

CHAPTER ONE

INTRODUCTION

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Introduction

A number of trends and issues have conspired to bring questions of “knowledge production,” “research policy” and “research management” to the fore on the higher education policy agenda’s of many countries. However, to date, analysis of the role of higher education in research and knowledge production has concentrated on North America and Western Europe. This volume is one of the first edited compilations to focus on different national perspectives on knowledge production and research in higher education in the Asia Pacific Region. There is very strong interest in this topic, both within the region and elsewhere, as the nations of the Asia Pacific Region build knowledge-based economies and in so doing, expand and adapt their respective higher education systems.

The book brings together leading experts on research and policy in higher education from the Asia Pacific Region. It arises from the meetings and deliberations of the **UNESCO Forum on Higher Education, Knowledge and Research** and the Regional Scientific Committee for Asia and the Pacific. The Forum focuses on higher education research and knowledge and provides a platform for researchers, policy makers, and experts to engage critically with research issues and research findings. Stressing the importance of strengthening research, particularly in developing countries, the Forum was established in 2001 within the World Conference on Higher Education follow-up framework in cooperation with, and funded by, the Swedish International Development Co-operation Agency (Sida). Its main objective is to widen understanding of systems, structures, policies, trends, and developments in higher education, research, and knowledge through the following: (i) gathering and engaging with existing and ongoing research; (ii) identifying research gaps and new priorities; (iii) stimulating and facilitating research; (iv) bringing current issues and debates to the fore; (v) making available research findings; and (vi) disseminating information on policies and practice (UNESCO, 2005). The Forum’s activities are, in part,

guided by the following four broad background issues affecting higher education and research nearly everywhere in the world today:

Globalization

Once viewed as mainly economic in nature, globalization has profound **social and cultural aspects**. Borders between countries have become more open to intellectual exchange, and the search for **uniformity and common solutions** continues to increase in many domains. In the field of higher education, numerous university activities involve international aspects as well. Many universities are part of international agreements, and mobility is facilitated by the rapid increase in international exchanges. In the field of research, there is an increased interest in the concerns of global governance, for example, democracy and human rights, collective social responsibility, the rising impact and interconnectedness of phenomena such as conflict resolution, multiculturalism, environmental matters, and the advent of technology. Significantly, there has been a noticeable emphasis on the need for research in the social sciences to fully understand the primary forces shaping the world today. (UNESCO 2005:1)

Transformation of Higher Education and Research

Today, student ranks are estimated at the 79 million mark and are expected to reach 100 million by 2025. Most of these will be in developing countries. This major change is forcing systems and institutions to diversify to meet the increasing demand for higher education. Similarly, the demand for research and knowledge is steadily increasing in the **“knowledge-based society and economy.”** As a parallel trend, funding of higher education and research has not kept pace with the demand, and in many countries public investment in higher education and research has been declining. Higher education is also forced to compete with other government priorities besides that include other education areas. The result of this is that higher education institutions to an increasing degree seek funding from sources other than governments. Simultaneously, the private sector is taking a greater interest in the higher education system and its financing. This may be due to dissatisfaction with the type of **training and skills** the current system produces for the world of work or may stem from an interest in higher education based **purely on a market logic**. At the same time, the traditional hallmark of university research has been free enquiry and the ability to sustain long-term investigation. Yet, the present context tends to privilege other criteria, especially **immediate application** and **diversified funding sources**. As a result, a trend of **“academic capitalization”** or **privatization of higher education and research** has begun, whereby knowledge is viewed and treated as a commodity. (UNESCO 2005:1)

Research and Development (R&D) Trends

Worldwide, R&D trends vary considerably. While R&D has gained prominence in Japan in university and basic research, this same area has fallen sharply from its former level in Russia. Stability has remained in Scandinavia and the United States of America, but public support has dropped in countries where the **funding role of government** has been reduced. Finally, and perhaps the most worrying aspect, is the increased **“targeting” of government support**. This, when applied stringently, leaves little room for the flexible, long-term approach required for scientific research. Governments finance most of these activities in the Organisation for Economic Co-operation and

Development (OECD) countries, but in the developing world growing pressures to prioritize objectives mean that public funding for R&D work must be shared with other areas. A trend of stagnation or reduction of public funding of higher education and university research can be noted, as can a trend of increased private funding of research. It is important that governments continue to be the main source of funding both for university R&D and for university-based basic research as a part of this in order to safeguard the public good of research. Moreover, R&D is carried out in a variety of contexts (e.g., universities, public laboratories, and research centers, private nonprofit institutes and industry), and these tend to be fewer and weaker in developing countries. (UNESCO 2005:1)

Changing Patterns of Knowledge Creation

This trend has significant ramifications for university research and research-based teaching, as knowledge production and dissemination are increasingly being carried out in diverse contexts and through new media. So far, universities have excelled at generating knowledge. However, they have not yet proved their ability to reconfigure knowledge—that is, to draw creatively upon the entire distributed knowledge system, which is now much broader than the university sector alone. Old and new patterns can be noted. Older patterns can be described in terms of problems being context-specific and disciplinary, requiring homogenous skills, where hierarchical organization is respected and where knowledge stands alone and is evaluated by peer review. Newer patterns are described in terms of knowledge being produced in a context of application, transdisciplinary in nature, needing heterogeneous skills, organized around simpler and more temporary management structures, more socially accountable and reflexive, and more reliably assessed by a variety of practitioners (Gibbons, 1998). The shift in knowledge production is also affected by the advances in new information and communication technology (ICT), and it has obvious implications for research due to the expanding gap in ICT capacity between industrialized and developing countries. (UNESCO 2005:1).

The UNESCO Forum on Higher Education, Research and Knowledge consists of the following: (i) 5 Regional Scientific Committees; (ii) Global Scientific Committee; (iii) Co-ordination Committee; and (iv) Forum Secretariat. The Regional Scientific Committees comprise research experts and policy-makers for each of the five regions involved in the Forum initiative: Africa, the Arab States, Asia and the Pacific, Europe and North America, and Latin America and the Caribbean. Members of the Asia and the Pacific Committee are leading higher education experts from eight countries, many of which are the largest and most influential in the region: Australia, China, India, Indonesia, Japan, Oceania, the Philippines, and Thailand.¹ In this book, each Committee member analyzes the current knowledge production and research policy issues most pressing in the higher education systems of their respective countries. The book also draws on a number of commissioned papers and the engagement of Committee members with other higher education experts at a meeting held at the Indian Council of Social Science Research (ICSSR) in New Delhi, India, in September 2003 and the Committee's 1st Regional Research Seminar for Asia and the Pacific held at the United Nations University (UNU) in Tokyo in May 2004. The issues raised and lessons learnt from these meetings and papers serve as information for the country-specific case studies.

