

# Brain Drain or Brain Gain?

## Insights from an Erasmus Mundus Masters Program

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### Abstract

Some argue that education programs funded by developed countries foster brain drain in developing countries; others argue that brain gain exceeds brain drain. After conducting the Erasmus Mundus Masters program in Geospatial Technologies for a decade, we analysed this ethical dimension of our program. An online survey amongst students and alumni covered eleven editions of the Masters program (2007-2017). We conclude from the results that this program substantially fosters brain gain by over 60 % of graduates returning to their home countries, that it also provides brain gain, at least to some extent, in those cases where graduates do not return to their home countries, and that it provides unique and excellent opportunities to students who would otherwise lack such opportunities.

*Keywords:* brain drain, brain gain, Erasmus Mundus, Geospatial Technologies, ethics, Masters program

## 1 Introduction

Brain drain is generally defined as the migration of highly skilled workers (e.g., Wong and Yip, 1999), often from developing to developed countries (Lien and Wang, 2005). Earlier studies mainly focused on its negative effects, such as loss of human capital or dropped wages for lower-skilled workers (e.g., Wong and Yip, 1999; Commander et al., 2004), while later studies point to positive consequences under certain conditions (Docquier and Rapoport, 2012). Independently of this discussion, it is clear that return migration yields positive effects for the source country, as these returners bring back high level knowledge, skills, experience, and connections (see e.g., (Chacko, 2007) for the case of India's returning skilled IT workers).

Developed countries face an important ethical dilemma in financing scholarship programs, designed to educate or train highly talented developing country students: will the graduates solely represent brain drain for their home countries in the form of permanent emigration, or do they also contribute to brain gain through return migration and possibly in other (indirect) ways?

In this paper, we investigate this dilemma for our Erasmus Mundus Masters program in Geospatial Technologies (<http://mastergeotech.info/>). An Erasmus Mundus Masters program stands out in the landscape of Higher Education in a number of ways: it is an EU funded project with specific organizational requirements, e.g., being trans-national and awarding joint degree, and cohorts consist of 90-100 % non-national students from all over the world. These characteristics, and the fact that the programs mainly target students from developing countries, raise the brain drain ethical concern.

Our Erasmus Mundus Masters program is a cooperation of three universities: University of Münster (WWU), Germany, Universidade Nova de Lisboa (UNL), Portugal, and Universitat Jaume I (UJI), Spain. Since the program started in September 2007, more than 200 students coming from 63 different countries from all over the world attend(ed) it, and 192 of them graduated so far. We surveyed alumni and current students to investigate a potential brain drain from this program.

Section 2 explains our motivation for analysing potential brain drain in more detail; section 3 provides an overview of

previous surveys in the Erasmus Mundus context; section 4 describes our approach to prevent brain drain and the setting of the survey; section 5 presents the survey results; section 6 discusses the ethical dimension of brain drain vs. brain gain in our Erasmus Mundus Masters program; and section 7 provides an outlook to further research.

## 2 Motivation

At the start of our program, a partner in another project who in the 1990s had obtained a PhD from a US university on a Fulbright scholarship, told us that he had been the only one of a group of 16 Latin-American Fulbright grant holders who had returned to his home country. This story got us thinking about brain drain early on.

Recent studies reveal that one-third of all African scientists live and work in developed countries (NASAC, 2009). In a study in the US and UK among management students, Baruch et al. (2007) reported that only 30% of the students intended to return to their home country.

Consequently, scholarship programs granted by developed countries can be ethically problematic: they can withdraw the „human capital“ from developing countries for a relatively small amount of money (essentially the scholarship), whereas the developing countries' tax payers had covered education costs since childhood. The countries thus, could lose money as well as their brightest minds.

The opposite of brain drain is brain gain. On the global level, (Olang, 2014) cites Rajiv Gandhi, the former prime minister of India, as having said “better brain drain than brain in the drain. It can be argued that the migration of African scientists has not only benefited those who leave their countries but global science as a whole”.

Furthermore, for each student not returning home after graduation, there might still be benefits for the home countries:

- Graduates might return later. In previous informal discussions some students stated they want to go back to high-level positions in their home countries. For this, a Master's degree from abroad is helpful, but a PhD from abroad is decisive.
- Graduates staying abroad might do research on problems relevant to their home countries. We observe a high motivation for such topics amongst the students writing their Master theses in our program.
- When taking up positions abroad, graduates might become initial points of contacts for people from their home country. This, in turn, may lead to cooperation and projects between home and host country.
- Graduates might financially support their families back home. In some economies, this is a substantial share of the gross national product.

