Organisation for Economic Co-operation and Development
Directorate for Education
Education Management and Infrastructure Division
Programme on Institutional Management of Higher Education (IMHE)

Supporting the contribution of Higher Education Institutions to Regional Development

Peer Review Report:

Busan
Republic of Korea

Chris Duke, Henry Etzkowitz, Fumi Kitagawa and Byung-Shik Rhee

This Peer Review Report is based on the review visit to the Busan Metropolitan City in December 2005, the regional Self-Evaluation Report, and other background material. As a result, the report reflects the situation up to that period. The preparation and completion of this report would not have been possible without the support of very many people and organisations. OECD/IMHE and the Peer Review Team for the Busan Metropolitan City wish to acknowledge the substantial contribution of the region, particularly through its Coordinator, the authors of the Self-Evaluation Report, and its Regional Steering Group.

TABLE OF CONTENTS

PREFACE

We have written this report with three main readerships in mind. The first is the people working together to nurture the development of Busan Metropolitan City, with a population of 3.75 million inhabitants, the second largest metropolis after the capital area of Seoul, and the largest international port city in South Korea. Regional partners in the Busan region include a wide range of groups such as universities, regional governments and businesses. The Metropolitan Cities of Busan and neighbouring Ulsan together with Gyeongsangnam-do form "the south east economic zone" which constitutes a super metropolitan region, with wider regional partners. We hope that the report will help them along their path of partnership to accelerate the balanced development of the region.

Secondly, the report is intended to have interest, relevance and benefit to others in South Korea concerned about balanced national and regional development. Over the past decades, South Korea's sub-national governments have experienced democratisation and decentralisation with the rapidly shifting economic structure of the wider East Asian region. Since 2003, the new central government generating waves of decentralisation initiatives, the pace of change for regional and local governments has only quickened.

Thirdly there is the Organisation for Economic Cooperation and Development, which with the Higher Education Funding Council for England commissioned, and along with the region, "owns" this review. The interest of these partners is in learning internationally about the role of higher education in regional development across regions in a number of Member States that are taking part, and others that are not. In addition we aim to reach a wider international readership, and to provide something of value to regions both within and beyond the OECD that are not included directly within this project.

Our report therefore attempts to read in a way that will be comprehensible and useful to these readers, and to fellow students of regions and higher education, with a minimum of assumptions about local knowledge, and as few acronyms as possible. As with the other reports in this OECD project, we have had to write for a particular, highly involved and well informed regional policy and practitioner community; but also for a more "remote" readership unfamiliar with the local story. Our primary consideration is to give back to the region something of value, something that will contribute to further development and be evaluative in this particular sense. We refer to and have drawn upon the substantial regional Self-Evaluation Report (SER) written by Professor Jang-Soo Ryu and his colleagues and available on the OECD website.[1] We make no attempt to reproduce or summarise that work; readers requiring more background data should refer in particular to that study.

It is likely that this report will be relevant, and we hope persuasive, to South Korean central government partners to the extent that it is accurately attuned to their own circumstances, and to the circumstances, recent achievements and current aspirations of the Busan region today. It will be useful to the other participating OECD regions in direct proportion to its relevance and utility for each different region.

We are grateful for the generous hospitality of those who prepared the SER and hosted the Review visit from 11 to 17 December. High expectations were generated by the region's own self-review process, as well as by our visit. We have departed from the initial draft OECD reporting

[1] See www.oecd.org/edu/higher/regionaldevelopment

template only insofar as the particular condition of the region seemed to require this, but not, we hope, so far as to make inter-regional comparison problematic.

NOTES ON CURRENCIES

In this report, we refer to South Korean won (KRW) simply as won. As of January 2006, 1 KRW equals 0.00101885 US dollars; 1 US dollar equals 981.500 KRW.

ABBREVIATIONS AND ACRONYMS

APR	Age participation rate
BK21	Brain Korea 21
BCCI	Busan Chamber of Commerce and Industry
BDI	Busan Development Institute
BETC	Busan Environmental Technic Centre
BHRDI	Busan Human Resources Development Institute
BRIC	Busan Regional Innovation Committee
CPD	Continuing professional development
CU	Cultural Technology
DIUC	Division of Industry-University Cooperation
GDP	Gross domestic product
HE	Higher education
HEIs	Higher Education Institutions
HRD	Human Resources Development
IUCRC	Industry University Cooperative Research Centre
ICT	Information communication technology
IPR	Intellectual property rights
OECD	Organisation for Economic Co-operation and Development
IMHE	Programme on Institutional Management in Higher Education
KEDI	Korean Educational Development Institute
KIT	Kyungnam College of Information and Technology
MOE & HRD	The Ministry of Education and Human Resources Development
MOCIE	The Ministry of Commerce, Industry and Energy
MOST	The Ministry of Science and Technology
NURI	New University for Regional Innovation
NGO	Non-governmental organisation
PNU	Pusan National University
PRR	Peer Review Report
PRT	Peer Review Team
PKNU	Pukyong National University
RGDP	Regional Gross Domestic Product
RIC	Regional Innovation Committee
RIS	Regional Innovation System
RSC	Regional Steering Committee
R&D	Research and Development
SER	Self-Evaluation Report
SME	Small and medium sized enterprise

LISTS OF TABLES AND BOXES

1. INTRODUCTION - CONTEXT AND APPROACH TO EVALUATION

1.1 Evaluation context and approach

This review of the Busan region in the Republic of Korea is part of the OECD/IMHE project entitled *Supporting the Contribution of Higher Education Institutions to Regional Development*. The project engaged fourteen regions across eleven OECD countries and Brazil in 2005-2006.

The IMHE launched the project in spring 2004 as a response to a wide range of initiatives across OECD countries to mobilise higher education in support of regional development. There was a need to synthesise this experience into a coherent body of policy and practice that could guide institutional reforms and relevant policy measures such as investment decisions seeking to enhance the connection of higher education institutions (HEIs) to regional communities. Current practice needed to be analysed and evaluated in a way that was sensitive to the varying national and regional contexts within which HEIs operate.

The aim of the IMHE project is to compare and evaluate the efficiency and effectiveness of regional initiatives and partnerships, to provide an opportunity for a dialogue between higher education institutions and regional stakeholders, to assist with identification of roles and responsibilities of stakeholders, to provide advice at national level on the impact of policy initiatives e.g. funding initiatives at a regional and institutional level, and to lay the foundations of an international network for further exchange of ideas and good practice.

Each of the participating regions engages in a self-review process during 2005, followed by site visits by international review teams from October 2005 to April 2006. Participating regions have designated Regional Co-ordinators and Regional Steering Groups to oversee the process. Each regional review is conducted by an International Peer Review Team with two International Experts, one being the Lead Evaluator, as well as a Domestic Expert and Team Co-ordinator. The entire project is coordinated and led through project management at the OECD secretariat and a Project Task Group which is also charged with the task of nominating the members of the Peer Review Teams. Each regional review produces two independent reports, a Self-Evaluation Report (SER) and a Peer Review Report (PRR). All reports are published online on the OECD project website for the benefit of the participating regions and a wider audience. A final OECD synthesis report, drawing from the experiences of the participating regions and a comprehensive literature review, will follow in 2007.

The focus of the IMHE project is on collaborative working between the higher education institutions and their regional partners. It seeks to establish a regional learning and capacity- building process.

1.2 The conduct of the evaluation

Self-evaluation as a change and development process

The self-evaluation exercise of the Busan region was a major project coordinated with the support of regional partners such as universities in the Busan region, the central government, the regional government, and businesses.

The entire cost of the Busan project was about USD 110 000. The central government, through the Ministry of Education and Human Resources Development, covered about 70% of the entire cost, while Busan city covered the remaining 30%.

The learning and capacity-building was undertaken through a process of wide consultation within the universities, and in conjunction with regional partners.

A Regional Steering Committee (RSC) was formed for the project. It had strong connections with the existing Busan Regional Innovation Committee (BRIC), established under the initiative of the central government in 2003 (see p. 61 of the SER). BRIC serves as the main mechanism in Busan to promote regional innovation and development, with representatives from commerce, industry, business, think-tanks, universities, the press and NGOs. The RSC for this particular project consisted of the Human Resource Development sub-committee of BRIC, with additional representatives from universities in the Busan region. This means that Busan has a natural mechanism to carry forward the work of this OECD review, whereas a completely free-standing RSC that disbands after the review is complete might leave a vacuum in terms of any follow-up action.

The self-evaluation and the capacity-building process were supported by the RSC drawing on the representatives of universities, business and regional partners. The members of the RSC included representatives from all the universities in Busan. There were no documents available before the Self-Evaluation Review was undertaken to provide an overall regional picture of the contribution of universities in regional development, although individual universities have promoted their own regional activities, some vigorously.

The Self–Evaluation Report

The OECD SER consultation process began in March 2005 with the first Regional Steering Committee meeting. The RSC met three times between March and October 2005, chaired by Mr. Young-Hwal Lee. These meetings contributed to the identification of key themes and of strengths, weaknesses, opportunities and threats for the region, and for the regional engagement of its universities.

A Working Group consisting of the authors of the Self-Evaluation Report played a pivotal role throughout the project. Three of the authors were previously involved in a Five Year Plan for Busan Human Resource Development. As a consultation process, many meetings were held with the Working Group and members of the RSC. A questionnaire survey was conducted in July 2005 with four-year universities in the region, and answers were received from twelve out of the thirteen universities [see Appendix of the SER for the list of universities (p. 78) and the questionnaire form (p. 93)]. Interviews were conducted with university professors as key informants, including those who act as Directors of Planning. Information about universities" sub-regional partnerships, arts, culture and community activities was collected through individual professors" networks. Business participation was relatively low in this process and throughout the project, reflecting no doubt the preponderance of SMEs in the region as well as the lack of a tradition for university-business partnership.

The Self-Evaluation Report was prepared by the Working Group consisting of six academics with different expertise, with Professor Jang-Soo Ryu of Pukyong National University as the leader. The Working Group contributed to the Self-Evaluation Report with information and comments to the text. The process of collecting information from a number of partners was designed to ensure wide consultation.

The draft of the Self-Evaluation Report was circulated around the Steering Group for approval in early October. Despite the wide ownership designed for the capacity-building process, time constraints appear to have allowed only limited interaction between the report writing and the wider stakeholder.

International peer review

The international Peer Review Team (PRT) was established by OECD in 2005. Professor Chris Duke (GBR) was nominated Lead Evaluator, Professor Henry Etzkowitz (USA) the second International Expert, Dr. Byung-Shik Rhee (KOR) the Domestic Expert, and Dr. Fumi Kitagawa (JPN) the Team Co-ordinator.

The Lead Evaluator and the Team Coordinator visited Busan in October 2005[2] to agree on the procedures for the review with the region, and to give feedback on the draft of the Self-Evaluation Report. Some additional information was required after this pre-visit. It was agreed that the report should include a description of the consultation process, and the methodology used to ensure the involvement of different stakeholders. It was also agreed that wider approaches to development going beyond a narrow economic focus including the social, cultural and civic agenda would be necessary. Additions, notably those linked with wider dimension of regional development, were required. In December 2005 a revised draft of the Self-Evaluation Report was submitted to the Peer Review Team, supplemented with additional background materials.

The OECD review visit took place from 11 to 17 December 2005. On arrival the PRT received further information including data on R&D distribution in regions in South Korea, and an overview of the south-eastern region of Korea encompassing Busan Metropolitan City, Ulsan Metropolitan City and Gyeongsangnam-do. Other related OECD works such as the Territorial Review of Busan published in 2004, the Economic Survey of Korea 2005, and information related to Tertiary Education Reviews conducted in Korea earlier in 2005,[3] were consulted during the Review.

Given that three of the four team members spoke no Korean, they had to manage issues of language, both translation and understanding or interpretation in a wider sense. An amusing example was one of Busan's strategic priority industry sectors, the silver industry. It took a while to appreciate that this referred not to work with the precious metal, but to the new and burgeoning market and needs of the elderly or silver-haired, which has possible points of connection with such other strategic industries as tourism and even film/IT. The requirement for sequential translation, either directly or following brackets of discussion in Korean among those being interviewed and including the Korean team member, cost something in time but had the compensation that in seeking to ensure that the literal translation had been clear and complete, the team tended to uncover assumptions and nuances that more rapid dialogue may well have missed. Naturally there was a price in terms of the number of issues that could be covered in the meetings.

The authority of this report is limited to what could be adequately explored in the week available to the team. On the other hand again, the unfamiliarity of the Korean situation to the international members prevented the taken-for-grantedness that can hide issues in more familiar settings. Whereas the Peer Review Team was mindful of its limitations, the visit, like the work for the SER, was taken very seriously in the region, where television interviews were required on two occasions, and in

2 Prior to the pre-visit, the Lead Evaluator and the Team Coordinator met the Regional Coordinator and several authors of the SER at an international seminar held in Karlstad "The role of higher education institutions in regional development" organised by IMHE/OECD, the Nordic University Association (NUS) and the Nordic Association of University Administrators (NUAS). This occasion helped the PRT and the SER authors to share the basic framework to work on for the pre-visit and the review visit.

3 See the OECD website of "Thematic Review of Tertiary Education", http://www.oecd.org/document/9/0,2340,en_2649_34859749_35564105_1_1_1_1,00.html

institutions, some of which provided a welcome more fitted to a head of state. The trip made to Busan by the Deputy Minister at cost to other commitments exclusively to meet with the team allowed direct corroboration on many key policy issues as well as showing how seriously the work and its possible advice and outcomes was being taken.

