effect might just point to the fact that those selected for the scholarship at a younger age might have had better qualifications (than

others) already then and thus consequently develop their career more rapidly.

**Employment mobility** also appears to be a significant factor in predicting one's current employment and is positively associated with the employment position, i.e. the more employment stays abroad the higher the position of the respondent. This might point to the importance of international experiences in high positions. However, the causality might also be reverse as people in higher positions are possibly more mobile for employment purposes<sup>13</sup>.

Furthermore, the **HDI of one's current country of residence** is an important factor in determining one's position (HDI of country of origin is statistically not significant). Those currently residing in Very High HDI countries (in this sample largely Western Europe and USA) have the lowest job positions while those in High HDI countries have the highest position followed by Medium and Low HDI countries.



**Figure 7: Employment position by HDI category of current country of residence (N = 233)**

<sup>13</sup> However, when including "position" as an independent variable in a regression estimating employment mobility, position does not emerge as significant. This would suggest that employment mobility can be seen as a determining factor for employment position.

This result could have several explanations. Regarding the relatively high proportions of scholarship recipients in upper positions in less developed countries it seems that a degree (or a part of higher education) from relatively well-known institutions in a Very High HDI country (i.e. Switzerland) is highly valued in countries with low, medium and high HDI. Scholarship recipients who return to their countries of origin thus have good career chances. The explanation for the relatively low proportions of upper positions in Very High HDI countries might be that recent scholarship recipients are currently working on their PhDs in Very High HDI countries (among them also in Switzerland but after the end of the Swiss scholarship), which allocates them into the “lowest” category of job positions (operational staff). Furthermore, a majority of those currently living in Very High HDI countries (such as Switzerland) are immigrants from lower HDI countries. This raises questions about potential barriers of respondents to attain higher employment positions in Very High HDI countries. Finally, people from the Very High HDI-category (who almost all are resident in this HDI category), might not possess the same comparable advantage of a higher education, due to the generally higher level of education in their countries of origin.

Since employment mobility is positively associated with the employment position but employment mobility is gendered, it is not surprising that gender was also found to be a potential factor determining ones position<sup>14</sup>. Although the distribution for operational staff and middle management is nearly similar for women and men, women are less likely to hold upper management positions. For upper management positions (which could be considered as more critical to achieve than middle management or operational staff) only 10% of women reached this position, while 20% of all men were in upper management.

### 3.3.2 Role of scholarship for the professional career and acquired skills

The vast majority of respondents (95%) indicate that the

scholarship facilitated their career development<sup>15</sup>. Hereby scholarship recipients' countries of origin seem to matter. Scholarship recipients from Low HDI countries all value the scholarship as important, scholarship recipients from Medium, High and Very High HDI countries increasingly less. “High quality support from institute/department of your studies” was mentioned as the most important support for careers during scholarship time, as second most important the access to “national and international contacts and network”. This was also highlighted in the interviews. Several scholarship recipients obtained their PhD positions after their first Swiss scholarship through contacts and recommendations by their supervisors in Switzerland or were subsequently employed by the university of their scholarship. During their studies in Switzerland alumni acquired various skills which they found to be particularly supportive in reaching their career goals (multiple answers possible). The most important were: subject-specific knowledge, methodological skills, language skills, general international experience, intercultural communication skills and attitude (work ethics, punctuality, precision). Interviewees mentioned the particular advantage of being introduced to cutting edge technology and software which might not exist at their home institutions, research methods which might not be taught at their universities or having been inspired by a new culture of publication and academic exchange:

*“...thanks to my colleagues in Zurich, I worked on scientific work that is also published...for people in not very well developed countries and young people from high schools they have to learn that the publication is something that makes you public in the world of science...that they will recognize you through your work, not through politics or something like that. That is very important. ...So in small countries like mine, economically not hugely developed, politics get a lot of influence on a lot of different things. People have to know that this is not only the point, the point is actually to make improvement and to make yourself public to get in touch, to get your work public.”*  
(Marta, director of a clinic, Eastern Europe)

<sup>14</sup> Gender did not appear as statistically significant in a regression analysis.

<sup>15</sup> Except for ZIL, here almost 1/3 of all scholars stated that the scholarship was of no importance to their career development.

*"I bring new knowledge from abroad, really the first knowledge about new trends and techniques in food production I was the first person that bring it to [my country of origin] and share with our producers, my colleagues"*  
(Selma, Professor, Eastern Europe)

*"...I think this scholarship [opened] doors for me that were not, that I didn't know existed before. Even though I wanted to continue research, I never thought I would have such international background in my studies and so I think that's been really, really wonderful for me."*  
(Gilberto, PhD student, South America)

Language (both English and German) also seems to be crucial, explicitly mentioned as an asset both within and outside academia. Depending on the context, an academic degree from abroad might be considered as an "overqualification" and actually hinder scholarship recipients to integrate in the local labour market. Therefore knowledge going beyond one's own subject such as language, management skills or working attitude are highly valued by scholarship recipients returning to their countries of origin:

*"...the foreign language, that is a great advantage. PhD degree perhaps less."* (Andrej, Eastern Europe)

Expectations might also change after a stay abroad bringing about a new perspective of one's own country:

*"Because I noticed that the university [in country of origin], did not have a lot of conditions, technical conditions, the library was not fantastic, we were not in contact with international papers and I wanted to have this, because I remember, when I was in [European country], you go to the internet and then you download good papers, and this, in this university unfortunately I had not this possibility. So I was considering doing a sandwich doctorate, with a period abroad."*  
(Maria, Engineer, South America)

Although not a detailed part of this study, interviewees, especially from China and India, have indicated that rapidly developing educational systems in their countries of origin now also provide an excellent education and basis for a professional career.

*"Normally if they study in Western countries, it's better for them to get a good job. Have more chance. (...) But some of those universities here, are also important universities, it is also easy to get a good job. For example the Tsinghua University, Beijing University and like that."*  
(Yan, Professor, East Asia)

*"So there are a lot of Indian students who travel abroad to do PhD and then they try to come back as well. And I know quite a few of them, and there are also lot of students from India who completely go through the national university system and they are also applying, and they are also extremely well qualified, some of them."* (Anand, PhD student, South Asia)

### 3.4 Transnational networks and the question of return

In this section, we seek to understand where scholarship recipients resided at the time of the survey and how it is linked to intentions to return to the country of origin or not. Furthermore this chapter provides insights in the characteristics of transnational networks sustained by the respondents. The starting point of the chapter is an analysis of current migration status; migration status is defined by whether the scholarship recipient at the time of the survey was residing in his or her country of origin or not.

#### 3.4.1 Residential status at the time of the survey

For the total sample (excluding Switzerland and China as explained above) 50% of former scholarship recipients still

live outside their countries of origin<sup>16</sup>. This is a rather high rate of out-migration as compared to other similar surveys on the mobility of scholarship holders from developing and transition countries. An evaluation of PhD-students from developing countries of the Swiss research programme NCCR North-South, showed that 90% of “Southern” graduates returned to their country or region of origin (HEIM et al. 2012). An extensive survey of DAAD scholarship holders from developing countries showed that 70% of scholarship holders returned to their regions of origin upon graduation. However, observed over a long time span, nine years after their scholarship, fewer scholarship holders were employed in their country of origin (DAAD 2013), showing that return to the home country can be also temporary and might be followed by another move to another country.

Looking at the HDI categories separately, scholarship recipients from Low and Middle HDI countries are the most likely to return, while scholarship recipients from High and Very High HDI countries are the least likely to return. Since almost half of all respondents finished their scholarship stay during the past four years, it is likely, as suggested in several interviews, that some of these scholarship recipients are still completing their (PhD) studies outside their countries of origin.