The book makes comparisons and contrasts and critically analyzes how policy in different countries of the Asia Pacific Region is encouraging a supportive (or otherwise) environment for the promotion of research within higher education. The book focuses on the capacity of higher education to promote social, cultural, and economic change through research. It examines recent changes that have taken place in the different Asian and Pacific countries' policies and practices regarding research in higher education in all of the broad disciplinary areas: sciences, social sciences, humanities, and the arts. The emphasis is on reviewing the changing context of governments' research policies and includes issues such as the impact of privatization, market forces, basic vis-à-vis applied/sponsored research, the relationship between teaching and research within and between higher education institutions, faculty development, equity and gender equality, and commercialization of research results. Research policy is broadly interpreted with the emphasis on understanding the different national policy contexts shaping how universities and other higher education institutions promote research for change, equity, and the social and economic well-being of society. The type of policies analyzed range from broad national policies on the funding of university research to institutional initiatives with respect to the management of intellectual property and knowledge transfer.

The remainder of this introduction will first summarize the key themes and issues resulting from the Committee's wide-ranging deliberations and consultations and will also explore the various perspectives and frameworks presented to it used to analyze the capacities of higher education institutions and systems to generate knowledge. The introduction concludes with a brief outline of what is to follow in the remaining chapters. The following discussion is adapted from the Rapporteurs' reports of the Committee meetings and of the Scientific Committee's 1st Regional Research Seminar for Asia and the Pacific, which took place in Tokyo, Japan, in May 2004, and the latter was recorded and transcribed.

Background Themes and Issues

As indicated above, this book is the product of the collective effort of the UNESCO Forum on Higher Education Research and Knowledge of the Regional Scientific Committee for Asia and the Pacific. Through an intensive process of meetings and seminars involving the presentation and exchange of papers amongst members and those of invited experts, the Committee has had the opportunity to consider and address many issues associated with higher education, research, and knowledge within the region. Some of the key issues are summarized below and are, of course, addressed in far more detail in the subsequent chapters.

The Committee held its inaugural meeting in Bangkok in February 2003 and its second and more substantial meeting in New Delhi in September of the same year. The New Delhi meeting laid the foundation for the Scientific Committee's 1st Regional Research Seminar for Asia and the Pacific, subsequently held in Tokyo, Japan, in May 2004. The Regional Research Seminar was the genesis of this book. Participants at the New Delhi meeting and Tokyo seminar are listed in appendices 1 and 2.

The 2nd Meeting of the UNESCO Regional Scientific Committee for Asia and the Pacific, New Delhi, India, September 2003

The 2nd Meeting of the UNESCO Regional Scientific Committee for Asia and Pacific was held at the Indian Council of Social Science Research (ICSSR) in New Delhi in September 2003. At the New Delhi meeting, Professor V. R. Panchamukhi, chair of the ICSSR, in his welcoming address stressed the basic human liberating values of higher education, without which most, if not all, other functions of the sector are of little worth. The address also highlighted the importance of research funding coordinating agencies, like the ICSSR. As intermediary bodies among government, industry, and higher education institutions, research funding agencies play an important role in the scientific innovative framework of most nations. They do much more than simply distribute research funds. The ICSSR, for example, regards itself as a trendsetter in social science research and it helps focus research in three main areas: (i) relevance; (ii) usefulness; and (iii) sustainability. The importance of the policy role played by research funding agencies is an area deserving considerably more research. The point was also made that it is necessary to draw a distinction between knowledge and information. In many places it appears that what is developing is an “information society” rather than a “knowledge society.” It is one of the key functions of higher education institutions to convert information into knowledge. Besides this values need to be brought back into the education process, without which education lacks substance and direction.

The Committee also received the presentation of a paper it commissioned from Professor Arun Nigavekar, chair of the Indian University Grants Commission (UGC), entitled “Trade in Higher Education” Nigavekar (2003). Higher education has itself become a tradable product and knowledge has become commodified. But as yet, there is little, if any, empirical evidence that GATS per se is compromising national systems of higher education. Trade in education should not merely be seen as the domination of developed countries over developing ones. In many instances, a more interactive relationship is evolving, particularly with respect to the GATS category of Commercial Presence. A country can simultaneously be a “sending” and “receiving” nation of educational services. Countries of the region that traditionally sent students overseas—particularly to Australia, the United States of America, and the United Kingdom—are now receiving foreign higher education students from the region and elsewhere. Proportionally, the largest recent growth in trade in higher education has been with respect to Commercial Presence, with universities in Australia, the United Kingdom, and elsewhere, establishing offshore programs, and sometimes full-fledged campuses, in various nations in the region. This may be done in partnership with a local university or private agent. The regulation of foreign universities operating domestically varies from country to country.

Much current analysis stresses that higher education institutions nearly everywhere are going through profound change and have, to a degree, lost control over their own destinies. Nearly everywhere, increasing demands are being placed on higher education institutions to address pressing national problems. In the context of the privatization of public higher education that is occurring in one form or another in most countries, research is not being prioritized or adequately funded. Many national knowledge

systems are in need of change and reform. There is a need for greater flexibility in the way in which higher education systems are coordinated at the systems level, and critical decision making both within institutions and at the sector level needs to be better aligned with national priorities.

That said it also needs to be recognized that higher education institutions may be more resilient than commonly presumed and that they do much more than merely respond to external pressures. Higher education helps shape the very environment necessitating change, and in terms of theory, the relationship between higher education institutions and their external environment should be viewed as an interactive one. In some countries—Australia, Canada, China, Ireland, and so on—there has been significant real increase in research funding in the past decade and more firm recognition of the contribution of research to the “knowledge economy.” While there are a number of issues in common across the various higher education systems, they must be interpreted in the context of local historical and cultural circumstances.

Developments in the area of higher education should not be viewed as either linear or inevitably moving in a certain predetermined direction. Many of the issues being discussed today have their historical antecedents, and over time, many of the same issues go on and come off the higher education agenda. Nonetheless, the complexity of the external environment with which higher education must engage has never been greater than it is at present.

Higher education needs to be viewed in terms of adequately balancing opposing forces, for example, technological change and preservation of cultural values, globalization and local interests, and training for generic skills and specialized knowledge. Possibly, there is need for developing a pragmatic education philosophy incorporating four key concepts: (i) Scholarship of Discovery, (ii) Scholarship of Integration, (iii) Scholarship of Application, and (iv) Scholarship of Teaching and Learning. However, insofar as Scholarship of Integration and Scholarship of Teaching and Learning assume a tight integration of teaching and research, it should be noted that there is considerable debate as to whether teaching and research are inseparable functions for all academics and all higher education institutions.

The content of university mission statements and their implementation is another area requiring more discussion and empirical investigation. Questions concern how university mission statements have changed over time and how much they differ from institution to institution and between national contexts within the region. It would be interesting to know to what degree mission statements are left at the rhetorical level or whether substantial effort is devoted to their actualization. At times there may be conflict between the core missions of particular higher education institutions and the core values of their academic staff. A related issue concerns the need to better understand the impact of globalization on higher education goals, philosophy, and mission. *Do mission statements take account of globalization? Are students being prepared for globalization and internationalization?* The ethics of developing certain types of knowledge, such as in the area of biological warfare, should be taken into account as well.