Future plans

The Busan SER represents a major piece of ground-breaking work not just for Busan but within Korea. It could be used and even emulated with benefit by other regions in Korea. Within Busan, the status of the OECD Project Regional Steering Group as an expanded Human Resources Development (HRD) sub-committee of the existing Busan Regional Innovation Committee (BRIC) secures a natural means for continuing the work started and signalled by the SER. There is a plan to publish a booklet that will disseminate the results of the review to a general public audience in the Busan region, and to hold a symposium involving stakeholders and a wider interest group around the issues. The Ministry of Education and Human Resource Development (MOE & HRD) is encouraging the dissemination of the Busan case study to other regions in South Korea. The Deputy Minister favours not just a national dissemination event but also an international seminar, to share the outcomes of this project widely more with regions within Korea and with other regions and universities overseas.

The Peer Review Team commends those involved with this review at national level and in metropolitan Busan for their plans to take advantage of the review for ongoing development. It recommends that regional and national dissemination be pursued, and that the Ministry consult with OECD about the possibility of arranging an international OECD seminar, perhaps focused on taking these issues forward especially in the Asian and Pacific region.

1.3 Korea, its universities, and the Busan region

In this review report we highlight tensions within South Korean higher education and regional development, and call attention to new and changing policies concerning decentralisation and regional development in South Korea. We draw attention to the problematic nature of Busan Metropolitan City and "the region", also the distinctiveness of Busan as the second largest metropolitan city in South Korea, while examining issues raised by notions of "the south east economic zone" which includes neighbouring cities and a wider economic region. We consider how the profiles of the universities meet regional needs, given the existing management and governance structure of universities and the newness of collaborative mechanisms among regional partners. We ask how regional engagement is to be managed within universities in the South Korean higher education policy framework, given the current governance and management arrangements of the universities, more particularly in a system with such a high participation rate of 18 years olds, and with large numbers of institutions and a large private higher education sector.

Since the economic crisis of 1997, Korea along with East and North East Asia generally has resumed its dramatic economic growth, as part of a major shift in world economic power which will progressively make this "the East Asian century". Korea's near-miraculous rise in prosperity since the Korean war has been disproportionately based on the growth of Seoul where the great majority of the nation's universities, research institutes, and productive power are concentrated. The government has recently resolved upon major decentralisation or rebalancing away from the Seoul metropolitan region and is attempting to pursue a multi-pronged strategy to shift resources and new growth away from greater Seoul, encouraging regional authorities to assume responsibility for the mobilisation and coordination of efforts for development in each region.

In his meeting with the Peer Review Team the Deputy Minister for Education and Human Resource Development stressed the determination of the more participation-oriented central administration to drive through decentralisation, to require regional authorities to take on the new responsibilities, and to strive for "joined-up" government as well as true devolution from the centre. The Minister for Education and Human Resource Development himself is also one of three Deputy Prime Ministers, with oversight for a portfolio of ministries. The intention behind this new system, like the powerful President's Committees, is to override inter-ministerial and inter–departmental separatism and drive forward an overall coordinated decentralisation policy.

As Korea's second largest city, metropolitan Busan, with a population of 3.5 million and all the features of "rust-belt" decline, as well as aspiration to renewal as "dynamic Busan", a world class city, is the classic test case for Korea's decentralisation and rebalancing policy. Failure here would be most damaging to the whole approach as well as serious in itself. The ambition for Busan to succeed on the world stage appears well established and shared, but there is less clarity what is required and how this is to be achieved. Nor is it evident that city leaders have any clear sense what role higher education has in bringing this about. The Peer Review Team was left with a sense that the potential was there but that the vision was not yet well formed. Partnerships are modest and not well tested, and the city's change role is at best embryonic. Given the determination of central government to drive its two key changes forward together, ideally so that they are irreversible two years hence when a general election becomes imminent, the case and sought-after success of Busan is likely to be of wider significance to the nation.

The Peer Review Team found itself wondering whether metropolitan Busan was the right long-term ambition for the decentralised region; or whether there was not a more natural and viable larger region comprising three provinces centred on Busan, which have some natural market and community connection and synergy. On the other hand there appears not to be the locally grounded commitment to inter-regional collaboration between administrations that underpins the creation of the Daegu-Gyeongbuk Regional Innovation Council linking these two administrations in response to the central government initiative. The Peer Review Team was interested to learn about this new level of super-metropolitan governance, but acknowledges that the history of shared life and development is not there in the "greater Busan" south east Korea region to make this easy in the short term. The Team also recognises Deputy Minister Dr Kim's view that a population of a few million is a good size for regional administration to be manageable. Nevertheless

the Peer Review Team recommends that consideration be given to developing a south-east Korean administrative and economic super-region centred on Busan, to achieve the scale and critical mass required to compete and do well nationally and internationally.

Korea is keenly aware of the opportunities and threats presented by globalisation, especially by neighbouring China, a key trade partner, competitor, and now deliberate destination for some of Korea's excess of trained graduates who gain work experience and placements there during their study. The policy of encouraging each region to develop distinctive excellence in the new "knowledge economy" is meant to equip Korea for this global competition. It takes us to the second main policy thrust relevant to this review: the drive to raise the quality and relevance of Korean higher education to serve competitive regional (and thus national) development, by creating much greater specialisation and diversification, making university teaching and research relevant to the economic needs and potential of each region.

Another characteristic shared with most industrially advanced and wealthy countries is a declining birth-rate, increased longevity, and a rapidly ageing population. The first of these, wedded to an outstandingly high age participation rate of over eighty %, presents a life-threatening challenge for

all but the most prestigious universities as competition increases for the declining number of young adults seeking a university education. Despite the need for older working age adults to update their knowledge and skills so as to remain employable in the new economy which is displacing the main late twentieth century industrial revolution and growth phase, rather few older adults receive higher education and this is not seen as a major higher education business arena, with the exception of some continuing professional development (CPD) programmes, and some personal development and civic programmes of courses arranged for retired "third-agers". The Deputy Minister for Education and Human Resource Development on the other hand went to some lengths to emphasise to the Peer Review Team how important the changing demography, and especially the needs of middle aged older workers who has manned the original industrial growth, were to Korea, and so should be to the future work of its higher education institutions (HEIs).

Korean higher education is characterised not only by its very rapid growth and its remarkably high age participation rate, but also be an unusually large private higher education sector among OECD member countries. This makes the study particularly interesting, and instructive for the comparative aspects of the OECD project as well as important. It is also important within Korea, given the rapid reform process and changing demography.

While a large private HE sector is familiar to several neighbouring countries of East Asia as well as the United States, for most OECD countries a private HE sector is virtually unknown, rudimentary, or of very recent origin. Korea with its extremely high age participation rate and very large private sector offers some lessons and from a continental European perspective perhaps surprises. All the private HEIs are not-for-profit institutions, often with strong religious or other charitable foundations and significant income streams from often church-based sponsors and donors. Community engagement and service tend to feature strongly in mission statements, and these and the value base of (notably Christian) service are up-front in student recruitment publicity. There is discussion of allowing the establishment of for-profit HEIs further to sharpen competition, but as yet nothing has materialised, and the large private sector has a character quite different from that called forth for instance by the idea of privatising established public universities in the West.

On the other hand, on a per capita basis Korea has a comparatively high number of HEIs, many of them private and rather small; hence the policy expressed by the government under the New University for Regional Innovation (NURI) programme for concentration, specialisation and diversification so that the HEIs in each region between them meet a range of needs and play a complementary role as an HE *system* calculated to serve the development needs of the region in the quest to rebalance nationally. The Ministry cannot direct the behaviour of private universities, although it wishes to encourage rationalisation including mergers. [4]

While HEIs strive to excel in developing and marketing curricula as educationally sound and offering good employment prospects, there is little sign of widespread more fundamental reconsideration of role in terms of significant partnership, and of other arrangements short of merger (or ultimately closure), within or beyond the sector. That the subject of government "interference" in private HEIs is delicate was illustrated during the visit of the Peer Review Team by media stories about religious groups opposing the reform of private schools; private universities, 70% of which are members of the Korea Private School Foundation Association, are also resisting changes in new legislation designed to increase transparency and public accountability (*The Korea Times*, 16 December 2005; *JoongAng Daily*, 16 December 2005). The Ministry of Education and Human

4 MOE & HRD recently expressed plans to induce the merger and acquisition of private universities.
http://english.moe.go.kr/html/policy/?menu=policy&mode=policy_view&Board_MainNo=59&menuno=02

Resource Development, and indeed regional public authorities, can use incentives and persuasion to try to reform the system, but the scope for direct intervention is limited.

Another distinctive feature of Korean higher education is that it is treated as a unitary tertiary system, in the sense of combining all post-secondary education in a unitary rather than binary way; the one system includes both two/three year and four year institutions. Two/three year junior vocational colleges are called *jeonmun daehack*, which literally translates as "specialised universities", with a strong vocational element responding to industrial needs. These colleges are categorised as part of the higher education system under the Higher Education Act. Colleges and universities, separately and jointly, are sometimes all just referred to as "schools" or as colleges. While the main focus of this project is on four-year institutions, the boundaries between these institutions are getting blurred.

Given the interest of many OECD countries in arrangements to facilitate near-universal higher or post-secondary education in an integrative tertiary system, and the interest particularly in vocational preparation and progression from upper secondary levels,

the Peer Review Team recommends that other countries participating in the OECD project look closely at the Korean system of managing its two year colleges and progression into four year universities, for itself and in the context of regional planning and development.

1.4 The structure of this report

The following chapter sets out more fully the scene for the Busan review in light of the changing industrial structures of the region, national policy contexts, and the wider East Asian political economy. Chapter Two also sets out the role of HEIs in the development of the region of Busan within the fast-evolving national higher education policy context.

Chapter Three examines issues of human resource development within the regional context, while Chapter Four concerns the recent focus on new mechanisms for university-industry cooperation and regional innovation strategies.

Chapters Five considers wider approaches to development – the social, cultural and civic agenda. Here we attempt to look beyond the narrowly economic, and to give a broader sense of the scale and scope of regional engagement strategies and practices across several institutions, while drawing out commonalities of approach.

Chapter Six highlights aspects of the present key role of higher education in regional economic development, in response to national initiatives such as NURI, and the new organisational and management issues that this raises. Chapter Seven looks into capacity-building for regional cooperation in the Busan region. In the final chapter we provide a summary of conclusions for the region and for wider comparison, and draw together the various recommendations that arise in the course of the different chapters.

We end this introductory chapter with a caveat. Our report draws on interviews carried out during a week-long site visit in December 2005, on the findings of the Busan Self-Evaluation Report, and on some additional information provided to the Peer Review Team at the time and immediately after the main review visit. Any such review inevitably represents only a snapshot of an evolving process of development. In the case of Korea and Busan this is a time of very rapid and significant policy change. The coincidence of major change in policy affecting both regional imbalance and devolution and also higher education makes this review very timely. On the other hand it is too early to judge the success

of these new policies. This review can make observations and suggestions; it cannot pass any kind of summative judgement.

2. NATIONAL AND REGIONAL CONTEXTS

2.1 The geo-politics of South Korea and the wider Asian economy

The Republic of Korea confronted massive devastation after the Second World War and the destructive Korean war of the fifties. The task of rebuilding the nation followed throughout the uneasy cease-fire armistice period that has prevailed, instead of a true peace treaty, to this day. The character and style of national government has itself moved a very long way beyond the authoritarian and somewhat harsh post-devastation administration that managed the country for a long period.

For the past four decades, Korea has experienced remarkable economic growth. This rapid growth has been achieved as a result of the government's strong commitment to aggregate economic growth centring on the Seoul Metropolitan area or the so-called Capital Region (Seoul, Incheon, and Gyeonggi-do). Post-war revival took the form of dramatic, but regionally highly unbalanced, growth: the Korean miracle was in effect a greater Seoul miracle, and the disparity between the regions has persisted. Korea paid a price for its huge growth and prosperity, environmentally and perhaps socially. These dimensions are beginning to be both recognised and addressed today.

The Asian financial crisis which began in the autumn of 1997 severely affected the Korean economy. Some effects of the crisis are shown by per capita income decline (from USD 10.6 thousand in 1996 to USD 6.8 thousand in 1998); and the fall of the exchange rate against the US dollar from 845 won at the end of 1996 to 1 695 won by the end of 1997. Korea's industrial structure dominated by *chaebols*, once considered to be the "engine" of its economy, is now considered to be one of the major causes of the economic crisis (Lim, 2000). After the economic crisis of 1997, the previous Kim Dae Jung government succeeded in implementing a number of financial restructuring and liberalisation policies. The economy is changing profoundly as a result of the structural reform programme launched after the 1997 crisis, with increasing integration within the world economy. The Korean economy has recently benefited from strong external demand, particularly from China. International competition is growing. There is rising foreign direct investment especially in the finance sector, while the Korean manufacturing sector is facing severe competition with neighbouring countries such as China, which has abundant cheap labour. Consequently, the country is facing enormous economic and spatial challenges, both globally and locally.

2.2 New paradigm for balanced national development

The concentration of population and economic activities in the so-called Capital Region has been one of the most dominant spatial patterns in the process of rapid industrialisation and urbanisation. The central government policies in the past that maximised national and/or regional development in the interest of efficiency may be one major reason for increasing regional inequalities in Korea. The spatial development strategy in Korea has been almost synonymous with population and industrial decentralisation since the mid 1960s, but so far, it appears that the spatial restructuring of Korea has not yet been successfully implemented. The population growth around Seoul rapidly increased from the early 1970s, resulting in significant costs of agglomeration along with serious urban problems such as rising land and housing prices, environmental deterioration, and traffic congestion. The dominance of the Capital Region is attributed to the abundant job opportunities, the concentration of R&D expenditures and personnel in both the public and private sectors, in-bound foreign direct investment, and over-concentration of large enterprises principally caused by government-led economic development. The Seoul metropolitan area contains 11.8% of Korea's total area, while accounting for

about 45% of total population, and about 55% of manufacturing firms. 95 of the 100 largest firms have headquarters in the same area (Lim, 2000).

