



CODOC – COOPERATION ON DOCTORAL EDUCATION BETWEEN AFRICA, ASIA, LATIN AMERICA AND EUROPE

THOMAS EKMAN JØRGENSEN



European Commission
**ERASMUS
MUNDUS**

*The project is
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Partners:



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Contents

Acknowledgements	5
Executive summary	6
I. Introduction – convergence, collaboration and capacity building	8
II. The project	10
III. Survey results	13
IV. Collaboration	20
V. Capacity building	26
VI. Conclusions	34
Annex 1 – Regional reports	36
Annex 2 – Project partners	51
References	54

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EUA looks forward to the continued cooperation with the CODOC partners as it further supports doctoral education reform and internationalisation in Europe through the EUA Council for Doctoral Education (EUA-CDE).

Executive summary

The **starting point** for the CODOC project was the need to develop a new, global approach to doctoral education, taking into account the development of new means of communication and easier physical mobility, but also the need to build research capacity across the world to meet global challenges. In this spirit, the project attempted to examine and promote creative and mutually beneficial modes of collaboration to foster a more equitable global research community. For this purpose, the project looked at three world regions with developing, emerging and developed countries, namely East Asia, Latin America and Southern Africa. It compared how doctoral education was developing within these regions, and related the findings to developments in Europe.

The project **methodology** was based on regional reports, a survey of universities in East Asia, Southern Africa and Latin America and three workshops. This approach has been possible due to close cooperation between university networks in the four regions concerned: OBREAL and OUI-IOHE in Latin America, SARUA in Southern Africa, AUN in East Asia and EUA in Europe.¹ These networks and associations gave access to a wide range of universities in those regions. At the outset, partners in each region compiled a report, giving an overview of the situation in their particular region. The survey was then partly based on information in the reports, and covered a broad spectrum of issues concerning doctoral education in order to gain an idea of the main convergences and divergences between the regions. Based on the survey results, three regional workshops were organised in order to collect and discuss concrete case studies that would validate and elaborate on those results.

The **survey results** yielded a basic understanding of the type of institutions within, and some of the main differences between, the four regions. The most striking revelation was the strong common trend towards upgrading university staff through doctoral education. In all regions, universities planned for steep increases in the number of staff with doctorates, and in many cases institutions actively encouraged their staff members to obtain a doctoral degree. Expected increases in the number of staff with doctorates were very ambitious, and the growing labour market demand for doctoral qualifications could aggravate problems faced by universities in retaining their staff.

This point was underlined by another finding from the survey as regards the careers of doctorate holders. It was found that

a considerable number leave universities after obtaining their degree to pursue careers as researchers or managers in government and in the private sector. On a positive note, very few doctorate holders have positions for which they are definitely overqualified.

The survey also collected views on the role of doctorate holders in society. Here, there was a remarkably uniform discourse about the need for countries at all stages of development to train researchers to make further development towards a knowledge society.

The report also highlights the importance of collaboration and capacity building. The survey showed that doctoral education was a very high priority for respondents in their internationalisation strategy. Participants in the workshops illustrated this with several concrete examples of **collaboration**, usually between a research-intensive university in the North and a Southern partner engaged in capacity building. The survey showed a higher number of collaborative ventures with Europe than with the US. It was emphasised that the main incentive for undertaking such collaboration should be to secure complementary benefits, such as opportunities for Northern universities to access 'natural laboratories' (for instance geographical locations with high biodiversity) and for capacity building by Southern universities.

Where collaboration was successful and enduring, it was usually built on common research interests. While the collaborative efforts were driven by the research staff, support from the university leadership seemed to be critical for their sustainability and ensured that research partnerships gave added strategic value to the whole institution.

Both the surveys and workshops confirmed that government support, particularly in terms of funding, significantly improves the capacity to sustain international collaboration. Cross-border funding like that of the EU Framework Programmes would be highly beneficial as an added incentive.

As regards **capacity building**, the most important issue discussed in the project was how to attain the critical mass of research needed to foster a research environment that nurtures doctoral education. Some countries attempt to meet this challenge on the systemic level, concentrating research capacity in a few research-intensive institutions, which are meant to supply the whole system with doctorate holders.

Many universities engage in networks or partnerships with institutions with higher research capacity in other regions, in order to benefit from the critical mass there. In order for these partnerships to promote capacity building, they often entail a strong element of common institutional development, in which the partners aim to nurture a common understanding of issues such as good supervision and research ethics, as well as sharing their know-how in management and common programme development.

Another important aspect of capacity building, especially concerned with knowledge transfer, is the exposure of doctoral candidates to other sectors and academic cultures. Exposure to the private sector in particular is central to establishing university-industry relations, which enhance the human resource development of all the partners involved.

Investment in capacity building must be comprehensive. Much of the funding seems to be earmarked for the mobility of doctoral candidates in order to provide them with experience from other research environments. However, their mobility needs to be combined with the development of research environments, including the necessary infrastructure and human resources for growth and sustainability. Dialogue between institutions and the development of supervisory capacity is especially important.

The **conclusions** of the CODOC project point to three major areas of convergence across the regions examined:

1. convergence in the discourse on doctoral education, emphasising its role in the knowledge society;
2. convergence in growth patterns with increased demand particularly from the university sector, but also from the non-academic labour market where the growing demand for doctoral staff might seriously worsen existing problems of staff retention within universities;
3. convergence in the interest shown in strategic collaboration, with universities engaging in several collaborative ventures either to develop capacity and attain critical mass of research, or to cement the global presence of research-intensive institutions.

In order to give a more detailed overview of the four regions, this report also contains an annex devoted specifically to each of them in turn, which are based on the reports submitted by

the partner associations. The section on **East Asia** underlines the investments made in several countries in the region to establish research-intensive universities and engage in internationalisation. The section also demonstrates how some governments in East Asia are granting more autonomy to universities.

The section devoted to **Southern Africa** focuses more on the discrepancies within the region, in which South Africa is by far the major provider of doctoral education. Within South Africa itself, disparity persists partly because of the country's past. The section concludes that the region needs more investment in research to provide better infrastructure, more funding and particularly more regional collaboration.

The section on **Latin America** emphasises the concentration of research capacity in a small group of universities in the continent's major cities. It also examines specifically how Brazil and to some extent Mexico stand very much apart in terms of higher research output. The section argues for more collaboration with a clear capacity building purpose, in order to overcome the considerable challenges in the region concerning the retention of researchers.

Finally, the section concerned with **Europe** demonstrates how the continent has been going through a process of modernisation of doctoral education, to a large extent promoted by the establishment of common structures for education and research in the Bologna Process and in the European Research Area.

Despite important challenges, particularly relating to the retention by universities of their research staff, a converging global system of doctoral education has the potential to develop a worldwide research community that will fully embrace the richness of human knowledge and address the global problems facing mankind.

I. Introduction – convergence, collaboration and capacity building

Doctoral education has become central to higher education and research policies. In Europe, for example, reforms in doctoral education have been a critical component of the Bologna Process and deemed vital to creating “smart, sustainable and inclusive growth”, according to the European Commission’s Europe 2020 strategy.² Doctorate holders should be trained through research yet capable of embarking on any of a broad range of careers, thus making the sectors they join more knowledge-intensive. In emerging and developing countries, increased attention is being paid to policies concerning doctoral education, as the rapidly expanding university sectors of those countries require more staff trained to conduct research and more robust research capacity.

At the same time, the nature of higher education and research in the global arena is changing. Earlier decades saw clear US dominance in terms of providing graduate education and attracting international students, with universities in Europe, Australia and Japan next in line. Nowadays, Brazil, China and India have emerged as notable hubs of knowledge and are challenging the notion of a ‘Northern’ hegemony in this area – although they have far from broken it. In addition, other emerging countries are also investing considerably in graduate education and displaying remarkable growth trajectories with regard to PhD and research output and a general capacity to attract international talent. Graduate education is thus becoming multipolar and the centre of gravity is gradually moving away from the North Atlantic. Despite this race for research prowess, doctoral education is simultaneously becoming more collaborative on a global scale, as ease of communication, sharing of data and physical mobility have improved drastically within recent decades.

What seems like a diffuse landscape for the provision of doctoral education is actually driven by strong currents of convergence in which the same issues and developments can be seen across different continents. The link between economic growth and investment in research and development is now cited as an almost universal truth, often regardless of national and regional contexts.

Despite differing demographic outlooks, ‘Northern’ countries and ‘Southern’ countries alike are emphasising the fact that local knowledge is essential when it comes to solving any region’s particular challenges, from water recycling in Singapore to prevention of malaria in Southern Africa. In ageing societies, a common approach to the problem of a shrinking workforce is to encourage the upgrading of qualifications and productivity by investing in doctoral education and subsequently injecting research-trained professionals into the economy. The aim of this is to enhance innovation and added value and ultimately have a smaller active workforce produce more.

By contrast, in societies where the demographic imbalance is tipped towards large cohorts of young people, the higher education sector finds itself under pressure to deliver better teaching to more students. The answer here is to upgrade the qualifications of new and existing research and teaching staff through research training. Emerging economies face the challenge of educating large cohorts as well as addressing ambitions to flourish as knowledge economies.

In both scenarios, doctoral education has an important role to play. Doctoral candidates produce a large part of the research output of universities, whether through sizeable research teams or individual contributions. Moreover, doctoral candidates are likely to comprise the most mobile group of researchers, thus forming the backbone of much research collaboration.

While these scenarios are largely concerned with national developments, they run parallel to a growing awareness of global problems. Climate change and food and energy supply are just three very clear examples of such problems, which reach beyond local research agendas. Attempts to respond to these challenges are almost unequivocally seen as requiring highly innovative approaches. In order to foster such innovation, young researchers need doctoral education that forges international partnerships, pools resources and provides dynamic and responsive research training.

The CODOC project's underlying premise was that the new links between the global North and South imply more than Northern universities just initiating collaboration with new international players. One can identify a more explicit and articulated interest on the part of Northern universities in engaging in capacity building relationships with universities in developing countries across Southern Africa, East Asia and Latin America. The project attempts to illustrate how these relationships can be mutually beneficial, sustainable, and strategic facets of the international agendas of the universities involved. They form an important part of a varied portfolio of collaboration. Such long-term institutional partnerships might indeed prove (and should prove) to be a competitive advantage for those countries and institutions that cultivate them.

This report will show how recognition of the importance of doctoral education has increased considerably in four world regions – East Asia, Southern Africa, Latin America and Europe – and how this is subsequently affecting universities and higher education systems in these regions. It summarises a project which has included internationally leading universities from advanced knowledge economies, as well as institutions taking initial steps to develop their research base. The report aims to demonstrate how doctoral education at the global level is knitted together in a pattern which is becoming more convergent, more complex and more inclusive.

II. The project

Precedents and vision

The introduction to this report describes how the CODOC project evolved from the realisation that doctoral education is becoming a truly global endeavour after having been heavily dominated by the developed world, particularly the US and Europe. From this point of departure, it looked at common trends in doctoral education in the global South, particularly with regard to collaboration and capacity building.

Through its international agenda, EUA has already been engaging a variety of international partner associations in Asia, Latin America and Africa in projects that tackle various higher education development issues. These initiatives have repeatedly posited that doctoral education is a key area for follow-up to further collaboration between individual universities and regional university associations. Following this observation, the EUA Council for Doctoral Education (EUA-CDE) identified the clear need to launch an international dialogue project with global partners on the subject of doctoral education, to complement its strong focus on European issues since its establishment in 2008.

The vision underlying the CODOC project was thus conceived by EUA and six partners from Africa, Asia, Latin America and Europe, each striving to respond to local and global demands concerning doctoral education. According to this vision, it is not only desirable but necessary to develop new global approaches to collaboration in doctoral education, taking into account the global changes that are already happening in doctoral education. New means of communication, enhanced infrastructure and easier physical mobility over long distances have brought research communities much closer together worldwide. The relevance of building knowledge societies is not limited to the developed world; globally, all countries are facing a set of common challenges linked to issues such as food, energy and climate change. However, this knowledge cannot be confined to a small number of highly research-intensive regions. The common challenges have local repercussions and produce local opportunities that require the development of local knowledge at a high level. Furthermore, over-concentration of research in just a few hubs mainly in the northern hemisphere does not do justice to the rich cultural and natural diversity of the planet as a whole.

In sum, CODOC sought from the outset to highlight and promote creative and mutually beneficial modes of delivering doctoral education that seek to address common

challenges and enrich understanding of the world, and foster a more globally equitable research community. CODOC was pointedly formulated as “a small initiative to think big”.

As stated in the introduction, doctoral education has been receiving much attention in the last decade. With the spread of the notion that investment in research and development, and the establishment of a ‘knowledge economy’ are the main route to sustainable economic growth, doctoral education has come to the fore as the link between higher education and research. Increasing the number of doctorate holders in society has been a priority in most European countries, as well as in the emerging economies. This growing output has been a result of investment in research and development to build knowledge economies, and thereby achieve sustainable economic competitiveness.

The development of doctoral education is closely connected to the issue of capacity building. The two agendas intersect in particular in collaborative research, which often includes the mobility of doctoral candidates and the development of human resources for universities and society at large. Doctoral education and the mobility of doctoral candidates are central to the issues of academic staff retention and brain drain. The ability to educate and retain doctorate holders is vital for the sustainability of university research capacity. Doctoral education is moreover a globally recognised form of education. Whereas the concept of Master’s and Bachelor education will often vary considerably from one higher education system to another, the doctorate has historically developed from the adoption of the distinct model developed in Prussia in the Nineteenth Century. There is thus a surprisingly high level of common understanding of the doctorate and what is required in order to obtain it.

Project scope and objectives

CODOC was an Erasmus Mundus Action 3, European Commission co-funded project that was carried out over two years (October 2010-October 2012) with the following aims:

- to gain a greater understanding of and enhance collaborative doctoral education involving European universities and their partners in Southern Africa, East Asia and Latin America;

- to strengthen the partnership dimension in university doctoral and research collaboration in order to enhance capacity building;
- to bolster the participation of universities and university organisations from Southern Africa, East Asia and Latin America in international dialogue on doctoral education and to facilitate information sharing, exchange of good practice, and networking between different regional stakeholders in higher education and research.

The partners

The CODOC project was carried out by a consortium of seven partners, from four different regions of the world:

- five university networks/associations, namely the European University Association (EUA), the Southern African Regional Universities Association (SARUA), the ASEAN University Network (AUN), the Inter-American Organization for Higher Education (OUI-IOHE), and the European Union-Latin America Observatory (OBREAL);
- two European institutions with a high level of expertise and experience in capacity building: the Karolinska Institutet in Stockholm, Sweden, and the Center for Development Research at the University of Bonn, Germany.

Methodology

The methodology of the CODOC project is based on a combination of quantitative and qualitative input gathered in three main stages: 1) regional background reports, 2) a survey and 3) workshops. All three combined qualitative and quantitative information to provide for the validation of results and the generation of concrete examples. The regional reports gave context to the quantitative results of the survey which in turn validated the main points in the reports, as well as indicating which cases were exceptional or identifiable as part of a larger trend. The workshops then offered an opportunity to investigate the apparent trends with university representatives in the four regions.

Initially, the partners submitted substantive reports about the state of play in their own regions of Southern Africa,³ East Asia and Latin America, in order to facilitate an overview of what systems and initiatives are already in place. The reports

contained an overview of doctoral education in the regions and pointed to existing research and specific problems. This exercise provided an important insight into the role of doctoral education in particular geographic contexts and into trends and potential avenues for exploration in the project. Certain trends and cross-regional similarities became apparent, such as the commonly perceived link between expanding doctoral education and developing knowledge societies. The high concentration of doctoral education in a few institutions in a number of countries was also of note. Results from these background reports have been included in the present publication.

As a second step, the consortium developed a questionnaire for universities in Southern Africa, East Asia and Latin America, which was distributed by the corresponding partner organisations (SARUA, AUN and OUI-IOHE). Given that the EUA-CDE has, since its establishment, amassed a considerable amount of data from its membership, it was not necessary to conduct the same survey in Europe. The survey functioned as a heuristic tool that provided a means of obtaining an overview of the main trends, similarities and differences between the regions. It was carried out between May and November 2011. The project partners identified a sample of universities that would provide a reasonable overview of their respective regions. As the scope of the project would obviously not allow for an all-encompassing data-gathering exercise, the goal instead was to identify areas of convergence and divergence between the regions, considering also diversity within each region or between different kinds of institution. This approach proved highly productive, as the results were robust and demonstrated in particular certain noteworthy convergences and divergences. Moreover, the questionnaire contained a number of qualitative fields in which respondents could give longer descriptions of their situation or of opinions concerning the doctorate. Results from these questions gave a valuable overview of the discourses surrounding doctoral education in the different regions.

While the survey responses gave an overview of the situation in different regions, it was considered important to validate these results and substantiate them in a third step by means of three workshops, each with a specific theme which could provide concrete examples from institutions offering doctoral education. Each of the workshops had a majority of participants from the region where it was held, with smaller delegations from the three other regions. In this way, the survey findings could be presented to host region representatives and stimulate feedback from them, while the presence of representatives from other regions also meant that regional discussions could be further challenged or confirmed. In addition, the workshops

³ Southern Africa refers to the countries included in the Southern African Development Community (SADC), all of which are covered by SARUA.

provided an opportunity to increase knowledge and build bridges across the regions.

The first workshop, organised by AUN and held at Chulalongkorn University (Bangkok, Thailand) in September 2011, was entitled ‘Strategic collaboration: doctoral education trends in a global landscape’. The workshop focused on the issue of collaboration and the relationship between research collaboration, collaborative doctoral programmes and the strategic priorities of individual institutions, countries and the world regions. It highlighted the fact that collaboration on a ‘South-South’ basis was less common, and explored how doctoral education could be an important starting point in fostering such partnerships. It also discussed how current funding schemes are still mainly national, with only a few opportunities for cross-border or regionally based funding, thus they hardly allow for the global approaches that would be critical both from a research and education point of view.

The second workshop on ‘Doctoral Education, Leadership and Knowledge Societies’, organised by SARUA and hosted by the University of Johannesburg (South Africa) in March 2012, looked more closely at capacity building issues. It discussed the challenges of nurturing sustainable local and global communities of researchers, funding doctoral education and how to connect these challenges to the national, regional and global policy agendas.

The final workshop was entitled ‘The value of a PhD – building capacity and refining purpose’. Organised with the support of OUI-IOHE and OBREAL in May 2012 and hosted by the University of São Paulo (Brazil), it examined the value of the doctorate to society at large. The workshop gave examples of how doctoral education is essential to the development of institutions, higher education systems and the establishment of knowledge societies. It paid particular attention to the careers of doctorate holders and partnerships between universities and industry.

This report presents key findings from the three stages of the project and identifies areas for further exploration. Chapter III provides an overview of the survey results, pointing to specific questions and topics of importance in all world regions. Chapters IV and V examine the two main cross-cutting themes of collaboration and capacity building, highlighting additional elements from the background reports, the survey, and the workshops.

Annex 1 looks more closely at the four regions of East Asia, Southern Africa, Latin America and Europe, which have been involved in this project based on the reports provided by the regional university associations. Finally, this publication ends with specific recommendations for universities, university associations and funders, in order to carry forward and achieve a truly global research community.

III. Survey results

The CODOC survey was carried out with the intention of gathering extensive comparable data on the development of doctoral education in East Asia, Southern Africa and Latin America. It was considered, first and foremost, as a heuristic tool, to raise questions on a wide range of issues concerning doctoral education with the aim of identifying its common features and differences in the three world regions, as well as areas of common interest for further collaboration. While one could argue that doctoral education in Africa, Asia and Latin America is currently concentrated in a few institutions and countries, the project also sought to gather information on the many other places and institutions in which doctoral education is emerging. However, in order to generate a comprehensive comparative framework across the three very diverse regions, the survey would have had to cover a vast number of countries and institutions, a feat which was beyond the scope of this particular initiative.

Therefore, it was decided to use the survey as a means of identifying divergences and convergences that merit further investigation. It posed questions on a wide range of issues, and it also contained a number of open fields to give a voice to the participating institutions and to provide an insight into how universities conceptualise doctoral education and the language that they use to describe the

field. The survey was distributed over a period of six months to institutions in Southern Africa, East Asia (including two Indian institutions) and Latin America. The questionnaire contained 55 questions (excluding sub-questions) in seven main sections: 1) institutional data, 2) research profile and strategy, 3) internationalisation and collaboration, 4) doctoral education – institutional managerial framework, 5) doctoral students, 6) labour market, and 7) retention and brain drain.

The sample

The survey was distributed in the three regions (East Asia, Latin America and Southern Africa) via regional university organisations, targeting essentially their membership. This was done in order to ensure a more concentrated follow-up, and to reinforce the role of the regional organisations in generating data and dialogue. The sample proved to be varied and provided a good insight into the different contexts and kinds of institutions in the regions. The total number of respondents was 85, evenly distributed with 28 in Southern Africa, 29 in East Asia and 28 in Latin America.