Clearly there is a need for more content-specific analysis of different national systems of higher education in the Asia Pacific Region. This involves the creation of new knowledge on the research process, taking into account indigenous knowledge systems amongst other things and the need to develop long-term strategies on the role of

higher education in research and its contribution to the “knowledge-based economy and society.” However, much of the debate about the contribution of higher education to the global “knowledge-based economy” is Eurocentric and takes little account of **indigenous knowledge systems** and **epistemology**.

Alternative views and choices with respect to globalization require investigation. While nations should not regard themselves as powerless in the face of the forces of globalization, different and alternative ways in which national systems of higher education might respond to the forces of globalization are not yet well formulated or articulated. Some of the primary questions these issues raise include the following:

1. In a globalized world, what is the “**appropriate**” **role of the state** in providing education at the local level?
2. With respect to trade in education, what is the **impact of new providers** on the quality of education?
3. How does the increased marketization of higher education impact its **governance and management**?
4. What is the **role of the university** in the “knowledge-based society”?

It is these and related questions that have guided the Committee toward the preparation of this book.

Committee members have had the unique opportunity to exchange experiences based on the analysis of the contribution of their respective higher education systems to knowledge production. Some of the key issues and general lessons arising from this sharing of information and experience are summarized below.

Some countries in the Asia Pacific Region are in need of special advocacy and assistance. The Asia Pacific Region is vast with nations at various stages of development. Policies that might be applicable to a well-developed country like Australia might have little or no relevance to less developed countries. Some of the poorest countries of the region may not possess the resources or infrastructure to effectively play a role in a global “knowledge-based” economy, and special measures may be required to assist these countries.

The **relationship between higher education and the labor market** is a crucial one. Rapid expansion of higher education, as has occurred in China, in the absence of corresponding expansion of labor market opportunities creates substantial problems and distortions. Rather than tying expansion of higher education to increases in gross domestic product (GDP), an argument can be made that expansion should be tied to the **size of the labor market** and **the need** for highly trained graduates.

Mass higher education requires **sector diversity**. Not all higher education institutions can be elite research-intensive universities—no country can afford to fund all of its higher education institutions as elite research-intensive institutions. However, while there is a need for institutional diversity, there is also the corresponding problem of how to maintain both legitimacy and quality with respect to other types of higher education institutions that have more of a **mass education** focus.

One possible approach to strengthening national systems of higher education is through greater **institutional and sector diversity**. This is a very important issue, both

educationally and politically. While the educational need for diversity may be demonstrated, there are often strong political forces requiring that all institutions are treated in the same way. **Equality of opportunity** in terms of participation and hierarchically segmented higher education systems may be in conflict, though the conflict has been addressed in several different ways in various countries.

Another important concern is the separation of teaching from research. As mentioned above, this is a hotly debated topic. Many people argue strongly that teaching in higher education institutions must be informed by research. However, the evidence suggests that nearly everywhere, even in research-intensive universities, a minority of academic staff produce the majority of research outputs (particularly with respect to externally funded research). The whole question of diversity and what type of role should be allocated to different categories of higher education institutions deserves much more serious consideration. In some national systems of higher education, however, it may be the case that the concept of the research university has little applicability.

The **relationship between higher education, government, and the market** is becoming more important and will continue to evolve, as will debates about the appropriate mix of public and private investment in higher education. It is recognized that there is a need to change thinking about higher education from regarding it in terms of immediate economic return to viewing it in terms of long-term sustainable development.

Market competition **does not necessarily** result in enhanced education quality. Government higher education policy-makers have been prone to assume that enhanced consumer choice and increased competition for students and scarce resources amongst higher education institutions will automatically improve quality. The evidence does not support such an assumption. Market competition can lead to an institution attempting to teach more and more students at a continuously declining unit cost, seriously compromising quality over time. It can also lead to institutions imitating each others products, thus decreasing the diversity of the sector as a whole.

On the other hand, market steering of higher education can be beneficial, particularly with respect to encouraging higher education institutions to **diversify their funding base**. The “marketization” of higher education has both positive and negative aspects. It is more on how market-oriented policies are applied in specific contexts than the “market” being all good or bad. More attention needs to be paid to **the detail of the way** in which market-oriented policies are formulated and implemented.

Generally, quality assurance mechanisms with respect to research are not well developed in many of the higher education institutions in the region. Traditionally, the quality of research was left mainly to the scientific community itself, with its emphasis on peer review. But the traditional approach to peer review has come under challenge, with governments intervening more directly in the research process through various policy initiatives and other mechanisms—such as the Research Assessment Exercise (RAE) in the United Kingdom. As mentioned previously, research funding agencies are playing a much more proactive role in assessing research quality and output. Also, more “outsiders,” particularly representatives from industry, are being included in setting research priorities and assessing the relevance and quality of outputs.

In some countries in the Asia Pacific Region, there has been rapid expansion of private higher education, particularly private for-profit higher education. But some of these new institutions may be of dubious quality. Related to this is the need to think of strategies of how to better mobilize private investment in public higher education. There is a need to maintain an appropriate balance between the quality and quantity of higher education and, in so doing, to be cognizant of **graduate employment opportunities**.

Increasingly throughout the Asia Pacific Region, research management and control is **becoming centralized**, both within institutions and at the sector level. Governments are prioritizing their research funding, and institutions are concentrating their resources on a limited number of select areas of research, while concentrating control of research at the executive level. The impact of this on scientific innovation is not well understood and has the potential to stifle scientific creativity. The way in which research is organized and managed within higher education is a primary factor governing the relationship between research and the “knowledge-based economy.” However, the impact of different management approaches on research productivity deserves much more serious investigation.

Many countries in the region are facing the question of the renewal of the academic profession as the present generation of academic staff reach retirement age. Related to this is the problem of attracting talented and well-trained young people into the academic profession. There is a growing amount of evidence to suggest that the present generation of graduates does not see the academic profession as an attractive career prospect, though there is a need for more empirical evidence on this issue.

Related to the career attractiveness of the academic profession is the problem of “brain drain,” particularly when attractiveness is considered at the international level. While brain drain remains an important issue, it does not appear to be as great a problem as it once was, with the concept of brain drain being replaced by the notion of “brain circulation.” Countries such as India, for example, have implemented policies to better utilize their nationals based overseas in local knowledge/scientific innovation networks.

Academic staff nearly everywhere are being asked to do more for less and be more productive. But this sometimes occurs in the context of inadequate faculty support. Higher education institutions may need to devote more time and effort to the development of their academic staff, particularly to development over and above traditional training and socialization in the disciplines. The modern academic engages in a much broader range of activities related to knowledge production than was the case 20 or 30 years ago. Many academics, for example, are being asked to be more entrepreneurial and to address complex issues associated with intellectual property rights (IPR). Teaching is another area where faculty development could be fruitfully applied. Still today in many instances, academic promotion is based more on research than teaching. Information and communications technology (ICT) is having a profound impact on higher education and is another factor that is making the role of academics more complex and difficult.