The national reform process led by the democratic and innovative reforming "participatory government" of President Roh Moo-Hyun, following the previous Kim Dae-Jung government, has been under way about two years. Since the launch of the new government in 2003, the Korean government has implemented various policies to achieve *Balanced Development of the Nation*. The context is one of political as well as economic liberalisation. The Korean government now attempts to promote regional development by inducing a policy shift from a centralised and concentrated approach to a decentralised and less concentrated one. The emphasis is primarily placed on local government-initiated development through endogenous development strategy, as opposed to the local government's heavy dependence on central government, especially in terms of financial allocation (Lee, 2004).

In order to achieve successful balanced development, the government has emphasised cooperation among local universities, enterprises, local governments and local public institutions. The President's Committee approach implies serious commitment to having these policies enacted. But there is without doubt an almost universally shared problem about centralist traditions and an instinct for control, and a related problem of working in strong vertical silos with little effective horizontal collaboration, and little inter-portfolio sharing of power and responsibility.

The Presidential Committee on Balanced National Development was established in 2003, being composed of government (12 Ministries) and civilian members. They published *Vision and Agenda for Balanced National Development* in May 2003 in which operational strategies to achieve balanced regional development were schematised, such as the building of Regional Innovation System (RIS). The Special Law on Balanced National Development was passed in December 2003. The Presidential Committee approach implies the government's serious commitment to having these policies enacted. But there is no doubt an almost universally shared problem about centralist traditions and an instinct for control, and the related problem of working in strong vertical silos with little effective horizontal collaboration, and little inter-portfolio sharing of power and responsibility.

In order to enhance regional capacity and conditions for internal local development, there should be a clear division of responsibility, and an upgrading of the capacity of local governments to enhance balanced regional development.

The Peer Review Team recommends that close coordination and collaboration between central and local governments be accorded high priority as being indispensable to implementing devolution and regional development strategies.

In order to achieve successful balanced development, the government has emphasised cooperation among local universities, enterprises, local governments and local public institutions. Universities, so far, have not been seen as at all strongly collaborative and inter-connected with industry and the community within their respective regions. Universities are not highly entrepreneurial in respect of industry collaboration and partnership, nor are they as a rule strongly collaborative and inter-connected to each other within the region, or at any other level. All the above organisations are now facing new challenges to discover and create a role for universities in the regions, and to develop a process whereby these universities may be involved in helping to reduce regional disparity.

The Peer Review recommends that in order to enhance regional capacity and conditions for internal local development, there should be a clear division of responsibility between the centre and

the regions, and upgrading of the capacity of local governments to enhance balanced regional development.

2.3 The higher education policy context and the reform agenda

The new policies make large demands for reform and development on a higher education system that is already unusual, and located at the end of a spectrum of "models" within the OECD Member States and their higher education systems. The Korean education system is characterised by an emphasis on primary education. Beyond the primary level, the state concentrates its resources on national priorities, allowing the private sector to fill the gap between demand and supply. As a result of this emphasis on primary education, the proportion of state educational spending on higher education in Korea is around one-third of the OECD average. The private sector provides around 75% of tertiary education in Korea, which has enabled the rapid creation of a mass higher education system in Martin Trow's definition.

The number of higher education institutions in Korea increased from 142 in 1970 to 411 in 2004. During the same period, the number of students in colleges and universities increased by about 17.7 times (from 201 436 to 3 555 115). The number of faculty in post-secondary institutions also increased greatly, from 10 435 in 1970 to 62 631 in 2004. Korea's enrolment rate in higher education is one of the highest in the world. Currently more than 95% of eighteen-year-olds graduate from high schools, and 81.3% advance to higher education institutions.[5]

Since the launch of the Kim Young Sam government in the early 1990s, the nature of higher education policy shifted from the previous top-down mechanism to a policy of deregulation geared toward the "demand side", that is to say students and universities themselves. The number of university students rapidly increased during the 1990s due to government policy to deregulate and expand student numbers at HEIs.

However, the rapid growth of higher education brought several problems. A major drawback of such rapid growth was that quantitative expansion was not accompanied by a qualitative advance in higher education. While colleges and universities sprang up across the nation, backed by public and private expectations about higher education, conditions of higher education have not been improved. It has been pointed out that, contrary to expectations, some indicators such as student-faculty ratio show that conditions of higher education have rather deteriorated. There is also a mismatch in terms of the number of university graduates and the graduate level jobs available. Since the 1990s most of the employment rates of the four year universities have been under 60%, while specialised 2/3 year colleges have maintained around 80% employment. Since the mid-1990s, higher education policy has further changed to promote diversity and specialisation of HEIs by linking performance reviews to financial support with greater focus on special projects.

A continuing decrease in the college-bound population is another major challenge to colleges and universities in Korea. Since 2000, the age cohort size, and so the absolute number of high school graduates, has been declining. In 2002 the number of university places available exceeded the number of high school graduates. According to recent population growth projections, the college-bound population (age 18-21) will drop massively, from 3 278 000 in 2000 to 2 336 000 in 2020. The number will go down further to 1 511 000 in 2030 (Lee, 2005). This huge drop in college-bound population means that colleges and universities will undergo still fiercer competition with one another in order to recruit students. The fall in the college-bound population is a huge threat to Korean colleges and

5 Korean Educational Resources Information Service, March 2005
http://eris.knue.ac.kr/html/notice/news/read.asp?board_index=28&page=6&searchfield=&searchtext

universities, especially for private institutions and institutions located outside the Seoul metropolitan area: these types of institutions have disproportionate difficulties in recruiting students and securing their future financially.

2.4 New Universities for Regional Innovation (NURI)

Against such a background, the new Roh government launched a major new initiative, the New Universities for Regional Innovation (NURI), along with other reforms of higher education at the national level such as the Brain Korea 21 (BK 21) project.[6] The NURI Project is a government-funded project to strengthen the capability of colleges and universities located outside the Seoul metropolitan area which comprises Seoul, Incheon, and Kyunggi-do. The NURI Project, which is aligned with the major national policy, *Balanced Development of the Nation,* focuses on (1) reinforcing the capabilities of local colleges and universities, and (2) linking the capacity-building of local colleges and universities to promoting and facilitating the development of the regional economies.

The NURI project aims for the equitable development of the nation, by selecting and nurturing regional universities with excellence, by region. Specifically, the NURI project aims to develop college curricula in terms of specialised areas which are closely aligned to characteristics of the regional economy, thereby improving the relevance and competitiveness of colleges and universities. The NURI project also aims to promote regional development by training high quality manpower; the project will cultivate college graduates through various educational programmes reflecting the demands of the labour market as well as the needs of regional industries. The resulting highly qualified college graduates are expected to invigorate the regional economy. Another essential purpose of the NURI project is to establish a collaboration system, called the Regional Innovation System (RIS), in which HEIs, local governments, research institutes, and corporations build partnerships for mutual development and improvement (Lee, 2005).

The Ministry of Education and Human Resources Development announced in June 2004 that they had selected 112 universities, including some two-year colleges, for 111 project teams as schools supported by the NURI project. A 1 420-billion-won budget will be spent by NURI through to 2008. Altogether, 454 project candidates nationwide applied for NURI project inclusion. Universities, local governments, and local industries formed project groups to promote mutual efforts, and to cultivate diverse manpower for regional development. Large-scale project teams that are funded with 3 to 5 billion won per year number 25, mid-scale ones with one to three billion won also number 25, and there are 61 small-scale ones for less than one billion won.

Seventy-nine universities among a total of 135 four-year regional universities, and 33 colleges among a total of 106 regional colleges, will be supported by the programme. The Ministry made a decision to distribute equally the available financial resources into 11 districts in the nation, excluding the Seoul metropolitan area, while selectively focusing on supporting competitive areas. The selected project teams are supported with a five-year supply of personnel expenses, management costs, money for materials and machines in laboratories, scholarships, and other benefits. The Ministry of Education and Human Resource Development will discontinue the assistance if a project team disqualifies itself in annual evaluations.[7]

6 Recent reforms of higher education at the national level can be summarised by the following four projects: 1) The Brain Korea (BK) 21 Project; 2) The New University for Regional Innovation (NURI) Project; 3) The Study Korea Project; 4) The Plan for Restructuring HEIs.

7 “Regional Universities' Restructuring Accelerated” The Dong-A Iibo, 16 June 2004, http://english.donga.com/srv/service.php3?biid=2004061787528&path_dir=20040617

2.5 Putting Busan in context

The two government initiatives mentioned above, Balanced Development of the Nation and the NURI Project, come together to make the choice of Busan as an OECD case study timely and significant. Busan is Korea's second largest economic centre. It is a post-industrial city that has to address the complex challenge of restructuring its economy in the globalising economy. The city needs to secure long-term regional growth by shifting toward innovation-based regional development.

As the second largest Metropolitan City after Seoul, Busan is the obvious test case for two major thrusts of Korea's domestic policy initiatives affecting (1) regional development and rebalancing to reduce the huge disparity and domination of the greater Seoul region, and (2) the reinforcing and reform of higher education at the regional level. They combine, as central purposes, significant devolution of responsibility and resources for development to the regions, with ambitious plans to rationalise and enhance the quality of higher education, while increasing its relevance and utility, especially at local-regional levels. In this case study that means the further regeneration of Busan within a knowledge society and economy, both economically and perhaps more broadly in terms of culture, identity and quality of life.

Since the opening of its port in 1878, Busan has been the second largest city and Korea's largest port city. To the east, the automobile and steel industries are clustered around Ulsan and Pohang. To the west, Changwon is an important centre of machinery industry. The city of Busan has the fifth largest container port in the world and the largest in Northeast Asia. When the Korean government launched its industrialisation process in 1962, Busan played two important roles. One was as a port, the other was in its role as an emerging industrial city. From the early 1960s, Busan was rapidly industrialising by attracting labour-intensive industries. The footwear industry was the most significant in regional output and employment up to the mid-1980s.

However, a rapid rise in wages and changing technology made this industry less competitive, and it has been declining without any substitute in sight. As the Korean economy kept growing at a headlong pace, Busan began to lag behind the more recently industrialised regions. Busan's manufacturing industry peaked around the 1980s while the national average kept on growing at least until 1996. In the early 1990s, Busan tried to attract an automobile assembly factory to achieve an industrial transformation, seeing automobile production as the engine of regional growth. However, the economic crisis of 1997 hit the regional economy, and Busan lost its major industries (Lim, 2000).

There remains a fundamental question as to why Busan has been suffering from economic lag despite its locational advantage, such as having the best port in the country, and despite the Korean economy's high overall growth rate maintained over more than the past four decades. The first answer to this question is the overwhelming dominance of the Seoul metropolitan area in the national economy, which explains not only Busan's but also many other regions" and cities" relative deprivation. According to the third National Land Development Plan (1992-2001), Busan was designated as a national centre for finance, trade and logistics. But the lack of corporate headquarters in the region tend to make other industries less efficient and less productive, rendering producer services less effective.

The second reason for the relative lag of Busan has been the lack of local autonomy in developing a regional industrial policy. In the past, under the central government-selected industrial location policy, there had no opportunity for Busan to transform its industrial structure on its own. Prior to 1995 there was no real local autonomy, and local governments were not permitted to implement their own industrial policy. For a long time, city governance was dominated by a mayor

appointed by the central government. As the mayor is now elected, he/she has to pay more attention to local public opinion.

The third reason for Busan's economic difficulty was the central government's designation of Busan as a growth constraint area in the early 1980s. Firms in the city were encouraged to move out, while incoming manufacturing firms were subject to heavy taxation. This policy was fatal to Busan's industrial restructuring, as it restrained the development of urban service, as well as the manufacturing sectors. From 1989 onward, the city's population started to decline, while other large cities in the region were gaining in population.

Large firms represent only 0.4% of total firms in Busan, while headquarters of the remaining firms are located elsewhere, often in Seoul or in Gyeonggi province. Research functions are kept closer to the decision centres in the capital region, because most of the labour force is there. The remaining 99.6% of enterprises in Busan comprises small and medium sized enterprises (SMEs).

There is a question whether, in the medium term, the region should be just the Busan city administration, or the three administrations that together comprise the south east region of Korea. Busan is located at the centre of the so-called "Southeast Industrial Belt" along the coast. Until the 1970s, Busan city used to play the role of a core region in the Southeast Industrial Belt, but since then it has not accomplished its maximum potential. While business activities tend to expand beyond city boundaries, the current policy of regional economic development tends to be applied to existing administrative boundaries.

The significance of the south east region as a wider economic zone has been recognised under the Presidential Committee on Balanced National Development. The first five year plan on Balanced National Development divides the nation's territory into six regions, including the south east region. The south east region comprises Busan Metropolitan City, Ulsan Metropolitan City and Gyeongsangnam-do. Busan Metropolitan city visualises its future as the backbone of the south east economic zone, and the centre for marine culture and tourism of Northeast Asia. There is a common regional vision to create a broad regional cluster in the south east linking Ulsan-Busan-South Gyeongsang.[8]

2.6 Restructuring Busan: governance, economy and the role of the universities

Busan is now confronted with multiple tasks to thrive in the 21st century. The most urgent is to revitalise its economy. The goal and process of economic revitalisation is through industrial restructuring and human resource development for the region. Busan's economy is now shifting from its manufacturing structure to one more oriented toward a producer service-oriented structure. For Busan, however, a quick turnaround from manufacturing industry is difficult even if it is a declining sector in terms of regional output and employment.