Figure 1 – Map of respondent distribution



Major findings

An uneven landscape

In some countries, there were considerably more respondents than in others: for example there were many responses from South Africa, which of course mirrors the considerable weight of South African higher education and research in the region of Southern Africa. This is also demonstrated by the relatively high number of doctorates awarded by a few universities from these countries, as compared to the regional average.

In **Southern Africa**, in which the overall output of doctorate holders is very low, the University of Cape Town awarded 631 PhDs between 2007 and 2010 compared to an average of 230 for the regional sample. Although Southern African universities were generally younger than in the other regions, the University of Cape Town, founded in 1829, was the oldest in the whole sample.

In **East Asia**, the National University Seoul awarded nearly 5 000 PhDs between 2007 and 2010, whereas the average for the sample was 697.

In **Latin America**, doctoral education is to a large extent concentrated in Brazil and Mexico, and within Brazil in the state of São Paulo, in which the University of São Paulo (not included in the survey) awarded 2 338 PhDs in 2010 alone (10% of all Latin American doctorates awarded that year).⁴

This uneven landscape makes it difficult to look at averages across university sectors, as a few institutions that would statistically have to be treated as isolated cases are those in which most doctoral education takes place. The purpose of this report, however, is to look at the trends for the regions as a whole, including those institutions with very limited provision of doctoral programmes or those only planning to introduce it.

In terms of the diversity of institutions, the sample contained some marked differences within and among the regions. Respondents in the same regions, and at times in the same country, came from a very broad range of institutions in which some would be considered as global players and others as relatively inexperienced in doctoral education.

Naturally, comparisons between institutions of the same type, irrespective of the region, produced somewhat more

consistent results than the analysis based simply on regional groupings. The group of respondents that identified themselves as having a “high research capacity” stood out from the group of universities that described themselves as having “low research capacity”.⁵ It must be emphasised that both are very small samples of 16 research-intensive universities and 13 universities with low research capacity, respectively. However, as a heuristic exercise, the results from the comparison are quite interesting.

Internationalisation

Both high- and low-capacity groups are represented in all three regions, although the Asian sample has the most countries with institutions that consider themselves to be research-intensive. Research-intensive institutions are much more likely to have a research strategy (87% compared to 54%), but surprisingly, they are not more likely to have a global outlook or even an internationalisation strategy than institutions with low research capacity (77% as opposed to 62%). However, the research-intensive universities all attached “rather high” or “very high” importance to doctoral education in their internationalisation strategies, while more than a third (38%) of the universities with low research capacity found doctoral education “rather unimportant” for their internationalisation strategies. This would seem to point to different views about the internationalisation of doctoral education and its link to the overall internationalisation agenda of the university concerned. Research-intensive respondents seemed to be more oriented towards the internationalisation of research activities, while the least research-intensive may have associated internationalisation with other activities. Moreover, research-intensive universities tended to receive government support for activities aimed at the internationalisation of doctoral education and were more likely to be in countries in which the government had measures in place to sustain the retention of doctorate holders within the academic community.

Autonomy

The research-intensive universities are important as institutions where doctoral education is concentrated in all three regions. The sample is thus lacking in representativeness, since not all of the main regional universities had responded. However, these institutions are easily identifiable within their system.

⁴ For the University of São Paulo (USP) and Latin America: <https://uspdigital.usp.br/anuario/> and RICYT (the Network on Science and Technology Indicators – Ibero-American and Inter-American).

⁵ The categories in the questionnaire were 1) low research capacity, 2) good capacity compared across the sector at national level, 3) leading in most fields at national level, and 4) high research capacity.

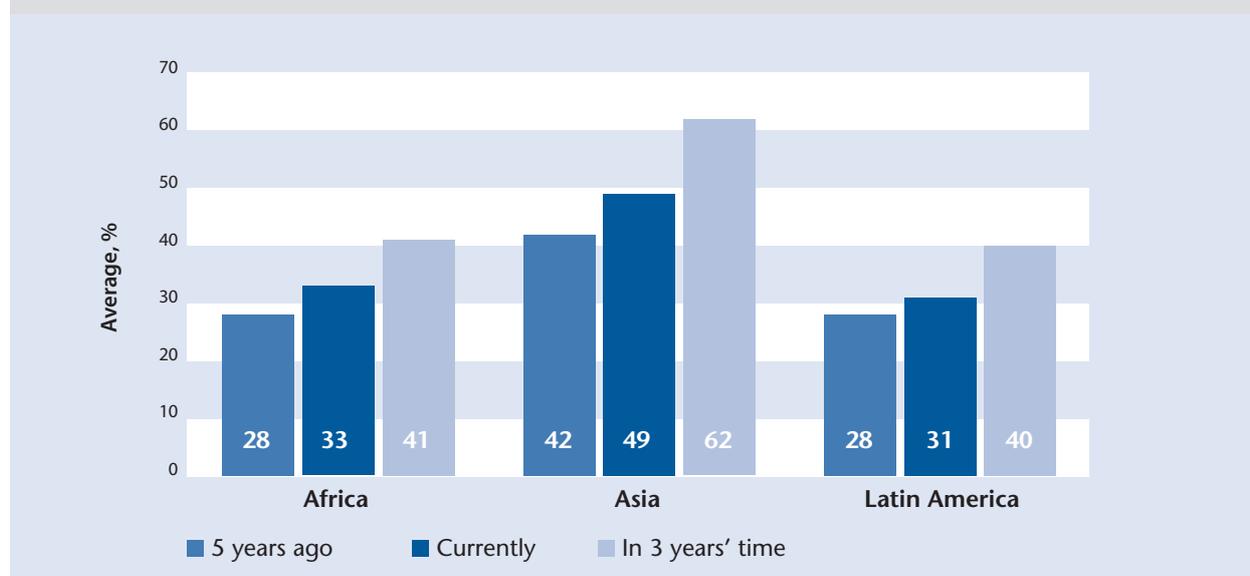
Research-intensive respondents were generally more autonomous than less research-intensive ones, a conclusion similar to other studies investigating this correlation.⁶ Although research-intensive universities are autonomous in terms of strategic planning as already noted, general government support for their development seems to be crucial. As will be described below, similar trends are apparent in Europe where increased autonomy has been granted along with support to develop research capacity in various ‘excellence initiatives.’⁷

Most respondents in the survey were able to autonomously decide on the management structure of doctoral education. Structural changes towards professional management have been very important in Europe (see Annex 1 on Europe). However, institutional reform was less important for doctoral education particularly among respondents from Southern Africa. Southern African universities were also less likely to have the autonomy to decide on their management structure.

Upgrading of staff

The upgrading of university staff is an important finding, which relates in particular to emerging and developing countries. The questionnaire contained one question about the number of doctorate holders among research and teaching staff.⁸ For 68% of respondents,⁹ the answers showed that the number of research and teaching staff with a doctorate was expected to grow. The average expected growth predicted for this group was 8% in just three years. Considering that the estimate given in the survey for the time taken to obtain a degree is about four and a half years, this growth rate is very ambitious. It presupposes that either a very high proportion of staff will be replaced by doctorate holders or, in all probability, that a very high percentage are currently engaged in research for their doctorate.

Figure 2 – Question 15:
Please estimate (with a concrete number) what percentage of your research and teaching staff hold a PhD degree?



Realistically, it may be assumed that a combination of both trends is at work. In each case, the pressure on universities to turn out new doctorate holders is considerable. Moreover, the estimated future growth in staff with a doctorate is set to intensify in comparison with the last five years. The survey suggests that most universities have developed their own strategic measures to support this extraordinary upgrading of their staff. The questionnaire specifically asked whether universities had incentives for staff intending to complete a doctorate. The vast majority of them responded

positively, claiming that they offered financial support and sometimes research leave to staff so that they could work on their doctorate. This impression was reinforced by 24% of respondents who said that they did not “manage to recruit and retain sufficient doctorate holders for [their] own institution”, thus providing an explanation for the need to train and upgrade existing staff. But there are clear differences between the regions: while 43% of universities in Africa had problems with the recruitment and retention of doctorate holders, this was rarely the case in the Asian sample.

⁶ Estermann, Nokkola, & Steinel, 2011, *University Autonomy in Europe II*, p. 11.

⁷ For Germany, see http://www.dfg.de/en/research_funding/programmes/excellence_initiative/index.html

For France: <http://www.enseignementsup-recherche.gouv.fr/cid51351/initiatives-d-excellence.html>

⁸ “Please estimate (with a concrete number) what percentage of your research and teaching staff hold a PhD degree, a) currently, b) 5 years ago, c) what will be realistic in 3 years’ time.”

⁹ 11 universities did not respond, while 54 indicated future growth, and 63 growth in the past.

Overall, the upgrading of university staff by means of doctoral education is one of the main trends, if not the most important issue for universities in the three regions. This was also confirmed in the three workshops.

Careers of doctorate holders

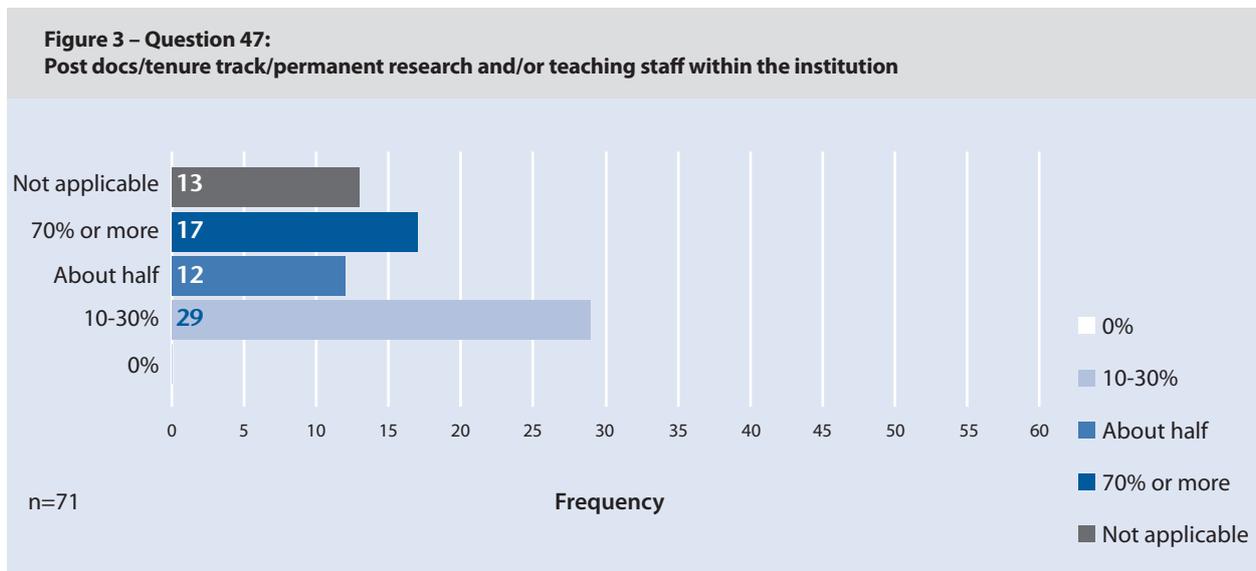
The career prospects of doctoral graduates are wide-ranging and quite good. They usually take up senior positions appropriate to their skill level, with roughly the same proportions entering government, the private sector, non-governmental organisations (NGOs) and the universities. This also implies that universities face a challenge in achieving their intended growth in numbers of staff with doctorates.

Bearing in mind the need for doctorate holders in the university sector, the survey results show a broad distribution of doctorate holders in various careers. There appears to be a gap between the aspirations of universities to upgrade research and teaching staff and the actual proportion of those with doctorates who continue in university careers. The questionnaire asked its recipients what percentage of doctoral graduates from the institution would, in their view, have careers in 1) the university sector as either administrative staff or researchers, 2) the private sector, 3)

government, 4) NGOs, or 5) in employment decidedly below their competences as doctorate holders. Only rarely did respondents state that the majority of those with doctorates at their institution would find employment in only one of the sectors specified in the question. Generally, doctorate holders gain employment in senior positions in a range of different sectors, though in proportions that vary from one sector to the next. As regards careers outside universities, many respondents indicated that doctoral graduates from their institution had careers in government, the private sector or NGOs in significant proportions of between 10% and 30% for each sector. Thus the career prospects of those with doctorates seem to be fairly wide-ranging.

The questionnaire asked specifically about research or management positions where doctorate holders would presumably use the skills obtained in their doctoral education. Since only very few respondents indicated that doctorate holders found employment “decidedly below their qualifications”, it can be assumed that, as in Europe, they have very good careers often in senior positions.¹⁰

According to 20% of respondents, 70% or more of those with doctorates would continue in a research position within the same university, while 12% said that about half would continue, and another 34% indicated that between 10% and 30% of doctorate holders would remain within the institution.



As 68% of respondents predicted an average future growth rate of 8% in three years in the number of staff with doctorates, these figures are modest. If an institution aims to achieve this growth rate in a short time, it should be able to retain a large proportion of its doctorate holders – at least 10-30% – particularly if they are already staff members, which is often the case.

If these results are representative, retention of doctorate holders within the university is or will be a growing problem. If and when emerging economies move into more knowledge-intensive types of production, the gap between retention and demand in the university sector will widen. The workshop discussions demonstrated that several universities were already struggling to develop their capacity to supervise doctoral

¹⁰ Borrell-Damian, 2008, *Collaborative Doctoral Education*, p. 81.

candidates. If demand from the private sector rose with increased wages, the already severe problem of supervisory capacity within them would worsen. This could create a vicious circle, with universities struggling in competition with the private sector to keep staff with doctorates, and thus unable to increase their supervisory capacity. This would in turn prevent them from raising their doctorate output to satisfy both their own demand and that of the private sector, with the consequent threat of a constant and possibly increasingly acute undersupply of doctorate holders in society as a whole.

Contribution of PhD holders to societal development

When asked to give an opinion on the role of doctoral education in societal development, 34 respondents emphasised its importance for the development of society, while 23 answered that doctoral education was important, but without explicitly mentioning society as a whole. The answers were remarkably similar and generally quite positive, irrespective of the country or region of respondents, as the following selection illustrates:

“As societies, we are challenged daily by big issues: poverty, health, disease, disasters, resource depletion, technology, overpopulation – the list goes on. There is an acceptance and an expectation that some of these big issues will also be addressed in the doctoral endeavour.” (South Africa)

“Doctoral education is very important since it is the driving force towards societal and economic development. Additionally, societal and economic development requires knowledge societies that are based on highly-skilled human resources.” (Malaysia)

“Doctoral education is considered fundamental for the development of society in that it contributes to raising the training capacity of professionals to develop scientific research, and take on public policy management and administrative functions in other institutions that contribute to development.” (Honduras)

“Doctoral education is extremely critical for societal development. Given the short-term nature of work by most corporations, universities are the only institution in human society that can focus on hard problems which require long-term critical thought.” (Singapore)

Despite the need for doctorate holders for their own capacity building, universities seem fully committed to providing doctoral education for a range of sectors.

For the survey results at large, it is remarkable how similar the answers to the questions are. There seems to be a very strong convergence in the perception of the role of doctoral education. In all three regions, doctoral education is very important for the development of staff and for building institutional capacity in research and teaching. At the same time, the discourse of the knowledge society emphasises the role of doctorate holders in societal development.

This strong convergence towards a common perception of the knowledge society is a very important finding from the survey. It has consequences for global trends in doctoral education. If developed, emerging and developing countries alike wish to increase the number of doctorate holders in society, yet with their output remaining below demand, they will become a scarce resource and subject to fierce competition. Some warning signs are already visible. In the workshop discussions, several countries gave examples that universities had increased the number of doctoral candidates, but without a significant rise in the number of doctorates awarded. It would seem that universities are already having problems in developing the capacity for doctoral education that is needed to meet the demand for doctorate holders.

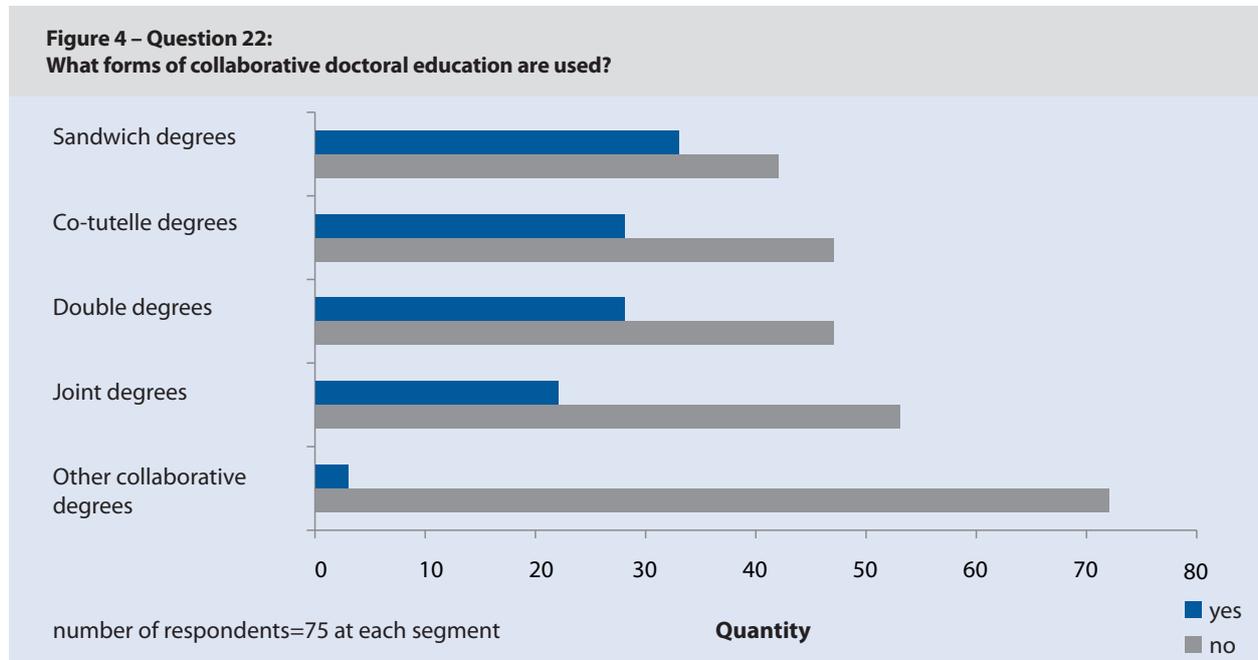
Major regional differences

As noted above, the survey relied on a limited sample that in no way sought to map higher education sectors in the world regions. There are, however, some indications of general differences between the three regions that deserve to be further investigated. These differences concern mainly Southern Africa and East Asia, as the Latin American results were less conclusive as well as less regionally representative.

First, fewer of the Southern African respondents have an internationalisation strategy, and only one institution indicated that it primarily served the global community (as opposed to five in Asia and four in Latin America). Those Southern African institutions that do have an internationalisation strategy, however, are more likely to attach higher importance to doctoral education as part of that strategy than any of the other regions. Although this result is no more than a first indication, it is interesting to observe the role of doctoral education in Southern African universities in terms of their internationalisation. Particularly significant perhaps are the doctoral models used by these universities. While Southern African universities were at least as likely as the East Asian universities in the sample to provide institutional support for internationalisation, they were somewhat less likely to engage in collaborative programmes, and when they did so they were considerably more likely than the other two regions to use the sandwich

model (16 respondents compared to 9 in Asia and 8 in Latin America). At the same time, the Southern African universities in the sample were less likely than the Asian respondents in particular to use the double degree model (6 respondents in Southern Africa against 14 in Asia). It would seem that

although fewer Southern African universities have an internationalisation strategy, their internationalisation activities focus on specific models and groups, and above all the sandwich model for doctoral education.



This would correspond well to the higher number of Southern African respondents that reported difficulties in academic staff retention. The sandwich model takes these difficulties into account as it requires candidates to return to their sending university, whereas in the double degree model candidates are shared between two institutions, which entails greater risk in terms of retention. The sandwich model also allows academic staff to return to their home institution to resume teaching responsibilities. This finding should be qualified, however. It became clear from the workshop discussions in Johannesburg that certain funders and international donors have developed particular models for PhD and research support in developing countries, which influence significantly how developing institutions cooperate.

Although the Asian sample was very wide in terms of types of institution, its respondents conveyed a slightly different picture, probably because the sample included universities in countries with highly developed economies such as Singapore and Japan. The comparison with Southern Africa is thus to a great extent one between two regions with unequal resources. As noted above, the Asian universities in the sample were more likely to have an internationalisation strategy, and had considerably more doctoral candidates engaged in collaborative programmes. This would seem to

indicate that, whereas the Southern African universities in the sample are much more focused on particular areas and models in their internationalisation efforts, Asian ones tend to engage at a broad institutional level. If it is assumed that Asian universities do indeed have more resources, it might also be assumed that Southern African universities obtain financial support from the external funding of particular activities such as individual doctoral programmes. However, the survey revealed no major difference between the two regions in answers to the question “Has there been support provided by other bodies and partners (agencies, donors)?”