However, while the significance of the impact of new technology on higher education is undeniable, a few caveats are necessary. *First*, ICT should be viewed as a

means to an end, rather than as an end in itself. *Second*, what may appear as leading-edge technology in one country may be conventional practice in another. *Third*, it does not appear that the virtual campus will replace the traditional one, and different types of higher education institutions using different technologies are not necessarily directly competing with one another—for example, in the United States of America the traditional four-year liberal arts colleges and virtual for-profit universities cater for distinct student clienteles. *Finally*, it was noted that application of ICT in higher education can increase the gap between the “haves” and the “have nots.” For example, it may be inappropriate to put too much emphasis on ICT in situations where a substantial number of students do not even have access to electricity.

The above are some of the key issues identified by the Scientific Committee that are confronting the higher education institutions and systems in the region. In order to advance our understanding of these issues more systematic and detailed comparative studies, both historically and geographically based, would prove fruitful. Also, research on higher education policy could better inform policy makers than what it does and general higher education policy research could be better integrated with the more specialized area of science and research policy. Not enough is known about the differences and similarities of the higher education systems of the region, and there is a particular need to identify best practice in approach to particular issues amongst the various nations. In this respect, a key comparative research question could be formulated:

What sort of enabling environment should governments provide in order to better stimulate higher education institutions’ and systems’ knowledge contribution?

Governments must have the political will to construct an appropriate environment in order for higher education-based research to flourish. Factors include the following: (i) roles and policies of funding agencies; (ii) articulation of national objectives; (iii) appropriate institutional incentives; (iv) innovation networks that incorporate business and industry as well as universities; (v) sustainability of funding; and (vi) wide-ranging public debate on the desired size, shape, and character of particular higher education systems. There is potential for greater interaction amongst the regional systems to address common problems and a need for cooperation as well as competition both *within* and *between* higher education systems and sectors. Approaches to a better understanding of these factors guided planning of the Scientific Committee’s 1st Regional Research Seminar.

The 1st Seminar of the UNESCO Regional Research Scientific Committee
for Asia and the Pacific, Tokyo, Japan, May 13–14, 2004 on “Changing
Research Policy in the Higher Education Systems of the
Asia Pacific Region”

The Scientific Committee’s 1st Regional Research Seminar for Asia and the Pacific, which was held at the United Nations University in Tokyo on May 13–14, 2004, focused on changing research policy in the higher education systems of the Asia Pacific Region, emphasizing the capacity of higher education to promote social, cultural, and economic change through research. Chapters three to eleven of this book are revised versions of papers presented at the seminar and thus will not be summarized

in this section of the introduction, though they are briefly outlined in the final section. A number of other key note addresses, discussants' responses, and significant interventions from the audience, however, were presented during the seminar and it is worthwhile to outline the main features of these below.

The Japanese Director General for International Affairs, Ministry of Education, Culture, Sports, Science and Technology (MEXT) Mr. Hiroshi Nagano welcomed the participants. Mr. Hiroshi Nagano maintained that the twenty-first is the era of knowledge. The growing demand for higher education, the rising use of ICTs in education and research, the increasing internationalization and demand for higher education in developing countries, and the growing number of new providers of higher education are just some of the developments that are changing the roles of traditional universities within higher education systems. With the transition to a "knowledge society," economic globalization, and the rapid development of science and technology, the importance of the role of higher education is increasing in all countries.

MEXT is in the process of creating an environment in which higher education institutions are able to operate more independently and autonomously. Institutions are encouraged to develop their own unique educational and research activities in accordance with their particular missions and objectives, and efforts are being made to build universities that are internationally competitive. Japan is introducing structural reform of universities through third party quality evaluations and by transforming national universities into independent corporations. Evaluation results will influence resource allocation, and third party evaluation has been introduced to guarantee the quality of universities and institutes of higher education. By becoming a university corporation, universities are expected to further develop their educational and research functions on the basis of their management, autonomy, and independence. The government has a responsibility to support national university corporations in terms of promoting academic research and producing professionals of the highest calibre. In addition, MEXT is promoting cooperation among the business, academic, and public sectors. It is important for Japan to promote business, academic, and public sector corporations to turn research achievements at universities and national research institutes into practical applications and thus return the benefits of this research to society.

Professor Hiroyuki Yoshikawa, president, National Institute of Advanced Industrial Science and Technology (AIST) spoke at the seminar about the "Japanese Policy of Science-Technology and Higher Education." Like many other countries, Japan is currently engaged in a process of research priority setting. The four broad areas of current interest are as follows: (i) life sciences; (ii) information/telecommunication technologies; (iii) environmental sciences; and (iv) nanotechnology and material technology. However, Professor Hiroyuki Yoshikawa cautioned against the naïve assumption that all society had to do was to invest in an area of research for substantial benefits to be realized. There is a time lag, sometimes a considerable one, between the creation of a new idea in science and its practical application. Professor Yoshikawa likened this to a sequence of "dream/nightmare/reality." The trick is to ensure adequate funding of innovative research during the "nightmare" period when the glow of initial great expectations has faded, but the reality of successful

technological transfer has yet to occur. In Japan the field of biotechnology is in the period of a “dream”; researchers are enjoying substantial funding, as they keep ensuring society that in a very short time they will come up with tailor-made drugs and other great medicines. However this could actually take from 10 to 15 years, and the field of biotechnology will soon face the “nightmare” period. Others also made the point that the practice of research needs to be better understood by policy-makers. Research has its own saga, its own story, and this fact needs to be appreciated.

Professor Philip Altbach, director of the Centre for Higher Education, Boston College, spoke about “Winners and Losers in Asian Higher Education.” The world in general, and Asia in particular, is at a turning point with regard to the role of research in higher education. Questions include: How to think about it; how to plan for it; how to do it? Many Asian countries are interested in, maybe even obsessed with, the idea of a “world-class” research university. But one must think carefully about *what is* world class—What is a world-class university and how can it be sustained? The future of the economies of some nations will depend on the decision taken concerning how research is to be organized, who is to do it, and what is its role in society.

Scientific progress in research is highly unequal—some countries have more, and some universities within countries have more. There are centers and peripheries in the scientific “knowledge system” on both the global and national levels:

The fact is that the basic global status quo in international higher education is likely to remain for the coming several decades or more. The strength, size and focus of the major world higher education systems give them significant advantages—especially the USA. Asian countries have sufficiently deep problems [making it] difficult to see them emerging as the dominant academic systems—but having said that, it is likely that key Asian universities in the larger countries such as China, India, and Japan, and perhaps Indonesia, could emerge into the top rank but not as dominant institutions. Challenges include declining government support, privatization, pressures of enrolments in all Asian countries except Japan, academic traditions that do not fully support meritocracy and competition, in some cases overcentralization, language issues, and many others. (Altbach, 2004:1)

No nation can afford to fund all of its higher education institutions as if they were world-class research universities. Even in the United States of America, out of the 3,200 or so higher education institutions, only the top 100 receive 80 percent of the research funds allocated by either the federal government or private philanthropic foundations. Even in the United States of America the higher education system, as a whole, is not research-intensive.

Research-oriented universities have specific characteristics and requirements. These include the following:

- Full-time academic staff with doctoral degrees and a commitment to research. This might seem obvious, but many Asian universities lack . . . professors capable of doing research.
- Work responsibilities that recognize that research is part of the job—teaching loads that are not too high.
- The infrastructures at the university that will support research—libraries, Internet access, laboratories, supplies, equipment and the like. These facilities

must be kept up-to-date and similar to those found in the most advanced universities.