The government encourages specialisation for regions as well as for universities. In Busan, there are four core strategic industries, port logistics, mechanical parts and materials, tourism and conventions, and film and IT, and six "regionally embedded strategic industries" - finance and futures, bio-marine, silver industry (meaning care and services for the elderly), footwear, processed marine products, textile and fashion.

8 The central government has attempted to establish the Southeast Regional Cluster Planning Body. See OECD (2004) Territorial Review Busan pp. 100-101.

Both central and local governments in Busan have shown keen interest in the concept of a Regional Innovation System (RIS), and have readily adopted the term in their economic development plans. However, turning the region into a RIS should not be an objective in itself, but a framework for thinking which can help to design innovative policies, and to encourage the dynamics for growth (OECD, 2004). With the launch of RIS, local government has more responsibility in implementing its own industrial policy and strategies, but even today, the local government needs stronger autonomy and more ability to implement a decentralised planning system.

In view of local government's need to have the instruments necessary for a successful industrial policy, such as budgeting, financing, investment and authorisation, the Peer Review Team recommends that efforts to be redoubled to enable this at regional level.

The central government asked local governments to draft their own regional innovation plans. In the process of designing its own *2004-2008 Five-Year Regional Innovation Plan*, Busan launched a Regional Innovation Agency composed of 56 representatives from city government, the business community, universities, research institutes, and civil society in April 2004. The agency is located in Busan Techno Park. Its role is to monitor regional innovation policy in the Busan area, acting as a co-ordinator and networking facilitator in close collaboration with Busan Regional Innovation Committee (BRIC). The strength of a regional innovation system depends on the existence of integration mechanisms and actors providing guidance to combine knowledge inputs from the different partners. Inter-SME co-operation should be further promoted, and demand for R&D needs to be properly addressed, especially in traditional sectors.

To reverse the downward economic trend, and to attract new businesses, in particular foreign inward investment, to the city, the newly opened Busan-Jinhae Free Economic Zone is one of the government's most salient initiatives since 2003. The current government has also designated four municipalities, including Busan, as special development zones, to achieve balanced regional development across the country.

Busan has an available knowledge pool in the form of local universities and R&D infrastructure, but it needs to better coordinate existing knowledge in order to collect innovative output. Busan ranks fourth in Korea in terms of R&D expenditure per capita, but it is characterised by the proliferation of relatively small-scale research bodies in various industrial sectors that remain sometimes underused due to the lack of critical mass and of financial support. A practical way to add some weight to local research capacity would be to attract more branches of large national or regional research institutes that could take on local leadership and generate spillover effects on the existing small-and medium-size research bodies (OECD, 2004). The national context offers opportunities to revitalise local research, thanks to the central government's effort to decentralise major public institutions outside the capital area. Busan applied for the relocation of public institutions related to its port economy as well as its new emerging industries.

Regional universities are certainly well positioned to become a driving force in innovation networks, and have already taken useful steps in building up RIS and broader social networks. However, universities in the region still need to improve the quality of their R&D, and to re-balance their teaching, research and regional economic engagement functions. The obvious lack of knowledge transfer from research institutes and universities to local firms needs to be solved in order to link production and diffusion of innovation.

The Peer Review Team recommends that efforts be made by Busan City in partnership with its universities and MOE & HRD to correct the mismatch between the supply of research and the needs of firms due to sub-optimal research programmes.

As with regions in many OECD cities, Busan has been suffering from a severe brain drain toward the capital region. Brain drain to the capital region may serve as a deterrent to locating large firms" R&D and their managerial functions in the Busan area. In Busan, the relative mismatch between the curricula of local universities and the needs of local firms suggests that the capacities of the local talent pool could be better utilised. The same curriculum is duplicated in several different universities, and there is a shortage of specialised human capital that could match the needs of regional industries on the Busan labour market.

In order to remove such obstacles to synergistic effects, the Peer Review Team recommends that links between education and business communities are significantly reinforced in Busan, by implementing industrial liaison programmes and other forms of liaison activities.

3. TAKING FORWARD REGIONAL HUMAN RESOURCE DEVELOPMENT IN THE REGION

3.1 Teaching, learning and the student agenda

Universities play a pivotal role in human resource development in Busan. Although there is rising concern that a significant proportion of talented high school graduates move out to the Seoul metropolitan area for better education, statistics show also that over 80% go on to HEIs in metropolitan Busan, and most of these university graduates get a job in the region.

Universities also contribute to regional development by collaborating with regional industries in Busan's strategic areas. Individual universities are developing specialised fields relating to the core strategic industries of Busan. For example, Busan Maritime University's area of expertise is oceanography; Pukyong National University specialises in fisheries; and Kyungsung University and Dongseo University focus on digital animation and films.

Nevertheless, like other regions in Korea, Busan also seems to face a supply-demand mismatch of human resources. Since the majority of this region's industries is SMEs, the demand for college graduates trained in vocationally oriented fields is much greater than that for graduates with a general education. The industry demand has been unmet so far. Ryu et al. (2005) predicted a 20% over-supply of those graduating with college degrees during the period from 2004 to 2015. More specifically, the review team learned that graduates of four-year HEIs find it more difficult to get a job than those of junior vocational colleges (typically 2-3 year HEIs). The employment statistics published by KEDI and MOE & HRD confirmed that the average employment rate of four-year HEI graduates is somewhat lower than that of vocational junior colleges in Busan. Furthermore, as in other advanced countries, high school graduates with high achievements in Korea prefer educational programmes for professional careers, such as medical doctors and lawyers, rather than those for engineers. The Busan region was also a part of this trend. While the region needs more quality engineers in port logistics and distribution, its universities seem to fail to meet the demand for skilled work-forces in Busan. In addition, although SMEs continue to ask HEIs to incorporate a vocational dimension into the university curriculum, their request has not been fully answered.

Table 3.1. Employment rates (%) by institutional type, compared to the national averages in 2004

Region	Junior College		University		Graduate School	
	Total	Female	Total	Female	Total	Female
National average	77.2	75.6	56.4	53.5	82.4	76.4
Busan	83.3	81.2	59.3	57.2	83.1	76.4

Source : KEDI • MOE&HRD (2004). Current Status of Korean Higher Education: 2004 indicators

The Peer Review Team recommends that four-year universities in the Busan region downsize their undergraduate enrolments and adjust themselves to match the regional demands for human resources. Furthermore, universities should be more active in incorporating industrial needs into their curricula.

Responding to regional needs

Universities in Busan have sporadically attempted to incorporate meeting regional needs into research and education long before the implementation of NURI projects, which seem to have accelerated the collaboration between universities and regional stakeholders. As presented in the SER, universities in Busan have differentiated themselves from those of other regions and developed various programmes for regional development. For example, Kyungsung University introduced the idea of an "open university", which makes university facilities, such as the library, museums and sports centre, available to the local community. The trade incubator of Kyungsung University, which is introduced in the SER, is another example of a region-based educational programme.

Although these efforts at institutional level reflect in part how seriously universities respond to their region's needs, the review team was unable to locate a formal mechanism to incorporate industries" requests into the university's curriculum. The lack of such a mechanism can be attributed in part to their concern over the extent to which they should take into account regional needs. Several deans of academic affairs whom we interviewed mentioned that they were struggling to create a balance between what industries ask and what the university is supposed to do. More importantly, the cooperation of university faculty is essential for curriculum revision, which is rather difficult to obtain in the current situation, where collaborations among regional stakeholders have only just begun.

The Peer Review Team recommends that individual universities each establish an official mechanism to reflect their regional needs and to run it in an effective way. In the long run, it is crucial to revise the evaluation system so that a new culture of collaboration thrives.

A division of labour

Throughout our visits, we found that while universities in Busan worked as traditional HEIs, a new trend of industry-university cooperation is beginning to emerge. University staff whom we interviewed acknowledged that faculty members were becoming concerned with their decreasing commitment to teaching and research, since they were more frequently asked to take on another role, that of university-industry collaborator. What is worse for faculty members at national universities is that the relatively low tuition rates attract more students into graduate programmes for workers. This in turn increases the faculty's teaching loads from nine credit hours, which is officially recommended by the MOE & HRD, to 12 to 15 credit hours, which is 30% to 50% more than is recommended. The less competitive salary of faculty members at national universities entices them to do more teaching on the graduate programmes. It may be a win-win strategy for national universities to get rid of most specialised graduate programmes, except for some that are in low demand but important.

Table 3.2. Number of graduate programmes, departments and enrolments in master's degree programme by institutional type, 2004

Institutional type	Number of institutions	Number of graduate programs	Number of departments[1]	Enrollment in masters degree program
National	4	16	339 (137)	8,646 (4,467)
Private	10	47	431 (234)	6,352 (4,392)

1. at graduate level
Note : Numbers in the parenthesis exclude academic graduate programs.
Source : KEDI•MOE & HRD (2005). Basic Educational Statistics.

The Peer Review Team recommends that serious consideration be given to a division of labour between national and private universities. National universities should downsize their graduate programmes in a significant way, leaving most of this work to private universities with teaching capabilities.

3.2 Contributors and mechanisms for stronger HRD in the Busan Region

Contributors

Collaboration among regional stakeholders is essential for regional human resource development. The review team learned that many stakeholders, not only the central government but also the Busan city government, HEIs, economic and labour associations, Technopark and RIC, were working hard on human resource development in Busan, although not in a collective way. First of all, the central government, especially through the NURI project initiated by MOE & HRD, contributes to regional HRD. NURI was designed to help HEIs to develop skilled workforces according to the needs of regional industries.

The city of Busan recently implemented *Busan Brain Korea 21*, which was designed to encourage talented people to stay in the Busan region. It provides graduate students with financial aid: 400 000 won a month for master's degree candidates; 600 000 won a month for doctoral students. The programme started in 2002 and will last until 2006. Most of the areas it supports are in Busan's strategic industries, but other areas take into consideration the needs of national development.

The Busan Office of Labour runs HRD programmes for job-seekers with college degrees, and develops vocational training programmes geared toward regional enterprises. Specific programmes include a job training programme, and support for internships.

Box 3.1 Busan Employers' Federation and Busan Chamber of Commerce and Industry

Busan Employers" Federation Membership

Out of 2 400 member companies, 400 companies hold a full membership, paying a monthly membership fee of 50 000 won. The rest of the companies pay administrative fees for government affairs. About 99% of the member companies are SMEs with fewer than 300 employees.

Busan Chamber of Commerce and Industry (BCCI)

The BCCI is an association independent from the government. The Chamber's major clients are SMEs. Until 2002, SMEs exceeding a certain threshold of sales were forced to become a member of the BCCI by law. After that, enterprises were no longer required to join. Due to this change, the membership of BCCI fell to 3 500 from 8 000 in 2002.

Representatives from industry and labour associations also mentioned that the fledging collaboration between HEIs and industries in Busan for regional HRD resulted from the NURI projects, which reflected business enterprises' demands. For instance, BCCI formed a network with HEIs in Busan in 2004. There was no official mechanism for the BCCI to work together with HEIs until 2003, but the network developed as the E-Commerce Research Centre (under the BCCI) and NURI projects were introduced. As a result of collaborative activities, new HRD joint programmes between the BCCI and Busan HEIs have been created. Busan TechnoPark, sponsored by the Ministry

of Commerce, Industry and Energy, also contributes to regional HRD by providing grants to graduate students who do research in strategic industries of Busan.

The Peer Review Team recommends that central and local governments continue to support the key regional stakeholders for HRD through government-funded projects like NURI.

Collaborating mechanisms

In addition to the various networking mechanisms mentioned earlier, there are also comprehensive coordinating bodies for regional HRD. Until recent years, Korean universities were directly controlled by the central government, so they had only loose ties with local governments and regional agencies. To strengthen those relationships, HRD centres were set up in each region outside of the Seoul metropolitan area in 2004. One of them is BHRDI, which receives an operating budget from the MOE & HRD through the Busan city government. Its board consists of all HEIs (15 four-year universities[9], 12 junior colleges) and 13 regional agencies, including the Busan city government.

Although the scope of the Institute is quite comprehensive, it appears that it mostly offers education and training programmes for regional HRD. The RIC's HRD sub-committee is another coordinating body, membership of which overlaps with that of the BHRDI board. During a meeting with the committee members, we received the impression that the HRD sub-committee seems to be representative but lacks professionalism and an active commitment to its mission. It should be noted that there is no umbrella organisation to coordinate HRD policies and the activities of various stakeholders. Collaboration among the coordinating bodies is not substantive. The weakness of this coordinating mechanism explains in part the lack of cooperation among HEIs in Busan.

The Peer Review Team, believing that active collaboration among regional stakeholders is the key to effective regional HRD, and that establishing a strong coordinating mechanism for RHRD is essential, recommends that the role and function of BHRDI be further bolstered to serve as the knowledge centre for regional HRD.

3.3 Brain drain and gender issues

Maintaining high quality human resources

Attracting and retaining talented people is as important as HRD for regional development. Talented people are more likely to move to places with better job opportunities and quality of life. Through a series of meetings with many stakeholders in Busan, we perceive that the disparities in economic, social and educational conditions between the Seoul metropolitan area and elsewhere seem to be substantial. This prompts high quality workers to move into the Seoul area. Statistics confirmed these disparities (see Table 3.3 & 3.4 below).