Against this backdrop of various arguments for and against brain drain and brain gain, and as initiators and responsables for an Erasmus Mundus Masters program, we wanted to know what our students are doing where after graduation, and whether our program is achieving its ethical goal of not causing net brain drain.

## 3 Previous relevant surveys on Erasmus Mundus Masters programs

Erasmus Mundus Students and Alumni Association African Chapter (2009) did a survey from the early years of the Erasmus Mundus scheme. While detailed results are not available, they summarize them saying that „most of the alumni returned to Africa to work and most of the students intend to return to Africa. From the preliminary survey results it was concluded that Erasmus Mundus has not contributed to “brain drain” in Africa, rather it has contributed immensely to “brain gain””.

A broader survey (Agudo et al., 2009) with 225 respondents across many Erasmus Mundus Masters programs revealed some interesting numbers with respect to individual plans. Before starting the program, 76.34 % of the students intended to go back to their home country after graduation. After graduation, 30.77 % of the respondents still intended to go back home, 26.24 % intended to stay in the EU, 37.56 % did not know yet, and 5.43 % had other plans. Obviously, many students changed their minds after gaining new experiences in such a program.

While these numbers do not show what actually happened and why, they highlight that there is at least a potential for substantial brain drain. If those who were still undecided in the second survey came to stay in the EU, then less than a third of all graduates would return to their home countries (while, of course, some of the other mentioned benefits to home countries would still accrue).

## 4 Approach

The European Commission claims that it wants to avoid brain drain. Proposers of Erasmus Mundus projects are requested to describe strategies to mitigate the risk, and the plausibility of these strategies is an evaluation criterion for proposals. Our approach was to develop a curriculum for a broad audience of Bachelor graduates in various Geoinformatics application areas such as Ecology, Urban Planning, Agriculture, Geography – rather than offering a further specialization to Bachelor Geoinformatics graduates, which would target positions in developed countries. In addition, we designed the program to support life-long-learning by making professional experience in a Geoinformatics application area a positive criterion for awarding scholarships.

By these measures, we tried to attract students who have a strong link to their application area, possibly having worked in it already, so that they would be more likely to return to the original area of studies and work in their home countries.

In order to find out whether or not this approach has been successful, we conducted a survey amongst students and alumni of eleven yearly program editions starting from 2007 and running to 2017. 63 (out of 192) alumni and 30 (out of 51) current students filled in an anonymous online questionnaire during September and October 2017. Typically, a response rate of 25 % is considered a success. Thus, we concluded that we had solid data for analysis.

The questionnaire addressed a couple of issues such as career chances and quality of the program. Since we are focussing on possible brain drain in this paper, for this context we only considered respondents who had a non-EU nationality and did not reside in an EU country before starting with the Masters program – 49 alumni and 25 current students fit those criteria.

## 5 Results

A first survey result indicates very good career chances for alumni (EU and non-EU): 22.6 % of the respondents found a job within a month after graduation, 19 % within 2-3 months, 17.5 % within 3-6 months, and 6.3 % within 6-12 months. 3.2 % of the graduates started with another Masters program, 19 % with a PhD. Only 5 of 63 respondents (7.9 %) did not find a job or continue studying.

Before starting the Masters program, 12 out of 25 non-EU current students had plans to go back to their home countries after graduation; 8 out of 25 did not know yet (see table 1). After having started the program, their plans became more firm, i.e. all students now were able to say what they were planning to do after graduation. There also was a significant increase (to 10 out of 25 students) of those planning to stay in one of the host countries. The number of students planning to go back to their home countries remained stable, around 50 %.

Table 1: Students' plans regarding the location where they plan to pursue their careers (25 responses)

Before starting the Master's program, where did you plan to pursue your professional career after graduating?	At this moment, in which country do you plan to pursue your professional career?
Home country 12 (48%)	Home country 13 (52 %)
Consortium country (Spain, Portugal, Germany) 3 (12%)	Consortium country (Spain, Portugal, Germany) 10 (40 %)
Other EU country 2 (8%)	Other EU country 2 (8%)
I didn't know 8 (32%)	I don't know 0 (0%)
Total 25 (100%)	Total 25 (100%)

After graduation, 17 out of 49 alumni pursued their career in their home countries (see table 2). These represent two thirds of the 26 alumni who indicated that they returned to their home countries in the first year after graduation. Apparently, 9 alumni returned home after less than a year of trying to find a job abroad. Altogether, 31 out of 49 alumni had returned to their home countries by the time of the survey, 18 alumni had not. In two cases, students could not return to their home countries - even if wanted - due to the political situation (Eritrea, Syria).