- Top quality students, especially at the graduate level.
- A research university must offer doctoral degrees and place considerable emphasis on graduate/professional degrees.
- Adequate financial support—including in all cases from governmental sources. Research universities can be private but nonetheless need governmental resources. Further, this support must be sustained over time. It is very damaging for support to vary considerably, as it does in many academic systems. The financial arrangements for a university can include tuition from students, support from private industry and others, external donors, and income from patents and consulting, but there must be a firm fiscal base as well.
- A clear vision of the goals of the research orientation—in most Asian countries and institutions, specific fields and departments will need to be targeted.
- Academic freedom and a culture of inquiry.
- The role of the English language (Altbach, 2004:3).

Only in the United States of America are there private research universities; no other country in any significant way has research universities in the private sector—it is simply too expensive.

Increasingly, there is an international market for academic and scientific talent in which the Asian countries must compete. And with all forms of market competition, there are “winners” and “losers”:

Inevitably, a limited number of Asian universities will be research-focused. Some countries will find it impossible to build up research capacity, and this must be clearly recognized. . . . Academic systems must be differentiated and there will be research “winners” and “losers” within countries as well. The academic profession itself will necessarily be differentiated. The development of research-oriented universities is not an easy task and there are many examples of failures or limited success in the USA and other countries. For Asia to compete in the “knowledge-based economies” of the 21st century, research universities and a research culture is necessary. (Altbach, 2004:2)

Professor Altbach made the point that most Asian countries have not made full use of universities and research to achieve their impressive levels of economic and social development. They have done it on the basis of things such as cheap manufacturing. But this is changing, which can be easily observed through the increased sophistication of the products, knowledge products in particular, coming from the Asian regions. Nonetheless, the academic systems need to catch up with the new economic realities, and those Asian countries that do not develop some kind of scientific infrastructure will be left behind in the economy of the twenty-first century. Asia is part of the world economy, and the world economy is knowledge-based. There are few countries that can hide behind cheap labor in the long run and prosper in this new economic environment.

In replying to Professor Altbach’s presentation, Dr. Chan Basaruddin, Board of Higher Education, directorate general for Higher Education, Ministry of National Education (MNE), Indonesia, made the important observation that one of the principal

drivers for universities to engage in research is the need and demand from industry and other institutions in the productive sector. The ability of universities to develop their research capacity will be determined, at least in part, by the maturity of the industries in their surrounding environment. In some developing countries there is little or no research undertaken or required by industry.

Academic systems in the twenty-first century will be differentiated academic systems, with a small number of research-intensive universities at the top. Difficult decisions need to be made in each country about how this differentiated system is to be organized, and funding for research will necessarily need to be concentrated at the top of the system. While this may sound elitist, it is the reality all nations must face, even wealthy ones.

Another point made during discussion was that Asia, as it thinks about its research culture and focus, needs to have the self-confidence that its ideas about research are as legitimate as anybody else's ideas about research. There is hegemony of knowledge and there is hegemony of ideas about the organization of knowledge and research, which is very much dominated by the West.

Professor Harman's paper is included in this book, and thus is summarized in the next section of this introduction. However, it is worthwhile to outline here some of the important points made by the discussant of Professor Harman's presentation, Dr. Allan Benedict Bernardo, academic vice-president of De La Salle University System, Manila, the Philippines.

Dr. Bernardo noted that developed countries have a number of policy instruments to apply to the management of research, such as priority setting and the competitive allocation of resources to research infrastructure: "These policy instruments are conceptualized and rationalized by the appropriate government agencies within well-defined although increasingly contested and evolving frameworks on the role of research in higher education and in attaining economic and social goals" (Bernardo, 2004:1). Government agencies have a number of ways and means available for fine-tuning policies on infrastructure, organization, and processes of higher education research. The availability of sophisticated policy instruments, however, is rarely a feature of developing countries that face challenges often substantially different from their more developed Asian neighbors. Higher education in most developing countries in the Asia Pacific Region was not founded on a research base. According to Bernardo,

Typically higher education institutions were first established to provide post-secondary education for the socio-economic and/or intellectual elite. Eventually the higher education institutions and enrolments grew, although at different rates. . . . However, the growth of the higher education sector was focused on addressing the human resource development needs of these countries . . . [H]igher education was primarily designed to promote individual professional development and socio-economic mobility and it was possible to attain these goals without necessarily having a strong research base.

In many developing countries in the region the infrastructure, organizational and work structures, incentive systems among others are not hospitable to research. For example, faculty member's work conditions typically involve heavy teaching responsibilities and research can only be undertaken over and above the teaching requirement. Libraries, physical facilities and other learning resources lean towards instructional

needs and do not support the specialized requirements for sustainable higher-level research programmes. Curricula emphasize the development and mastery of professional knowledge and skills instead of developing . . . analytic, critical, and creative thinking skills. Instruction emphasizes the consumption of research knowledge rather than problem posing and development of new knowledge. (Bernardo, 2004:1)

Policy-makers in many of the poorer countries of the Asia Pacific Region have had to concentrate on issues such as equity, access, quality, and efficiency rather than building a research base in higher education. Again, according to Bernardo,

[W]e can anticipate that higher education institutions in certain countries will be able to participate better in the more complex types of research activities compared to others. In these more developed systems the focus of research policy making is to fine-tune the existing priorities, structures and processes in order to better and more effectively participate in the global research enterprise and to address the emerging forces in the larger global environment. On the other hand, in the less developed systems the focus of research policy making is more developmental in nature. . . . The scenario might lead to a clear set of “winners” and “losers” in the arena of higher education research, where certain countries aggressively pursue their research development programmes while other countries for ever play “catch up.” . . . We should pay attention to the concerns confronting the developing education systems, if we do not, there would emerge a clear divide between higher education systems within the region. (Bernardo, 2004:1)

The question is, however, How should the higher education systems in the developing countries of the Asia Pacific Region respond to these challenges?

A simplistic answer would be for these countries to radically and aggressively re-envision and re-engineer the higher education system in ways that give more emphasis to the research base of higher education. However, such radical movements are difficult to realize within higher education systems that are struggling with some fundamental problems of quality, access and efficiency. Externalities of these higher education systems would also most likely not be supportive of such radical changes.

A more realist response for developing countries would be to develop more strategic research policies that are rationalized within the diversity of higher education institutions of the country. As the higher education sectors in these countries are called on to address various concerns there might be a need for a policy environment within which different higher education institutions can develop to address specific concerns, leading to a diversification of universities. Probably in these countries most higher education institutions would not have the ability to develop the research culture or environment needed to effectively participate in the knowledge development process. However the state should create a higher education policy and regulatory environment, wherein selected institutions can grow to fulfil the more complex high-end research functions of a university. . . . [O]ne critical factor that would support such research policy initiatives in the developing countries would be strategic and collaborative programmes with more developed countries. Recent history has shown some outstanding examples of bilateral research collaborations between two countries of different levels of research capability. . . . As our countries strive to better develop policy instruments to enhance their respective higher education systems, we ought to discuss policy initiatives that would capitalize on strategic bilateral or multilateral collaborative efforts that have sustained long-term impact. (Bernardo, 2004:2)

In general discussion, it was also noted that in the Asia Pacific Region, the impression is that the leading nations are doing very well in terms of research policy and research and development. To a large extent they are following the same lines as many other OECD countries in that there is a greater role for the state, more public funding and effort to bring industry, universities, and public research institutes together in a new emphasis on research commercialization. In contrast, the higher education systems in the more developing countries of the region are in danger of becoming irrelevant to the increasingly globalized knowledge economy.