Among those who are currently not in their countries of origin, a clear pattern of migration emerges; nearly 85% choose to either stay in Switzerland or migrate to another Very High HDI

country, i.e. to Western Europe, the USA or Canada. The pattern of migration to an equivalent or higher HDI category country can be found across respondents from all HDI categories, a fact which was also commented by several respondents:

*“...like the Swiss Foundation has sponsored Africans, to solve problems that are serious in Africa, but they end up in the US, maybe they end up in Switzerland, they end up in Europe or Australia, that is not in my opinion a good return on the investment.”*  
 (Henri, Research group leader, Sub-Saharan Africa)

*“The people from my university, from my faculty, mostly they came back, but not all. Especially younger people than me, they start to stay in Europe I think. Because they have no opportunities and they want to develop their personal career and they have new opportunities, they have more chance outside of [my country of origin] I think.”*  
 (Selma, Professor, Eastern Europe)

Furthermore, respondents’ contact with their countries of origin is considerable (see 3.3.3). Of respondents currently abroad, almost all (98%) have personal contacts with their country of origin and 53% have active professional contacts. This suggests a potential flow of knowledge and skills and implies that those scholarship recipients are interested in (or committed to) collaboration with their countries of origin and possibly also keeping a door open in case of return.



**Figure 8: Migration pattern of respondents currently outside their countries of origin (N= 96, all nationalities except Swiss and Chinese)**



<sup>16</sup> When looking at the migrational status from the perspective of country of origin, categorised according to HDI, and excluding the scholarship recipients from the Very High HDI categories, the numbers change slightly, 52% of all scholarship recipients return to their countries of origin

### 3.4.2 Determinant factors and reasons for staying abroad

Approximately 50% of the scholarship recipients are currently residing outside their country of origin. Since “migration status” is by definition temporary, those returning might go abroad again and those currently abroad might return to their countries of origin. Nevertheless, since half of the respondents have gone back to their country of origin and the other half has not, questions arise about reasons of not having returned (yet), possible remaining exchanges with the home country and brain drain or circulation.

A regression analysis examined possible determinants of out-migration respectively living outside one’s own country of origin. The sample assessing the migration status excluded those born in Switzerland and China and those whose scholarship ended after 2011<sup>17</sup>.

The most influential factor in predicting whether a scholarship recipient is likely to currently reside in his/her country of origin is the **HDI category of the scholarship recipient’s country of origin**. Those from a Very High HDI country are the most likely to be outside their country of origin while those from Low and Medium HDI countries are the most likely to return to their country of origin. This result is further confirmed by looking at the intention of scholarship recipients currently outside their country of origin to return. Scholarship recipients from Low and Medium HDI countries are considerably more likely to return to their countries of origin and state that they will move back sooner than scholarship recipients from higher HDI categories. Given that the regression controls for factors such as social status and parental education, this result suggests, that unique barriers or disincentives to permanent out-migration exist to those from Low or Medium HDI countries.

Age and time of the life stage also influence the mobility of the respondents. The regression analysis reveals that **the younger a scholarship recipient is at the time of the**

**scholarship**, the more likely he or she is to be outside his or her country of origin. It should be noted, that after a scholarship the residential status of the person usually changes since many scholarship recipients only have a residence permit for the time of their scholarship and few months after. If they do not manage to find a job or further educational possibilities within a given time they are not granted another residence permit. While the quantitative survey did not show evidence for systematic barriers by scholarship recipients’ country of origin, different barriers were occasionally mentioned and confirmed by other studies related to mechanisms of in- and exclusion in the European labour market (e.g. RIANO 2012). Given the restrictive migration and labour market policies for non-EU citizens in Switzerland and the European Union, access to the labour market becomes very challenging. This fact not only applies to the respondents themselves but also their spouses if they are non-EU citizens. Combined with for example still existing language barriers, missing job related networks, limited knowledge about the potential job market and application procedures or missing financial capital to bridge times of unemployment can make the job search difficult. Yet, perhaps such barriers are easier to navigate for those who migrated at a young age.

Furthermore, the level of **mother’s education** (as a measure of parental education) is not closely associated with out-migration; however, when analysed by HDI groupings (Low/Medium and High/Very High), it becomes relevant. We found that for the HDI Low/Medium group, as maternal education increased, out-migration increased compared to maternal education levels in the High/Very High HDI group<sup>18</sup>. This result seems to indicate that parental education matters differently with respect to out-migration in Low/Medium HDI than elsewhere. Higher parental education in Low/Medium HDI countries corresponds with higher rates of out-migration, whereas levels of parental education in High/Very High HDI countries do not appear to be a consistent predictor of out-migration.

<sup>17</sup> Hypothesis tests confirm that the sample populations from Switzerland and China are significantly different from the rest of the sample population regarding out-migration, and do not justify being included in the same analysis. We also excluded those whose scholarships ended after 2011 to allow some time for scholars to relocate and (if they chose to) resettle following the end of their scholarship.

<sup>18</sup> Although, in this case, mother’s education was utilised as a proxy for parental education, using average parental education (instead of mother’s education) yields the same results.

The reasons for the clear relationship between well-educated parents in Low and Medium HDI countries with out-migration, remain unknown. In the interviews, not enough evidence was found to either confirm or refute the impression that well-educated parents in less developed countries might explicitly encourage and support out-migration to potentially increase social mobility.

Building on determinant factors of out-migration unveiled by regression analysis, survey and interview data pointed to the following as stated reasons to return: the desire for a professional contribution to the home country, longing for family and friends, and a better social status:

*"... but if I go back to Africa, it is going to be much more valuable, you know, because you are closer to the people who need the technology the most, so I'm not going to stay here [USA]. I want to go back at some point to use all this baggage, you know, that I've accumulated here for many years, you know, to start some really wonderful thing, back home."* (Henri, Research group leader, Sub-Saharan Africa)

Some respondents have a strong desire to return to their home countries to – potentially – apply their acquired knowledge and to possibly contribute to improvements in the home country. This aspiration to help develop one's country of origin was stronger among respondents from Low or Medium HDI countries, probably due to structural factors related to country development although it is not exclusive to those countries.

*"I wanted to help the development of [my country of origin] on my way and it was out of question to go. Even (if) my salary is poor, I like this work."* (Selma, Professor, Eastern Europe)

*"And I would like to somehow change the education system in [my country of origin] and build something research oriented, more or less, and contribute to this (...) which is a bit lacking in [my country of origin] and I find it mandatory in any country to have."* (Kamal, PhD student, Northern Africa)

A second reason given was the higher social status in the country of origin than living as "foreigner" abroad. Through their newly acquired educational and professional qualifications scholarship recipients' social status was considerably higher when returning, than when staying abroad:

*"... here in [my country of origin] I don't hear all the time that I deserve respect even though I am a foreigner. Here it is natural, as I am a notable young man, in my own country, that I earn more respect"* (Andrej, Eastern Europe).

Apart from better status, personal longing for family and friends and the wish to stay closer to them was a major reason to return. Therefore even when material incentives might be higher abroad, social relations and aspirations for family life are certainly a main reason for people to return to their home country.

Reasons not to return to the country of origin are also diverse. The predominant reason for living abroad, though not necessarily in Switzerland, as mentioned both in the survey and in interviews was **access to interesting jobs or research opportunities** and to use qualifications acquired in their studies. As most scholarship recipients are in academia, the scholarship in Switzerland might also provide a platform to move further to a research position in another High or Very High HDI country as supervisors in Switzerland often provide connections for further academic work such as a PhD or Post-doc:



*"(...) my focus is that finding a nice career or a job, (...) I'm trying to find a place where I could contribute and learn and grow. And the geographical location doesn't really matter, so I'm applying pretty much everywhere, applying to companies in [my country of origin], universities in [my country of origin] and also few of them in Europe and Canada."*  
 (Anand, PhD student, South Asia)

*"I'm absolutely going for academic positions, I mean that's what I've always wanted, to be a researcher. It's kind of a child dream." (...) "So I think that the future plans for me is to have a Post-doc and then in 5-10 years hopefully, I'd like to continue in research. I've always seen the university as the end point for this type of work. (...) The country doesn't really matter at the moment, because we have been moving so much, it's just ok to go anywhere."*  
 (Gilberto, PhD student, South America)

Further reasons given for living and working abroad were political instability, corruption in the country of origin, or having better educational opportunities for family members, both children and partners.