Although Busan is the second largest city in Korea, brain drain is one of its toughest regional challenges. It occurs systemically at various stages. First, a significant number of high achievers from high schools in Busan go to universities in Seoul. Secondly, students matriculating at universities in the region later transfer to other universities outside Busan for a better education. Finally, college graduates with honours degrees move out of Busan for better job opportunities (Busan Metropolitan City & Busan Metropolitan City Office of Education, 2003: pp. 170-175).

9 This includes 13 universities in Busan, and Inje University and Youngsan University from the neighbouring province, Kyungsangnam-do.

Central and local governments have implemented BK21 and Busan BK21 to address the brain drain issue, but the programmes have not been as successful as was hoped. The central government even announced that it would relocate public institutions related to Busan's strategic industries into Busan as a part of its plan to balance national development. However, previous experience tells us that the relocation of public institutions alone cannot solve the problem. Daum, one of the leading Internet portal companies in Korea, which recently moved from Seoul to Jeju Island, still recruits the majority of its employees from Seoul instead of Jeju.

The Peer Review Team believes that competitive, highly respected universities attract talented people to their regions. For Busan to become a leading region, the Team recommends that the City sets itself the challenge of having at least two world-class universities in the region.

More female students in engineering programmes

The situation is improving, but female college graduates" participation in the labour market is still relatively weak. More seriously, in Busan most female graduates are employed in low-skilled industries with relatively low salaries. However, even though engineering is less popular as a major, women are increasingly advancing in those fields with the government's financial assistance.

The Peer Review Team recommends that universities redouble efforts to recruit more female students into the engineering and natural science programmes, and that employment promotion activities for female students such as internship programmes should be further emphasised.

Table 3.3. Regional Gross Domestic Product, 2000-2004
(Unit: million won, relative % to Seoul)

Region	Year 2004		Year 2000	
	GRDP	Relative %[1]	GRDP	Relative %[1]
Seoul	162,758,812	100	140,731,584	100
Busan	41,051,399	25	36,431,928	26
Daegu	22,811,094	14	20,142,453	14
Incheon	32,796,015	20	28,330,608	20
Gwangju	15,221,991	9	13,282,542	9
Daejeon	16,808,684	10	14,764,341	10
Ulsan	29,662,029	18	26,332,336	19
Gyeonggi	139,391,889	86	130,632,288	93
Gwangwon	19,497,122	12	16,680,679	12
Chungbuk	21,841,747	13	21,230,766	15
Chungnam	37,351,035	23	33,581,549	24
Jeonbuk	21,892,904	13	19,670,179	14
Jeonnnam	31,391,221	19	25,079,636	18
Gyeongbuk	52,066,313	32	46,622,292	33
Gyeongnam	47,284,761	29	42,878,918	30
Jeju	6,363,610	4	5,626,855	4

1. Relative % to Seoul's GRDP

Source : Korea National Statistical Office (2005). Regional Gross Domestic Prod

Table 3.4. Number of Persons employed by Region and Occupational Category, 2002
(Unit: thousand, %)

Region	Number of persons employed (percentages)								
	Total	Professional, technical, managerial		Administrative		Service & sales		Low skilled	
Seoul	4,783	1,363	(28.5)	699	(14.6)	1,295	(27.1)	1,417	(29.6)
Busan	1,704	280	(16.4)	200	(11.7)	532	(31.2)	672	(39.4)
Daegu	1,155	202	(17.5)	148	(12.8)	359	(31.1)	424	(36.7)
Incheon	1,178	219	(18.6)	136	(11.5)	316	(26.8)	496	(42.1)
Gwangju	603	120	(19.9)	81	(13.4)	184	(30.5)	191	(31.7)
Daejeon	642	135	(21.0)	91	(14.2)	209	(32.6)	196	(30.5)
Ulsan	473	78	(16.5)	57	(12.1)	110	(23.3)	211	(44.6)
Gyeonggi	4,485	1,038	(23.1)	698	(15.6)	1,017	(22.7)	1,548	(34.5)
Gwangwon	683	81	(11.9)	75	(11.0)	202	(29.6)	213	(31.2)
Chungbuk	682	85	(12.5)	72	(10.6)	176	(25.8)	218	(32.0)
Chungnam	908	87	(9.6)	90	(9.9)	201	(22.1)	286	(31.5)
Jeonbuk	841	103	(12.2)	79	(9.4)	214	(25.4)	237	(28.2)
Jeonnnam	981	91	(9.3)	81	(8.3)	232	(23.6)	257	(26.2)
Gyeongbuk	1,378	146	(10.6)	146	(10.6)	319	(23.1)	406	(29.5)
Gyeongnam	1,402	202	(14.4)	140	(10.0)	355	(25.3)	475	(33.9)
Jeju	271	33	(12.2)	30	(11.1)	75	(27.7)	77	(28.4)

Source : Korea National Statistical Office (2004). A Survey of Economically Active Population

4. THE CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

4.1 Institutional strategies for industry-university links

Academic-industry relations may be considered as a subset of the university's relationship with external actors: government at various levels, NGOs, and intermediate categories such as its own alumni. Of course, when the university is a subsidiary part of government or industry the relationship is more likely to be shaped by its sponsors than when the university is an independent actor. All of the above considerations may be identified in the university-business relationship in Korea.

The traditional relationship between university and industry has been the supply of human capital. We shall use this term since many companies traditionally complained that they did not receive "trained human-power" from the academic sector and had to conduct considerable training of their own to make their employees useful members of the firm. In Korea the main university-industry issue prior to 1997 may be said to be the degree to which the university should provide industry-specific or firm-specific education.

This chapter discusses the sea change in university-industry-government relations that followed upon the 1997 economic crisis. The effects on the university included expansion from a narrow focus on certifying students for employment in large organisations to a broader focus on providing students with skills to work in SMEs in new and old sectors, improvement of SMEs, assisting firm formation, and playing a role in formulating and enacting regional development strategy.

The world has turned

The 1997 financial crisis changed the terms of the debate, since one outcome was the realisation that Korea could no longer almost entirely rely on large conglomerates (*chaebol*) as a major source of employment for university graduates. The focus shifted to small and medium sized firms and the potential of the university as a source of new firms. The ability of the university to perform these new roles often meant developing additional capacities that were quite new to the academic scene, with the exception of highly specialised universities in fisheries etc. that had long-standing relations with an industrial sector and were a source of information to firms, mediated through government agencies, as for example the collection of marine data by a university training vessel in the maritime sector.

More traditionally academic focused universities had to develop new capabilities. This largely appears to have taken place through extension of the professorial role, adding on new activities and responsibilities, rather than by drawing in persons from the sectors that the university wishes to relate to as Professors of Practice – an alternative, supplementary, model. Relationships with existing firms typically follow a procedure of pairing faculty members with individual firms related to their areas of expertise, in the expectation that the faculty member, together with their student, will be a useful source of advice and problem-solving for the firm. Students will gain some familiarity with SMEs and consider them as an alternative source of employment to large firms. Such one on one relationship programmes build on previous informal relationships that may have existed between professors and firms prior to the crisis.

System of family companies

At one university, 170 companies registered for the 1-1-3 system, in which a professor and a team of 3 students cooperate in assisting technological development or providing managerial guidance to firms. The university equipped itself with expensive facilities for these companies to share. Faculty members receive incentives in their evaluations for participating in this programme. These programmes formalise previously informal relationships between academics and firms, making them an explicit part of academic training and teaching for students, while also expanding the number of firms involved.

However, the capacity of this model is likely to be limited by the number of firms an individual professor can take on in addition to regular teaching duties and increasing expectations for research. Even with a decline in student numbers that might allow for a reduction in traditional classroom teaching responsibilities in favour of alternative tasks, an individual relationship model may need to be supplemented by a group approach, such as the use of student firms as intermediaries. The two approaches are commonplace in the US and Brazil.

The introduction of increased responsibilities for faculty members to participate in relations with industry has raised the issue of adjusting traditional evaluation criteria, focused on teaching and research, to take account of this new task. It appears that the universities with which we held discussions are aware of this problem, and are taking steps to revise their tenure and promotion guidelines accordingly.

The Peer Review Team recommends that Busan look closely at approaches and examples elsewhere and test some of these selectively; and that the Ministry of Education take a close and supportive watching interest in such experimentation.

Technology transfer

A Busan research university is engaged in informal relations among firms and faculty members, contracts, patenting, licensing and firm formation. The university began with an information strategy by publishing a booklet that introduced new technology developments to readers. As a result, some people from companies come and buy new technologies developed at the university. The School also utilises joint development approaches, in which its researchers work with firms and even take out patents jointly. Some know-how of professors is transferred, some is licensed. Inventions embodied in patents are said to be the most difficult to commercialise, no doubt because their patentability is also an indicator that they are a long range technology that will require a longer development and incubation effort. The university appears to be engaged in the full range of forms of technology transfer.

The Peer Review Team recommends that universities within the region deliberately learn together from one another and emulate successful best practices.

Reallocating resources

A relatively inexpensive US National Science Foundation Program, Industry Cooperative University Research Centers (IUCRCs), brings together groups of firms in an industrial sector, typically located in the same region. Each firm contributes an amount of funds matched by government. These funds are pooled in a common pot, and firm representatives, together with professors from one or more universities, act as a “club” in deciding upon joint projects, usually research that addresses common problems. This is carried out by professors and students, sometimes

with industry participation. Informal learning and collaboration among firms is often a side effect of membership in the club, going beyond the specific findings of the project. Over time, the firm contribution increases and the government contribution declines. Typically, firms have found the model so useful that they ask for the programme to be extended beyond the initial five-year time limit.

A higher level, more expensive version is the NSF Engineering Research Centers Program which involves advanced training of PhD students, who conduct research in emerging inter-disciplinary fields, These Centers have firm memberships and contributions, but the research projects are more university-led and at the advanced edge of technology, where firms may not yet be developing products. Participation provides firms with a window on an emerging technology, especially since firm researchers from various companies participate in the centres on a secondment basis.

This model is, of course, based on universities with highly developed research capabilities that are extended through these centres. They also typically involve a lead university, with several other associated schools in order to create a critical mass in a new field. This may be useful as a model, both to develop research capabilities in emerging fields with theoretical and practical potential, as well as to encourage inter-university cooperation. This issue will be especially salient to Busan as strategy shifts from assisting existing industries and forming new firms based on existing technologies, to the more difficult task of firm formation from leading edge technologies, more closely tied to academic research.

The Peer Review Team recommends that Busan consider the desirable balance between research for longer term new developments and "exploitative" R&D for the use and dissemination of existing technologies, and develops more inter-institutional collaboration and partnership of a complementary nature.

In Korea, the Ministry of Commerce, Industry and Energy (MOCIE) funds research in industry. The Ministry of Science and Technology (MOST) funds research at public research institutes and universities. The Peer Review Team considers that it is important to promote some of the jointly funded university-industry research with different government agencies such as MOE, MOST and MOCIE while recognising different areas of strength of each ministry. This is based on the view that in order to support the widest commercial development of scientific knowledge and services, the creation of critical mass is vital. A good example of such joined-up funding is the Industry-University Cooperation Hub project jointly funded by several Ministries: MOE, MOCIE, and the Presidential Committee on Balanced National Development.

The Peer Review Team recommends that the Korean government promote joint funding for projects, University-Industry Cooperation Centres and other commercialisation of research activities by different central government agencies.

Extending the teaching mission of the university into economic and social development – the student firm

This group liaison model was developed in Brazil as a means of conserving professorial time while extending the reach of the university to a broader group of low-tech SMEs than can be reached through one to one relationships.[10] In this model, students who have been trained in entrepreneurship, an educational theme widely extended in Brazilian universities, are encouraged to form "companies". Typically such firms are given a small office with a computer and a telephone as their base. The

10 There are additional programmes such as "hotel for firms" to prepare students to start companies that will attempt to enter the economy after graduation.

student firm is the first line of response to SME inquiries to the university seeking assistance, as well as an outreach mechanism to contact firms. If a problem appears that the students cannot handle, they pass it on to a university technician. The professor is called in as a last resort, thus conserving resources, on the one hand, and solving the problem of status difficulties that might arise if the professor was the first line of interaction with company heads who often have little formal education, on the other.

In summary, one on one programmes represent a good start in developing relationships and gaining experience in interacting with SMEs and learning their needs. To extend the capacity of the university to interact with such firms, more organised group models of interaction with a sector may have to be considered to avoid overloading faculty members, and increasing the capacity of the university to interact with firms on a cost effective basis.

The Peer Review Team recommends that Busan develops a staged series of interactions with low- and mid-tech SMEs, using students and technicians as a first line of assistance, to conserve faculty resources for difficult cases and to expand the number of firms that can be assisted.

Commercialisation of medical research

Commercialisation of research is fast growing at university medical schools, which is worth mentioning here (see Box 4.1. below).

Box 4.1. University Medical School and Commercialisation of Medical Research

Four medical schools are located in Busan. Recent researches in biomedical field are directly linked to industry. The organisation in each university supports management of patents and their commercialisation. One research team in Pusan National University School of Medicine developed the oligochip for microbial diagnostics and the technology was transferred to industry. Another research team in Pusan National University developed cancer vaccines for the treatment of colon and lung cancer. The vaccine is under phase II clinical trial for commercialisation. Research teams in Pusan National University and Dong A university are developing cell therapeutics for tissue regeneration, electronic endoscope and ubiquitous health care systems in collaboration with industry and local government. A research team in Inje University is studying pharmacogenomics for the development of a personalised drug.