Outline of the Book

The issues raised above are further elaborated upon in the following two overview chapters (chapters two and three), which look at the impact of the rise of the global knowledge economy on countries of the Asia Pacific Region and assess key research policy issues associated with the changing role of the state and the effect on the region's higher education systems' capacity to promote research. William Cummings begins this review in chapter two. This author points out that knowledge utilization is nothing new in the Asia Pacific Region—for centuries, it has been central to the development strategies of the region. Countries like Japan have been most apt at incorporating Western knowledge and science while maintaining commitment to Eastern morality.

There are many scholars who maintain that the nations of the Asia Pacific Region, like developing countries everywhere, are in a peripheral position in relation to the Western nations, forced to accept knowledge and technological application produced elsewhere. Cummings, however, argues that the Asia Pacific Region is much more of a “knowledge production powerhouse” than commonly assumed and is steadily becoming more so. Many countries of the region are becoming key players in the global knowledge economy: China, India, Indonesia, Hong Kong, Korea, Malaysia, Singapore, Thailand, and Vietnam, to mention but a few. Cummings eloquently demonstrates that modern knowledge economies in the Asia Pacific Region have their roots as firmly in Eastern culture and tradition as in Western scientific practices. It is interesting to note that compared to Western countries, a larger proportion of financial support for research in the Asia Pacific Region comes from the corporate sector.

In chapter three, Grant Harman discusses national and institutional research policy for higher education in the Asia Pacific Region. Harman's chapter concentrates particularly on the topics of the role of the state in university research and development, the public funding of university research, priority setting, and university research links with industry and research commercialization. Research policy is defined as “guidelines and decisions expressed as directives, regulations or laws with regard to the funding, regulation, direction and monitoring of research activities.” Harman notes that “research is defined differently, in different disciplines, in different countries, in different cultures. There are a number of different ways to classify research: basic, applied, curiosity or problem driven, etc.”

Harman asks, “Why do universities engage in research?”, and at the same time he replies that they undertake research to support teaching activity and particularly

advanced-level research training and many academics have a strong commitment to conducting research. Research also is a very important service to society. Harman notes that higher education in the Asia Pacific Region reflects the tremendous diversity of this region. The higher education systems vary in size, resource capacity, student participation rates, research activities, and the mix of public and private. Many of these higher education systems are undergoing rapid change; just as the systems vary considerably so does the national research capacity. The strongest performers in terms of researchers per million populations are Australia, Japan, Korea, and Singapore and in terms of R&D expenditure Japan and Korea. The leaders in this region are amongst the leaders internationally.

Governments in the region are being forced to respond to pressures from diverse sets of stakeholders, especially from business firms and other consumers of research outputs. There are also changes taking place with respect to type of research activities, increased costs, and demands to capture research benefits. Governments are responding, argues Harman, in different ways. They are improving stakeholder involvement in priority settings with a much larger range of stakeholders being involved. They are restructuring research funding arrangements by redefining responsibilities of funding agencies, by combining agencies, and by developing new coordination mechanisms. Public funding has changed greatly over the past half century, from limited funding to support basic research and research training to an increased emphasis on mission-oriented funding and greater support for research and development. In many countries there is an increased emphasis on research commercialization. Harman concludes that fundamental economic and social changes are impacting significantly on higher education in the region and on national and institutional research policy.

The next eight chapters provide national perspectives on knowledge production and research in higher education in the following jurisdictions: Australia, China, India, Indonesia, Japan, Oceania, the Philippines, and Thailand. Lynn Meek (chapter four) opens the country reports with an analysis of policy and research management issues in Australian higher education. Though Australia has a small population base, it contributes about 3 percent to world scientific output. For the most part, research in Australia is primarily publicly sponsored. However, the nations' 37 public universities that enroll close to a million students are now largely privatized as government has reduced its financial support of higher education to less than 40 percent of the overall budget.

In terms of research policy at the sector and institutional levels, the emphasis in Australia has been on concentration and selectivity. Institutions have had to set research priorities in a national context where government also has set research priorities used to channel funding. Australian universities have developed elaborate research management structures, with all universities having a large research management office, headed by a professional research manager and overseen by an executive officer with a dedicated research portfolio.

Increasingly in Australia, research is being funded on the basis of outputs and the value of research defined in terms of its economic and commercial relevance. Though all institutions presently have a mandate to engage in research, most of the research funding and outputs are concentrated in a few research-intensive universities. The research teaching nexus is currently under question in Australia, with government

introducing a research quality assessment framework, along the lines of the Research Assessment Exercise (RAE), United Kingdom, which will even more severely concentrate research funding in a few select universities.

Meek concludes that there is no one best approach to coordinating and funding university research at the national level. A number of competing demands must be balanced—balance and plurality are the key words. The public good nature of research must be recognized and supported. But as research becomes more elaborate and expensive, policies of concentration and selectivity are necessary. Governments and universities alike must make choices. But the choices must be informed ones—not driven primarily by ideology—and take place within a set of parameters that will sustain the research endeavor in the long term.

The recent and rapid expansion of higher education in China is on an unprecedented scale, as Professor Wei Yu demonstrates in chapter five. China has surpassed the United States of America in having the largest higher education system in the world. There are now nearly 20 million students and an enrollment rate of 17 percent of the of 18- to 22-year-old-age group. There are about 3,000 higher education institutions. Following the 1949 Revolution, China adopted the Russian higher education system, which locates research in separate academies rather than in universities. Following the 1979 reforms, universities began to engage in research as well as teaching. Research funding to universities has grown from CNY1.4 billion in 1990 to CNY21.9 billion in 2002. Currently, 60 percent of the scientific papers published within China and abroad are authored by university faculty. About 60 of the universities could be classified as research-intensive. Almost 80 percent of the postgraduate students are enrolled in these 60 universities.

Professor Wei notes that on the one hundredth anniversary of Peking University in May 1998, the then president Kiang Zein announced that China would build first-class world universities. The Ministry of Education embarked on the “985 Project,” named after the date of President Kiang’s announcement, establishing nine “first-echelon” universities, including Peking University and Tingha University. This was followed by support for more than 20 “second-echelon” universities to become leading world universities.

Half of the research funds going to Chinese universities is provided by the state and the other half by private enterprise. In China, being a developing country, the majority of the research is applied research with an emphasis on technological transfer. The establishment of science parks since 1999 has been one means for attempting to forge closer links between university-based research and the commercial sector. Some universities have established their own commercial branches, helping to facilitate technological transfer. It appears that the importance of the role of the university in contributing to the development of the “knowledge society” and “knowledge economy” is clearly recognized in China. An important characteristic of China is that many of the senior leaders have backgrounds in science and technology, particularly engineering. This may, in part, help explain the country’s emphasis on research and technology in national development.