One indication of differences in resources might be the priorities of the different regions concerning the development of doctoral education. Asia clearly gives high priority to collaborative programmes and joint delivery, as well as institutional reform (like Latin America). By contrast, Southern African universities give priority to infrastructure and the development of supervisory capacity. This might suggest that many Asian universities are considering the development of more advanced forms of delivery, in terms of doctoral schools and collaborative programmes – and have resources at hand for this purpose – whereas many Southern African universities are using their resources to build basic capacity in terms of staff development and infrastructure.

Figure 5A – Question30:
How would you prioritise the following factors concerning the development of doctoral education in your institution?

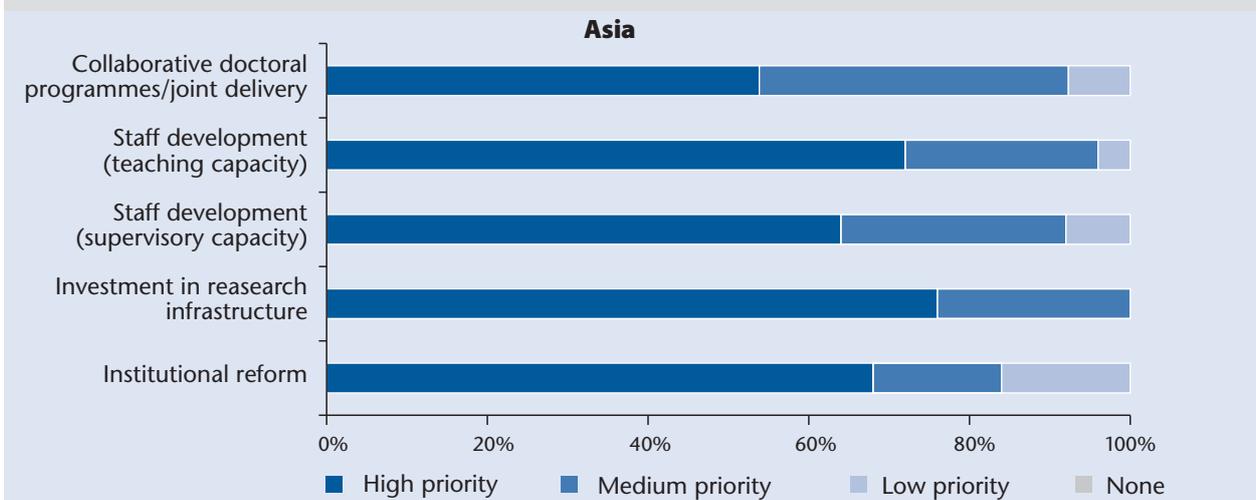


Figure 5B – Question30:
How would you prioritise the following factors concerning the development of doctoral education in your institution?

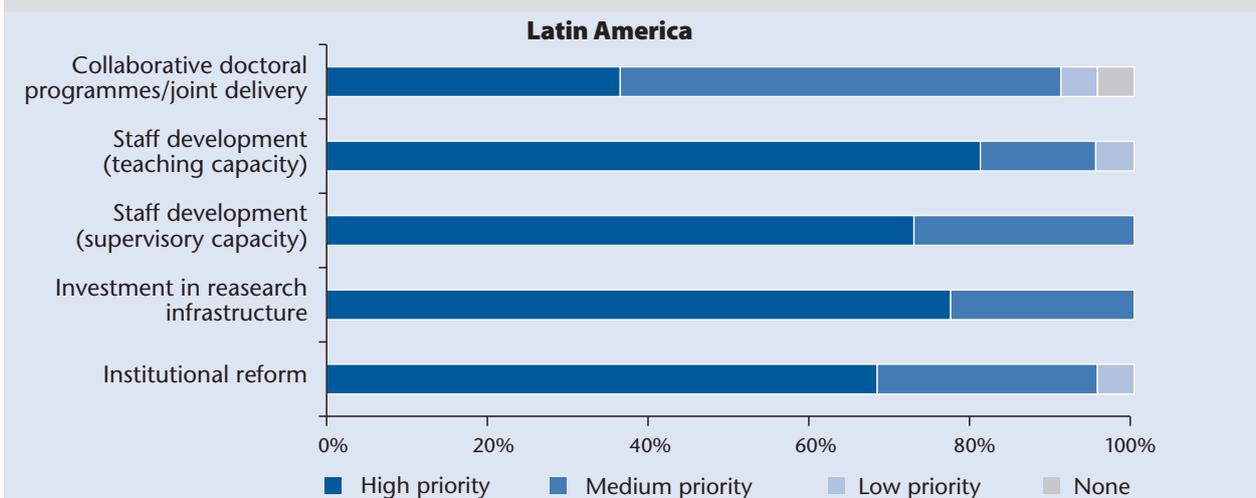
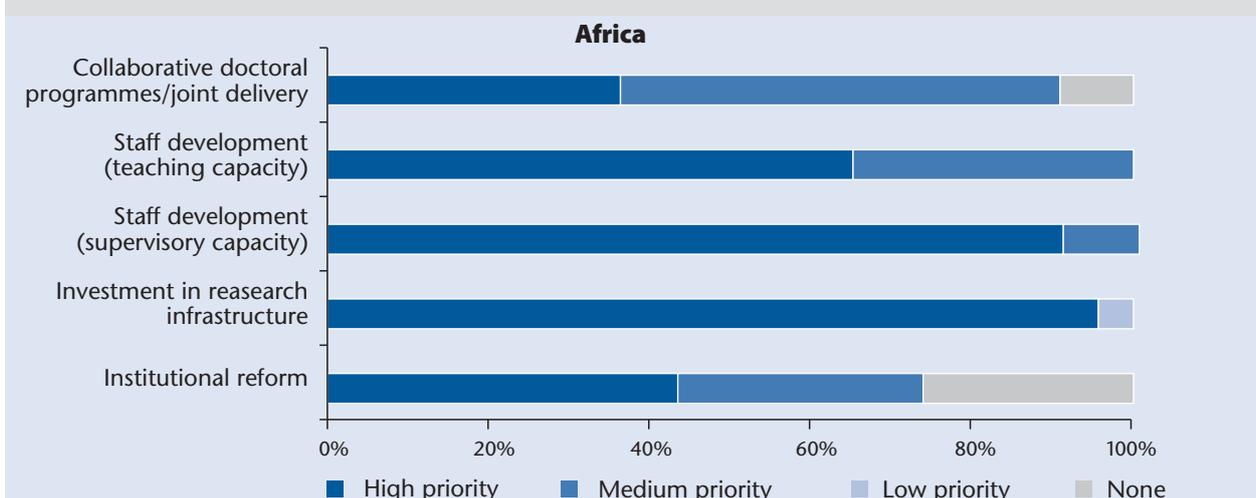


Figure 5C – Question30:
How would you prioritise the following factors concerning the development of doctoral education in your institution?



IV. Collaboration

The CODOC project assumes that, despite their many differences, universities everywhere increasingly feel the need to internationalise and collaborate in the field of doctoral education in order to develop capacity and provide doctoral education with an international dimension, albeit for very different reasons and in different forms. Building strong and sustainable partnerships can be a means of developing reciprocal links between institutions with similar levels of research capacity, in order to pool resources and develop critical mass. However, it is also viewed as a way of transforming those with low research capacity into solid providers of doctoral education.

In particular, the examples from the CODOC project point to collaboration as an opportunity for building capacity in regions with little research, or with weak or very dissimilar institutions. As already discussed, research in these regions is highly concentrated in a few research centres or clusters.

Sustainability is also an important issue. Exclusively short-term collaboration represents a drain on resources without adding much value in terms of capacity building. As the CODOC survey results have demonstrated, the biggest issue in doctoral education for the three world regions involved in the survey is to provide staff with training in research, and to do so in a good research environment.

Research-intensive universities find themselves in a highly competitive environment, in which they increasingly work at global level. It is vital for them to collaborate so as to develop their international outreach and place themselves at the forefront of global research. These institutions can either choose to work exclusively with global players like themselves, or develop a more varied portfolio of collaborations to suit their particular profile and needs.

Whereas the shared interest in collaboration is obvious between institutions of the same kind, the question remains how to use collaborations to give access to good research environments while at the same time being attractive to all partners and not contributing to brain drain. Clearly, the provision of funding and a general commitment to development cooperation are important, but there are other motivating factors. In the examples of partnerships between different types of institutions, which were cited in the CODOC workshops, one of the partners was often a leading university with an internationally recognised research capacity, while the other(s) possessed growing capacity and certain strategic scientific advantages. In some cases 'giving' and 'taking' partners are not easy to identify

and may even change over time. The following section provides examples of modes of collaboration, as well as concrete cases of various kinds of collaborative relationship.

Modes of collaboration

In the survey, universities were asked about their internationalisation strategies, partners and concrete internationalisation activities. Almost all respondents in East Asia and Latin America had an internationalisation strategy, while a sizeable minority of the Southern African respondents were still developing their strategy. For most institutions, doctoral education was seen as a "very important" part of their internationalisation strategy. Respondents increased internationalisation at their institutions in a variety of ways, such as attracting international staff and students, providing institutional support for cross-border activities, or engaging in joint or collaborative programmes or research and in ad hoc mobility. The only activity with a significantly lower priority was ad hoc mobility, where doctoral candidates for example conduct field work or engage in informal exchanges unrelated to a programme or a structured progression path. While ad hoc mobility is undoubtedly attractive for the individual doctoral candidates and research teams, it clearly has little strategic significance for institutions compared to more formal types of collaboration.

Examples of collaboration

At the CODOC workshops, a number of interesting case studies were presented with valuable details about the many models and motivations that come into play when universities engage in partnerships.

Where the partners have different levels of research capacity, the motivations of each institution have to be defined in a more complementary way, and the capacity building aspect needs to be integrated in the model. However, it is also important that dissimilar starting points are not ultimately reflected in a client-donor relationship and that all partner institutions invest in and gain from the collaboration.

Generally, participants in the project workshops stressed the importance of developing collaboration by capitalising on existing research strengths and contacts. In addition, institutional commitment contributes to sustainability and provides added strategic value. While the research basis

for collaboration is essential when institutions start to form partnerships, support from the university leadership is vital for their relations to become durable and for the partners to develop in their own right. As a participant in the first workshop put it, partnerships have to be “built bottom-up, but supported top-down”. Collaboration in the following examples is indeed inspired by particular research interests, but many of the ventures involve strong commitment from the leadership at all institutions concerned.

Ghent University in Belgium awards scholarships to doctoral candidates from developing countries, paying for 24 out of 48 months of doctoral education. The scholarships come from the university's own special research fund. Although in this particular sandwich model candidates defend their thesis in Ghent and receive a Ghent doctorate, the criteria for obtaining the scholarship explicitly state that the research project should strengthen the capacity of the partner institution in the developing country and that the candidates have to belong to a research group there. Another interesting feature of the Ghent scholarships is that institutions have the option of awarding the doctorate jointly with Ghent.¹¹

Such joint doctorates point to the often misunderstood difference between joint programmes and joint delivery. The Ghent scholarship is a flexible sandwich model based on research done in two institutions without any formal joint curriculum development, quality assurance or funding – elements that would normally be essential for a joint programme. However, there is the possibility of a jointly awarded doctorate or joint delivery if Ghent and the partner institution so decide. The point is that the ‘jointness’ of the programme and of the delivery are not directly linked.

A very prominent example of the use of more integrated joint programmes comes from the **National University of Singapore (NUS)**, which has established several joint doctoral programmes, most notably with other research-intensive European technical universities. The university has an extensive joint programme with **Imperial College London (ICL)**, which has been designed at institutional level for all departments and provides for full access to facilities in both universities, 50% of the time spent at each, and a common NUS-ICL degree. While this kind of partnership between two leading universities is very attractive for candidates seeking a diploma from highly respected institutions, it requires partners of similar standing that benefit mutually from their combined prestige.

Since 2010, **Newcastle University** in the UK and the **Universitas Indonesia** have established a joint doctoral

programme in biomedical sciences based on common supervisory teams, but with strong support from their university leadership to expand their collaboration. In terms of research opportunities, this has enabled Newcastle to study patient cohorts with distinct genotypes and, in terms of institutional strategy, to strengthen its presence in South East Asia, where it already has a branch campus in Malaysia. Universitas Indonesia has developed expertise through the joint research teams, as well as acquiring practical knowledge from its partnership with a globally active university about how to establish good doctoral programmes. In order to achieve these goals, such collaboration needs to be highly integrated and based on a common understanding of the programme structure and, most importantly, of what constitutes good supervision. The institutions have also had to reach a similar joint understanding of how to recruit, monitor the progress of and examine doctoral candidates, and to share a common view on research ethics. All these aspects of establishing integrated doctoral programmes have helped to develop the capacity of both partners in terms of practical know-how, international outreach and intercultural understanding.

Complementary capacities and interests

Some disciplines present obvious win-win situations for interregional collaboration. Medical departments in small European countries might have a very large research capacity, good expertise and advanced equipment but only small populations to study. Finding partner institutions in countries such as India and Indonesia will give them access to very large populations, while those partners will obtain access to their research infrastructure.

Many countries represent ‘natural laboratories’ in the sense that their natural environments are excellent for studying certain phenomena. Chile, for example, hosts the European Southern Observatory because of the particularly good conditions for observing the sky in the Atacama Desert. The country also attracts seismologists and glaciologists. The biodiversity of other parts of Latin America and the linguistic diversity of Western Africa are similarly impressive. At the time of writing, the most striking example of the importance of ‘natural laboratories’ in national research development is the scramble for the Square Kilometre Array (SKA) between South Africa and Australia/New Zealand. This enormous radio telescope needs a location with minimum man-made radio interference, either in the Karoo in the Northern Cape Province of South Africa, or in Western Australia. In the summer of 2012, a solution encompassing both sites was

¹¹ Special research fund announcement 2012. Doctoral grants for candidates from developing countries. North-South “Sandwich”-type grants, p. 2 <https://www.ugent.be/nl/onderzoek/financiering/bof/DOS/doscall.pdf>

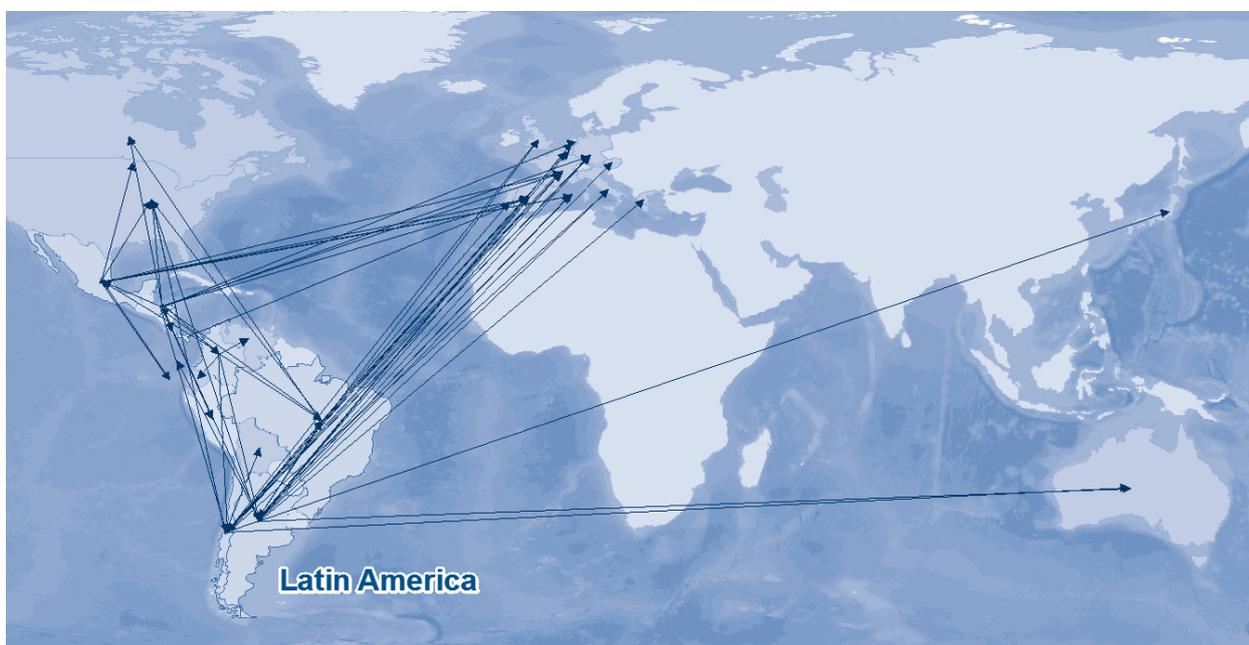
being proposed. The competition, including considerable investments in infrastructure by the candidates, demonstrates the importance of such large infrastructural projects for countries wanting to exploit the potential of their ‘natural laboratories’.

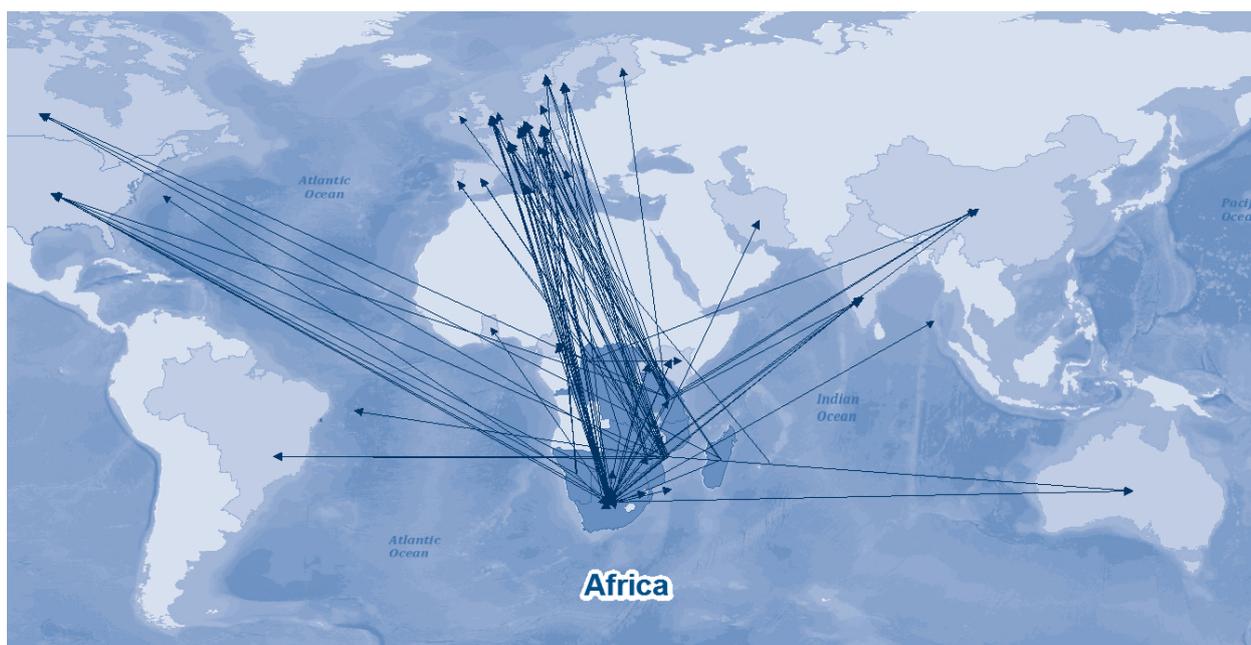
Geographical ties

The survey results rather uniformly suggest that by far the greater share of collaboration occurs between universities

in the global North (comprising primarily Europe and the US) and the South, with some intraregional collaboration and only very few collaborative ventures linking Southern Africa, East Asia and Latin America. One of the assumptions of CODOC has been that economic and subsequently educational forms of collaboration were emerging between countries such as China, Brazil and South Africa. However, participants in the project workshops confirmed that such collaboration on the contrary remains limited by the geographical distances and language barriers involved, not to mention the fact that funding sources have not favoured such collaboration.

Figure 6 – Question 24:
With which countries/regions do you collaborate on doctoral education?





Nevertheless, there are very interesting examples of collaboration, supported in several cases by political and economic agendas for regional integration. In Europe, the goal of EU research funding in particular has been to further collaboration between EU member states in order to create a unified European Research Area (ERA). Since 2009, the Treaty of Lisbon has defined the creation of ERA as a part of the EU 'constitution', and hence allows common European legislation.¹² This is very far from the political framework for cross-border research in other world regions. Although EU funding schemes for doctoral education (mainly the Marie Skłodowska-Curie Programme) are relatively modest compared to the combined funding of the member states, they are highly symbolic in setting standards and benchmarks for collaboration in doctoral education. They aim to enhance intra-European exchanges as well as mobility from and to non-EU countries.