### 3.4.3 Transnational linkages while living abroad: remittances and knowledge exchange

Looking at the high rate of respondents who did not return to their home country at the time of the survey, questions about brain drain or possible linkages to the home country and other means of exchange emerge. As outlined in chapter 1.2, physical return is only one way of keeping connections with the country of origin. Expanded international networks, technology and skills transfer, remittances for families as well as substantial investments can be other means of keeping places connected.

*"Yeah, for me since the beginning I thought of going back there, not only for family reasons, I mean of course I miss my family and friends but also because I thought I could help the country somehow. I thought by having a slightly different education, I mean the university [my country of origin] is quite elitist still, so few people can really go to university. I thought ok, I should go back and contribute to the country. I keep this idea in mind; I think I just became more realistic on seeing what I can actually do, so the idea of returning to [my country of origin] continues in my mind. I always think that I should get there at some point, but my main motivation would be to contribute to the country, I mean to develop the country, the ecological area that is so, that lags behind so much, so I thought I could contribute in that way. Now, I start seeing perhaps even staying here [European country] I could contribute by having collaborators in [my country of origin] and doing research there while still living abroad. So I think I've made my mind that I contribute in that sense without actually being there physically."*  
 (Gilberto, PhD student, South America)

To explore the scholarship recipients' connections with their countries of origin the survey asked for remittance incidence, as well as social and professional contacts.

36% of respondents<sup>19</sup> sent back remittances during the time of their scholarship in Switzerland. The proportion of people sending remittances back home was considerably higher among scholarship recipients from low or medium HDI countries (55% and 35%) than among scholarship recipients from high or very high HDI countries (27% and 7.5%). A similar picture emerges for social status: scholarship recipients from lower social status backgrounds are more likely to send money to their countries of origin than those from higher status backgrounds. The amounts contributed vary slightly,

<sup>19</sup> It should be considered that for 15 alumni the question was not relevant, as their country of origin was Switzerland.

however no clear pattern between the country categories or social status groups could be found. A contribution of CHF 1,000–2,000 annually was most common.

Apart from financial transfers, contact networks with the country of origin of those respondents currently not residing in their countries were assessed. Almost all scholarship recipients (98%) had some contact (personal and professional) with their countries of origin and a considerable proportion (53%) maintained professional collaborative contacts with their home countries. This may be compared to the findings of the large scale GlobSci Study on researchers mobility (FRANZONI et al. 2012), which reported slightly over 40% of all foreign born researchers (i.e. residing outside their country of origin) currently collaborating with someone from their country of origin (FRANZONI et al. 2012). Scholarship recipients from Latin America and Sub-Saharan Africa maintain the most professional contacts, while those from Western Europe maintain the least. Scholarship recipients currently working in research and higher education maintain most contacts. As a large proportion of scholarship recipients who do not live in their country of origin (e.g. in Western Europe, USA) continue to engage in professional collaboration with their countries of origin, this could support the concept of brain circulation, where knowledge or technologies for the benefit of the country of origin might be transferred through other means than physical presence. The interviews also indicated that professional collaboration with the country of origin, mainly with academic actors, seems to be in the interest of scholarship recipients who stay outside their countries of origin, to ‘contribute’ to important issues. However, scholarship recipients still in their PhD studies feel that they do not yet have this degree of freedom where they themselves can choose their scientific partners or topics, and thus are not yet able to actively engage in collaboration with partners of their choice.

#### 3.4.4 Networks with Swiss institutions

Apart from more obvious benefits of the scholarship stay, such as improved knowledge, technical or language skills, respondents’ networks with Switzerland were also hypothesised to contribute to their improved position on the labour market. To determine the extent of scholarship recipients’ professional networks with colleagues in Swiss research institutions, organisations or companies, the number of intensive scientific collaborations (e.g. shared papers, publications), entrepreneurial collaborations (e.g. shared business projects), and general professional communication (e.g. knowledge and resource sharing) were recorded. In the sample, scholarship recipients with Swiss and Chinese citizenship were excluded<sup>20</sup>, and we also excluded those whose scholarships ended after 2011 to allow some time for professional contacts to develop.

The key determining factor of the strength of scholarship recipients’ professional network with Switzerland is **migration status**, i.e. scholarship recipients currently residing outside their country of origin are more likely to be in contact with Swiss institutions. This result suggests that coming to Switzerland provided former scholarship recipients the opportunity to establish professional contacts, which are most likely to be utilised when scholarship recipients reside outside their country of origin. One obvious explanation is that almost 50% of those outside their countries currently reside in Switzerland<sup>21</sup> and thus naturally use their Swiss professional network more intensively. However, those living outside of their country of origin but not in Switzerland also maintain higher levels of professional contacts to Switzerland than those residing in their countries of origin, which supports the importance of a network with Swiss institutions.

86% of scholarship recipients with a professional network in Switzerland maintain professional contact with the host university of their scholarship and 93% maintain professional contacts (either with their host university or others) which were established during their scholarship. During their

<sup>20</sup> Chinese and Swiss were excluded as it was hypothesised that mobility would play a role in determining Swiss contacts

<sup>21</sup> Approximately 83% (64 persons) of former alumni currently living in Switzerland were not born in Switzerland, most of them are in research or – disproportionately overrepresented – in the private sector as operational staff or in middle management positions.

scholarship 6% of ETH scholarship recipients had collaborative contacts with UZH; 20% of UZH scholarship recipients had collaborative contacts with ETH during their scholarship.

### 3.4.5 Networks with international institutions

In addition to the Swiss networks, respondents' international professional networks were investigated in more detail. In a regression analysis, employment mobility, position at the current job, and HDI category of one's country of origin emerged as determinant factors for the strength of respondents' international professional network.

Higher **employment mobility** predicts a larger network, which could be a logical consequence of having worked in comparatively more countries and therefore having contacts with more institutions and people. Furthermore, a higher **job position** is associated with a larger international network, which suggests that those in higher professional positions have more opportunities or necessities to establish and maintain broader professional networks.

The findings regarding **scholarship recipients' country of origin** indicate that those from Very High HDI countries (highest number of people who live still outside of their country of origin at the time of the survey) are likely to have the widest professional network while those from Medium HDI countries (lowest out-migration) have the smallest international professional network. As known from the analysis regarding migration, scholarship recipients' country of birth (as HDI category) is associated with mobility (which is associated with networks). However, as these factors (migration status, educational mobility, employment mobility as well as position, age, social status, and parental education) have been taken into consideration, the result seems to suggest that there are other barriers to those from lower HDI categories in developing wide professional networks. Interviews also pointed to the reciprocal factor in networks as professional collaboration is only likely to take place between equal partners. Scholarship recipients at institutions

or in companies in less developed environments are thus in general less likely to collaborate with well-established institutions such as the University of Zurich or ETH Zurich.

## 3.5 Scholarship programme specific findings

### 3.5.1 Overview of the sample by scholarship programmes

In the previous chapters, aspects of migration, mobility, employment and networks have been investigated for the total sample, composed of alumni of five different scholarship programmes. In the following chapter, these scholarship programmes are examined individually concerning their particular characteristics. As the programmes differ, both regarding target group and objective, some parameters regarding the scholarship recipients of each programme are briefly presented in the following.