India has a large and complex system of higher education. Karuna Chanana notes in chapter six that until the early 1990s, Indian higher education was publicly dominated. Private institutions have been allowed to expand, but the system remains

primarily public. From 1950 to the early 1990s, there was a phenomenal expansion of the Indian higher education system. In addition to universities, India has what are called “deemed to be universities”—institutions teaching single subjects, such as the Indian Institutes of Technology (IITs). There are also unitary universities that have no colleges affiliated to them, offering mainly postgraduate programs, and affiliating universities, such as the University of Delhi that has over 90 colleges under its umbrella. The Indian University Grants Commission (UGC) plays a critical role in setting standards and maintaining quality of the sector. In 2002, India had 288 universities: about 19 central universities, nearly 180 provincial universities, and about 76 mostly recently established deemed universities. There are a total of about 14,000 colleges. The affiliating colleges are mainly undergraduate colleges—90 percent of the undergraduate students are enrolled in them. The colleges are not regarded as research institutions. There are about 450,000 faculties in Indian higher education, of which 82 percent are in colleges and 18 percent in universities.

Soon after Independence in 1947, India framed a policy dictating that science will be promoted only in specialized institutions and independent research laboratories. India established the Council for Scientific and Industrial Research (CSIR), which allocated most of the funds to the specialized research institutions and little to the universities. Chanana points out that India does have world-class research institutions in the form of the All India Academy for Medical Sciences (AIIMS), the Indian Statistical Institute (ISI), Indian Institute of Technology (IITs), and others. These organizations are in the public sector and there appears to be little or no potential for private higher education institutions in India, or elsewhere in Asia, to emerge as an important part of the research enterprise.

The Asia and the Pacific Region is vast and diverse. It contains not only China and India with their huge populations but also the sparsely populated island continent of Australia with about 20 million people and the Indonesian archipelago with roughly 17,000 islands and a population of 250 million people and hundreds of ethnic groups and dialects. Enrollments in Indonesian higher education have grown from 1,000 students in 1945 to over 3 million students today. Jajah Koswara and Muhammad Tadjudin in chapter seven examine how the Indonesian higher education system is building a sustainable research culture. The issues to be addressed are substantial and include the following: (i) disparity in research capacity across universities and fields; (ii) poor research management; (iii) limited and unpredictable research funding; (iv) lack of an extensive research culture among academics; (v) low level of research quality; (vi) lack of a national research umbrella organization; (vii) low number of publications in national and international scientific journals; (viii) low appreciation of intellectual property rights; (ix) poor integration of research and graduate student research; and (x) limited collaboration with industry and international institutions.

Koswara and Tadjudin demonstrate that Indonesia is tackling these problems in various ways, particularly with respect to the nation’s public higher education system. There have been significant policy shifts and innovations from the mid-1990s. The country has started a process of changing the system from a centrally controlled model, where universities were considered as part of the state bureaucracy, to a more decentralized system that enhances institutional autonomy. Long-term development strategies include institutional accreditation and evaluation, improving quality and

relevance, enhancing access and equity, and the introduction of tiered competition that includes a number of quality enhancement schemes such as the University Research for Graduate Education (URGE). The goals of the ten programs that constitute the URGE program are to improve graduate programs, increase competitive funding for graduate education and university research, strengthen selection processes for grants and fellowships, integrate university research and graduate training, and attract highly qualified candidates for graduate education. With respect to their study of institutional capacity building, the authors draw a number of lessons. Tiered competition helps promote equity justice. The URGE project is excellent in terms of graduate capacity building. A research culture is beginning to emerge and is being integrated with educational programs, though publication in accredited scientific journals should be obligatory. Integration of research with community service is still difficult to achieve, and institutional incentives are still too low to prevent academic staff from “moonlighting.” There are several types of research grants available to Indonesian academics with funding coming from a number of different ministries: grants for young researchers, research in gender studies, competitive research grants in natural science and technology, grants for fundamental research, grants promoting interuniversity research, grants for research in teacher education, grants for graduate students’ research, and grants for research on classroom teaching in schools.

Japan like Australia is one of the highly industrialized countries of the region with a long tradition of investment in research and development. But as Akira Arimoto discusses in chapter eight, this country too is experiencing significant shifts in higher education policy, many of which impact on the conduct of research. Professor Arimoto first locates a discussion on Japanese research policy shifts in the broader context of general social change drivers, including globalization and the shift from what the author terms Knowledge-Based Society1 (KBS1) to Knowledge-Based Society2 (KBS2)—similar to (Gibbons et al., 1994) Mode 1 and Mode 2 science. Knowledge, social change, government higher education, and research policy are all interrelated.

Over the past decade, there have been many policy changes in Japanese higher education, including those that promote distinctive universities in a competitive environment, the promotion of science and research, and the incorporation of national universities, which began in 2004. Japan is attempting to bridge the gap between itself and the United States of America in terms of scientific and technological output. One option to achieve this end is the introduction of graduate schools along the lines of the North American model.

In chapter nine, Konai Helu Thaman argues for the inclusion of Pacific “indigenous knowledge systems” in the discourse on knowledge production and dissemination in higher education, particularly in higher education institutions in Oceania. Like indigenous peoples everywhere, the inhabitants of the islands of the Pacific Ocean have for centuries used local knowledge of themselves and their environment to live, work, trade, and communicate with one another. Western influence commencing about 300 years ago constitutes a small fraction of the thousands of years of history of these peoples. Thaman uses the term “indigenous knowledge systems” to refer to “specific systems of values, knowledge, understandings and practices, developed, and accumulated over millennia, by a group of people in a particular region, and maybe unique to that group or region.”

“Indigenous knowledge systems” and “Western knowledge systems” are different but have equally valid ways of knowing and interpreting the world. Western knowledge claims universality, while “indigenous knowledge” is peculiar to the culture that owns it. In recent years there has been a concerted effort by some educators to incorporate “indigenous knowledge” into the formal education systems in Oceania, both to improve results and to preserve the cultural heritage of the Pacific people. Western scientific interest in “indigenous knowledge” is increasing. For some time, Western scholars have been interested in local agriculture and farming technologies. Presently, this interest has extended into the areas of environmental protection (“traditional ecological knowledge”), housing and health (“ethno-medicine”). But “indigenous knowledge” is more than making modern development more efficient and productive. It is, as Thaman argues, part and parcel of the “very identities and futures of Pacific Island people themselves.” Nonetheless, “there remains a need to develop new methods (participatory, interdisciplinary research) to elicit and generate local knowledge, as well as innovative teaching methods that involve alternative forms of knowledge transfer, and to produce teaching materials that are adapted to local situations.”