In terms of commercialisation Pusan National University Medical School is most active in this area. PNU Medical School plays a key role in education, research, and health care in Busan and Gyeongsangnam-do. The medical school was established in 1955, the oldest one in Busan-Gyeongnam province. Since the establishment of a medical school the school produced 5 300 medical graduates and 1 230 PhD graduates. In 2006 the school system was converted into school of medicine that limits admission to graduates of 4 year colleges. Pusan National University hospital is the core facility for health care in the Busan and Gyeongnam area. The hospital runs 1 070 beds and treats 1 million outpatients per year. The hospital has a regional emergency centre and regional cancer centre.

Several research teams in PNU Medical School are developing commercialisation products and collaborating with biomedical companies in Busan. Although the gross sales of research products are still small, the contribution of the research of the medical school to the Busan Economy will greatly increase in the near future. Until 2004 the support from the local government was minimal. However, Busan Metropolitan city acknowledged the contribution to the regional economy and greatly increased supports to the research teams. In 2005, the city provided support of USD 100 000 for the Medical Research Centre for Ischemic Tissue Regeneration, USD 300 000 for development of a ubiquitous Home Health Care system in Pusan university hospital in 2005 and USD 500 000 for 8 research projects. The city will provide support of USD 4 million for the regional cancer centre in the next two years.

4.2 Incubation

The new economic role of the university: incubation and firm-formation

In addition to raising the technical and organisational levels of existing firms, the creation of new firms from the organisational and knowledge resources of the university is another major strategy for university-industry relations. In Korea, incubators appear to have been developed as an extension of the university's administrative capabilities.

A new organisational unit for university-industry relations has been established as required by government, as part of the administrative superstructure of all or most universities, a physical facility for an incubator constructed and a faculty member who learns administrative firm regulations etc. becomes the incubator director. Firms appear to use the incubator from both inside and outside the university, including persons retiring from large corporations or leaving existing firms, students and other faculty members. The incubator typically operates on a full service model, providing funding to firms as well as other services. A major service appears to be assistance in complying with government regulations. This may indicate a need to simplify administrative procedures to establish new firms, but this is only a possible inference.

The physical facilities visited by the Peer Review Team are of high quality, but only limited capacity. Moreover, firms typically remain in the facilities for 3-5 years. This is longer than the typical 2-3 year period elsewhere. On the other hand, it has been noted in the UK that there is a need to incubate firms based on early stage technologies for as much as ten years. Nevertheless, if the firms being incubated are based on near-term close-to-market technologies, then the primary need is for organisational training which can be conducted in a relatively short time. More explicit graduation times, and even a ceremony, may be warranted to encourage firms to move on.

The Peer Review Team recommends that Busan's universities and their partners plan and adopt procedures, criteria, norms ,and maximum times for the progression or graduation of new companies beyond the incubator phase.

Movement is implied in the phased incubation process in place in the Busan region, with the recent construction of a Technopark. The Technopark appears to provide many of the same services as the university incubators, and the distinction between the two was not clear to the Review Team. Moving firms out into lower cost facilities could be considered in order to expand the capacity of the incubation process. Instituting virtual incubation models, in which services are provided to firms off-site, could also be considered. Having firm members come to the incubator to participate in training programmes is one means to accomplish this goal. An incubator can also extend its capabilities, by forming clubs of firms in the same field, linked to established firms run by university alumni. Since alumni links are very strong in Korea, and do not have to be developed from scratch, as is typically the case in Brazil and Sweden, this would appear to be a natural development. No doubt this process is already in place informally to some extent.

The Peer Review Team recommends that the relationship of Busan Technopark with HEI-based incubator arrangements by clarified and developed.

Incubation as organisational training

We learned that there are currently 20 incubators in Busan, including 17 university incubator projects, and that 351 enterprises have entered into those incubators. Busan City provides subsidies to many of these companies, and business management consulting to those who want to start firms. In the

past, entrepreneurs of venture firms were mainly university students. However, at present individuals are coming to the incubators from previous companies, large and small, after and prior to retirement, with ideas to start firms.

In the IT sector Busan city has its own Research Institute for Infomatics and Communication, with ten business assistance teams. There are many difficult challenges to be faced in incubating firms; the biggest problem for further growth has been found to be marketing. Busan City also supports clubs in universities where students gather to learn abut starting new companies.

The incubator mode can also be utilised for a variety of purposes, beyond high-tech firm formation. Essentially, an incubator is a means of training a group of people to act as an organisation. It is an extension of the teaching mission of the university from an individual to a group approach, in addition to being an expression of the new economic and social development mission of the university. The Brazilian experience is instructive in this regard. The incubator format has been used to foster the creation of different types of organisations, including NGOs and cooperatives as well as firms. People without higher education, either skilled or unskilled, are trained in forming firms and co-operatives in service sectors as a job creation measure.

The tendency in Korea, and in many developing countries, is to look to advanced industrialised countries for organisational models, as well as technologies for inward transfer. However, as several of the examples in this report indicate, developing countries have much to learn from one another. The Brazilian organisational training and networked incubator model, in which more experienced university incubators mentor new ones, might be considered for adaptation (Etzkowitz, Almeida and Mello, 2005). Indeed, advanced industrialised countries like Sweden have found that they can usefully adapt aspects of the Brazilian incubator and entrepreneurship education model that extends such training, from engineering and business, throughout the university to the arts and social sciences.

The Peer Review Team recommends that the Busan region and its stakeholders look to a wide range of established, emergent and new approaches and models for innovation and technology transfer in different regions.

Co-operation among universities with different skills and capacities can also be utilised as part of an economic development strategy extending from the university – see below also in relation to PNU. In India, high level technological Institutes, for example IIT Kanpur, bring in graduates of lower level technology institutes to participate in R&D projects that might lead to firm formation, having found that their own graduates are still primarily oriented to seeking employment in large established organisations, at least at the start of their careers (Shakur, 2006).

The Peer Review Team recommends that Busan seeks to build on current system capability to accelerate development, in particular taking advantage of the integrated tertiary structure and the capacity for inter-HEI collaboration between 2 and 4 year institutions.

4.3 Strategies for developing the region

Foreseeing strategic areas: choices for the region

At present, regional strategy concentrates on developing ten areas[11], a rather broad range targeted at upgrading the technologies of existing industries, like footwear, or introducing new industries,

11 There are four core strategic industries, port logistics, mechanical parts and materials, tourism and conventions, and film and IT, and six "regionally embedded strategic industries" finance and futures, bio-marine, silver industry (meaning care and services for the elderly), footwear, processed marine products, textile and fashion.

based on existing technologies, like film. Advanced technological capabilities are used to some extent in these strategies. However, given that the research capacities of universities in the region are relatively under-developed, certainly in comparison to Seoul, a strategy of developing entirely new industries based on advanced research has not yet been essayed.

One key to creating an *innovating region* is having the ability to move across technological paradigms (Etzkowitz and Klofsten, 2005). Such a strategy would require capacity-building at a limited sub-set of area universities, with links to faculty at other universities who might participate in centres at hub research universities. PNU, for example, already has research institutes and centres in a variety of medical, engineering, natural science, business and economics, and humanities and social science fields that could be expanded upon by various collaboration methods.

Critical mass could also be achieved more quickly by location of Research Institutes decentralised from Seoul onto, or at least adjacent to, research university campuses. Institute members could be given part-time faculty appointments, and faculty members could be given part-time institute appointments. The French experience in decentralising CNRS research units to university campuses is a possible model. The Mexican experience in relocating research institutes from the capital to the regions, during the 1990s, and their subsequent involvement with local problems, may also prove to be instructive (Casas *et al*.2000).

The Peer Review Team recommends that the relocation of Research Institutes be managed so as to enable the creation of critical mass for regional development.

More rigorous means of decentralising the distribution of research funds to universities outside the Seoul region might also be considered. Currently, funds are distributed through peer review, modified by informal ties. This tends to leave them highly concentrated. The EpScOR (Experimental Program for Research) model, introduced in the US to redress regional imbalance of research fund allocation, to a limited extent, by creating set-asides of a small proportion of funds, might be considered as a way of encouraging the build-up of research universities outside the Seoul area, while still using peer review procedures within this framework.

The contribution of academic research to future regional development

Currently, development of new areas for regional growth such as multi-media is based on extending the highly developed undergraduate training capabilities at area universities into new fields. An additional strategy is to focus on graduate education as well. This entails opening up regional development possibilities in more research intensive fields such as bio-technology and nanotechnology, to mention two currently popular areas, but there are, of course, many others not currently on everyone's radar screen that could be selected. Making early bets on future research areas with economic potential is a long range, yet highly significant, and possibly lucrative, economic development strategy.

The Canada Research Chairs programme, adapted to meet Korean needs to redress regional imbalances, may be a useful model to consider. To engage in development of industries from advanced research, a higher level of focus on PhD training is required. Some of these areas may be hybridised from existing areas, while others may be built entirely from research capabilities. Expanding research groups to include post-doctoral fellows as well as PhD students can extend the capacities of such groups. In addition, related groups, within and across universities, may be linked to each other through centres, focused on interdisciplinary research areas, as well as on fields ripe for commercial development. Pre-incubation activities can be conducted within the research groups, preparatory to moving them into the university's incubator facility.

Undergraduate training can be extended by offering research opportunities to selected undergraduates. Some universities have special offices to arrange the match of undergraduate students with research opportunities, for example in the biological sciences at Cornell University. Other universities run special summer programmes to introduce undergraduates, especially from under-represented groups, into research groups. These summer programmes give students a realistic idea of what a research career would be like, in addition to serving as a recruitment device for the university to attract students to its graduate programmes.

Korean universities are highly skilled at competing for undergraduates. The next level is to engage in a competition for graduate students, but also to increase graduate student and post-doctoral positions and to expand the research training system. Research groups themselves are akin to small businesses in many ways, and serve implicitly as entrepreneurial training grounds within the world of academic science. An expanded system of research groups with informal hands-on research training conducted within these groups is the basis for future high-tech industrial development.

Another strategy for developing regional research capabilities is to attract back to the area persons who have pursued careers elsewhere in the country or in other countries, whether for lack of opportunities at home or for other reasons. The experience of Taiwan, India, Ireland and France, through both formal and informal outreach and attraction programmes, may provide useful models to relate to the Busan and Korean diasporas (Saxenian *et al*. 2002).

International collaboration

Busan area universities have established numerous agreements with foreign universities, primarily oriented toward exchange of undergraduate students to give them an experience abroad. It is not clear whether these programmes are being used as a base to develop broader collaborations, especially with regard to joint research. Identifying scholars of Busan origin elsewhere in Korea and elsewhere in the world, and engaging them in research collaborations with local universities, can be a useful first step toward re-engaging them with the region. Establishment of Visiting Committees for academic departments and centres, including diaspora scholars, can also be a useful mechanism for re-involving them with the region. No doubt, some aspects of these international collaborative initiatives are already underway, even if they did not come to the fore during our brief visit. Our intention here is to highlight the general concept of re-engaging with the Busan region's diaspora, and focus attention on the potential of this strategy.

The Peer Review Team recommends that MOE & HRD focus on advice and support to regions for alumni and diaspora strategies that will develop regional capacities, and that Busan try out different approaches for this purpose

Matching funds and other incentive techniques

As recently as eight years ago, there were no matching fund requirements for obtaining industrially oriented research funds. Assistance was typically given through block grants to nurture regional universities. During the last five years, especially, a matching fund system has been instituted by the government to encourage competition among universities and to enhance accountability. Finding such funds can present a maybe insuperable obstacle, and is then a brake on development.

The current strong requirements for matching funds should be reconsidered with regard to the balance between near and long term research and economic development strategies. Matches are more likely to be found in areas of near term R&D that already have industry involvement. Longer term fields may not have companies active in the space, or if they exist they are often new start-ups with

little extra funds available to contribute to university projects. Thus, matching fund requirements should be calibrated to avoid over-concentration on near-term fields while, of course, recognising the utility of the device to orient areas of advanced research to considering commercial potential. A sophisticated use of this rather blunt technique can provide good results.

The Peer Review Team recommends that the Ministry of Education now reviews and evaluates the effects of the requirement for universities to obtain a certain proportion of funds from industry partners in order to improve their chances for government research funding.

From the other end of the spectrum, research funds could be offered to firms, on condition that they engage in collaboration with university research groups. Such a technique could encourage firms lacking R&D capacity to begin to engage researchers in advanced product development, outsourcing research components to university partners. Such programmes are especially relevant for encouraging SMEs in traditional sectors to upgrade, by undertaking a hybridisation strategy of developing new products, based on a combination of advanced research and traditional skills.

The Peer Review Team recommends that the Korean government led by MOE & HRD explore ways of directly stimulating research in firms, especially SMEs, in collaboration with HEIs.

Cooperation across regions

A collaboration strategy across regions might be considered as part of a regional development strategy. In this regard, the Canadian National Centers for Excellence Programme which brings together research groups across the nation also encourages regions to build up capacities at local universities in order to participate in this national programme. Informal requirements to include various regions in order to access these funds might provide a means for Seoul area universities to mentor universities in less developed regions, should such a programme be adapted to Korean circumstances.

The Peer Review Team recommends that the Korean government through MOE & HRD considers sponsoring selective national network development for advanced research and R&D in key areas, thus combining regional and national development.

4.4 Conclusion

Our remit in this chapter has been to document the shift from human resource development as the main focus of university-industry relations to a more direct role of the university in (1) improving the technological and organisational levels of existing firms, especially SMEs; (2) assisting the creation of new firms and clusters and (3) the university playing a more strategic role in future regional development through expansion of its research capacities in strategic areas.