**Table 4: Duration of scholarships and proportion of female scholarship recipients**

Scholarship	Target group	Duration (years)	Women (%)
Scholarships for doctoral students from developing countries (Entwicklungsstipendien), Univ. of Zurich	PhD (part) (R4D)	1.33	60
Swiss Government Scholarship (Bundesstipendium), University of Zurich	"research student", Master, PhD, Post-doc	1.42	40
Swiss Government Scholarship (Bundesstipendium), ETH Zurich	"research student", Master, PhD, Post-doc	1.49	30
Excellence Scholarship and Opportunity Programme (ESOP), ETH Zurich	Master	1.88	25
Research Fellow Partnership Programme (RFPP), all Swiss Universities	PhD & Post-doc (R4D)	3.06	24
Swiss Centre for International Agriculture (ZIL), ETH Zurich	PhD & Post-doc (R4D)	3.17	47

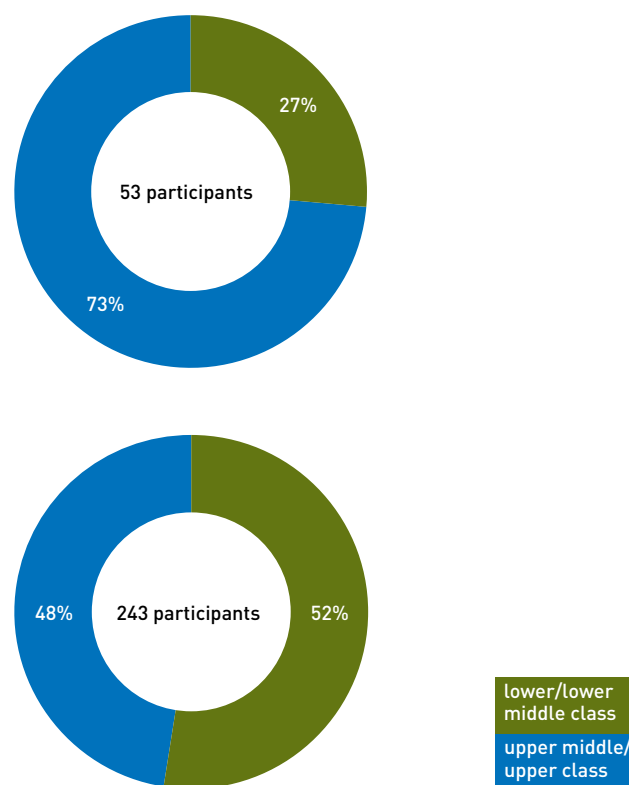
The duration of the scholarships can be attributed to the format of the respective scholarships as (fully funded) PhD and Post-doc scholarships have considerably longer durations than for example Master or “pre-doc” scholarships.

### 3.5.2 Migration status

The migration status of scholarship recipients generally corresponds to the average out-migration rate of the total sample (about 50%), except for the ESOP (return 33%) and ZIL (return 30%) scholarships. For the ESOP, this might be explained by the fact that this scholarship programme was established rather recently and many scholarship recipients currently engage in further studies, e.g. PhD research, in a Very High HDI country. For ZIL, the fact that approximately two thirds of the students come from countries of the Very High HDI category, which is the most “mobile” category, explains ZIL candidates’ high rates of out-migration.

When looking into the data in more detail, comparing the HDI categories of country of origin and of current residence, it becomes apparent that RFPP scholars (high proportion from Low HDI countries) are highly likely to return to their countries of origin. This can, to a certain extent, be explained by the format of the scholarship: all fellows did their research in collaboration with a CGIAR centre (CGIAR Consortium of International Agricultural Research Centres) mostly located in Low or Medium HDI countries, and subsequently possibly found employment in one of these centres. In addition, some students did not spend the major part of their scholarship time in Switzerland (“sandwich” model) and did not get their degree from a Swiss university. Furthermore, as the scholarship was explicitly targeting development issues, supervisors often encouraged their students to implement their knowledge and increase their skills “in the field”. This is highlighted as an example how the scholarship programme structure, target topics and selection process influence the career of scholarship recipients.

Regarding further mobility, as described in more detail in 3.2.1 and 3.2.2 regarding stays abroad of their country of origin for educational and employment purposes, there are no striking differences between scholarship programmes. The only deviations are RFPP and ZIL scholarships, which both show higher rates of educational and employment mobility than the average.



**Figure 9: Social status by scholarship programme (N = 296)**

The upper diagram applies to ESOP, ZIL and development scholarships; the lower diagram represents RFPP and Government Scholarships.

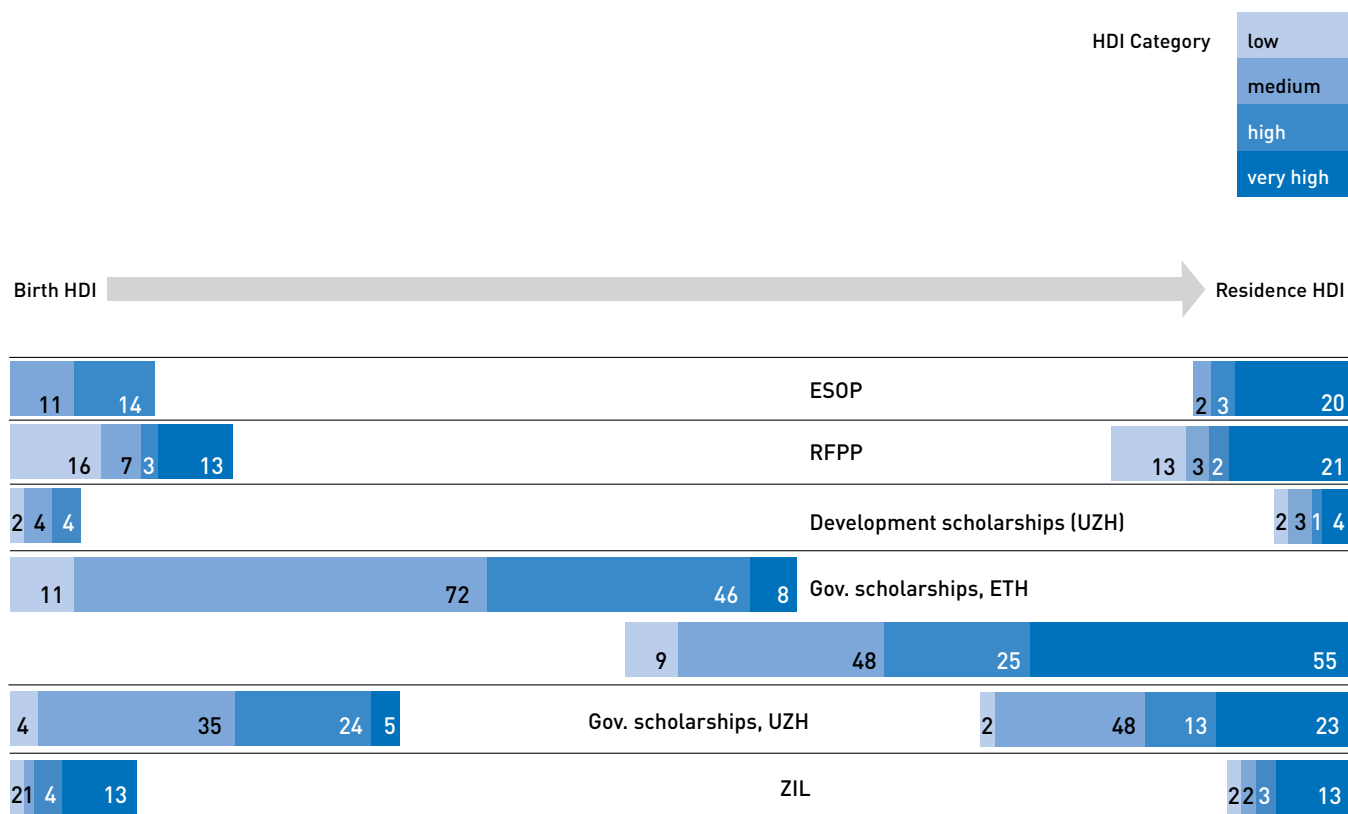


Figure 10: Birth HDI and residence HDI by scholarship programme

### 3.5.3 Employment sectors and job positions of former scholarship recipients

Some scholarship programmes were thematically open; others targeted particular subjects or broader academic fields, e.g. ZIL and RFPP had a focus on natural resources and agriculture. It is thus not astonishing that most students in these programmes engaged in environmental, natural and health sciences. The scholars from Swiss Government Scholarships at the University of Zurich and ETH Zurich show clear alignment with the thematic strengths of the respective universities; at the University of Zurich health sciences (predominantly medicine), social and natural sciences while at ETH Zurich the most common fields are engineering, environmental and natural sciences. The ESOP at ETH Zurich is heavily dominated by engineering sciences, also reflecting the focus of ETH Zurich.