Many studies on education and educational reform have been conducted in the Philippines. Rose Salazar-Clemeña in chapter ten examines the development of national research policies and their institutional impact. The mandate of the Commission on Higher Education (CHED) is to formulate and recommend development plans, policies, priorities, programs, and research on and in higher education; recommend to government grants for higher education and research; develop criteria for allocating additional resources for research; and set research development priorities. CHED has produced a 10-year National Higher Education Research Agenda (NHERA) for the period 1998–2007.

The NHERA delineates policies, priorities, and procedures for the encouragement and support of research in higher education institutions in the Philippines. Its goals are to (i) push back the frontiers of knowledge in all the higher education disciplines; (ii) enhance instruction through strengthening bonds between teaching and research; and (iii) develop unifying theories or models that can be translated into mature technologies to improve the Filipino’s quality of life. The policy attempts to ensure that the academic environment in higher education institutions nurtures and supports Filipino research talents and stimulates the development of a research culture. Given these policy directives, higher education institutions are expected to provide administrative support for research and to develop management capacities to help support research infrastructure. Several intervention strategies designed to increase the quantity and quality of research outputs of higher education institutions can be identified: (i) technical and financial aid to selected higher education institutions; (ii) linkages with foreign research institutions; (iii) support for research journals, awards, and other incentives; and (iv) development of research-oriented human resources through research training of promising junior faculty and graduate students. Research priority areas have been established based on the notion of multidisciplinary.

Achievement of the NHERA goals is, not surprisingly, hampered by the meager funds that most institutions have available to allocate to research. The main problem with respect to boosting research productivity revolves around the research capacity of the higher education institutions. Of the 1,357 higher education institutions in the Philippines, 85 percent are private institutions relying mainly on tuition fees as

their main source of income. Government funding to the state colleges and universities is spread ever more thinly as new public institutions are established. Thus, there is very limited financial support for research, and additional funding is urgently needed.

The last of the country case studies is Thailand presented by Charas Suwanwela in chapter eleven. Thailand is experiencing major higher education reforms, both structurally and functionally. The country is still in the massification phase of higher education expansion. There are about 1.7 million students enrolled in 126 Thai higher education institutions, 1 million of these in 24 public universities, including 660,000 students enrolled in the Open University. In 2002 there were around 220,000 students enrolled in 56 private universities. As is the case in a number of other developing countries, the expansion has mainly been in the area of the social science and humanities, where graduates experience high levels of unemployment. While the country has an excess of social science and humanities graduates, it has an insufficient supply of scientists, engineers, and health professionals. A national quality assurance framework for higher education has only recently been established.

The National Research Council (NRC) was established in Thailand in 1961 and the Thailand Research Promotion Fund (TRPF), the National Science and Technology Development Agency (NSTDA), and the Health Systems Research Institute (HSRI) were created in 1993. The National Science and Technology Development Agency (NSTDA) has three centers: National Electronic and Communication Technology Centre, National Biotechnology Centre, and National Metallurgy and Material Centre. The NSTDA also runs Thailand's science parks, which involve some academics. The Thailand Research Promotion Fund (TRPF) is solely a grant-giving agency. Only about 17 percent of the total budget for research goes to the universities, which are only a small component of the research and development field.

According to Suwanwela, the relatively low investment in higher education that has prevailed for several decades has been one of the root causes of the problems faced by the Thai higher education sector. Higher education institutions must depend more and more on sources of income other than the government. There is a need to diversify research funding in the universities. The Thai case clearly demonstrates the importance of the networking of researchers in the various agencies, including universities.

In chapter twelve, the concluding chapter, Meek attempts to bring together the various arguments presented in this volume to form a comprehensive final analysis of the role of higher education in "knowledge production" in the Asia Pacific Region. Meek questions some of the common assumptions underpinning recent arguments concerning the transformation of higher education and its role in the "knowledge economy and society," such as the inevitable march toward the introduction of New Public Management principles in higher education and the transition of science from a traditional disciplinary base to diffusion throughout society. This chapter suggests an agenda for future research on higher education and knowledge production in the Asia Pacific Region.

Appendix 1: The 2nd Meeting of the UNESCO Regional Research Scientific Committee for Asia and the Pacific, New Delhi, India, September 2003

The following participants attended the Regional Scientific Committee Meeting for Asia and the Pacific, which took place on September 8–9, 2003 in New Delhi, India.

Welcoming Address:

- V. R. Panchamukhi—Chair of the Indian Council of Social Science Research (ICSSR)

Committee Members:

- Akira Arimoto—Chair (Japan)
- Karuna Chanana (India)
- Konaiholeva Helu-Thaman (Fiji)
- V. Lynn Meek (Australia)
- Rose Marie Salazar-Clemeña—Vice-Chair (the Philippines)
- Charas Suwansela (Thailand)
- M. K. Tadjudin (Indonesia)
- Yu Wei (China)

Author of a Commissioned Paper:

- Arun Nigavekar—Chair, University Grants Commission (UGC), New Delhi, India

UNESCO Staff:

- Qutub Khan (New Delhi)
- Terry Tae-Kyung Kim (Paris)
- Katri Pohjolainen Yap (Paris)

Appendix 2: The 1st Seminar of the UNESCO Regional Scientific Committee for Asia and the Pacific, Tokyo, Japan, May 2004 on “Changing Research policy in the Higher Education Systems of the Asia Pacific Region”

The following participants attended the Regional Research Seminar for Asia and the Pacific, which took place on May 13–14 2004, in Tokyo, Japan.

Welcoming Address:

- Hiroshi Nagano—Director General for International Affairs, Ministry of Education, Culture, Sports, Science and Technology (MEXT)

Committee Members:

- Akira Arimoto—Chair (Japan)
- Karuna Chanana (India)

- V. Lynn Meek (Australia)
- Rose Marie Salazar-Clemeña Vice-Chair (the Philippines)
- Charas Suwansela (Thailand)
- M. K. Tadjudin (Indonesia)
- Yu Wei (China)

Keynote Speakers:

- Philip Altbach (United States of America)
- Grant Harman (Australia)
- Hiroyuki Yoshikawa (Japan)
- Jajah Koswara (Indonesia)

Discussants for Keynote Address:

- Chan Basaruddin (Indonesia)
- Allan Benedict Bernardo (the Philippines)
- Jandhyala B. G. Tilak (India)

Participants:

- Richard Braddock (Australia)
- Do Van Xe (Vietnam)
- Fumi Kitagawa (Japan)
- Futao Huang (Japan)
- Hans Van Ginkel (Japan)
- Hiroshi Nagano (Japan)
- Li Zhi Min (China)
- Evangelia Papoutsaki (Papua New Guinea)
- Shuji Uchikawa (Japan)
- Norietta C. Tansio (the Philippines)
- Jean C. Tayag (the Philippines)
- Ulrich Teichler (Germany)
- Utak Chung (Republic of Korea)

UNESCO Staff:

- Yonemura Akemi (New Delhi)
- Molly N. N. Lee (Bangkok)
- Tony Marjoram (Paris)
- Min-Chul Shim (Paris)
- Tawfik Mohsen (New Delhi)
- Katri Pohjolainen Yap (Paris)

Note

1. In 2005, membership of the Asia and the Pacific Committee was extended to Malaysia, Mongolia, and South Korea. However, these countries are not included in this book.

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