The Erasmus Mundus Joint Doctorates strand funded only a handful of programmes, but nevertheless had a considerable impact on the way universities view joint doctorates as an important part of their internationalisation strategy. Due to this type of cross-border funding, European universities have developed considerable know-how in setting up such collaboration which would indeed seem to give Europe an edge in the competition with other regions. From the survey data, it also seems that formal collaboration occurs with Europe to a greater extent (48 respondents cited collaboration with European countries, and 29 with the US). Some evidence suggests that the existence of these formal collaborative ventures and related funding schemes

makes European institutions a convenient and attractive destination compared to even the more prestigious US universities.¹³

One African example is the Consortium for Advanced Research Training in Africa (CARTA), which has a twofold focus on supporting doctoral candidates and developing university supervisory capacity within Africa. One way to do this is by organising common doctoral programmes between partner institutions in the consortium that give the doctoral candidates access to the combined research capacity of the institutions, while allowing the institutions to support each other in developing their capacity. While the majority of CARTA consortium partners are within Africa, its non-African partners and main funders are European, North American or Australian research-intensive institutions.

Looking at both the different modes of collaborations, it would seem that partnerships between research-intensive universities in the North and universities involved in capacity building in the South are quite common, and indeed almost the norm in interregional collaboration in many countries covered by the project. However, several pioneer programmes are strengthening the case for intraregional collaboration. It might well be interesting in the future to examine the further potential for universities in regions engaged in capacity building to pool their resources. The above-mentioned CARTA programme is a good example of this in the African context, in which local capacity is pooled to achieve a critical mass of research. Examples from Europe, notably Scotland, indicate that the creation of discipline-

¹² A power, which up to 2012 has not been used.

¹³ Calabrese, & Ramón, 2007, *El Futuro de la Política de Cooperación en materia de Educación Superior de la Unión Europea hacia América Latina, Oportunidades y Riesgos*, pp. 7-9.

specific networks to provide high-level training and a common research environment is a very profitable strategy for all partners. The Scottish Universities Physics Alliance (SUPA) – a foremost example of such pooling – offers doctoral candidates an extensive range of specialised programmes and opportunities to interact with over 500 other doctoral candidates. This programme enables universities with small physics departments to provide the necessary critical mass for good doctoral education. Moreover, collaboration in these discipline-specific networks is capable of raising considerably their common research output. For example, citations involving the EaStChem sub-network (Edinburgh and St Andrews Research School of Chemistry) doubled from 2005 to 2010, thus demonstrating the potential of pooling for all partners concerned.

Funding

One interesting question that arises from the scholarship model of funding is how additional costs for universities such as overheads are covered. Scholarships for individual doctoral candidates still imply investment by universities in the necessary administration, which is considerable in very large programmes. While some respondents also point to the funding of joint programmes, they offer no details concerning the actual funding model and the precise costs covered. In the Brazilian case, in addition to the investment through scholarships, universities with proven research records have received extensive federal and state funding to sustain their research infrastructure. In most instances, as in Europe, they are presumably making some investment themselves through the indirect costs of doctoral mobility, particularly if support is earmarked for scholarships in joint programmes or other models requiring sizeable institutional investment.

Government

In many cases, government support has been crucial in kick-starting collaboration. In the survey, 86% of respondents indicated that governments had stimulated or supported instruments specifically related to internationalisation and mostly supporting mobility. According to the survey, government support comes mainly in the form of scholarships for doctoral candidates wanting to go abroad. However, the form and size of these grants seem to differ widely; some take the form of bilateral agreements in which the possible destinations of candidates are limited. For example, the impressive Brazilian Science without Borders programme awards over 30,000 scholarships mainly for doctoral candidates (mostly sandwich programmes). Host

institutions will have to participate through the official national partner in their country as in the case of Campus France, DAAD (the German Academic Exchange Service), or Universities UK. National funding bodies also have certain fields – often the STEM fields (science, technology, engineering and mathematics) – to which they give priority.

The CODOC project did not specifically aim to investigate these funding opportunities in detail. The survey results revealed many government scholarship programmes, suggesting that governments in the regions allocate resources for the internationalisation of doctoral education, and that they view the mobility of doctoral candidates as important for the development of research capacity.

Donors

As in the case of the government support models described above, a large majority of respondents to the survey said that they received assistance from donors or other agencies.

One particular type of collaboration consists of capacity building partnerships, often supported by national and multilateral development cooperation funds. These types of programmes, which are funded to varying degree in France, the UK, the Netherlands, Germany, Belgium and all of the Nordic countries (to name the most prominent contributors), have an explicit element of building the capacity of the ‘Southern’ partner and take various forms. While most of them involve scholarships for doctoral candidates at universities in the South to study and conduct research in the North, they also include complementary measures, such as the development of research infrastructure in the Southern institutions, training programmes for proposal writing and research grant management, and support for the Southern institution to set up spin-off courses. The Flemish VLIR-OUS¹⁴ is an example of a programme that aims to build capacity by fostering research collaboration and mobility between Belgian universities and universities in developing countries. The programme also offers support for infrastructure including research equipment for the partner universities.

The issue of donors was especially prominent at the workshop held in South Africa. The Swedish International Development Cooperation Agency (SIDA), the Flemish VLIR-UOS and the German DAAD were all mentioned in relation to different case studies. The DAAD, for example, supports local initiatives and even offers scholarships to doctoral candidates in their home countries in order to combat brain drain, and ensure the development of domestic universities.

External funding of doctoral programmes is also very common in Europe, in which cross-border funding is mostly provided by the programmes of the European Union. In the EU, the strength of the funding schemes has been the high prestige and visibility of the funding and thus their function as a model for doctoral programmes in general. Here again, the CODOC project has not been investigating the impact of funding models, but it would be interesting to compare how the particular models of funding through donor organisations such as the DAAD, the Danish International Development Agency (DANIDA) or SIDA have had an impact beyond the specific programmes that they are funding.

Guiding principles for cross-regional collaboration in doctoral education

During the three regional CODOC workshops, participants identified a number of principles which should be borne in mind when engaging in international collaboration.

Complementary capacities are one very important factor in successful collaboration. Even in seemingly uneven partnerships, it is important that each partner university makes a firm contribution and invests accordingly. Such a contribution could be access to a natural laboratory in which the local university has expertise and the right location to profit from biodiversity, population, culture or special geographical features. It could also be a particular local area of excellence, complemented perhaps by the strengths of the partner institution. The important aspect is to create mutually beneficial collaboration with **both parties contributing to the common venture**.

Such collaboration works if built on **concrete common research interests**. The university leadership cannot unilaterally define or create such common interests which must spring from tangible ongoing research in the two institutions. Once these interests and contacts have been established, the university leadership can and should support collaboration in a way that corresponds to the strategy and capacity of institutions. Here again, the “**build bottom-up – support top-down**” principle applies in the sense of building upon existing research strengths and international networks of researchers. Researchers know in what fields collaboration will be fruitful, while universities can support their endeavours by investing and reaching the necessary agreements. Institutions can also devise an appropriate form of collaboration, be it an integrated joint programme, a sandwich arrangement, or arrangements for joint supervision of doctoral theses. Institutional leadership commitment is in turn fundamental in making the partnership work in the long run, and ensuring that its benefits are not confined to one faculty or department.

Government support strengthens the ability to engage in collaboration. Investments should be allocated through an integrated policy for promoting doctoral education, which aims to support individual doctoral candidates and build the research environments in which they work. Such an approach is also effective as a means of strengthening the retention of doctorate holders, as they will have access to research infrastructure in the country in which they graduated.

Cross-border funding should be increased. The European example demonstrates that this kind of funding increases the capacity of institutions to engage in collaboration. Such funding might also potentially have a big impact as a benchmark for other doctoral programmes, if the criteria of the funding scheme become a guide to what is needed for good doctoral education.

V. Capacity building

The main challenge for all world regions covered by the CODOC project is to increase research capacity.

In Southern Africa, East Asia and Latin America, the immediate aim is to upgrade an expanding higher education sector with the longer-term goal of developing knowledge societies. Doctoral education is central to both aims: the university sector needs research-trained staff in order to raise overall capacity in research and teaching, while doctorate holders are expected to provide the human capital and innovative mindset necessary for the knowledge economy and society. A similar discourse prevails in Europe. In order to meet the European challenges posed by structural impediments to growth, more and better trained doctorate holders are seen as a key element in EU ambitions for “smart, sustainable and inclusive growth” as well as national growth strategies.¹⁵ There is a global line of reasoning which claims that building capacity in research and innovation will enable societies to overcome their challenges and that this capacity building requires good doctoral education. Such education should have a critical mass of research while possibly also providing links to the private sector to develop knowledge transfer and foster innovation.

Recognising the importance of doctoral education for building research capacity, many government initiatives focus mainly on increasing the number of doctorate holders, setting very ambitious targets for relatively short time spans. However, there are many aspects to be taken into account in enabling doctoral candidates to complete their research and graduate with the qualities, skills and mindset needed to take on the challenges they are expected to meet and resolve. Capacity building in doctoral education requires multi-focused strategies and use

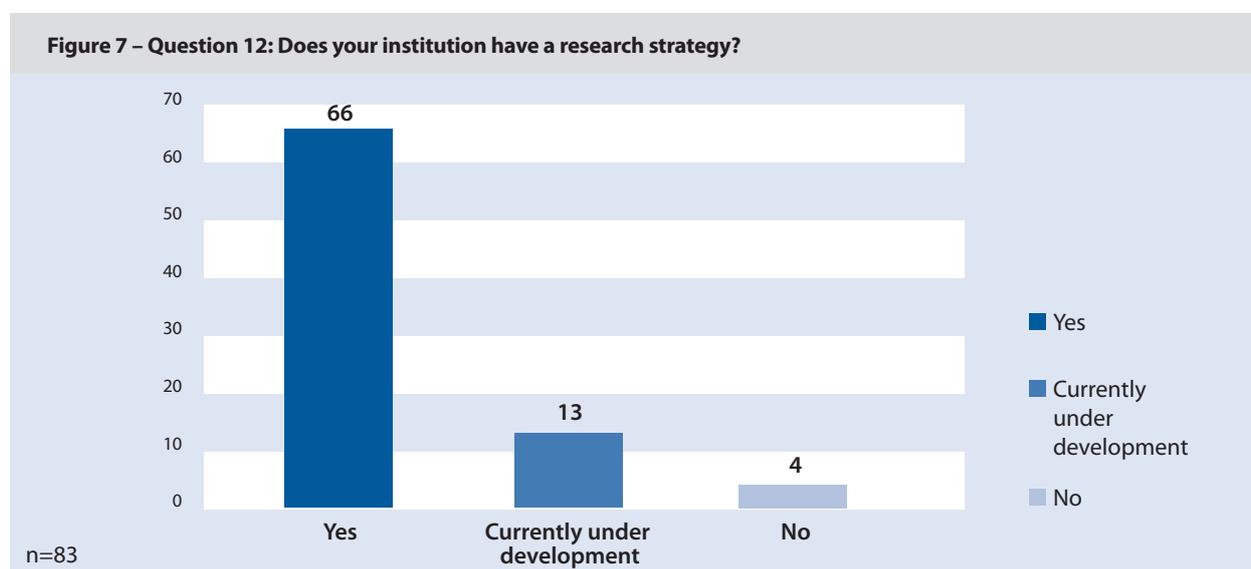
of resources. While various approaches to it are discussed in Chapter V and the regional section in Annex 1, this chapter will examine the issue in greater depth, with reference to particular cases considered in the CODOC workshops.

Attaining critical mass

One of the key principles in the European debate about the reform of doctoral education has been the need to have a critical mass of research. The Salzburg II Recommendations, widely accepted as an authoritative statement on doctoral education, emphasised that:

Institutions must develop a **critical mass and diversity of research** in order to offer high-quality doctoral education. Critical mass does not necessarily mean a large number of researchers, but rather the quality of the research. Europe’s universities have developed diverse strategies to assure critical mass and diversity, building their areas of strength through focused research strategies and engaging in larger networks, collaborations and regional clusters.¹⁶

This recommendation is applicable to geographical regions beyond Europe. From the survey results, it would seem that universities see the need to adopt a strategic approach to the development of research capacity, irrespective of geographical region or existing research performance: 66 respondents did have a research strategy and 13 were developing one, leaving only a very small minority not engaged strategically in developing research.



¹⁵ European Commission, 2010, *Europe 2020*.

¹⁶ EUA, 2010, *Salzburg II Recommendations*, 2.1.

Individual research strategies vary considerably. Many respondents mentioned the importance of balancing fundamental and applied research, and serving domestic priorities and demands, while keeping abreast of international research and technology:

“The university must:

- organise basic and applied research so that it is directed towards the specific problems of the country, while however considering the global developments in science and technology;
- be open to their environment. The university should not only contribute to the development of the local community; it should contribute to build the nation as such.”(Democratic Republic of Congo)

A number of universities are concentrating resources on areas where they have capacity or the potential to develop it; “investing in areas of strength” is a common strategy. Particularly universities with an established position are looking at benchmarking, often in terms of national or international rankings to: “Improve the research profile of the [university] in terms of total research output, the qualification profile of staff, productivity and focused excellence in order to position [the university] among the top six universities”.

To most universities doctoral education as a means for developing research capacity and increasing the number of doctorate holders on their research and teaching staff seemed to be equally important.

Case studies gathered through the workshops demonstrated different possible paths to capacity building. There were examples of incentives encouraging staff to obtain a doctorate and of policies for the recruitment of talented researchers who would increase the capacity of the institution. It would seem that many universities view doctoral education as a human-capital investment. Some approaches were heavily influenced by the national funding structure and research framework; others relied on creating interinstitutional links between relatively strong and weak universities.

Concentration of capacity

In some countries, there were examples of research capacity concentrated in a few institutions in order to ensure critical

mass. The Brazilian example is especially noteworthy with doctoral education largely concentrated in the State of São Paulo, in which the University of São Paulo and the University of Campinas together graduate about a quarter of all doctorate holders in the country. Both universities are part of the small group of research-intensive universities in Latin America. By concentrating capacity in selected institutions, doctoral candidates in these universities will be able to conduct research in advanced research environments. Indeed, as explicitly specified in the missions of the universities concerned, they will be able to go to less research-intensive universities after graduation, taking with them the expertise and know-how needed to increase capacity wherever they go.

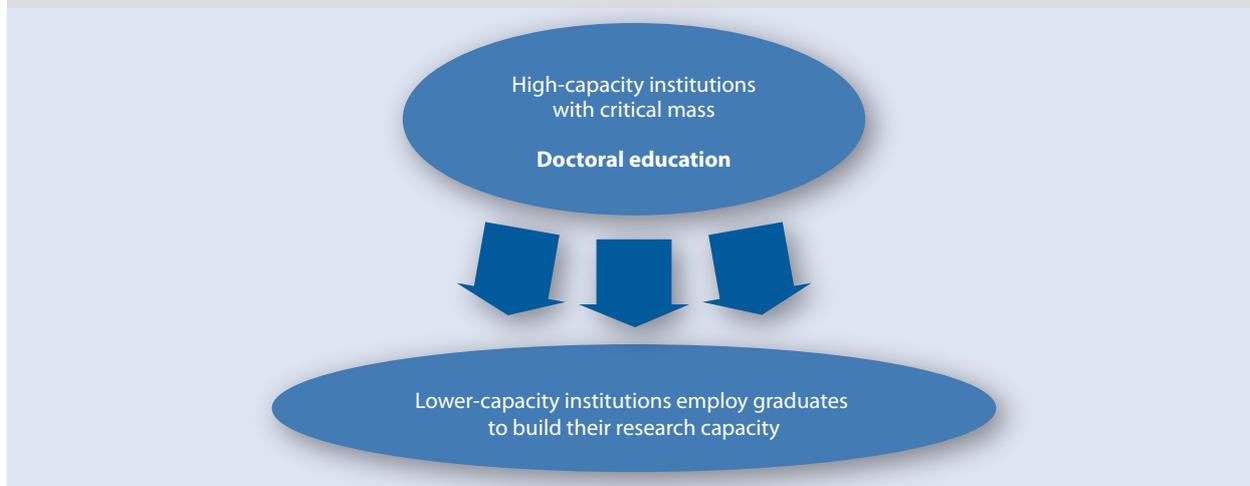
This system of concentration comes together with a combined programme evaluation and funding system through the CAPES Foundation.¹⁷ CAPES conducts peer review evaluations of doctoral programmes and distributes funding accordingly, giving more funding to the top-graded programmes and closing down programmes falling under a certain threshold. Even if Brazil cannot match knowledge-intensive European economies in terms of relative spending, its absolute size (with a population of almost 200 million) enables it to concentrate considerable funding in CAPES (with a 2012 budget of 2 billion USD) and to channel some of it into high-quality doctoral programmes. Programmes with good evaluations receive more funding and are able to develop their capacity further. In this way, critical mass is achieved at a few large institutions that can guarantee a high level of research in well-funded doctoral programmes. There are, however, also incentives for the research-intensive institutions to engage in capacity building for Brazil as a whole, since one of the criteria in the CAPES evaluations is the extent to which a programme contributes to capacity development of higher education in the region or country.

In South Korea, the concentration of doctoral graduates in a few institutions is even more striking than in Brazil. In 2011, over 5 500 doctorate holders graduated from Seoul National University and Yonsei University alone, corresponding to probably half the total graduations in the country.¹⁸ As described in the section on East Asia in Annex 1, this situation is the result of targeted government policies to concentrate doctoral education in institutions that have the research capacity required for it and to develop those institutions further. The process has in part been driven by government funding schemes, notably Brain Korea 21, which will get total funding of 1.4 billion USD over 13 years to nurture individual doctoral programmes with high research capacity.

¹⁷ The CAPES Foundation is a public foundation established in 1951 within the Ministry of Higher Education, as a Brazilian government agency awarding scholarship grants to graduate students at universities and research centres in Brazil and abroad, www.capes.gov.br

¹⁸ OECD, the most recent figure for South Korea is 9 912 graduations in 2009.

Figure 8 – Concentration within the system



These initiatives, aimed at creating critical mass, undeniably generate very impressive outputs in terms of sustaining high-quality research environments for doctoral education. It might be interesting to examine them alongside the output of doctoral graduates in countries where training is more evenly spread across the higher education sector, in order to compare their systemic impact, their ability to increase the broad capacity of national higher education systems and their impact on society at large.

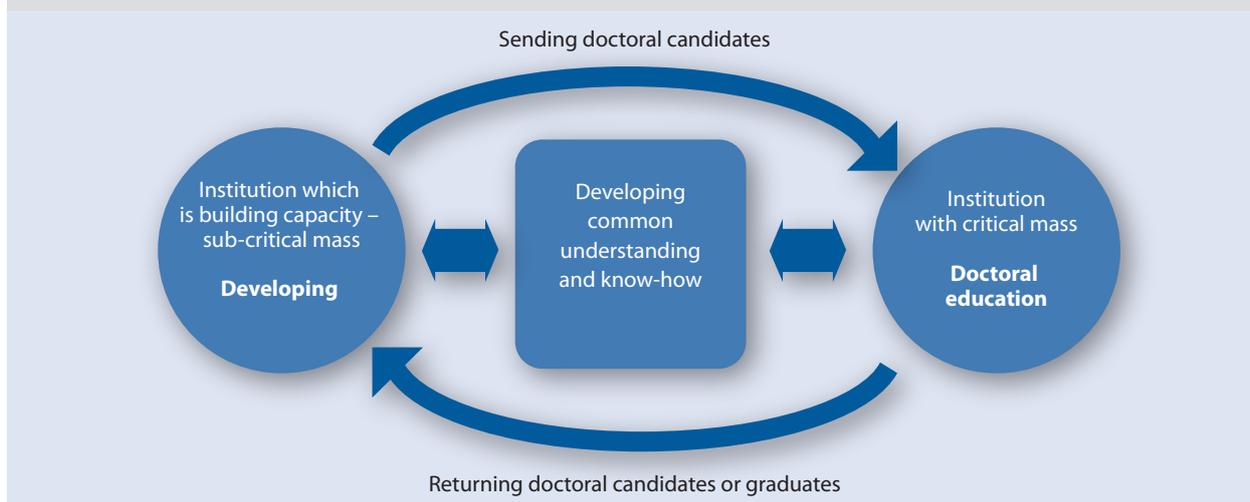
Sharing capacity, pooling and partnering

While the concentration of capacity requires well-coordinated and coherent government policies, many universities form partnerships with stronger institutions as a complementary strategy that can provide environments with the critical mass of research needed to train doctoral candidates and develop local research capacity (see also Chapter IV).

An interesting example of this may be observed in Colombia. Here, the national accreditation system tries to prevent collaboration-based capacity building from resulting in permanent, unbalanced partnerships in which one university simply uses the resources of a stronger partner instead of making the necessary local investment to develop its own research capacity.