Table 2: Alumni's careers in home countries vs. abroad (49 responses)

After graduation of the Master, in which country did you pursue your professional career?	How many years after graduating did you return to your home country (to live there again)?
Home country 17 (35%)	between 0-1 year 26 (53%)
Consortium country (Spain, Portugal, Germany) 28 (57%)	between 1-2 years 3 (6%)
Other EU country 2 (4%)	between 2-3 years 0 (0%)
Other non-EU country 2 (4%)	between 3-4 years 0 (0%)
Total 49 (100%)	between 4-5 years 1 (2%)
	more than 5 years 1 (2%)
	I didn't return to my home country 18 (37%)
	Total 49 (100%)

Current students agree to a high degree (4.44 on a scale of 1 to 5) that their home country would benefit if they returned to it after graduation. Interestingly, these students also agree to quite a high degree (3.68/5) that their home country would even benefit if they did not return after graduation.

Table 3: Current students' opinion regarding brain gain (25 responses)

Scale: 5 = completely agree to 1 = totally disagree	I think my home country would benefit if I went back after graduating from the Master	I think my home country would still benefit, even if I did not go back after graduating from the Master	I think my home country would not benefit in any way from my graduation from the Master
5	16 (64%)	6 (24%)	0 (0%)
4	5 (20%)	10 (40%)	0 (0%)
3	3 (12%)	5 (20%)	1 (4%)
2	1 (4%)	3 (12%)	2 (8%)
1	0 (0%)	1 (4%)	22 (88%)
Average	4.44	3.68	1.16

The alumni feedback regarding brain gain is similar, although on a slightly lower level (see table 4). Alumni agree to a quite high degree (3.87/5) that their home country would benefit if they would return. They also agree (3.36/5) to the statement that their home country would even benefit if they would not return.

Table 4: Alumni's opinion regarding brain gain (49 responses)

	I think my home country would benefit if I went back after graduating from the Master	I think my home country would still benefit, even if I did not go back after graduating from the Master	I think my home country would not benefit in any way from my graduation from the Master
Scale: 5 = completely agree to 1 = totally disagree			
5	19 (38%)	11 (22.5%)	2 (4%)
4	13 (27%)	11 (22.5%)	2 (4%)
3	11 (22%)	14 (29%)	5 (10%)
2	5 (10%)	10 (20%)	8 (16.5%)
			32
1	1 (2%)	3 (6%)	(65.5%)
Average	3.87	3.36	1.65

## 6 Discussion

The main question motivating our work reported in this paper was whether our Erasmus Mundus Masters program fostered brain drain or brain gain.

There might be a quantitative answer to this question, as Beine et al. (2011) calculate that “in low-income countries, the net effect of the brain drain on human capital is positive when the brain drain is not too high (i.e., lower than 20–30% depending on country characteristics).” Yet, our survey results do not provide sufficient data for such a calculation. Nevertheless, our survey results revealed that more than 60 % of non-EU alumni had returned to their home countries. Assuming that the home countries benefit from returning well-trained graduates, we may consider this as a positive result for home countries.

Respondents agreed to a high degree that source countries even benefit when graduates stay abroad (3.68/5 and 3.36/5). Although “only” being opinions, we assume that this attitude is based on concrete experiences and indicates true potential benefits.

The discussion so far focused on a societal level of ethics, not considering the individual perspectives of the students and graduates. The survey results revealed that the experiences gathered while taking part in the program affected their plans for the future and provided them with excellent career chances. How these typical individual perspectives should be “counted” for weighing brain drain vs. brain gain is, of course, debatable.

In summary, while we are not able to provide a quantitative answer, we can conclude that a return quota of over 60 %, the expected benefits even from no-returns, and the positive outcomes for the individuals suggest that brain gain outweighs brain drain.

## 7 Outlook

It would be useful to broaden the dataset, ideally by targeting alumni from all Erasmus Mundus Master programs since the

beginning of funding in 2003. While our survey covers a long period, 2007–2017, it tackles only one program. Previous surveys investigated several programs, but only during the beginning years of Erasmus Mundus funding.

A further line of research would be to quantify brain gain when graduates do not return to their home countries. While students and alumni mostly agree that home countries still benefit in these cases, our and their assumption requires a stronger analysis. Finally, in-depth case studies of individuals and their career paths would also lead to further insights, for example regarding the impact of prior education on career development.

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