Regarding scholarship recipients' current employment sector, working in science and higher education is most common. There are however slight differences; while ESOP and "Entwicklungsstipendium" show the highest rates of scholarship recipients in science and higher education, alumni from ZIL and RFPP are comparatively more likely to be working for NGOs or international organisations.

Comparing scholarship recipients' career goals at the end of their Swiss scholarship with their current sector of employment, ESOP fellows show the highest rate (90%) of meeting their initial career expectations (possibly explained by their relatively short careers), followed by Swiss Government alumni at ETH Zurich (>75%), while the other scholarship programmes all have rates at around 60%.

ZIL and RFPP show the highest proportion of former fellows in middle or upper management positions, which may be attributed to the fact that these scholarships were only targeting PhD or Post-docs, i.e. in general a higher academic qualification than the other scholarships. However, when only looking at the group of respondents working in upper management

positions, the Swiss Government Scholarship programme shows high rates, 16% (University of Zurich) and 24% (ETH Zurich) of total respondents. ESOP alumni generally hold the lowest positions, which relates to the fact that the programme only started in 2007 and many scholarship recipients are still in qualifying positions (e.g. PhD studies).

Taking a closer look at scholarship recipients' satisfaction with their current position, more than 75% indicated that they are very satisfied or satisfied; only very few state that they are currently dissatisfied or very dissatisfied (0–15% depending on the scholarship programme), the rest are neutral. Most scholarship recipients are presently working in a field which is highly or medium related to their Swiss scholarship funded studies; RFPP is an exception with less than 15% not relating to the topic of their studies.

### 3.5.4 General programme feedback: motivation and obstacles

Respondents' motivations to look for a possibility to study abroad and apply for a scholarship programme are quite broad, however the reason most commonly referred to is "interest in a scientific/academic career", followed by "reputation of the university" and "chance to study abroad and learn about a foreign culture". Findings from the qualitative interviews show that a driving force to look for scholarship-supported studies abroad is the lower quality of research facilities in many of the countries of origin.

*"If you want to continue in this field and you want to really be good, you have to go abroad. Almost everybody does that."*  
(Kamal, PhD-student, North Africa)

Professors and lecturers with international experience often serve as good examples. The most commonly mentioned way to get information about the scholarship (or the universities in general) was through a university supervisor, followed

by the website of the targeted university or a web search. A considerable proportion also received the information from a Swiss consulate or embassy, as the Swiss Government Scholarships are advertised through these and the first selection is organised by the Swiss diplomatic representation abroad.

Respondents generally stated their utter satisfaction with the scholarship programmes and their stay in Switzerland. Many respondents stated that the scholarship had been a career boost for them and enabled them the possibility to study at a university and in a country otherwise possibly not accessible to them:

*“It was the only way, being from [a] financially challenged background, that I could do research work at prestigious ETH Zurich and gain skills which have earned me both recognition and also opportunities in my career.”*  
(Respondent in questionnaire)

*“I mean, if I didn’t get the scholarship, I wouldn’t have come. (...) without the language it was very difficult to find any job that would support you. Besides I was more to focus on studies than to find another job and spend time working. So for me, it was crucial that I get the scholarship to come here.”*  
(Kamal, PhD-student, North Africa)

Many scholarship recipients had difficulties in adapting to the new environment, particularly in the beginning of their stay, relating to issues of cultural understanding which could often be solved during the first few months. Others mention longing for their families and their home countries as reasons for discomfort during their time in Switzerland. However, a continuous obstacle during the scholarship time seems to be the language (German and in particular Swiss German) and, in particular after the end of the scholarship, the administrative hurdle to stay and work in Switzerland outside academia, due to their nationalities. One scholarship recipient, who was denied a work permit despite employment opportunities, exemplified this:

*“...my impression is that the system is severely flawed, if talented students around the world are brought to Switzerland, trained using Swiss taxes but then forced to leave due to quotas and other ridiculous measures. (...) it is easier to stay in Switzerland and get a proper work-visa [as] a stripper than it is [as] a highly qualified applied mathematician.”*  
(Respondent in questionnaire)

Another scholarship recipient describes the timing as difficult regarding obtaining a work permit:

*“By the time I received a job offer and permit, which took about 4–5 months, I already had my PhD offer in another country.”* (Respondent in questionnaire)

### 3.5.5 Interest in alumni networks

Scholarship recipients from ETH Zurich and the University of Zurich included in this study have a very high interest in alumni associations, 90% state that they want to know more about the alumni association of their host university. Furthermore, 13% of UZH alumni and nearly 30% of ETH alumni would be willing to contribute approximately CHF 100 per year to be a member of the alumni association. Interested alumni come from all countries of origin; however most of them currently reside in a Very High HDI country. Scholarship recipients from all fields and position levels are interested in the alumni associations.

Particular reasons for interest in an alumni organisation as listed are (multiple replies possible): scientific collaboration, to promote the university abroad (UZH scholars), network on professional issues (ETH scholars) and for the purpose of general contact.

Most people currently stay in touch with one to five students, and younger scholarship recipients stay in touch with more fellow students and more via facebook than older students.

## 4. Conclusions

The present study was initiated to review several finalized as well as a selected number of on-going programmes for students from developing and transition countries. The sample represented a total of 304 individuals from 57 different countries who all received a Swiss scholarship for a shorter or longer period of time at either ETH Zurich or the University of Zurich. The results aim to present career paths of scholarship recipients with a focus on their current employment situation, analyse their mobility patterns and transnational networks. Furthermore, specific aspects of each scholarship programme were evaluated, and the interest in alumni networks of the hosting universities was explored.

The high response rate (80%) to the quantitative survey provided a sound data basis and indicated the great interest of the respondents and their appreciation of the programmes. The feedback from former scholarship recipients was overwhelmingly positive and their commitment to respond to the survey questions was enormous.

### **Career development**

One of the main intentions of the scholarships was capacity building through access to education and research facilities. The findings confirmed that this intention was largely achieved. The results indicate that the scholarships were supportive in attaining higher employment positions: the longer ago ones scholarship ended, the higher position one was likely to have (independent of age). However, it could not be proved if this was mainly related to the skills and competences obtained through the scholarship, or if being selected for a competitive scholarship programme was an indicator of the previous high qualification of the applicant. While respondents' country of origin does not seem to matter with respect to their current professional position, their current country of residence is a determining factor.

The Swiss scholarship is highly relevant when back in one's country or region of origin: respondents currently residing in less developed countries have considerably higher positions than those in highly developed countries. A further interesting finding is that the younger generation is geographically more mobile (both for employment and education), pointing towards the internationalisation of education and work.