Accreditation of collaborative doctoral programmes in Colombia occurs at two levels. First, a basic accreditation procedure confirms that the collaborative programme can ensure the common capacity needed to run a doctoral programme. Secondly, after three years, one or more Colombian partners need to have developed this capacity by themselves in order to get the programme accredited on the basis of its publications, staff qualifications, supervisory capacity, external funding and international outreach. The relatively short period of time allowed for developing programme capacity limits the risk of ‘outsourcing’ or, in other words, of maintaining programmes at a low research

Figure 9 – Partnership model



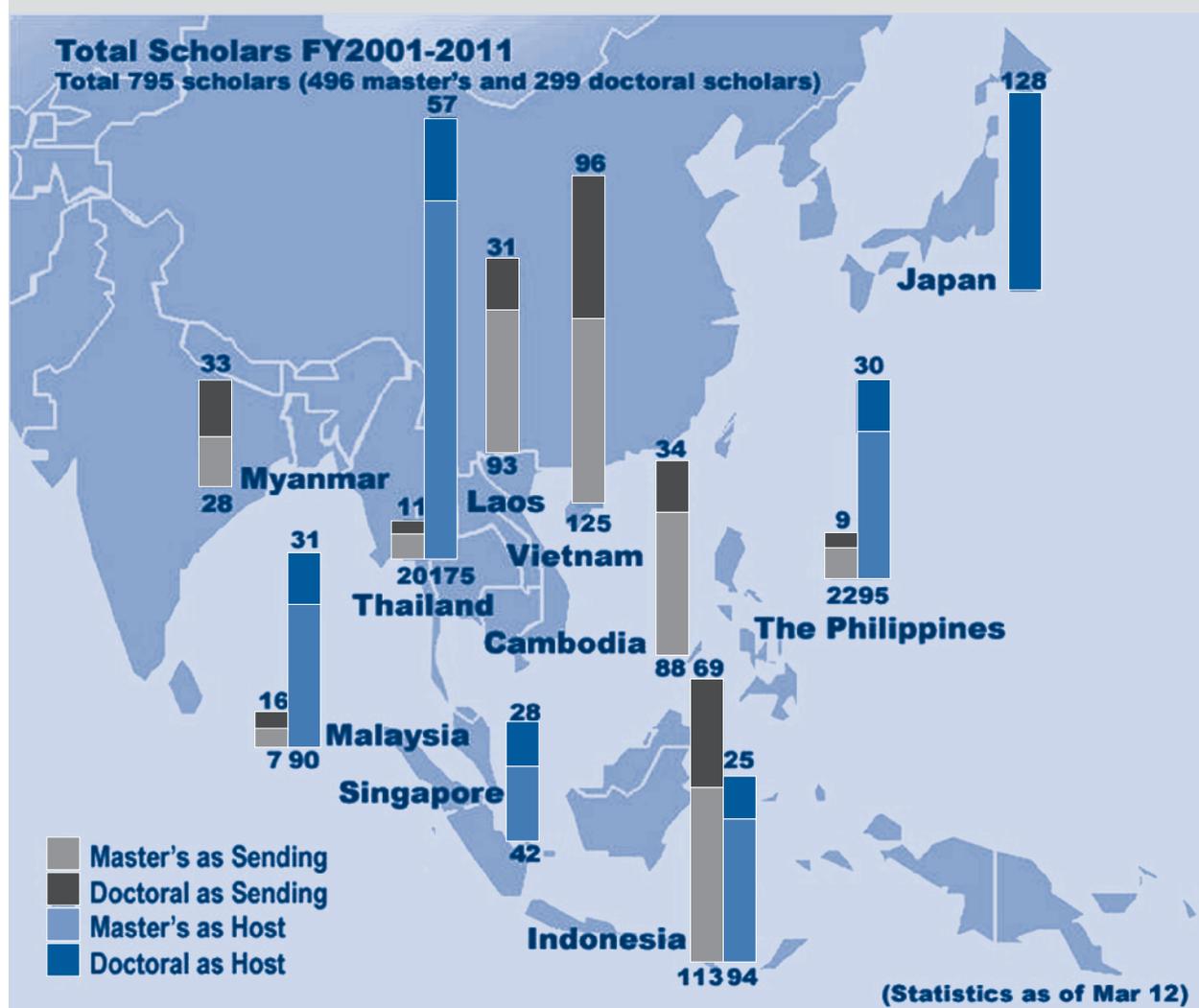
level through the continued input of foreign, research-intensive partners.

As regards the trend towards upgrading the capacity of existing staff through doctoral training, complementary partnerships and the pooling of resources to ensure the critical mass of research required for the training environment seems to be a promising strategy. Staff graduating from sandwich programmes or similar will bring cutting-edge knowledge, know-how and research culture back to their home institution and thus create local critical mass.

One example of using a network to build capacity is the AUN-SEED (ASEAN University Network/Southeast Asia Engineering Education Development Network) project in Asia.¹⁹ Here, several Southeast Asian and Japanese universities have built a network around common research

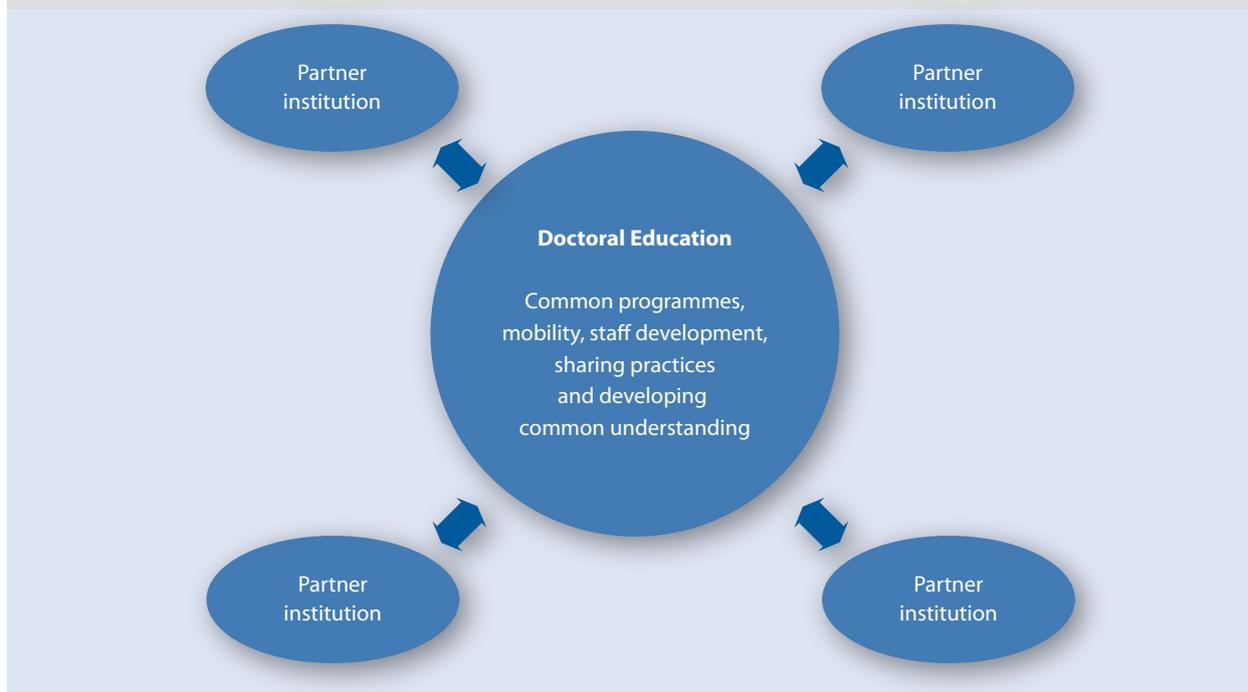
activities that enable them to take part in exchanges and capacity building activities together. The project includes mobility schemes with joint supervision, regional conferences, an engineering journal and a common database. The network is an example of capacity building focusing both on individual doctoral candidates and institutional structures. On the one hand, it allows countries with little or no research in advanced fields to train their researchers by accessing institutions with good research environments; on the other, it simultaneously pursues activities that strengthen university management and raise the international competence of staff in all member institutions. While the network still includes universities which are either solely host or sending institutions, it may be inferred from Figure 10 that some institutions are both sending and receiving. Furthermore, 80% of graduates return and take positions as university staff, building research capacity in their own institution.

Figure 10 – AUN-SEED total scholars distribution



¹⁹ <http://www.seed-net.org>

Figure11 – Network model



Exposing doctoral candidates to different environments

Seeing capacity building in the broader perspective, doctorate holders are considered necessary for the comprehensive development of society, and they need to be exposed to different environments in order to develop a comprehensive professional profile. They should be able to integrate national research in international research networks, and they should have knowledge of non-academic sectors in order to facilitate knowledge transfer between different areas to strengthen the research and innovation capacity of the system as a whole.

Private-sector relations

In Europe, where the output of doctorate holders is much greater than the needs of the academic job market, growing attention has been paid to exposing doctoral candidates to non-academic environments in order to make them ready to enter a wider labour market after graduation. As in the other three world regions, it is widely believed in Europe that doctorate holders in many professional sectors will further innovation and contribute markedly to developing or sustaining economic competitiveness. For decades,

countries like France, the UK and Denmark have run national 'industrial doctorate' programmes where doctoral candidates conducted their research projects partly in private companies. At EU level, the Marie Skłodowska-Curie Programme highlights the training of doctoral candidates in different environments as one of the main characteristics of its doctoral programmes.

One important element in this kind of action has been the insistence on academic quality and the original contribution to research. Theses are submitted to the university partner and defended in the same way as normal PhDs. More than a quarter of the graduates from the French industrial PhD programme CIFRE, for example, work in the academic sector and not in industry.²⁰

According to the CODOC survey results, industry-university relations are fairly common throughout the three regions covered: 59% of responding universities said that they engaged systematically with partners from the private sector in their doctoral programmes, while 57% of respondents said that 10-30% of their graduates eventually found employment in the service industry or services. Compared to Europe, where up to 90% of those with doctorates leave academia for other sectors, these are very low proportions. However, they do suggest that universities and industry organise many collaborative ventures and that doctorate holders enter the non-academic labour market in significant numbers after graduating.

Particularly in Asia, there has been interest in industrial doctorates as a way of developing knowledge economies. In Malaysia, scholarships for these doctorates have been introduced as part of the national MyBrain15 project. However, this scheme largely targets candidates who already have experience in research-based companies. The opportunity for them to conduct research as doctoral candidates can thus upgrade their skills and competences as professional employees and also intensify knowledge transfer between industry and the universities.

In addition to industrial doctorates, there is some debate in Africa and Asia about professional doctorates. In Europe, this particular type of doctorate is awarded almost exclusively in the UK, where it aims to give practitioners (typically in business, health or education) the opportunity to engage academically with their particular practice.²¹ Formal requirements often differ from those of the PhD, especially as regards the dissertation. Outside Europe, the concepts of the 'industrial' and 'professional' doctorate overlap to a greater extent. For example, the above-mentioned Malaysian industrial doctorate scheme does indeed contain elements of the professional doctorate by catering for people who already have a career in the private sector, while at the same time insisting that candidates should satisfy the same formal requirements as those of a PhD.

European experience in the area of university-industry relations is quite positive. Doctorate holders in collaborative programmes in Europe have greater knowledge of different sectors. They also facilitate knowledge transfer and ensure the common development of human resources in industry and universities alike. The studies done by EUA noted that human resource development in particular was an important motivation for undertaking collaborative activity, which might be a very interesting aspect for the other regions, in which the enhancement of university human resources is a dominant theme.

The CODOC project has not gathered enough evidence to reach any firm conclusions about this trend in the other regions, although it clearly aroused interest. In the emerging economies moving into more knowledge-intensive types of production, there should be considerable potential and demand for sharing relevant experience in this area.

Exposure to other academic cultures

In order to build capacity in countries where research and higher education have been developed quite recently and

are not very strongly rooted, exposure to different academic cultures is especially important. Places with traditionally strong research environments and a well-established academic culture can provide not just training in research techniques or access to advanced infrastructures, but an introduction to other ways of thinking about and conducting research that expand the outlook and skills of those who experience them.

One example from a CODOC workshop focused on Vietnam, in which the traditional learning culture is centred on the reproduction of knowledge rather than its active creation. While the country generally has very well-trained students, breaking free of this particular culture is one of the challenges facing its doctoral education. Exposure to other academic cultures in which critical thinking and active learning shape the growth of knowledge is one way of meeting this challenge.

As has been visible in more integrated forms of partnership, universities have activities for developing common academic cultures in order to achieve a common understanding of issues such as supervisory practices or research ethics. The partners realise that simply shipping doctoral candidates abroad to foreign institutions is not sufficient. Common ground and standards that are agreed upon are needed for mobility to be fruitful in the long run.

However, academic culture and research paradigms were criticised on different occasions for being almost exclusively based on western or North Atlantic models. The implication was that this could create a hegemony of theoretical approaches in research, which would view the world through Northern eyes. In order to generate local knowledge, it was necessary to also develop local paradigms or theories, rather than importing already existing ways of thinking from abroad.

While learning from good practices in other research cultures is certainly important for building and sustaining research capacity, this – as for other aspects of partnerships – should be a reciprocal process.

Higher education and research for capacity building

Capacity building in higher education and research must be developed within supportive national systems. Such

¹ UKCGE, 2010, *Professional Doctorate Awards in the UK*.

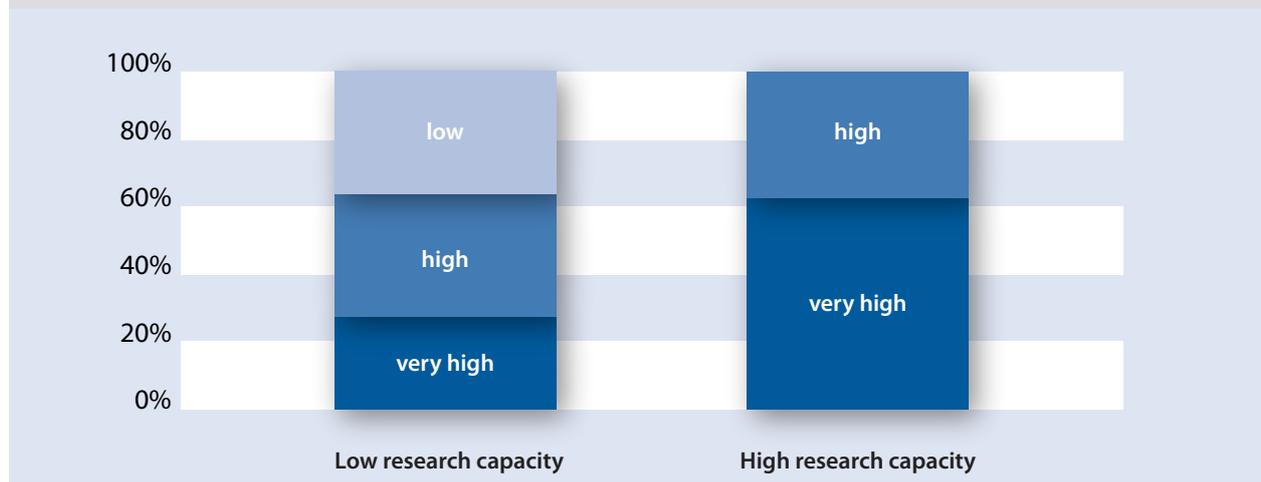
systemic support requires the political will to promote doctoral education as a means of economic and social development. It was apparent in the survey responses and in many government policies that the discourse of the knowledge society has been embraced worldwide. Respondents to the survey almost unanimously referred to the need for knowledge to counter the challenges of their societies, and governments have set very ambitious targets for increasing the number of doctorates awarded.

However, there are problems to consider. In particular, rising admissions to doctoral programmes have not always led to a corresponding rise in the numbers of candidates who obtain doctorates. This could well be the effect of government investing mainly in scholarships without considering the local research environments needed in terms of infrastructure and supervisory capacity. In addition, the goals set by certain countries for dramatically increasing the number of doctorate holders over short periods of time suggest that some policy makers have but a vague idea about the nature of doctoral education. Simply increasing admissions to doctoral programmes is not enough to ensure sustainable capacity building. Instead, there is a need for an integrated approach

with a critical mass of research, and funding for infrastructure with a clear goal and commitment to the development of sustainable and productive structures.

In addition to the need for coherent, long-term national investment in doctoral education, the issue of university autonomy was raised on several occasions at the CODOC workshops. Several studies have pointed to the importance of strengthening universities by granting them more autonomy²² and many countries have undertaken reforms for this purpose. This has occurred in Europe but also in Asia where China and Korea for example have increased the autonomy of their universities, albeit in very different political systems. The survey results confirm this correlation between more autonomous and stronger universities, especially when replies from the least research-intensive universities are compared with those from the most research-intensive ones. There is a marked difference in their level of autonomy, which is low in approximately a third of the least research-intensive universities and “high” or “very high” in all the most research-intensive. Thus capacity building should be considered within the context of university autonomy, as a condition for developing and developed universities to reach their potential.

**Figure 12 – Question 10: How would you describe the research capacity level of your institution?
And Question 14: How would you describe the ability of your institution to autonomously decide on and implement a research strategy?**



²² Estermann, Nokkola & Steinel, 2011, *University Autonomy in Europe II*, p. 11.

Guiding principles for capacity building

The following guiding principles for capacity building have been derived from the survey and the discussions.

1. The need for a critical mass of research

Achieving a critical mass of research is a basic requirement for providing doctoral education, in order to provide the research environment that is needed by doctoral candidates to conduct research. Funding or accreditation, which encourages the creation of critical mass, should take account of the impact on the national or regional system concerned. For example, the concentration of research capacity should ensure that research-intensive institutions are incorporated into the university system in a way that produces a 'trickle-down' effect.

Funding agencies and governments should foster capacity building through **coherent and comprehensive funding models** that develop the research environments essential for doctoral education. The funding of scholarships without supporting research and supervisory capacity runs the risk of being a failed investment that results in low completion rates. Funders should consider both the duration and flexibility of their support, in order to meet the needs of the universities involved and promote sustainability.

2. Reciprocity

While collaboration is an effective way of achieving critical mass, it should aim to **develop local capacity** and not be used by one university to satisfy its needs through reliance on a stronger partner. Collaboration must thus be **reciprocal**.

3. Exposure to other ways of thinking

Exposure to other ways of thinking in different academic or non-academic environments builds capacity beyond the university sector. Intersectoral mobility – for example between universities and businesses – develops human resources on both sides and facilitates knowledge transfer. Learning from different academic cultures should **entail mutual respect and curiosity regarding different paradigms of knowledge**, while upholding core scientific values.

4. University autonomy

Finally, **university autonomy** has proven to be an important element in developing and sustaining research capacity.

IV. Conclusions

The starting point for the CODOC project was that doctoral education is becoming an increasingly important aspect of national research policies, attracting significant investment worldwide. Although different world regions have undertaken different levels of investment, there has been a steady increase in all of them in the number of doctorates awarded in the last 10 to 15 years. Despite the diversity of the regions examined in the project, there are considerable global convergences in motivations, increased investment and, to some extent, the different models of doctoral education.

Convergence

Three major convergences can be identified between the different regions:

- 1) There is a major convergence in terms of the discourse surrounding doctoral education. Universities and to some extent governments worldwide view doctoral education as a key element in strategies to develop knowledge societies. This is based on the assumption that societal challenges must be met by increasing knowledge, research and innovation. As a result, doctoral education should be reformed to produce doctorate holders that will be able to contribute to economic growth and social development.
- 2) There is convergence in terms of growth. Throughout the world, the number of doctoral candidates is increasing. In Europe, this growth has been explicitly linked to the idea of developing a European knowledge society and integrating research-trained staff in many different sectors. In the other world regions, it has been fuelled by the wish to equip more university staff with doctorate degrees. To sustain growth, there is an acute need to build critical mass of research for doctoral education in universities, which will face the twofold challenge of training doctorate holders for higher education as well as for an increasingly knowledge-dependent private sector.
- 3) There is a convergence of emphasis in collaboration. All regions concerned with capacity building view collaboration in the form of university partnerships or the pooling of university resources as the main way of achieving a critical mass of research. Likewise, some of the most research-intensive universities are collaborating with a wide portfolio of partners. For these universities, global presence and access to 'natural laboratories' are just as important as incentives for collaboration as is the need for less research-intensive universities to build capacity.

Common issues, challenges and ways forward

Despite the growth in doctoral education in recent decades, increased admissions to doctoral programmes in many countries have not led to a proportional increase in doctorates awarded. However, even if more candidates completed their doctorates within a shorter period, the aim of awarding doctorates to large numbers of university staff within a relatively short time does not seem realistic under present circumstances. As emerging economies rely on increasingly specialised knowledge and seek to recruit more private-sector researchers, competition for staff with doctorates could intensify. Current problems of retaining staff, which are already causing concern could worsen, perhaps even leading to a vicious circle in which universities could not compete with the private sector for human capital and thus not develop and sustain the capacity needed for good doctoral education. The current staff retention crisis may also intensify in many countries unless far more doctoral candidates manage to complete their training.

Collaborations for capacity building, as mentioned, could alleviate the current problems by creating a critical mass of research between the partner universities. However, such collaboration should go beyond the mobility of doctoral candidates, and include the transfer of know-how and institutional sharing of good practice. If commitment to the knowledge society is serious, research capacity is needed to provide local knowledge for local challenges. This means that universities should collaborate to create common platforms and a common understanding of how to develop and improve doctoral education. Infrastructure, supervisory capacity, dialogue between researchers and the support of the institutional leadership are all required for collaboration.