The Peer Review Team recommends the exploration of models to expand the capacity of universities to engage with business, by expanding from an individual academic-to-firm relationship to a broader organisational approach to university-industry relations, in order to expand capacity and efficiency, without replicating high cost facilities. The objective is also to reduce the potential for overloading individual faculty members, while increasing the impact of university engagement efforts.

Finally we suggest that various experiences from regions across the world, in developing as well as advanced industrial countries, may prove to be a source of useful ideas and future collaborations. Individual examples of every form of university-industry co-operation can be identified in Busan. A stronger collaborative effort involving university-industry-government spheres, including the creation

of a regional venue for discussion and strategy formation among key actors, a more fully developed *consensus space*, is required. The challenge is to shift from a top down to a more bottom up innovation regime, with central government supportive of regional initiatives, generalising innovative approaches from one region to another (see also Chapter 7 below on capacity-building).

The Peer Review Team recommends that the metropolitan Busan administration set up arrangement whereby the region can create and carry out innovation plans with universities at the heart of the process, in continuous engagement.

5. WIDER ASPECTS OF REGIONAL DEVELOPMENT

5.1 Wider development and the Self-Evaluation Report (SER)

The OECD Guideline for Peer Reports suggests a section on the contribution of universities to social, cultural and environmental development. This is the subject of Chapter 5 of the Busan Self-Evaluation Report. These aspects did not however get as much attention in the first draft SER as the research, teaching and HRD aspects directed towards economic development. The SER chapter suggests that social development is in its infancy for HEIs in the region. It gives some examples of social, cultural and environmental activity, but concludes that there is a desperate need for the involvement of HEIs in these dimensions, in order to reinvent the city of Busan.

The Peer Review Team shares this view, and recommends that Busan City gives urgent consideration to encouraging its universities to be more fully involved in wider social and cultural development, and in more environmental activity.

This impression was confirmed by the pre-visit, in the sense that these aspects scarcely featured in discussions. The Peer Review Team was aware of this, and wished on its visit to check the impression, and to reflect accurately both the present situation and ideas about strengthening these wider aspects. There was no suggestion in the pre-visit or the SER of work relating to civic, political and democracy dimensions, such as participation in local government below the city region level, or with NGO (third sector) partnership enhancement. There was also little suggestion of participation in city development as such, or of work by HEIs in urban renewal. On the other hand, participation features as a desirable quality of the national reform government, and there may be rising awareness of the notion of "social capital" in the Korean development agenda. The Peer Review Team was also impressed by the strength of social purpose commitment, and the valuing of community service, that was shown in the private universities visited.

There are some mentions in the SER of specific environmentally oriented research projects, and some community oriented activity, but little on eco-sustainability, and nothing about the universities themselves and their role as exemplars, such as the "green campus" idea of universities as good corporate citizens.

The Peer Review Team wanted to know which of these items and aspects were on, or coming onto, the agenda of universities, city planners and other partners; whether they are seen as relevant to HEIs, to the broader society and to governments; and whether we were in danger of overlooking some new developments and ideas. One dimension of change with important economic but also wider social implications in Korea is ageing, a subject that features strongly in the Deputy Minister for Education's priorities. Because of these wider implications we have included the subject in this chapter rather than, as in the SER, in the chapter on teaching and learning.

5.2 Broader dimensions of development beyond the economic

This chapter concerns social, cultural and environmental aspects of development, often referred to collectively as quality of life aspects. These broad social dimensions may be considered in their own right, in terms of quality of life, health and happiness, and broad sustainability. They may also be seen as conditions for sustaining economic development, in the sense that a distressed, unhealthy,

fragmented or alienated population living in bad physical and social conditions will not be productive for very long. There are references to health and welfare contributions in the SER, including some teaching, research and volunteering activity. Similarly with cultural and sporting areas, there are some particular programmes, and some references to community use of facilities.

We encountered several references to quality of life issues in terms such as traffic congestion, notably in Seoul, and lack of public parkland space in Busan due to metropolitan growth and the scarcity of flat land in a hilly region, but not wider discussion of such matters. However, during the team visit *The Korean Times* carried a front page story (13 December 2005) titled "Only 1 in 3 Koreans in Good Health", which was based on a report of the National Health Insurance Corporation. It may be that connections are being made between such trends and the role of both cities and universities in development, as was obvious for example in the parallel OECD study of North East England, but the Review Team did not find evidence of this.

By contrast the same newspaper carried another front page story - "More Education Means More Pay", based on a National Statistical Office (NSO) report. This showed that the bachelor degree householder's average monthly pay gap compared with that of a high school diploma holder widened to 953 500 won per month (average 3 million won compared with 2.06 million). Similar trends were reported for master's degree holders, whereas for the first time over a six year period, the monthly wage of those having only elementary education actually fell, by 2.9%. There was ample evidence of the awareness and impact of these individual indicators in the intensely fierce competition among school leavers for a university place, and for a place at as prestigious as possible an institution. One result is the impressive promotional presentations and up-market high-tech materials in which universities in this highly competitive system are adept.

The Peer Review Team recommends that Busan City promotes discussion of the broader social, environmental and quality of life dimensions of regional development, as being important in themselves and vital to the long-term sustainability of economic as well as social development.

5.3 Towards a new adult education

In terms of communities' health, welfare and social development, there is evidently rising concern in Korea, and specifically in Busan, about older or third age adults. Korea now has one of the longest life expectancies among all nations. Its low and declining birthrate means a rapidly ageing population. The response to greater longevity is most commonly referred to as social education or lifelong learning. It takes the form of mainly non-credit general, cultural or "leisure" education for older, retirement age adults.

"Wider aspects" of development in many countries include issues of equity and participation in higher education on the part of under-represented groups and categories. These may be working class communities in general, remote rural, fishing and mining communities, women, ethnic minorities, and those with disabilities. Korea has probably the world's highest participation in higher education measured by age participation rate (APR) at the point of transition from secondary to tertiary or higher education (over 80% nationally and higher still in Busan). The Review Team encountered particular cases of access and wider participation equity concerns at different universities, but this aspect of individual opportunity was understandably less evident than in countries with lower rates of participation and more obvious socio-economic disparities.

A striking exception in terms of age awareness as a wider dimension of development was provided by the Deputy Minister for Education and Human Resource Development who spoke very freely with the Review Team about his perceptions and aspirations for the role and development of

higher education. Dr Gwang-Jo Kim is keenly aware of the impact of falling birth-rate and changing demography as an equity and a labour force issue. He notes the much lower educational attainment of middle aged and mid-working life adults, as a result of the dramatically fast rate of economic growth and educational expansion: many of those who built the new, prosperous Korea are now under-qualified and disadvantaged for employment in the new knowledge economy.

For Dr Kim it is imperative to take the education (or lifelong learning) of older adults more seriously, for both labour market and equity reasons. Coincidentally, during the Peer Review visit, *The Korean Times* carried a front page story, "Workers' Average Age to Top 40 in 2010". Reporting a Korean Employers Federation study, this noted that the average age of workers in 1980 had been 28.8 years, rising to 37.5 in 2004. By 2020 it would be 43.9. The rate of ageing was outpacing that of Japan. "The Federation suggested that the government overhaul the current wage system to meet the growing number of older workers. South Korea also needs to expand educational programs for workers at workplaces and create a more favourable working environment for the elderly". (*The Korean Times* 14 December 2005).

The impression of the Peer Review Team is that this perspective has yet to be widely grasped, much less acted on, across relevant policy portfolios. Adult or social education (equated with lifelong learning) is understood mainly as leisure-oriented programmes for the retired, in which some universities in the region make significant and commendable provision. Together with these go a variety of mainly employer-based in-service professional updating courses (CPD or continuing professional development) for the already well qualified.

The Review Team recommends that the national government consider as a matter of urgency the implications of Korea's changing demography and ageing population for the role of higher education, taking account of both workforce and equity considerations.

One method of enhancing access and widening participation, of interest to many OECD countries, is enabling progression to and through higher education for those following vocational pathways. The working arrangements and the fuzzy boundary between two year junior colleges and four year universities appear to work well in this respect, and perhaps to offer a model for other systems. The Peer Review Team learned of the example of Dongseo University and the two-year Kyungnam College of Information and Technology (KIT) which links closely with Dong-Seo. KIT graduates 2 500 students a year, of which 500-600 go on to complete four-year programmes at Dongseo (96.5% of the remainder find employment). Some of these come directly on to the four year programmes, but a number go into SME posts first, and return to complete four year degrees a year or two later, in order to qualify for better employment. This compares extraordinarily well against progression from further to higher education in some other systems.

The Peer Review Team recommends that other nations interested in progression through two-year vocational routes to full graduate status take note of the Korean two year college - four year university relationship and approach to progression.

5.4 Culture and the development of Busan as a leading international city

Busan's vision and plans favour the term *dynamic*. Economic development is planned around ten strategic industries and four key industry sectors in particular. The city has slipped in terms of both population and productivity within Korea. The outflow of wealth and human talent to Seoul and abroad remains a concern, threatening morale and a self-confident sense of identity. Clearly the new decentralisation policy should greatly benefit Busan and give heart for a more successful future. There are obvious signs of vigour and investment through many parts of the metropolis, as well as risk of

further decline of key industries and loss of jobs especially to China, which is seen as a significant economic threat as well as a key trade and development partner.

Two of the four key sectors identified for growth, including growth through the involvement of higher education, are film and IT, and tourism and conventions. The evident success of the high profile APEC Conference held in Busan in the weeks between the pre-visit and the main visit of the Peer Review Team gave further impetus, as does the continuing success and rising stature of the annual International Film Festival. How good are the prospects from tourism and conventions wedded to new visual technologies, image and culture, and what role will the universities play in this?

There is potential synergy here, and perhaps the capacity to transform Busan's international identity and self-image into that of a vibrant and creative city, a place to be, with the buzz and increasingly the cosmopolitanism that characterise leading world metropolises. It was not evident to the Review Team that the City, despite its promotional efforts around the slogan "dynamic", has grasped the notion that Richard Florida has characterised using the idea of creative classes, or of a city benefiting with pride and prosperity from the energy and cultural wealth of its many universities. The recently completed fast train route between Seoul and Busan halving the journey to under two and a half hours on the KTX at present is described with irony as a faster means for resources to leave Busan for Seoul. This journey will be reduced by a further hour when a newly tunnelled route is complete, further sharpening the question how and how far Busan will benefit from such proximity to the capital. Busan does not see itself as a magnet. Until it thinks and acts this way, progress may be slow.

The Peer Review Team recommends that Busan City widens its ambitions, creating a new image that celebrates and exploits its history and natural heritage as well as its current cultural capital, and the significant cultural and creative assets that its universities represent

High quality technical sophistication was displayed to the Review Team, especially at the private universities that it visited. This included the production by students and faculty at Kyungsung the same day of a disc to present to the OECD team commemorating their visit there, well illustrating the capacity for excitement and creative endeavour in the university system. There is within Busan's HE system a combination of strong research-based public universities, and entrepreneurial and energetic creative vigour wedded to a foundation-based sense of community service, in the private universities. With good leadership, sustained partnership and planning it is possible to see Busan becoming a leading city by international standards, especially as globalisation and the ever wider use of the universal English language change attitudes and accessibility all round.

The Peer Review Team recommends that Busan work with its universities purposefully to help transform the City's identity into one of cultural vibrancy, "the place to be".

There are further grounds for optimism, so long as present national policies are sustained and purposefully implemented. The Government cannot afford for Busan to fail; as the second city after Seoul it has a flagship position in the decentralisation strategy. Much depends on the City administration's capacity to grasp the leadership opportunity that devolution thrusts upon it. The HE system in greater Busan, perhaps embracing the wider region of south east Korea as a natural region as well as economic development zone, can be used to advance regional development culturally and in city-region identity, with direct economic benefit.

It is less clear whether, on a regional level, notions of development yet extend to include health and welfare, or other quality of life dimensions beyond employment and income. We were unable in the time available to discover whether from a city planning perspective such thinking exists. Certainly we did not encounter it, although it may be there in embryo. There is great potential in the values and

the resources of universities in the Busan area across areas of health and welfare, including civic participation via both professional and student volunteering. More broadly the central government-driven, more practical, applied and connected, orientation of restructured higher education may be expected to assist this wider utilisation of HE for community service and development.

5.5 The role of higher education in wider development – towards a broader paradigm?

The Review Team was struck by the clear values and the sense of social mission expressed by the two private universities that it was able to visit, as well as a public-spirited and outward-looking orientation among those in higher education whom it met, not only in the four universities visited but also more widely. Fierce competition in face of declining cohorts coming forward for higher education, and state pressure to specialise and diversify, have not translated into selfishly anti-social stances. There appears to be remarkably little conservative resistance in principle to the quite radical changes being pressed on higher education by the present reforming Government, as distinct from generally constructive criticism of some of the means whereby it is being carried out – for example in requirements for matching funds when the larger enterprises are not there, and SMEs cannot afford adequately to play this part.

There is explicit commitment to social service and welfare purposes and roles in the universities which we visited, and plentiful examples of volunteering, both as a community service in itself and as part of the total education of students to become good citizens. It is noteworthy that private universities appear able to combine vigorous market profiling and entrepreneurialism in a highly competitive environment with such a strong and practical sense of community service.