The scholarships facilitated the careers of almost all respondents (95%), whereas those from less developed countries valued the scholarship particularly high. Both, support from university institutes and supervisors as well as the access to national and international contacts was considered instrumental in supporting scholarship recipients' careers. The exposure to cutting edge technology and research methods was considered highly inspiring, but also non-academic skills were considered as important assets, e.g. language, international experience, intercultural communication and new attitudes.

### **Transnational networks and return migration**

The issue of "brain drain" and how many of the scholarship recipients actually return to their countries or regions of origin was a central question in this study. Half of the respondents currently reside (back) in their country of origin (excluding Chinese and Swiss scholarship recipients, due to methodological reasons). Compared to similar studies on international scholarship recipients' return migration, this is a rather low figure. Furthermore, respondents currently residing abroad are concentrated in highly developed countries, a fact that would indicate a tendency towards "brain drain". However, 53% of those abroad maintain considerable professional contacts with their country of origin pointing towards a sustained interest in collaboration. 36% of scholarship recipients sent back remittances during their scholarship studies in Switzerland, candidates from less developed countries and lower social strata considerably more than those from more developed countries and higher social strata.



Scholarship recipients from less developed countries are the most likely to return to their countries of origin, while scholarship recipients from highly developed countries are the least likely to return. Furthermore, those who received a Swiss scholarship at a younger age are least likely to return. The main reasons for return are (i) the desire for a professional contribution to the country of origin, (ii) longing for family and friends and (iii) a higher social status in the country of origin.

The professional network with Switzerland established during the time of the scholarship is utilised particularly when the scholarship recipient resides outside of his/her country of origin. However, results also suggest that there might be barriers to those from less developed countries in forming wide international professional networks indicating that long-term collaboration is more likely to develop between partners with similar academic standards or facilities.

Regarding the potential “brain drain” effect of the Swiss scholarships in question, most students supported by these programmes were educationally mobile, i.e. they lived in several places, both before and after their stay in Switzerland. The scholarship opportunity might hence rather decide *where* to go than *if* to go at all. From the perspective of a host country, the scholarship might therefore serve as an argument to attract mobile students to Switzerland.

In conclusion, normative concepts such as “brain drain” or “brain gain” might – at least partly – lose their significance for the more “globalised” generation, operating in a dynamic international education and research market. However, monitoring mobility patterns is considered relevant to establish tendencies and estimate consequences, on the individual and institutional as well as the national level.

#### **Scholarship programme feedback**

The scholarship programmes aim to enable talented students to conduct part of their studies or research at ETH

Zurich or the University of Zurich. Partially, the scholarship programmes covered in this study were open to candidates from less privileged family backgrounds, which can be considered an added benefit. Indeed, particularly in less developed countries, scholarships seem to be accessible to candidates from low or lower middle class backgrounds and families with less academic education.

Respondents’ interest in alumni networks is very high. 90% want to know more about the alumni organisation of their respective host university, exhibiting the large potential of connections which can potentially be tapped by ETH Zurich and the University of Zurich.

In conclusion, the benefits of the Swiss scholarships covered in this study were estimated as abundant on the individual level. However, while in the past access to excellent education and research facilities was mainly restricted to highly developed countries when several of the scholarship schemes were founded, the situation has changed today. To allow greater impact and added values it is first necessary to consider all actors involved: students and university supervisors as well as their research groups, host institutions and the national level, i.e. the benefit to both, the sending and receiving countries. Furthermore, the objectives and expectations of scholarship programmes should be reconsidered and adjusted to the current dynamic reality of global higher education where international mobility is an inspiring ingredient of academic life in culturally diverse institutions.

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# Annexes

## Annex A: List of countries and their HDI categories

Country	HDI	Number of respondents
<b>Low Human Development Index: HDI &lt; 0.534</b>		
Burkina Faso	0.343	1
Burundi	0.355	1
Côte d'Ivoire	0.432	9
Togo	0.459	2
Tanzania	0.476	3
Madagascar	0.483	2
Cameroon	0.495	6
Myanmar	0.498	1
Angola	0.508	1
Bangladesh	0.515	3
Kenya	0.519	7
<b>Medium Human Development Index: HDI 0.535–0.710</b>		
India	0.554	39
Morocco	0.591	1
Viet Nam	0.617	8
Kyrgyzstan	0.622	3
Tajikistan	0.622	3
Indonesia	0.629	2
South Africa	0.629	4
Uzbekistan	0.654	2
Moldova	0.660	2
Egypt	0.662	9
Palestinian Territories	0.670	1
Mongolia	0.675	4
Thailand	0.690	5
China	0.699	46
<b>High Human Development Index: HDI 0.711–0.799</b>		
Tunisia	0.712	2
Algeria	0.713	1
Sri Lanka	0.715	5
Colombia	0.719	12

Country	HDI	Number of respondents
<b>High Human Development Index (continued)</b>		
Turkey	0.722	5
Ecuador	0.724	5
Brazil	0.730	8
Bosnia and Herzegovina	0.735	4
Mauritius	0.737	1
Macedonia	0.740	2
Ukraine	0.740	13
Peru	0.741	2
Iran	0.742	6
Lebanon	0.745	2
Albania	0.749	1
Kazakhstan	0.754	1
Mexico	0.775	3
Cuba	0.780	7
Montenegro	0.791	1
Uruguay	0.792	1
Belarus	0.793	2
Malaysia	0.796	1
Serbia	0.796	11
<b>Very High Human Development Index: HDI &gt; 0.8</b>		
Argentina	0.811	10
Chile	0.819	2
France	0.893	1
Austria	0.895	1
Belgium	0.897	2
Switzerland	0.913	15
Germany	0.920	5
Netherlands	0.921	1
USA	0.937	2
<b>Total</b>		<b>300</b>

## Annex B: Regression analysis

Variable	Dependent variables				
	Employment mobility	Current employment position	Migration status	Swiss networks	International networks
(Intercept/Threshold)	2.658*** (.9185)	2.234; 4.924** (1.864; 1.905)	-5.544*** (1.146)	.229 (.8905)	1.863*** (.6945)
(Scale)	1 <sup>21</sup>			1 <sup>21</sup>	1 <sup>21</sup>
HDI category of birth <sup>22</sup> [Low]	.276 (0.5162)	-.070 (1.002)	-1.274** (.584)	-.389 (.2922)	-.228 (.2153)
[Medium]	-.279 (.499)	-.662 (.668)	-2.024*** (.622)	-.591** (.2746)	-.669*** (.1989)
[High]	-.359* (.2152)	-.995 (.613)	-.813** (.366)	-.317 (.2618)	-.355** (.1835)
[Very High]	0 <sup>23</sup>	0 <sup>23</sup>	0 <sup>23</sup>	0 <sup>23</sup>	0 <sup>23</sup>
HDI category of residence <sup>21</sup>					
[Low]		1.406 (1.069)			
[Medium]		1.623** (.691)			
[High]		2.404*** (.700)			
[Very High]		0 <sup>23</sup>			
Mother's level of education (1-4; lowest to highest)	-.232*** (.0882)	-.069 (.153)	.111 (.102)	-.006 (.0551)	-.006 (.0502)
Social status (0 = lower; 1 = upper)	.380** (.1606)	.342 (.397)	-.040 (.222)	-.144 (.1947)	-.017 (.1410)
Mother's level of education * HDI category of birth (interaction term)	.155 (.1298)		-.320** (.142)		
Migration status (0=in home country; 1=out of home country)		-.421 (.541)		.662*** (.2022)	.080 (.1238)
Educational mobility (0-4+; low to high)	.111 (.0698)	.016 (.148)		-.056 (.0795)	-.076 (.0525)
Employment mobility (0-4+; low to high)		.293** (.144)		.064 (.0555)	-.103*** (.0272)
Current employment position (1-3; low to high)				.139 (.1552)	.236** (.1053)
Gender (1 = female; 0 = male)	-.461*** (.1774)	-.285 (.377)	-.108 (.226)		
Relationship status (0 = single; 1 = relationship)	.055 (.1964)				
Age at scholarship acceptance (years)	-.005 (.0379)		-.119*** (.046)	-.006 (.0236)	-.020 (.0169)
Current age (years)	-.056** (.0239)	.045 (.046)	-.018 (.027)		
Time elapsed since end of scholarship (years)		.153** (.071)		.007 (.0208)	.021 (.0164)
Wald chi square	46.212	42.638	57.457	19.243	45.994
Degrees of freedom	12	16	10	12	12

Note: \* P<.1, \*\* P<.05, \*\*\* P<.01.