Interregional convergence could lead to more varied patterns of collaboration, and especially more collaboration

among world regions in the global South. The CODOC project has been unable to detect any strong trend in this respect. However, common needs, the consensus about the value of doctoral education and – not least of all – the convergence of emphasis in collaboration might well become the foundation for more and stronger collaboration in doctoral education between many different regions. The present strong North-South pattern of global collaboration could possibly weaken and more South-South collaborations will appear.

In most countries and world regions, government support and efficient funding are necessary to achieve doctoral education on the scale and of the quality desired. Scholarships are only part of the strategy required. Universities must also establish environments with a critical mass of research. Governments should work with them to devise realistic and comprehensive strategies for developing doctoral education and research capacity. In all regions, there have been examples of concentration of research in a few institutions. While large, research-intensive universities give visibility and prestige to national research and education, concentration should be seen in the context of national systems and relations with other institutions.

Despite all these challenges, the emergence of a more multipolar setting for doctoral education and research should be welcomed. A truly global research community with productive cooperation between different regions will enhance appreciation of the wealth and diversity of human knowledge. It will also enable local research to meet local challenges and improve prospects for responding effectively to global ones. Herein lies the promise of convergence.

Annex 1 – Regional reports

East Asia

Introduction

The region of East Asia,²³ here represented by the ASEAN countries together with China, Japan and South Korea, is very diverse in terms of geography, socioeconomic contexts, culture and politics. This diversity is also reflected in the different education systems and their levels of development, which vary significantly.

Despite these differences, the worldwide trend of expanding higher education has attracted government attention in many countries in the region. In recent decades, East Asian countries have been increasing their efforts to expand their higher education sectors and improve the quality and relevance of education.

The region includes some of the countries with the highest standard of living in the world such as Singapore, Japan and South Korea, but also some of its least developed countries including Laos, Myanmar and Cambodia, and a larger number of emerging economies such as those of Thailand, Malaysia and China.

While in the developing countries, the main challenge is to increase access and participation in basic education, in others the expansion of secondary schools and economic and technological development have created a demand for more sophisticated educational opportunities.

In this regard, the topic of doctoral education is particularly relevant. Many East Asian countries find that, while doctoral education is critical in developing the knowledge economy, it must be developed at the right pace in accordance with a realistic approach, focusing on the most relevant national and regional needs.

Investment in doctoral education has taken it to a relatively advanced state in many countries of East Asia. This is clear from the results of the CODOC survey, in which university respondents include more research-intensive institutions and report fewer problems with academic staff retention than respondents in Southern Africa and Latin America.

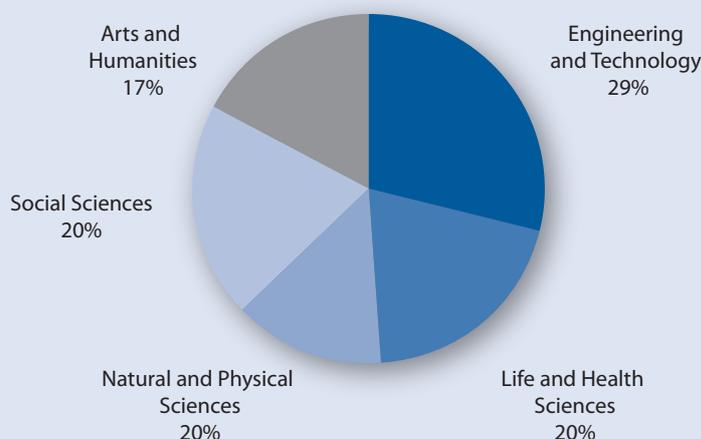
East Asia is also experiencing unprecedented expansion in the number of programmes and institutions operating internationally. Singapore is a foremost example of a country that has promoted internationalisation as a matter of national policy. Besides developing its own public sector-funded institutions, and the establishment of private higher education institutions, it has recruited prestigious foreign universities to establish local campuses in order to expand access to higher education for the local student population and to provide a higher education hub for the region.

Country profiles and doctoral programmes

There are over 1 500 doctoral programmes currently on offer in leading universities in East Asia in the fields of engineering and technology, life and health sciences, social sciences, arts and humanities and natural and physical sciences.²⁴ As most East Asian universities are comprehensive, there is a wide variety of doctoral programmes at each institution.

In terms of academic disciplines, the majority of doctoral programmes in East Asia are in the exact sciences, with engineering and technology the largest group. There are differences, however, between different parts of the continent. ASEAN countries have a more even distribution, while almost a third of the programmes in China are in engineering and technology.

Figure 13 – Doctoral Programmes in Asia



Source: AUN

ASEAN Member Countries

The Association of South East Asian Nations, or ASEAN, was established in 1967 in Bangkok, Thailand, with the signing of the ASEAN Declaration by Indonesia, Malaysia, the Philippines, Singapore and Thailand. The organisation was later joined by Brunei Darussalam, Vietnam, the Lao People’s Democratic Republic (PDR), Myanmar and Cambodia.

ASEAN has become increasingly interested in supporting higher education cooperation in the region. Cooperation in education is endorsed at ministerial level by an annual ASEAN Education Ministers Meeting. The implementation of programmes and activities for education matters is carried out by the ASEAN Senior Officials on Education (SOM-ED), which reports to the ASEAN Education Ministers Meeting. This mandate is also fulfilled by the ASEAN University Network, one of the project partners that has supplied background research for this report.

The development of doctoral education is at different stages in the ASEAN countries. Indonesia, Malaysia, the Philippines, Singapore, Thailand and Vietnam award a relatively high number of doctorates in comparison to Cambodia, Myanmar and the Lao PDR, in which the capacity to provide higher education is lower. Among the ASEAN countries, Singapore is considered to have high capacity and a well-established higher education system due to intensive government investment. Until 2015, the government will continue to allocate up to 3.5% of GDP annually for research and development. In return, universities in Singapore have made substantial scientific contributions, particularly in the area of biomedical sciences, environmental sciences, technology and media. Similarly in Malaysia, leading universities such as the University of Malaya and Universiti Kebangsaan have made remarkable progress in gaining global recognition, especially in the areas of technology, biology and innovation. Demand for doctoral education is

also increasing in Thailand, Indonesia and the Philippines.

To cite examples from leading universities in the region, the National University of Singapore (NUS) awards on average around 500 PhDs per academic year. In Thailand, Chulalongkorn University awarded 313 doctorates in 2009, while the doctoral graduation rate in other universities in South East Asia such as Mahidol University (Thailand), the University of Malaya (Malaysia), De La Salle University (the Philippines), Universitas Indonesia and Gadjah Mada University in Indonesia has been gradually rising every academic year.

As in the case of Southern Africa and Latin America, government support has been essential to the growth of doctoral education in East Asia. In the more developed countries, governments have put in place policies and strategies in order to promote it. The Malaysian government, for example, announced MyBrain15 as a measure to step up the production of human capital at doctoral level, with the aim of having 60,000 PhD holders in the population by 2023 (the current number of PhDs awarded annually is around 1 300). The government has also promoted the establishment of sandwich doctoral programmes and exchange programmes for professors to benefit from international experience. Thailand intends to raise the percentage of faculty members holding doctorates in public higher education institutions from 24% (2010) to 50%.

Many leading universities in ASEAN have already established international academic cooperation at the level of doctoral programmes, such as joint PhD and dual PhD programmes with universities in Europe, the United States, Japan, Australia and New Zealand. Such collaboration has also been a means of building capacity in countries like Vietnam, Laos and Cambodia, where several different national and regional donors have supported sandwich-

type programmes between an institution in a developing country and one in a developed country.

Individual countries in East Asia

Japan

In comparison with most other countries in East Asia, and in particular the ASEAN countries, higher education in Japan is well developed and the country has an established quality assurance and accreditation system.

Japan prioritises research in its national policy agenda. It spends the equivalent of 3.4% of GDP on research and development; almost double what China spends and more than the United States or Germany.²⁵ According to a government survey, the number of doctoral candidates was approximately 73,500 in 2004; enrolment had almost doubled from early 1990s levels, when the government stimulated leading universities to expand doctoral programmes in order to promote science and technology.

Doctoral programmes in Japan tend to have an interdisciplinary approach. Academic institutions use their doctoral programmes to collaborate domestically and internationally with public and private non-academic institutions and companies. University-industry partnerships are quite common and seen as an effective means of building research capacity.

The number of joint PhD programmes offered by universities in Japan has grown considerably. The Japanese government has continued to support the AUN/SEED-NET project (see Chapter V) in order to develop doctoral programmes in the field of engineering in the region. Moreover, both domestic and international doctoral candidates can benefit from various types of scholarship in Japan.

Although there are various types of PhD scholarships available, there has been a slight decrease in the number of doctoral candidates in Japan since 2004. This decline stands in contrast to the trend witnessed in most East Asian countries, particularly China.

China

Since China reformed and increased its investment in its higher education system in the 1980s, higher education has rapidly developed and become more efficient with regard to both education provision and management. The reforms sought to improve the relationship between government, society and higher education institutions, developing a new system in which the state restricted itself to overall planning and macromanagement while the institutions enjoyed

more autonomy. Until the early 1990s, Chinese universities specialised in particular academic disciplines and were classified accordingly. However, as a result of government policy, about 300 universities in China have been merged into multi-disciplinary institutions.

Doctoral education in mainland China has been growing in the past few decades. Since 1995, the number of higher education institutions authorised to award PhDs has increased rapidly. The number of PhD programmes has risen to approximately 4 000, while the number of admissions rose from 14,960 in 1998 to 59,800 in 2008 – a 400% increase. In 2008, 43,700 doctorates were awarded, making China the world's second biggest provider of doctoral education after the US.²⁶

The Chinese government has continued to invest in doctoral education by establishing 159 Key State Laboratories in higher education institutions. In addition, it has announced the 985 Project, which aims to develop 10 to 12 prestigious research institutions by means of increased funding for a few top-ranking research-intensive universities. Moreover, financial support for doctoral candidates is provided in the form of grants, government scholarships, placements, tuition waivers and loans.

China's fast economic growth has increased the demand for doctorate holders particularly in engineering. In 2004, those with doctorates in engineering had the highest rate of employment (over 70%), whereas employment rates for those with doctorates in philosophy, economics, law, history, agriculture and management sciences were around 60%. The lowest corresponding rates applied to education and literature. Not surprisingly, one third of all Chinese doctorates have been awarded in engineering, while 32% of 448 doctoral programmes in major universities were in engineering and technology. Among the remainder, programmes were equally distributed among natural and physical sciences, social sciences, life and health sciences, and arts and humanities.

To further enhance academic and research activities, many leading universities in China have established dual and joint degree PhD programmes with academic institutions in Japan, the USA, some EU countries and a few ASEAN countries.

South Korea

In past decades, the higher education sector in South Korea has undergone tremendous expansion, and its higher education enrolment rate is among the highest in the world. In order to safeguard the quality of research, the government created the Brain Korea 21 plan in 1998 with a total budget of

²⁵ 2009 figures OECD, Main Science and Technology Indicators.

²⁶ Ministry of Education of the People's Republic of China, *Statistical Communiqué on National Educational Development in 1998 and 2008* (www.moe.edu.cn).

1.4 billion USD. Brain Korea 21 promoted the concentration of research in the traditional elite universities responsible for doctoral education. Top universities integrate research and graduate education and are measured by their research activity and output of doctorates. The research component of doctoral degrees has evolved in significant ways in the last decade. With a few notable exceptions, research activities traditionally took place outside universities, but this is changing rapidly. Today, research is recognised as an important role of universities.

Through the development of research-based doctoral programmes, universities are increasingly involved in cooperation at doctoral level with other sectors such as industry, independent research organisations and government. In addition to the Brain Korea 21 plan, the Connect Korea Project facilitates university-industry partnerships. It is believed that building strong links between universities and other sectors will increase knowledge transfer and innovation.

In terms of academic disciplines, engineering and technology is the most highly represented field in doctoral programmes at most top universities. Programmes in arts and humanities, and in the social sciences share second place, followed by life and health sciences, and natural and physical sciences. Some leading universities work to enhance convergent and interdisciplinary studies in their doctoral programmes; Seoul National University (SNU), for example, involves science and engineering in arts and humanities, and vice versa.

A variety of scholarships and research exchange opportunities exist for doctoral candidates in South Korea, including some 660 scholarships awarded under the Korean Government Scholarship Program for Graduate Students, and 100 scholarships awarded under Research Fellowships for International Graduate Students. Private organisation scholarship opportunities are also available, especially in the area of IT where the country is very strong, and for the promotion of the Korean language. The facilities provided within the leading Korean universities are comparatively more advanced and comprehensive.

Summary and outlook for East Asia

The efforts to promote university autonomy in this region have been combined with substantial financial support

from governments to assist doctoral candidates and increase university research. Governments have also given research policies a high priority. Special attention has been paid to research policy in highly developed countries such as Singapore, Japan and China through large public investments in research and development.

Besides the changing relations between higher education institutions and government, another rising trend is collaborative partnership between university and local industry or the private sector, especially in the economically advanced East Asian countries.

The process of globalisation has led to the conviction that countries need to develop knowledge-based economies and societies. Knowledge (education, research and information technology) is often perceived in terms of competition, in which the innovative capacity of individual countries creates a comparative advantage in the global market. As the CODOC survey results indicate, the trend towards increasing the proportion of university staff with PhDs is clearly visible in East Asia. At the same time, the market demand for research-trained labour, especially in leadership positions, has led to increased demand for doctoral education. In particular, in the more developed countries in East Asia such as China (including Hong Kong), Japan, South Korea and Singapore, which possess specialised industry or services, the demand for doctorate holders will inevitably increase even further.

Strategic alliances will be very important in the near future. Doctoral education providers in East Asia will very probably continue to benefit from financial subsidies and political support to expand their collective partnerships and collaboration to include, for example, government, business and industry. However, there will be a need to incorporate internationalisation strategically in doctoral programmes to increase their attractiveness and develop good research environments. In many countries where the demand for higher education is increasing rapidly, private contributions to funding and provision will grow. The structure of doctoral programmes will be more aligned to the demands of society, the requirements of professional careers and market demand.

In relation to this, national governments should continue to play a supporting role in creating incentives for higher education institutes, doctoral programme providers and doctoral candidates.

Southern Africa

Southern Africa,²⁷ or more precisely the Southern African Development Community (SADC), includes 15 countries,²⁸ and comprises approximately 250 million people spread unevenly across them.

The SADC countries have a complex history rooted in colonialism, independence movements and post-independence development efforts. Like almost the whole of Africa, SADC countries endured the brief but traumatic experience of European colonialism. In addition, many of the SADC countries were settler colonies in which the struggle for African independence was more protracted, only ending in the most bitter of wars, followed by reconstruction efforts.

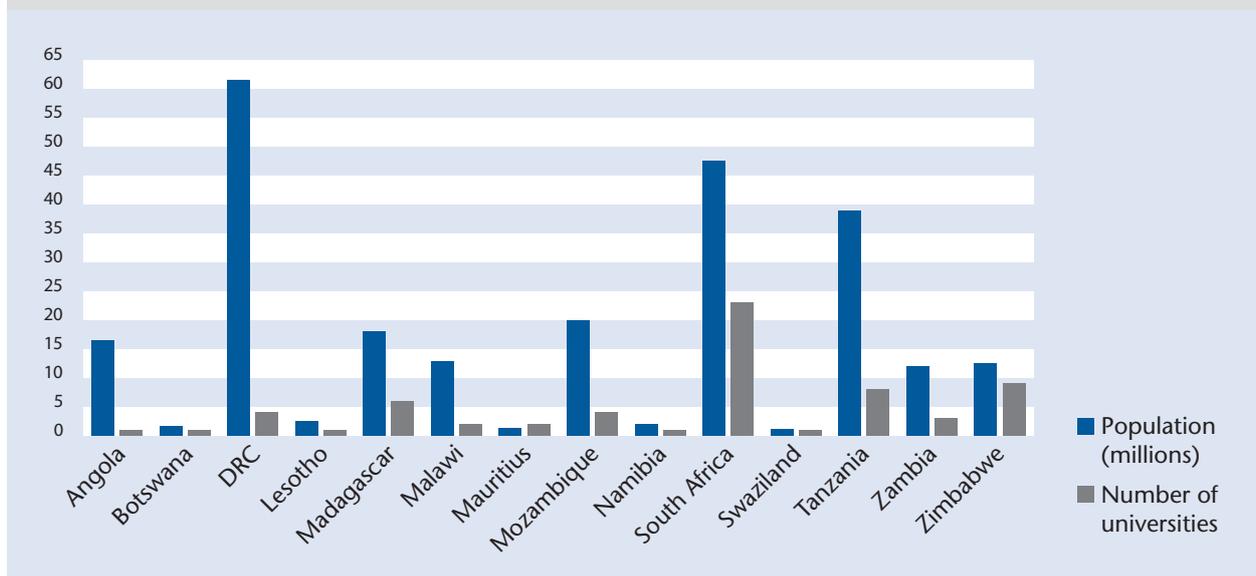
Before the 1960s, few African countries had universities, but there was genuine enthusiasm for higher education. By the 1970s, most of the continent was gripped by economic

crisis, while the 1980s saw the advent of the World Bank's economic structural adjustment programmes and a development aid philosophy modelled on the Pacific Rim development experience which, simply put, adhered to the principle of "first the schools, then higher education". The result of all these factors, as well as endemic sociopolitical unrest in many regions, was that African universities went into decline. Facilities deteriorated and the best academics joined the African diaspora.

Investment returned in the late 1990s and the World Bank now affirms a policy reversal, and provides evidence for the link between higher education investment and growth. However, higher education systems and institutions are still under-resourced and fraught with numerous challenges.

Public (state-funded) universities in the 15 countries are spread unevenly across the region. When SARUA undertook its baseline study of SADC higher education, *Towards a Common Future*,²⁹ there were 66 such higher education institutions.

**Figure 14 –
Number of universities and population in SADC**



It is immediately apparent from these figures that South Africa towers above the rest of the region in terms of the provision of public universities. This preponderance is even more striking when university student enrolment is considered: the total for the SADC region as a whole was 1 million students, 70% of whom attended South African universities.

The enrolment and graduation of doctoral candidates in all SADC countries (excluding South Africa) is precarious, as the following statistics demonstrate:

- SARUA's regional overview revealed that out of a total SADC enrolment figure of 1 million students, only 10,578 (or 1% of the total) were enrolled in doctoral

²⁷ This section draws on the regional report prepared by SARUA for the CODOC project.

²⁸ Angola, Botswana, the Democratic Republic of Congo (DRC), Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, the Seychelles, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

²⁹ Kotecha (ed.), 2008, *Towards a Common Future: Higher Education in the SADC Region*.

programmes. If the South African contribution is disregarded, the total number of students enrolled at the remaining 43 public universities in the SADC drops to just under 325,000, of whom only 685 (0.2% of the total student population) were working towards their doctorates.

- Doctorate statistics follow this trend. Out of all doctorates awarded at public universities in the SADC region, 1 274 were obtained, as we have seen, from South African institutions. This means that the 43 other state-funded universities in the SADC produced only 143 PhDs between them.
- Of the 143 doctorates awarded outside South Africa, 72 (or just over 50%) were PhDs in science, technology and engineering, while the other 50% were shared between business, management and law (14%), health sciences (8%), and humanities and social sciences (28%).
- In the SADC as a whole, a total of 8 441 academic and research staff hold PhDs. When South Africa is excluded, the figure is 3 747. Many countries are worse off than others. Zambia has only 12 doctoral graduates teaching in the science, engineering and technology (SET) subjects, while Madagascar has 340. Low-population Namibia has 33 PhD SET academics, but the high-population Democratic Republic of Congo has only 107.³⁰ This generates a general academic climate that is not conducive to the production of doctorate holders.³¹

It must be clear from these comparisons that, within the SADC and even disregarding the obvious difference between South Africa and the rest of the region, skills are very unevenly distributed to cope with an increasing demand for doctoral graduates in the most appropriate disciplines. It would seem obvious that regional initiatives are needed to meet these challenges. But even in South Africa, which has the most advanced system of doctoral education, there are also many challenges.

According to a study by the Academy of Science of South Africa (ASSAF),³² the legacy of Apartheid is still visible in the statistics. In 2007, the most recent year included in the ASSAF PhD study, black Africans who make up nearly 80% of the total population accounted for only 32% of PhD graduates. The main reason for this disparity appears to be economic, as black graduates are frequently under family pressure to enter the job market and earn money, or are simply obliged

to raise the necessary funding to continue their academic careers to PhD level.

In terms of academic disciplines, 454 of the 1 274 PhDs awarded in 2007 (or 35%) were in the fields of science, engineering and technology, which are seen as particularly important for development. The majority of PhDs were awarded in social, economic and management sciences, and religion.

Moreover, there is still a gulf between the established previously white universities and the previously disadvantaged institutions that were created to cater for specific ethnic groups (those from the independent and semi-independent homelands) where the recruitment of high-quality academic staff remains a serious problem. This situation is clear from the distribution of doctorates awarded across the 23 South African universities in 2007. The top six PhD universities, all previously white and urban-based, accounted for 65% of them. By contrast, the previously disadvantaged universities awarded less than 2% of the nation's doctorates.