Standard errors in parenthesis.

<sup>21</sup> Fixed at displayed value.

<sup>22</sup> The HDI variable categories each have 4 parameters and 3 df. HDI can be significant as a whole even if differences among the categories are not.

<sup>23</sup> Set to zero as this parameter is the point of reference for HDI parameters

### Annex C: Questionnaire for the Swiss scholarship career tracking study

The questionnaire was implemented as an online survey through Select Survey and sent out to 375 former scholarship recipients. The questionnaire was in English only but answers for “open questions” were possible in multiple languages (French and German speaking persons made use of this). In total, the questionnaire contained 60 questions. Personalised invitations and links were sent out to participate, followed by reminders. The survey took place during five weeks in June and July 2013. Where *-select-* is stated, pre-formulated options appeared.

## Swiss scholarship

1. Which Swiss scholarship did you receive? \*If you received more than one, please tick the latest one

- Swiss Government Scholarship (Bundesstipendium) at ETH Zurich
- Swiss Government Scholarship (Bundesstipendium) at the University of Zurich
- Excellence Scholarship & Opportunities Programme (ESOP) at ETH Zurich
- Research Fellow Partnership Programme (RFPP) all Swiss Universities
- Zentrum für internationale Landwirtschaft (ZIL) at ETH Zurich
- Scholarship for doctoral students from developing countries (Entwicklungsstipendium) University of Zurich

2. If you received one of the scholarships before the one mentioned above, please select below: *(selection as in question 1)*

3. Dates of your scholarship

	Month	Year
Start	<i>-select-</i>	<i>-select-</i>
End	<i>-select-</i>	<i>-select-</i>

## Personal information

4. Year of birth\* *-select-*

5. Country of birth\* *-select-*

6. Sex  Female  Male

7. Your citizenship (*Hereafter the definition of <country of origin> will refer to your first citizenship*)

First citizenship *(Pull-down menu)*

Second citizenship *(Pull-down menu)*

8. Country of current residence *(Pull-down menu)*

9. What is the highest level of education attained by your parents?

	Mother	Father
No formal education	<input type="checkbox"/>	<input type="checkbox"/>
Primary education	<input type="checkbox"/>	<input type="checkbox"/>
Secondary education	<input type="checkbox"/>	<input type="checkbox"/>
Vocational education	<input type="checkbox"/>	<input type="checkbox"/>
University degree (BSc/BA)	<input type="checkbox"/>	<input type="checkbox"/>
University degree (MSc/MA)	<input type="checkbox"/>	<input type="checkbox"/>
Higher university degree (PhD or above)	<input type="checkbox"/>	<input type="checkbox"/>

10. How would you classify your parents' social status? *Please tick the most suitable option*

- Upper class
- Upper middle class
- Lower middle class
- Lower class

11. In which environment did you grow up?

- Rural
- Semi-urban
- Urban

12. During your Swiss scholarship studies, you were

- Single
- Married/partnership
- Divorced

13. Do you have children?

*If no, please continue with the next page*

- Yes
- No

14. If you have children, please enter their year of birth

First child	Second child	Third child
_____	_____	_____
Fourth child	Fifth Child	Sixth Child
_____	_____	_____

## Your education

15. Information on your university degrees

	Discipline	University	Country	Kind of degree awarded	Financing of
First degree			-select-	-select-	-select-
Second degree			-select-	-select-	-select-
Third degree			-select-	-select-	-select-
Fourth degree			-select-	-select-	-select-
Fifth degree			-select-	-select-	-select-

16. Please list stays outside your country of origin for education purpose (not included above)  
Please only list stays longer than 3 months

	Country	Year	Duration of stay (months)	Purpose
First stay	-select-	-select-	-select-	-select-
Second stay	-select-	-select-	-select-	-select-
Third stay	-select-	-select-	-select-	-select-
Fourth stay	-select-	-select-	-select-	-select-

## Your employment

17. Were you employed before you started your Swiss scholarship studies?

yes  no

18. Which was your last employment before your Swiss scholarship studies?

	Country	Sector	Position
Employment	-select-	-select-	-select-



19. If the country mentioned above is NOT your country of origin, please indicate the reasons for working abroad  
*Multiple responses possible*

- Obtain a higher income
- Get a better position
- Private circumstances
- Political circumstances
- To use qualifications acquired in my studies
- Other, please specify

20. Which was your first employment after your Swiss scholarship studies?

*If you have not yet been employed after the end of your scholarship, please continue with question 25.*

	<b>Country</b>	<b>Sector</b>	<b>Position</b>
Employment	-select-	-select-	-select-

21. If the country mentioned above is NOT your country of origin, please indicate the reasons for working abroad  
*Multiple responses possible*

- Obtain a higher income
- Get a better position
- Private circumstances
- Political circumstances
- To use qualifications acquired in my studies
- Other, please specify

22. Please rate the relationship of your Swiss scholarship studies to your first employment after your Swiss scholarships

- Highly related
- Medium related
- Little related
- Not at all related

23. Which is your current employment?

	<b>Country</b>	<b>Sector</b>	<b>Position</b>
Employment	-select-	-select-	-select-

24. If the country mentioned above is NOT your country of origin, please indicate the reasons for working abroad  
*Multiple responses possible*

- Obtain a higher income
- Get a better position
- Private circumstances
- Political circumstances
- To use qualifications acquired in my studies
- Other, please specify

25. Please list your most important career steps (if not already mentioned above)  
*Maximum 3*

	Country	Sector	Position
1	-select-	-select-	-select-
2	-select-	-select-	-select-
3	-select-	-select-	-select-

26. Have you experienced phases of not being employed (longer than 6 months) after your Swiss scholarship studies?

- yes  no

27. If you have experienced phases of not being employed, please list the reasons  
*Multiple responses possible*

- No adequate jobs available
- Political circumstances
- Parental leave/family work
- Further studies
- Private time-out (e.g. travelling)
- Illness
- Other, please specify

28. Please rate your satisfaction with your current job situation

- Very satisfied
- Satisfied
- Neutral
- Dissatisfied
- Very dissatisfied

29. Please list stays outside your country of origin for employment purpose not included above  
*Please only list stays longer than 3 months*

	Country	Year	Duration of stay (months)	Purpose
<i>First stay</i>	-select-	-select-	-select-	-select-
<i>Second stay</i>	-select-	-select-	-select-	-select-
<i>Third stay</i>	-select-	-select-	-select-	-select-
<i>Fourth stay</i>	-select-	-select-	-select-	-select-

## Your Swiss scholarship studies

30. Where did you get information about the Swiss scholarship? *Multiple responses possible*

- University supervisor
- Education fair
- Former participants
- Friends, family
- Professional journal
- Newspaper, magazine, radio, TV, other media
- SwissConsulate/Embassy
- Website of the Swiss university of your scholarship
- Websearch or other internet source
- Other, please specify

32. For which university (or research institution) in Switzerland did you receive the scholarship?

- ETH Zurich
- University of Zurich
- University of Basel
- University of Bern
- University of Geneva
- University of Fribourg
- EPF Lausanne
- University of Lausanne
- University of Lucerne
- University of Neuchatel
- University of St Gallen
- Università della Svizzera italiana
- Other, please specify

31. Which were your personal reasons to apply for a Swiss scholarship?

*1: very important; 2: important, 3: neutral; 4: unimportant; 5: very unimportant*

	1	2	3	4	5
Better job prospects abroad	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Better job prospects in country of origin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Better salary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest in a scientific/academic career	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Reputation of the university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Location of the university	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Interest in Switzerland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Not possible to study my preferred subject in my home country	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Social/political/environmental factors in my country/region	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chance to study abroad and learn about a foreign culture	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recommendation by others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other					

33. In which discipline did you receive the scholarship?

34. With which other universities/research institutions in Switzerland did you collaborate during your scholarship?

35. With which international research institutions did you collaborate during your Swiss scholarship studies (country and institution)?

*Please name the 3 most important*

	<b>Country</b>	<b>University/ Research institution</b>
1	-select-	-select-
2	-select-	-select-
3	-select-	-select-

36. What was your career goal when you completed your Swiss scholarship studies?

*Multiple responses possible*

- Scientific/academic career
- Career in public administration
- Career in politics
- Career in private sector
- Independent consultancy
- Career in an international organisation
- Other, please specify

37. Which kind of support did you receive from the institution of your Swiss scholarship studies to reach your next career goal?

*Multiple responses possible*

- None
- High quality support from the institute of your research/studies
- Mentoring for funding applications for research
- Mentoring for job application
- National/international contacts and network
- Other, please specify

38. Did your Swiss scholarship studies support your overall career development?

- Yes, it facilitated my career development
- No, it was/is of no importance to my career development
- No, it obstructed my career development
- Other, please specify

39. Which skills and experiences acquired during your Swiss scholarship studies did particularly support you in achieving your career goal?

*Multiple responses possible*

- Subject-specific knowledge
- Language skills
- Methodological skills
- Professional network
- Technical skills (computer etc.)
- Intercultural communication skills
- General international experience (e.g. broadening your view, having experienced a different system)
- Attitude (work ethics, punctuality, precision)
- Other, please specify

40. What were the main obstacles encountered during the Swiss scholarship studies?

## Links with country of origin

41. What was your interaction with your country of origin during your Swiss scholarship studies?

*Multiple responses possible*

- Intensive scientific collaboration (common research project, joint publications etc.)
- Scientific collaboration (general professional communication)
- Entrepreneurial collaboration (common company, projects)
- Personal contact
- Remittances as financial support for family
- Remittances for professional investments (e.g. apparatuses, library, workshop, enterprise)
- No contact
- Switzerland is my country of origin
- Other, please specify

42. If you supported family members in your country of origin financially during your Swiss scholarship studies, how much did you approximately send *per year*?

- Nothing
- 1–500 CHF
- 501–1000 CHF
- 1001–2000 CHF
- 2001–4000 CHF
- 4001–6000 CHF
- > 6000 CHF
- n/a

43. Are you currently residing in your country of origin?  
If YES, please continue to the next page

- yes  no

44. Do you have contact with your country of origin?

- yes  no

45. With whom do you have contact?

	Kind of person	Kind of contact
1	-select-	-select-
2	-select-	-select-
3	-select-	-select-
4	-select-	-select-
5	-select-	-select-

46. Are you planning to return to your country of origin at some point?

- yes  no  I don't know

47. Which are the reasons for your planned potential return (to your country of origin)?  
Multiple responses possible

- Job opportunities
- Educational opportunities
- Business/investment opportunities
- Political situation
- Family reasons
- Personal wish to return (e.g. longing for home, culture, language, habits etc.)
- Negative experiences in country of current residence (e.g. discrimination, difficulties in getting a job)
- Other, please specify

48. When do you plan to return?

- In the coming year  < 5 years
- 5–10 years  10–20 years
- > 20 years  Upon retirement
- I don't know

49. If you are NOT planning to return to your country of origin, what are the reasons for this?  
Multiple responses possible

- Lack of job opportunities
- Lack of educational opportunities
- Lack of business/investment opportunities
- Political situation
- Family reasons
- Other, please specify

## Collaboration and network (Switzerland and international)

50. Currently, do you have contact to Swiss universities/research institutes?

*Please name the 5 most important*

	<b>Swiss university / research institute</b>	<b>Kind of contact</b>
1	-select-	-select-
2	-select-	-select-
3	-select-	-select-
4	-select-	-select-
5	-select-	-select-

51. With which other Swiss based actors do you have regular contact?

*Please name the 5 most important*

	<b>Kind of organisation</b>	<b>Kind of contact</b>
1	-select-	-select-
2	-select-	-select-
3	-select-	-select-
4	-select-	-select-
5	-select-	-select-

52. With which universities/research institutes (international and national) outside Switzerland are you in close contact? *Please name the 5 most important*

	<b>University / research institute</b>	<b>Country</b>	<b>Kind of contact</b>
1	-select-	-select-	-select-
2	-select-	-select-	-select-
3	-select-	-select-	-select-
4	-select-	-select-	-select-
5	-select-	-select-	-select-

53. With which other international actors (outside Switzerland) do you have regular professional contact?

*Please name the 5 most important*

	<b>Kind of organisation</b>	<b>Kind of contact</b>	<b>Country</b>
1	-select-	-select-	-select-
2	-select-	-select-	-select-
3	-select-	-select-	-select-
4	-select-	-select-	-select-
5	-select-	-select-	-select-

54. If you still have contact to fellow students (Swiss or international) from the time of your Swiss scholarship studies, with how many?

- None
- 1–5
- 6–10
- 11–20
- > 20

55. How do you stay in contact with your fellow students? *Multiple responses possible*

- Facebook
- LinkedIn
- E-mail
- Meet in person
- Other, please specify

## Links with country of origin

56. Would you be interested in joining the alumni organisation of the Swiss university from your Swiss scholarship studies (if you are not yet a member)?

- yes  no

57. Would you be willing to pay an annual financial contribution to the alumni network (max CHF 100 per year)?

- yes  no  I don't know

58. For what purpose would you be interested in joining the alumni network?

*Multiple responses possible*

- Scientific collaboration
- Network on regional issues
- Network on professional issues
- Promote the Swiss university abroad
- Stay up-to-date about the Swiss university
- Information on funding opportunities
- General/personal contact
- Other, please specify

59. Which general feedback do you have regarding your Swiss scholarship funded studies?

## Further contact

We thank you for your time and your kind participation in the survey; this will greatly support the universities in question to evaluate their scholarship funded studies.

60. If you are interested in receiving the report (scheduled for November 2013) or other related publications coming out of the study, please provide your e-mail address in the box below.

61. If you are interested in knowing more about the alumni organisation of the Swiss university of your scholarship studies, please enter your e-mail address in the box below.



**Annex D: List of acronyms**

<b>CGIAR</b>	Consortium of International Agricultural Research Centres
<b>EPFL</b>	École Polytechnique Fédérale de Lausanne
<b>ESOP</b>	Excellence Scholarship and Opportunity Programme
<b>ETHZ</b>	Eidgenössische Technische Hochschule Zürich/ Swiss Federal Institute of Technology Zurich
<b>FCS</b>	Federal Commission for Scholarships for Foreign Students
<b>HDI</b>	Human Development Index
<b>NGO</b>	Non-governmental Organisation
<b>R4D</b>	Research for development
<b>RFPP</b>	Research Fellow Partnership Programme
<b>SDC</b>	Swiss Agency for Development and Cooperation
<b>SERI</b>	State Secretariat for Education, Research and Innovation
<b>UNDP</b>	United Nations Development Programme
<b>UZH</b>	University of Zurich
<b>ZIL</b>	Zentrum für Internationale Landwirtschaft





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