Challenges for Southern Africa

Southern African universities face challenges that, though not essentially different from the ones encountered in Latin America and parts of Asia, seem particularly acute.

In 2010, the International Association of Universities carried out in-depth studies in a small group of sub-Saharan universities (including non-SADC countries in West and East Africa) and the findings were published in the report on the *Changing Nature of Doctoral Studies in sub-Saharan Africa*.³³ The study identified a number of challenges, very much in line with the SARUA report *Towards a Common Future* for the SADC region and the results of the CODOC survey, which gives quite a clear picture of the situation in Southern Africa.

Infrastructure: in line with the CODOC survey results which suggest that Southern African universities give high priority to investments in infrastructure, the IAU report identified inadequate facilities, equipment and research infrastructure as a major challenge facing African universities.

Funding: the IAU study revealed that “more financial support” for both doctoral candidates and staff (and doctoral supervisors) was a prerequisite for success. However, according to *Towards a Common Future*, nearly three quarters of SADC universities report that they receive

³⁰ Ibid.

³¹ Data source: ministries and departments of education, and SARUA questionnaire responses and websites, dated 2006 and 2008.

³² Academy of Science for South Africa, 2010, *The PhD Study. An Evidence-Based Study on How to Meet the Demands for High-Level Skills in an Emerging Economy*.

³³ IAU, 2010, *Changing Nature of Doctoral Studies in Sub-Saharan Africa*, IAU.

insufficient funding from their ministries of education for “effective operation”. This – along with frequent inefficiency inside institutions – must dampen any efforts to increase postgraduate activities, and contributes directly to the current low rate of doctorates awarded.

Administrative reform: although Southern African respondents reported less interest in administrative reform in the CODOC survey results, IAU concluded that there was a need to redefine doctoral study programmes and their coordination. Their administration needed to be reviewed and improved. The programmes themselves are not consistent overall, and what they contain is often obscure. Centrally administered structures are needed. One might add that with the very low number of doctoral candidates in the programmes, this question is linked to the issue of creating critical mass and investing in research.

Investment in research: on average SADC universities focus only 23% of their resources for research, concentrating instead on teaching/learning (65%) and community outreach (11%).³⁴ In fact, the reported estimated investment in research may well be lower in SADC universities outside South Africa, because between 1990 and 2007 South African universities were responsible for nearly 80% of all research publications emanating from SADC.³⁵ According to IAU, this is partly related to lack of institutional autonomy and political appointments to senior university positions. Lack of national research systems and strategic planning of doctoral studies has often led universities “to produce inadequate knowledge with little relevance locally, nationally or regionally”.

Retention: one result of this low attention to research is that many talented people with doctorates are tempted to join the African intellectual diaspora. One way of encouraging them to return would be to develop more research-driven universities in the region, as problems of academic retention stem partly from the lure of better facilities abroad in contrast to the run-down state of many Southern African universities.

Ways forward

The developmental stages of higher education systems in the SADC differ significantly, particularly when South Africa is taken into account. That said, there is a marked difference between Southern Africa and the developed world where PhD output is concerned.

There is growing awareness that the only sensible way forward is to engage in active collaboration. Rational

regional strategies are needed to use existing capacity more effectively, and investment in infrastructure and programmes has to be increased to counter brain drain. Universities should do more to evaluate quality and jointly establish inter-university teams and centres of excellence capable of stimulating research and pooling resources. It is also important to look at the whole pipeline to increase the number of learners eligible for higher education.

Clearly, the unevenness of the relationship between South Africa and the other SADC countries raises important questions. Is only increased international assistance able to help the SADC close the gap? What role can be played by national ministers of education, science and technology, and finance to devise and implement a combined strategy aimed at improving the situation in each country? What can Southern Africa itself do? And what might some form of regional cooperation be able to achieve?

There does seem to be a strong argument against individual universities trying to ‘go it alone’, or even individual countries attempting to do so. A more coordinated and cooperative approach is favoured by universities across the region. What is missing is national and regional political investment in the SADC that favours coordinated, strategic and equitable knowledge production.

Latin America

The university sector

The region of Latin America³⁶ covers 13.7% of the world’s surface and is home to 8.5% of its population. In addition, it consumes 8.5% of world GDP, though with substantial inequalities. The earnings of the wealthiest economic sector are 19 times higher than those of the poorest. Unemployment affects 25% of the economically active population. The poverty level is 35%, and 25% of the population lives in conditions of extreme poverty. The educational systems have been in a state of crisis, both in terms of coverage and quality because of low investment in education. Moreover, previous World Bank policies for the concentration of resources in primary education have significantly weakened access to higher education, as in Southern Africa. Still, the region of Latin America has 15 million students enrolled in higher education, corresponding to 12% of student enrolment worldwide.

Despite a common colonial and linguistic background, Latin

³⁴ Kotecha (ed.), 2008, *Towards a Common Future*, Part 2, p. 76.

³⁵ *Ibid.*, p. 78.

³⁶ This section draws on the regional report prepared for OUI-HOHE by Dr Luis Miguel Romero Fernández.

America stretching from Mexico to the southern cone is extremely diverse. Collaboration between its universities is modest as universities in general form partnerships in the US and in Europe, which have had the highest influence on Latin American higher education systems. International collaboration has increased considerably in the past decade, especially as the systems – including research and doctoral education – of countries like Brazil and Mexico, followed by those of Argentina and Chile, have gained in visibility and prestige.

Concerning higher education institutions, only some 3% of universities in Latin America correspond to the traditional definition of a university as a centre for both teaching and research. Besides a small group of research-intensive universities, others carry out research but not on a scale or of a quality commensurate with contributions to the international development of scientific and technological knowledge. The remaining 90% of higher education institutions in the region engage solely in teaching.

Internationalisation in higher education has increased significantly in Latin America as has the attention paid to strategies for regulation of its large private university sector and to quality assurance. Considerable emphasis is also being placed on the development of postgraduate studies, and especially doctoral programmes.

Doctoral education in Latin America is highly concentrated in a few countries and, within them, their main cities, such as São Paulo (Brazil), Mexico City, Santiago (Chile) and Buenos Aires (Argentina). In 2007, over half of grant recipients in Argentina came from Buenos Aires. In 2006, 60% of the doctoral programmes in Chile were concentrated in Santiago. While the situation in Brazil is somewhat more diversified, the majority of Brazilian research is nevertheless

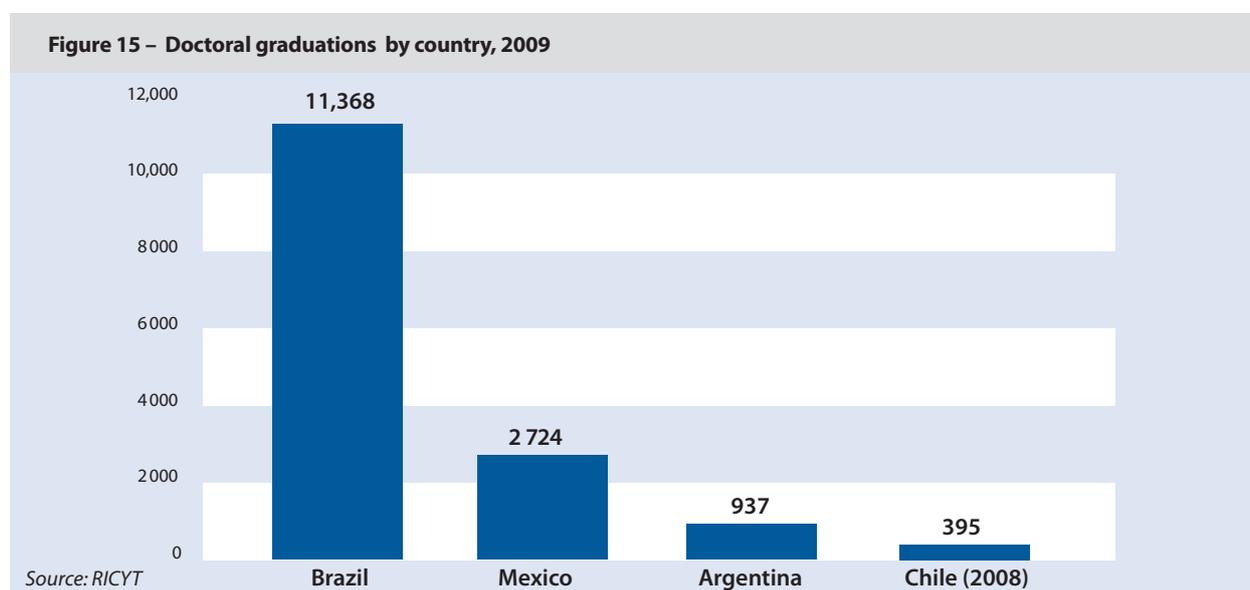
concentrated in the major cities, and overwhelmingly in the state of São Paulo.

Research capacity and doctoral education

Latin America’s contribution to global expenditure on research and development is 3%, but this is unevenly spread across the region. Brazil contributes the major share followed by Mexico, Argentina and Chile. These countries together represent about 90% of research and development expenditure in the region. The average expenditure on research and development as a percentage of GDP is only 0.69%, compared to the European average of 1.83% and 2.66% in the United States.³⁷ Links between universities and businesses are generally poor, with major differences between individual countries.

The situation regarding indexed publications is similar. While Latin America currently has the highest growth rate of both full-time researchers and scientific publications in proportion to the economically active population, it accounts for only 4.7% of global production. The same group of countries once more dominates the statistics.³⁸

These figures coincide with those mentioned earlier as regards the four main countries providing doctoral education, and the distribution of doctorates within each of them. As is clear from Figure 15, most doctoral training is carried out in Brazil and Mexico, which are also by far the biggest countries. In Brazil, the share of doctoral education in postgraduate studies is 35%, while in Mexico it is 7.3%, in Argentina 12.9% and in Chile 10%.



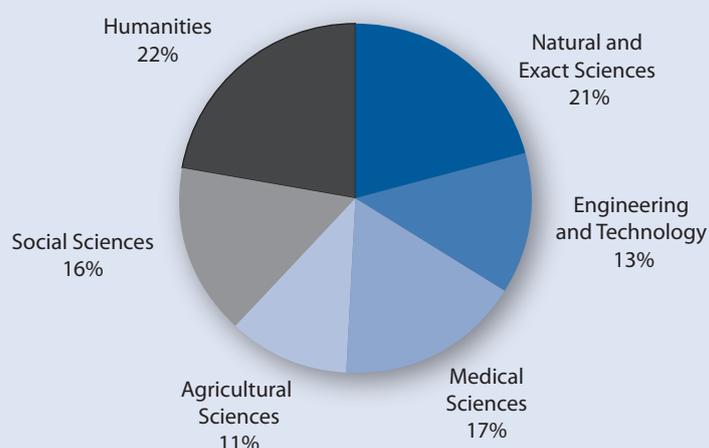
³⁷ Network for Science and Technology Indicators, RICYT, 2009, www.ricyt.org

³⁸ Ibid.

Academic disciplines are fairly evenly distributed although engineering and technology, which is considered a key sector

for development, has a much smaller comparative share of doctorates awarded than in East Asia and Southern Africa.

Figure 16
Doctoral graduations 2009 by discipline



Source: RICYT

Country profiles

Since the 1970s, **Brazil** has been sending vast numbers of researchers to train abroad in order to develop strong, international academic ties. This strategy is now bearing fruit, producing the most advanced postgraduate system in the region. In Brazil, it is common to carry out joint doctoral programmes with developed countries. However, in general, this remains limited to the research clusters in big cities. In addition, there are many experiences of sandwich degrees involving cooperation between developed and less developed universities in Brazil. These international ties, combined with a high level of domestic staff mobility, are creating a flow of researchers throughout the country. In this way, Brazilian doctorate holders are trained within the country, but at the same time in internationally networked research environments, either through shared programmes or in collaboration with research groups from developed countries.

This strategy has been of considerable importance in the development of the CAPES Foundation which both evaluates and funds doctoral programmes. State funding has also been a significant factor in the growth of doctoral programmes in Brazil. As a result, the number of doctoral candidates in the country coming from other Latin American countries is beginning to rise. However, the priority for international doctoral collaboration is global rather than Latin American: the CAPES Science without Borders programme, which targets top universities mostly in the western world, has attracted special attention due to its size and scope. Between 2011 and 2015, the programme

is awarding 75,000 scholarships for students to go abroad, 34,390 of them for doctoral candidates, mostly through the sandwich model with built-in return. In addition, private companies will provide 26,000 scholarships for postgraduate and undergraduate mobility.

Mexico is the second country making a major effort in terms of the volume of doctoral degree development. The country has 700 accredited doctoral programmes, a strong national grant programme, and a doctorate completion rate of 40%. This has been combined with the very extensive opening of new positions for PhD holders in universities. The amounts earmarked for fellowships are quite high and entail advantageous tax incentives for competitive research. Mexico is still dominated, however, by the presence of the National Autonomous University of Mexico (UNAM) in Mexico City, which awarded 636 doctorates in 2010, compared to 2 724 for the whole country in 2009.³⁹ Though research output is concentrated here, UNAM does have a very extensive network of contacts and relationships with other Mexican universities, which contributes to expanding capacity.

The volume of doctoral education in **Chile** is much smaller – also than Argentina, which has a similarly concentrated system as Brazil and Mexico – but given the size of its population and the economy, it is nonetheless significant. It is interesting to note that 70% of accredited doctoral programmes are in the fields of science and technology, and 90% of them are taught in public universities. Moreover, there are many interinstitutional academic programmes with international partners, which have a positive systemic

impact on research and development. Between 1982 and 1997, 2 450 doctoral fellows were engaged in international mobility, around half of whom went to Europe. Compared to the population of the country, this is a rather high number of mobile researchers.

Another country that is rapidly increasing its capacity is **Colombia**, which awarded 152 doctorates in 2009, up from only 48 in 2005.⁴⁰ In past years, a variety of funding mechanisms to support PhD growth have been launched. Colciencias, the Department of Science, Technology and Innovation in Colombia, is giving high priority to PhD programme funding and also encouraging public universities in particular to invest in PhD education. Accreditation processes for PhDs have been refined and programmes are subject to two levels of accreditation, one for inclusion in the basic registry and one to identify programmes of higher quality. In addition, capacity building is also being encouraged, with the obligation for all universities establishing an international doctoral programme partnership to have a three-year plan to achieve capacity aims.

Outlook – academic staff retention and capacity building

It is challenging to provide comprehensive data concerning academic staff retention and brain drain in Latin America. Something is known about the rate of return of those who leave their home countries to carry out doctoral studies abroad. The estimated rate of return to non-research-intensive universities is below 10%, whereas mobile doctoral candidates from the research clusters are much more likely to return. This leads to a further strengthening of already research-intensive universities at the expense of those struggling to achieve a critical mass of research to develop their capacity. Consequently, the majority of doctoral candidates who return to universities outside the clusters can rarely set up permanent research teams, which would develop this critical mass. They often experience a sharp contrast between the research environment abroad and the one to which they return at home.

There are two different situations in the region as regards capacity building. The research-intensive universities are increasing their capacity in accordance with their already established rate of expansion. In some cases, as in Brazil, there is sufficient internal mobility so that high-capacity institutions potentially can raise the overall level of the system. However, development levels vary widely in most of Latin America. Those universities that do international-level

research are gaining from global mobility and developing their research capacity, while other institutions with lower capacity are suffering from staff retention problems and competition from institutions with more attractive research environments.

A viable solution to this problem would be more sustainable collaborative programmes either based on the ‘sandwich model’ with a built-in return to the home institution, or in the form of joint doctoral programmes. Any such initiatives should be widely spread across the region in order to have the desired systemic effect. This again calls for better political support and funding incentives to make collaboration attractive for the research-intensive universities and to develop the infrastructure of universities building their research capacity.

At present, however, Latin America is suffering from general academic inertia. Universities are not always responsive to the need to invest in collaboration, and governments often fail to take the issues of retention and capacity building into account. A major step forward could be to adopt a more flexible approach to collaboration and funding, which might result in more efficient and dynamic arrangements for investing in doctoral education in Latin America. The establishment of fora for Latin American universities to share their experiences would also be very helpful.

Europe

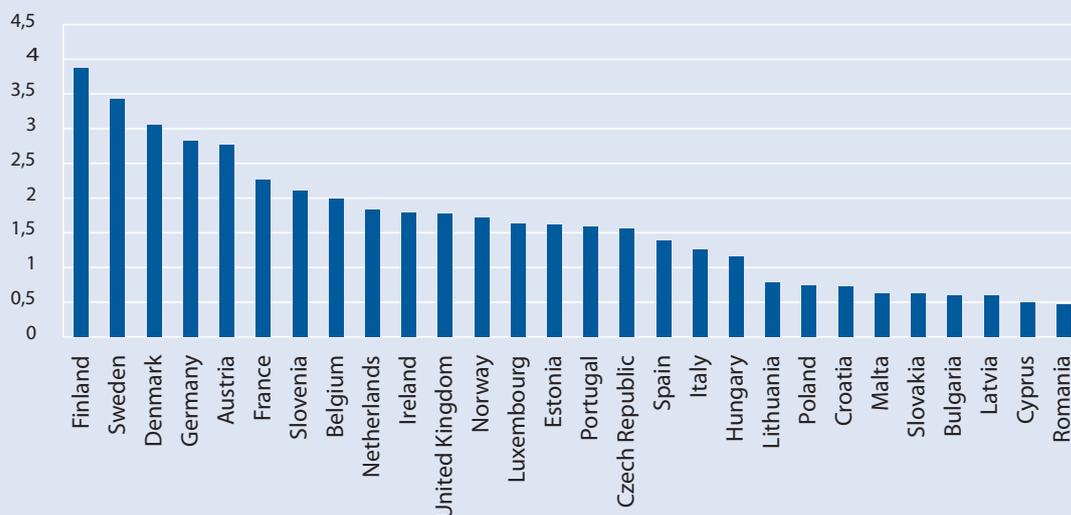
Europe – common educational and research policies

Developments in doctoral education in Europe have been characterised by firm political action to create common frameworks for education and research. The Bologna Process has had a marked impact on higher education, while the development of a European Research Area has been increasingly important in creating collaborations and synergies in cross-border research.

Nevertheless, in terms of research capacity, the situation in Europe varies widely, encompassing some of the world’s most highly developed knowledge economies, particularly in the northwest, and emerging, largely manufacturing-based economies in the south and east. These disparities are reflected in relative expenditure on research and development across the continent.

⁴⁰ RICYT.

Figure 17 – Research and development expenditure as % of GDP



Source: Eurostat, Science and Technology

It is thought that the disparities and – not least of all – the relatively low expenditure on research and development in many countries is a major obstacle to growth in Europe. The European Union has promoted increased spending on research through the Lisbon Strategy to make Europe “the most competitive and dynamic knowledge-based economy in the world”⁴¹ and, since 2010, through the Europe 2020 Strategy which, like its predecessor, underlines the need for more expenditure on and better coordination of research. Increasingly greater importance has been attached to doctoral education in these strategy documents as a means of expanding research and innovation in the European Union.

More specifically, the EU Framework Programmes, the world’s largest public funding scheme for research, have been established to create funding models with incentives for research collaboration throughout the European Union and in a number of associated countries. At the time of writing, the Eighth Framework Programme for 2014-2020, Horizon 2020, is being negotiated with a total proposed budget of 80 billion EUR. Only a fraction of this budget is directly allocated to doctoral education (in the Marie Skłodowska-Curie programme), but many doctoral candidates are engaged in research projects funded by other programmes.

Since 1999, the Bologna Process has been central to all aspects of European higher education. Contrary to widespread belief, it is not an EU initiative, but a set of common, non-binding agreements on the part of 47 countries with the aim of creating a European Higher Education Area (EHEA)

consisting of different but compatible higher education systems. The main achievements of the process have been to introduce a three-cycle structure in higher education with a Bachelor, Master’s and doctoral cycle, common agreements on quality assurance and the recognition of degrees across borders. As is described below, the process has been instrumental in furthering doctoral education. However, methods of implementation vary widely from country to country.

European Universities

Compared to the other regions examined in the CODOC project, research capacity is distributed more evenly across universities in Europe. Although leading universities do often receive a large share of both national and EU research funding, many have good overall levels of research and areas of international excellence without being considered among the top research-intensive universities. Some of these are universities with clear local missions, developing areas of strength and which are engaging in knowledge transfer in their particular region. These universities have developed good doctoral education to deliver research relevant to their particular aims, and often have advanced collaborative programmes with private-sector partners. In Central and Eastern Europe in particular, many universities specialise in certain fields, technical disciplines, branches of economics, or medicine.

Since the 1960s (at least in Western Europe), access to higher education has been a prominent issue, and the university sector expanded particularly fast in the 1970s. High-profile discussions have focused on the status of

⁴¹ Presidency Conclusion, Lisbon European Council, 23-24 March 2000.

colleges or polytechnic-type institutions. In many countries, there is formal cooperation between university colleges and universities in order to secure flexibility in the system. The most radical approach has been in the UK where polytechnics were re-labelled as universities in the early 1990s. Some other countries allow certain colleges to offer doctoral education under special conditions, but with universities awarding the degree. This means that there is a continuum of different kinds of university, rather than a system in which research capacity is concentrated in just one type of institution.⁴²

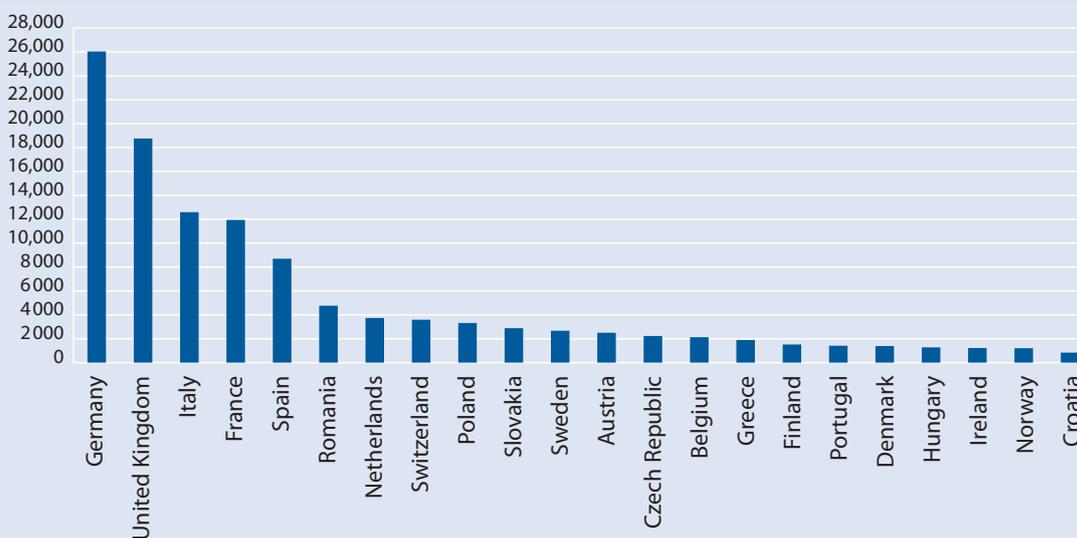
In the last decade, steps towards supporting the top layer of research-intensive institutions have been taken through ‘excellence initiatives’ in different European countries, in which universities that demonstrate very high capacity receive additional funding to increase excellence, as well as – less tangible, but equally as important – a prestigious classification within their national system. The German excellence initiative in particular gives significant weight to doctoral education, and explicitly to its professional management by institutions. Moreover, many countries

have promoted university mergers as a way of creating bigger institutions with more research capacity. Denmark, for example, reduced the number of research institutions from 25 to 11 in 2007 in one sweeping structural reform.

Doctoral Education in Europe

The number of doctorates awarded in Europe is higher than in any other world region, both in absolute terms and relative to the population. In 2010 an estimated 125,000 doctoral degrees were awarded in the EU alone (out of a population of 500 million), compared to 70,000 in the US (with a population of 300 million) and 16,000 in Japan (with a population of 130 million) – the two countries with which the EU commonly compares itself in terms of research. There has been a steady increase in doctorates awarded over the last decade, albeit with very uneven growth rates in individual countries. In some countries, the number of those who obtained doctorates doubled, whereas in others the increase was less marked.⁴³ This high number of doctorate holders far exceeds university requirements, and the majority of them will leave their university for another profession at some stage in their careers

Figure 18 – Doctorates awarded by country, 2010*



Source: Eurostat, *Italy 2008, France 2009

Europe has seen very rapid reforms in the administration of doctoral education, mainly as a result of the establishment of doctoral schools. Up to the end of the 1990s, doctoral education was mostly carried out in a ‘master-apprentice’ relationship between doctoral candidate and supervisor, with little institutional interference. Admissions procedures were often informal and doctoral candidates would at times only come into contact with the institution when submitting their dissertation. There was no monitoring of completion

rates, or the actual time taken to obtain doctorates, often because the data required to do so was not systematically recorded.

In the 1990s, individual countries – most notably Denmark and the Netherlands – began to establish institutional structures, such as doctoral schools, to provide more support for doctoral candidates and to integrate them better within their universities. These were isolated initiatives until the

⁴² See also, Reichert, S., 2009, *Institutional Diversity in European Higher Education*, EUA.
⁴³ Eurostat, education and training. Figures for the number of candidates awarded doctorates in Italy and France are not available for 2010. The combined total is estimated at 25,000, on the basis of the most recent data available.

middle of the 2000s, when doctoral education became part of the modernisation of universities in the Bologna Process.

In 2003, doctoral education was officially included in the Process as the third educational cycle (after Bachelor and Master's), but it was not until 2005 that the basis of reform was articulated in the Salzburg Principles.

Conclusions and Recommendations from the Bologna Seminar on 'Doctoral Programmes for the European Knowledge Society' (Salzburg, 3-5 February 2005)

- i. **The core component of doctoral training is the advancement of knowledge through original research.** At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.
- ii. **Embedding in institutional strategies and policies:** universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
- iii. **The importance of diversity:** the rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength which has to be underpinned by quality and sound practice.
- iv. **Doctoral candidates as early stage researchers:** should be recognised as professionals – with commensurate rights – who make a key contribution to the creation of new knowledge.
- v. **The crucial role of supervision and assessment:** in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
- vi. **Achieving critical mass:** doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.
- vii. **Duration:** doctoral programmes should operate within an appropriate time duration (three to four years full-time as a rule).
- viii. **The promotion of innovative structures:** to meet the challenge of interdisciplinary training and the development of transferable skills.
- ix. **Increasing mobility:** doctoral programmes should seek to offer geographical as well as interdisciplinary and intersectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
- x. **Ensuring appropriate funding:** the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding

These principles emphasised that the cornerstone of doctoral education was original research, but that this had to be embedded in institutional strategies, and that European diversity should be maintained. From then onwards, European universities began to establish doctoral

schools at an impressive rate. Whereas doctoral education in 2005 was eclipsed by the Bologna reforms at undergraduate level, EUA's biennial survey of European universities, *Trends*, stated in 2007 that a revolution was under way in European doctoral education and that 30% of university respondents

said they had doctoral schools at their institution.⁴⁴ In 2010, this number had risen to 65%.⁴⁵

The term ‘doctoral school’, however, has never been completely clear in Europe. In many universities, it refers to individual doctoral programmes with some level of institutional engagement, often in the form of taught courses. And as most doctoral education in Europe occurs after candidates have obtained a Master’s degree, its taught elements are quite new. Other universities differentiate between the programme and institutional levels, and use the term ‘doctoral school’ to refer to a central unit concerned with more relevant strategic issues in doctoral education, such as quality assurance and the drafting of common guidelines.

Despite the emergence of doctoral schools, many systems still maintain the traditional ‘master-apprentice’ model alongside the ‘structured’ model. In Germany, it is estimated that up to 70% of doctoral candidates are not attached to a doctoral school and conduct their research in a ‘master-apprentice’ relationship. By contrast, France has introduced doctoral schools by law and made it a requirement that they include all doctoral candidates in a given institution.

As a result of this diversity in the provision of doctoral education, common data collection is very difficult in Europe. Many countries and institutions only have a rough idea of the number of doctoral candidates since there are no uniform enrolment procedures. Other countries, such as Norway or Italy, have national databases that record the number of doctoral candidates. The persistence of one-to-one supervision in many systems also makes it difficult to provide data about doctoral programmes, as a significant proportion of candidates belong to a research team, or are even doing individual research without being enrolled in a programme.

Country profiles

Most doctorates in Europe are awarded in Germany, the United Kingdom, Italy and France. These countries also provide good examples of different models of doctoral education in Europe as a whole. Most reforms are still ongoing, and many systems have not yet settled on a final format. But European countries in general are now clearly implementing better institutional management and more structured programmes.

Germany

As shown in Figure 18, Germany is the biggest provider of doctoral education in Europe with about 26,000 doctorates awarded annually. Doctoral education has a special place in German culture, in which the Doktor title commands respect well beyond the academic community. Out of the 622 members of the German lower house of parliament (the *Bundestag*), 119 have a doctorate.

Partly because of this tradition, the development of doctoral education in Germany has been driven by incentives rather than firm requirements. Funding schemes in particular have been seen as a way of establishing good practice and providing pilot ventures for the development of doctoral education. The German Research Foundation has run the Research Training Group scheme for decades, funding doctoral programmes that show particularly innovative approaches in the form of interdisciplinary research, high-quality supervision and additional taught elements such as transferable skills training (see the UK section for more on transferable skills). The Foundation also manages the excellence initiative, which specifically funds the institutional management of doctoral education. These schemes have succeeded in motivating institutions to professionalise their doctoral education and bind it closer to the institution, a process that is still continuing. Doctoral education connected to training groups or doctoral schools is generally known as ‘structured doctoral education’ in Germany.

Nevertheless, the majority of German doctoral candidates are not on the ‘structured’ track but the ‘individual’ one which is the traditional way of doing a doctorate in Germany. Here, the doctoral candidate is directly recruited by a professor, with whom he or she works very closely. There is typically no enrolment in the institution, funding is often dependent on resources in the research group of the professor, and there is no contact with the institution as such before the thesis is defended.

Some disciplines, particularly engineering, award special doctorates to emphasise the particular subject background. However, there is little difference in the basic structure and criteria underlying most doctorates.⁴⁶

United Kingdom

British universities are varied and often belong to different ‘mission groups’ such as the Russell Group (of highly research-intensive universities), or Million+ (the former polytechnics). Different from some of the examples from the other regions in the CODOC project, these are self-established groups. They are neither the product of

⁴⁴ EUA, 2007, *Trends V*, p. 26.

⁴⁵ EUA, 2010, *Trends 2010*, p. 44.

⁴⁶ The degree Dr. Med. in medicine, is often considered to be less research-intensive and not at the same level as the PhD in medicine.

government classification (like the Chinese C9 League), nor of competitive schemes such as the German excellence initiative. Doctoral training is largely concentrated in research-intensive universities.

The UK is generally recognised as having a highly professionalised university sector, and universities are very autonomous. Doctoral education is, in the vast majority of cases, coordinated by the institution through doctoral schools which monitor the performance of their programmes and devise strategies, as well as rules and guidelines to assure quality. In line with the general European trend, the number of doctorates awarded in the UK rose by about 20% between 2004 and 2010.⁴⁷ Individual professors have much less power than in Germany, for example, and can sometimes lose their right to supervise doctoral candidates if repeated problems have been reported.

Transferable skills provision has been a major issue in British doctoral education since the 2002 report *SET for Success* by Sir Gareth Roberts, commonly known as the Roberts report.⁴⁸ It concluded, among other things, that doctoral candidates should receive training in skills that they would be able to transfer to non-academic jobs. These could be presentation skills, business awareness, intercultural understanding, or other skills that would allow doctorate holders to apply their research training better in a non-academic environment.

The government followed the report's recommendations and began the 'Roberts funding' of doctoral education, and particularly transferable skills. When this funding stream was stopped as part of the cuts following the financial crisis, most universities felt the activities supported were so important that they decided to continue to fund them from other resources.

One particular aspect of British doctoral education is the existence of different kinds of doctorate, and especially the professional doctorate. Professional doctorates are separate degrees with their own programmes for people with careers outside research who want to develop an academic dimension in their practice, very often in business, health or education. These professional doctorates are not offered by all UK universities and their recognition outside the UK is under discussion.

Italy

The doctorate degree is a fairly novel qualification in Italy and the Italian title *dottore* refers mainly to those with a Master's degree. The degree was introduced as recently as 1980 and then from 2000 onwards when the number awarded rose spectacularly from 3 500 in 2000 to 10,000 in

2007. However, this is far fewer doctorates than in the UK, which has a similar sized population.⁴⁹

The Italian system of doctoral education is still undergoing reform. As in other European countries, Italian universities began to establish doctoral schools as of 2000, but many of them preferred to set up small highly specialised schools, corresponding to the academic subject of one particular professor. This model is now giving way to the establishment of bigger units at programme level and more centralised management of doctoral education, along the lines of the British model or the one promoted by the German excellence initiative.

Italy is one of the European countries in which admission to doctoral education is on the basis of competitive national examinations, with the most successful participants admitted to a programme. This is an uncommon arrangement although it does exist in a few other Mediterranean and Central European countries in which admissions are centrally controlled.

France

The French university system has undergone significant changes in the last five years. In particular, universities have gained more autonomy, and there have been legal incentives for them to collaborate or even merge to create bigger units. In cities with many universities (quite a common situation), the latter have often set up a common unit for research and doctoral education in a PRES (*pôle de recherche et d'enseignement supérieur* – centre for research and higher education), at times with associated private- and public-sector partners. France has also launched its own excellence initiative (Idex) to create university alliances that will combine resources capable of competing at the highest international level. Some of these alliances, such as the alliance between some of the big Paris universities combine already considerable research capacities in very large units. For example, the Sorbonne University alliance will award over 1 200 doctorates a year, an estimated 10% of the French total.

Despite the move towards greater autonomy, direct law making has been more significant in France than in the UK and Germany for example. The French reforms of doctoral education require universities to set up schools for all doctoral candidates. They are very similar to the reforms in the rest of Europe, with more professional management and new elements such as transferable skills training. However they are often the outcome of a legal requirement. This approach has been taken up by other countries, such as Spain, which is currently implementing a similar reform.

⁴⁷ Eurostat, Education and Training.

⁴⁸ Roberts, G., 2002, *SET for success: the supply of people with science, technology, engineering and mathematics skills*.

⁴⁹ Eurostat, Education and Training.

Annex 2 – Project partners

European University Association



The European University Association (EUA) represents and supports higher education institutions in 47 countries, providing them with a unique forum to cooperate and keep abreast of the latest trends in higher education and research policies. Members of the association are European universities involved in teaching and research, national associations of rectors and other organisations active in higher education and research.

EUA plays an essential role in shaping tomorrow's European higher education and research landscape, thanks to its unique knowledge of the sector and the diversity of its members. The association mandate in the Bologna Process, as well as its contribution to EU research policy making and relations with intergovernmental organisations, European institutions and international associations, enable it to

debate issues that are crucial for universities in relation to higher education, research and innovation.

EUA is the result of a merger between the Association of European Universities (CRE) and the Confederation of European Union Rectors' Conferences, which took place in Salamanca, Spain, on 31 March 2001.

The EUA-CDE, a membership service of the European University Association, was launched in 2008 and currently consists of more than 190 European member universities. Building on the considerable work EUA carried out in promoting reform in doctoral education over the last decade, the EUA-CDE specifically aims to contribute to the development of doctoral programmes and the training of young researchers in universities across Europe.

ASEAN University Network



The ASEAN University Network (AUN) was established in 1995. AUN is designed to be the network of leading universities in the region with the aim of facilitating, strengthening and expanding cooperation in higher education. It also serves as the policy-oriented body in higher education in ASEAN, as well as the policy consultant for government agencies.

AUN's membership currently encompasses 26 universities across the ASEAN region. In furthering wider regional cooperation, the AUN networks of cooperation continuously expand through a number of AUN thematic networks with an emphasis on specific fields of cooperation. They include engineering, business and economics, human rights education, inter-library cooperation, intellectual property, and university social responsibility and sustainability.

Aside from conventional academic activities, AUN also undertakes a number of cultural programmes to build mutual understanding and increase links among peoples, which are intended to have a positive impact in shaping regional identity and the promotion of regional mobility.

Beyond ASEAN, AUN also extends its cooperation with the active ASEAN Dialogue Partners such as China, Japan, the Republic of Korea, the European Union and the United States. In doing so, AUN has served as the gateway for both internal and external academic communities to cooperate, exchange experiences and ideas, and explore the possibility of future collaborative frameworks in various fields.

OUI/Campus – IOHE

CAMPUS is an IOHE (Inter-American Organization for Higher Education) Programme that was originally designed as an interactive space for the discussion, analysis and development of strategic topics and new trends in higher education. Its mission is to plan, promote and establish collaborative relations with higher education institutions, institutional networks, NGOs, and other entities that will contribute to the creation of common areas of higher education.

Its core activities are centred on four strategic lines of action.

1. The Inter-American Mobility Space – INTERCAMPUS

This mobility space aims to improve the quality of university studies and the competitive edge of students, professors, researchers and administrative personnel from higher education institutions by means of mobility programmes.

2. The Research, Innovation and Science Space

This initiative aims to provide the dynamics needed to promote university development through teaching, research and service to society.

3. Collaboration in the creation of common areas of higher education

The main aim of this is to promote activities and collaborative linkages and to enhance exchanges with other institutions in the field of higher education, through the development of agreements, and participation in projects geared to the creation of the Inter-American Space of Higher Education.

4. The Spirit and Values in Higher Education Space

OUI/Campus – IOHE proposes establishing a working agenda rooted in the diversity of universities within each region, in which university learning thrives in an environment of diversity and challenge, and which is achieved by using dialogue as a key mechanism for teaching and social change. By so doing, students will be guided towards a more humanistic model of learning.



The Center for Development Research (ZEF), University of Bonn

The Center for Development Research (ZEF) is an international and trans-disciplinary scientific research institute at the University of Bonn. Its overall goal is to help, through its research and education, to enhance sustainable human development and combat poverty in the developing world. ZEF also strives to strengthen international development research in Germany, Europe and the developing world. It therefore cooperates closely with researchers from all over the world and with experts in the fields of development policy and cooperation.

ZEF has three research departments:

1. Political and cultural change;
2. Economic and technological change;
3. Ecology and natural resources management.



Zentrum für Entwicklungsforschung
Center for Development Research
University of Bonn

These three departments are interconnected by the cross-cutting research topics of land use, water management, biodiversity, health and sustainable energy. Disciplinary research is also conducted within research departments and projects. New research projects and proposals for doctoral theses have to fit into this overall research framework.

ZEF follows an integrative and cross-disciplinary research approach. Natural and social scientists devise research questions and solutions together with economists and in close cooperation with local partners. ZEF is currently running research projects in West, Southern and Eastern Africa and in Central, South and South East Asia.

With its Doctoral Studies Program, ZEF aims to educate a new generation of academics as well as decision-makers for developing countries and international development policy. Its international, interdisciplinary set-up and its size make this programme unique in Germany and Europe.

Karolinska Institutet



Karolinska Institutet is a leading European medical university. It conducts over 40% of all medical research in Sweden. Research accounts for more than 80% of its total revenue. Six hundred research groups span the full spectrum of medical disciplines. A total of 2 000 researchers, as well as almost 1 000 laboratory and other technicians, participate in these activities. Some 2 200 doctoral students take part in both basic and clinical research. Around 400 doctoral degrees are awarded annually. Researchers at Karolinska Institutet publish 4 000 articles a year in international scientific journals. Karolinska Institutet has 5 500 full-time undergraduate students.

Karolinska Institutet undertakes extensive international collaboration within the field of doctoral education. Around one third of its postgraduate students are international. The university has collaboration agreements with several institutions in other countries, including the USA (National Institutes of Health and University of Minnesota), Singapore (A*STAR and NUS), Japan (RIKEN Brain Science Institute), Finland (University of Helsinki), Ukraine (Kiev University), China (Peking University), Uganda (Makerere University) and Vietnam (Hanoi Medical University).

The European Union – Latin America Observatory (OBREAL)



The European Union – Latin America Observatory (OBREAL) is a network set up by 26 academic institutions and research centres in both regions, which is based in the University of Barcelona. Its main goal is to promote dialogue and synergies between governmental, academic and social sectors in Europe and Latin America. In this context, OBREAL sets out to “identify and develop all the opportunities offered by the partnership between the two regions to create a better understanding of the regional and sectoral problems which shape policy making”.

OBREAL activities strive to create long-lasting relationships between institutions of both regions. It is therefore critical for its work to take into account the specificity and heterogeneity of each region. OBREAL is particularly committed to fostering higher education cooperation between the regions, which it considers crucial in boosting development.

Southern African Regional Universities Association (SARUA)



SARUA is an association open to all the public universities of the 15 countries that make up the Southern African Development Community (SADC). As of August 2011, 53 public universities are members of SARUA, making up about 75% of the possible members. SARUA has a small secretariat based in Johannesburg.

convening strategic fora to enhance collaboration, linkages and partnerships across the sector; identifying key areas for strategic research and analysis; enhancing the knowledge and capacity of higher education leadership in the region; and acting as an advocate for the leadership of the higher education sector in the region.

SARUA was established in 2007 as a coordinated response to the many challenges and opportunities facing higher education in the SADC region. Its overall aim is to provide an effective platform that enables key regional higher education leadership players to engage and contribute meaningfully to regional development. It does this by

SARUA analyses and explores critical and systemic topics facing university leadership in the region. It shares this information with decision-makers through purposive interaction and dialogue, and thus aims to develop a regional consensus around the key priority areas requiring collective engagement for policy changes.

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