Indeed, community service and engagement are a distinguishing feature in promotional material prepared to attract students to these universities. In some places, the student experience includes mandatory credit-bearing moral or values education, community volunteering, and mandatory community and workplace experience during some vacations. Looked at in this way, the very large private, but not-for-profit, sector that distinguishes Korean higher education, and that is also found but not on such a scale in other East Asian countries and in the United States, takes on an entirely different complexion than is common in debate about privatisation and a private university sector in other regions, especially in western and northern Europe and the Commonwealth countries.

It is another question whether these mainly individual and individualised activities add up to a more integrative understanding of the role of higher education in regional development. Producing a stream of capable and civic-minded graduates who can serve as “good citizens” is one vital element. However, this does not amount to an integrated strategy to nurture a successful learning region with balanced, sustainable, economic and social development. That depends in large part on a wider grasp of the connections between the economic, social, political, civic, and environmental dimensions of development.

There may survive in the Korean tradition a stronger, sustained instinct for the communal or collective, compared with the individualised and socially more fragmented world of the West, especially as it has emerged from the nineteen eighties. The Review Team found no evidence, however, during its limited time in the region, of a more integrative approach to regional development that takes account of well-being in terms of the natural and constructed environment and of quality of life within it.

The Review Team recommends that Busan gives more thought to its place/region holistically, rather than only in terms measured by economic indicators.

This would mean a paradigm shift towards still wider, integrative and trans-disciplinary development that connects up different administrative tasks and portfolios more closely.

The role played by university medical schools is worth noting in the context of broad development issues of the region.

Box 5.1. University Medical Schools and Community Health Activity

There are four medical schools (Pusan National University, Dong-A university, Inje University,Koshin University) in Busan. The hospitals that belong to medical schools are the biggest in the Busan area. Therefore, they have a key role in community health service. Pusan University hospital, the biggest one in the Busan/Gyeongnam area, operates 1 070 beds and takes care of 1 million patients a year. The hospital is operating the regional emergency centre. In the next two years Pusan University hospital will build a regional cancer centre that will have a key role in prevention and treatment of cancer in this area.

Dong-A university hospital has 920 beds, Inje University Hospital has1 000 beds, and Koshin University hospital has 910 beds. The professors, doctors and students of medical schools also actively involve community health education and free medical services in the Busan area. Several departments at the medical school are also involved in community health activities. The Department of Environmental and Occupational Medicine has provided community based environmental education for many years. The department is also involved in a collaborative research and education projects in the city.

Another prominent community health activity is the Busan City Hospital that is owned by Busan Metropolitan City and operated by the collaboration with the medical school. The hospital provides primary care in 20 different disciplines including internal medicine, obstetrics and gynaecology, and paediatrics. The centre provides care to over 370 000 patients per year. The curriculum of some medical schools contains community services for health care.

The Review Team found no reason to think that universities across the spectrum in the Busan region will be backward in responding, to the wider challenge provided in this chapter, judging by their capacity to respond and to collaborate when faced with recent policy changes such as NURI. However, such a change will also and first be required nationally. Awareness is only now occurring of the need for a larger view of development. This is stirring as Korea takes stock of the social price paid for its late 20th century economic miracle alongside the more obvious economic gains. It seems probable that this awareness will increasingly flow through into national policies, and, in the new dispensation, flow on in turn as a requirement on Busan and the other regions.

The Review Team recommends that consideration be given nationally, via the Ministry for Education and Human Resource Development, to creating incentives and measures for HEIs to play a wider regional, social and community role, rather than being expected to do this entirely as charitable community service.

The seventh chapter examines capacity-building possibilities for more effective regional collaboration, reciprocal and shared learning and development between universities and other regional stakeholders. Such sharing and integration of purpose on a regional level is a necessary part of both economic and wider regional development.

6. THE RESPONSE OF BUSAN'S UNIVERSITIES TO THE NEW POLICY ENVIRONMENT

6.1 Impact of new policies (NURI)

Policy implementation through consensus

The Review Team learned that several ministries have initiated various government-funded projects, such as *NURI*, *University-Industry hub*, and *Specialisation of Higher Education*, for regional development. Representatives of HEIs and industries gave us much positive feedback on the policy initiatives, although they pointed out ways and room for improvement. New projects such as BK21 and NURI treat national and private institutions of higher education on an equal base. They have to compete with each other for government grants. This is quite a new experience for national universities, since the central government had been a reliable and automatic source of financial support in previous years. Nevertheless, they seem to believe that the new policies are overall going in the right direction.

Throughout our visits, the Peer Review Team got the impression that NURI had a considerable impact on the institutions of higher education. As previously noted, NURI is a new government-funded programme for regional development in which 1.4 trillion won will be invested over five years, starting from 2004. In the Busan region, 11 project teams of five HEIs including PNU participated in the program in 2004. That year, the project teams received 20.8 billion won altogether. The Peer Review Team learned that NURI somewhat strengthened collaboration among regional stakeholders, but not as much as had been hoped and expected.

Since regional development is a new agenda, regional stakeholders lack experience in working together, but this is not the sole reason why their cooperation in NURI failed to meet expectations. Sometimes a discrepancy exists between a policy ideal and reality. The penalty imposed this year on several NURI project teams may reflect the gap between how government expects a project to work and how things go in reality.

The Peer Review Team recommends that a clear and explicit consensus be established among key stakeholders in the process of policy-making, in determining policy goals and implementation strategies. Also, regional stakeholders such as local government, HEIs, and industries should involve themselves actively in the consensus-building process.

Differential effects of the NURI programme

Universities that the Peer Review Team visited claimed that NURI projects helped them to focus more on the strategic areas of the region, although some of the universities had already specialised in certain fields long before NURI. The Team noted that all HEIs have a Division of Industry-University Cooperation (DIUC) as an independent corporate entity, through which all university-industry cooperation activities are meant to be handled. This seems to serve as a catalyst for the institutionalisation of the new function of university-industry cooperation, within the university.

In meetings with university administrators, it was mentioned that in a research-centred university that joined the NURI programme, which is designed to supply regional workforces suited for regional strategic industries, the school experienced a subtle identity friction between research and education. This sort of tension was not found in the private institutions of higher education that we visited, most of which are undergraduate-focused teaching institutions with specialised fields of study.

Not only NURI but also higher education policies of the central government generally encourage HEIs to have their own fields of specialisation. It was notable that the two private universities that we visited tended to concentrate on a few areas closely connected to regional strategic industries, and even to identify themselves with the specialised areas. The Peer Review Team learned that while the Korean higher education system expanded dramatically, it has not been successful in differentiation. In other words, HEIs look similar in terms of what they teach and how they run.

The Peer Review Team recommends that distinct, specialised fields of study be grown, with related areas having synergistic potential. Along these lines, it is also recommended that HEIs take an interdisciplinary approach to developing educational and research programmes within the university.

Improving staff evaluation systems for university-industry cooperation

The Peer Review Team learned that faculty members working in NURI projects do not yet get the proper credit deserved for their efforts in university-industry cooperation. Although incentive systems for university-industry cooperation differ from institution to institution, in general universities tend to provide NURI project teams with no more than matching funds. For example, while talking to the representatives of HEIs in the Busan region, the Peer Review Team learned that most universities consider cooperation activities as minor ones, that is, treated as simply part of professional service under the current faculty performance evaluation system. There is however now a shift towards valuing these activities more.

The Peer Review Team considers that without appropriate incentives it is difficult to motivate faculty members to take part in university-industry cooperation, and therefore recommends that the evaluation system for faculty performance be revised to give more credit for university-industry cooperation.

6.2 Restructuring the higher education sector

Restructuring for specialisation

As globalisation and the knowledge economy become more widespread, many countries worldwide have been vigorously reforming their higher education systems to enhance national competitiveness. In line with this international trend, the Korean government is working hard at restructuring higher education. Dr. Kwang-Jo Kim, Deputy Minister of MOE & HRD, in referring to the recent higher education reforms of China and Japan, told the Peer Review Team that changes in higher education will be carried out to secure international competitiveness through specialisation. In other words, the competitiveness of the higher education system as a whole will be improved as individual institutions of higher education develop their own areas with a comparative advantage.

The Team learned that PKNU had already gone through a restructuring process by consolidating two campuses and becoming specialised in fishery and engineering. In 2006, PNU will merge with Milyang University in the nearby city of Milyang. It is planning to develop the Milyang campus to be a centre for nano-engineering. Unlike the national universities that are actively responding to the

government's restructuring initiative by downsizing and consolidating, not a single private university in Busan has taken a step toward restructuring as of 2005.

National universities appear to comply with the restructuring initiative, while private ones are the least willing. Although the Peer Review Team was unable to get precise statistics, following talks with institutional representatives the Team feels certain that most private universities in Busan have difficulty meeting their overall quotas for new students. Given the difficulty of attracting students, the Review Team found it interesting that private universities are reluctant to downsize. Since major national universities in local provinces as well as private ones in the Seoul region plan to reduce by up to 10% of their total enrolments, private institutions in provinces outside Seoul may be inclined to wait for the time being, in the hope of attracting more students later.

There seems to be a disjuncture between the central government and regional HEIs over the goals of restructuring higher education. While the deputy minister stressed that downsizing was not the main point or part of restructuring, representatives of HEIs apparently disagreed. Despite the government's strong push toward restructuring, a division of labour among HEIs and internal restructuring appears slow in coming. The institutions of higher education that we visited had no such shared vision of the universities at this time. As for the division of labour among the HEIs in Busan, Busan Environmental Technic Centre was found to be an exemplary organisation serving as a coordinating body for the specialisation of environmental studies. A brief description of the Centre is provided in the Box 6.1.

Box 6.1. Busan Environmental Technic Centre (BETEC)

BETEC is a research centre of Pukyong National University (PKNU) established by the Ministry of Environment to solve the environmental problems of the Busan region. BETEC established a research network consisting of all HEIs, relevant research centres, administrative agencies, and NGOs in Busan. By providing an environment "home doctor" service to the regional enterprises, it helps the city to reduce environmental pollution.

To enhance research capability, the centre asked its member institutions to voluntarily identify their area of concentration based on their strengths, and, if necessary, to coordinate the division of labour. Currently, Kyungsung University (KSU) is specialised in land contamination, KSU in natural ecology, Dongseo University (DSU) in environmental support for enterprises, Dong-A University (DAU) in air pollution, Dong-Eui University (DEU)/ Dong-Eui Institute of Technology (DEIT) in waste-water treatment, PKNU in ecology restoration, Catholic University of Pusan (CUP) in noise and vibration, Pusan National University (PNU) in water quality control and drinking water treatment, Busan Development Institute (BDI) in environmental policy, Silla University (SU) in waste disposal management, Korea Maritime University (KMU) and National Fisheries Research & Development Institute (NFRDI) in ocean pollution, and NGOs in environmental education and public affairs.

BETEC also set up a research council with subdivisions that come up with environmental issues and research agendas, conduct research as well as evaluations, and disseminate the findings. Each institution takes a specific role in the process, based on their specialties. The aforementioned mechanism helps member institutions to divide work and collaborate with each other.

Nature of specialisation

The diversification of expanding higher education systems is a challenge common to most OECD member countries. Scholars in the United States argue that diversity is a source of competitiveness for American higher education (Birnbaum, 1983). The Peer Review Team believes that the specialisation of higher education which the Korean government pursues is appropriate for enhancing the competitiveness of higher education. Universities that the Review Team visited appeared to conceive of specialisation as the process of differentiating themselves from other institutions of higher education by focusing on specific fields of study, such as Cultural Technology and fishery. They also appeared to have limited collaboration between specialised and non-specialised fields within each university. With regard to the nature of specialisation of higher education, we understand a strong foundation in basics such as teaching and research to be a necessary condition for a specialised university, but not vice versa.

The Peer Review Team believes that it is necessary to vary and diversify the models of specialisation, and to differentiate the different ways that a university becomes specialised. The selection of specialised fields should be made with consideration of strategic alliances with institutions within and beyond the Busan region.

6.3 The future of universities in Busan

Higher education was once for elites, but is now fast becoming universalised. Like other regions in Korea, Busan has universalised higher education, in that 80% of high school graduates go to colleges and universities. However, universities are still filled with traditional students of young age. As a result it is no surprise that they go through more initial education than lifelong education and learning. Also institutions of higher education have difficulty attracting enough students, as the overall student quota of places exceeds the total number of high school graduates. International students mostly from Asian countries make up for some of the shortfall. Incorporating a vocational flavour into college curricula has become a national trend.

The Peer Review Team had the impression that universities in Busan had no clear and confident idea about the shape of their future, despite the dramatic changes in their external environments. Administrators of a prestigious national university claimed that their goal is to place the university high in domestic or world rankings in the near future. Another private university had a plan to establish a ubiquitous campus with the help of ICT advances, but had no explicit vision for the role and function of the university in this campus. The universities seemed to perceive their goals as the ones that central government pursues. For example, research centred and industry-university cooperation (IUC) were the two main categories with which the universities identified themselves.

Box 6.2. Ubiquitous Campus: Dongseo University

Dongseo's 2005 project to establish a "U-Campus" is designed to make its campus fully equipped with an intelligent integrated information management system and intelligent infrastructure, based on a ubiquitous sensor network. Once a high-tech lecture environment and Ubiquitous Environment Experimental Centre are set up, students can enjoy the cutting-edge technology such as an attendance check using 900 MHz and 13.56 MHz Dual RFID u-student ID cards, personal authentication system at the Student Service Center, intelligent view-data board, "u-offices" for professors, wearable computers, intelligent window, and "u-printing". These systems were introduced in Korea for the first time.

Dongseo students can be provided with information they need anytime, anywhere. All sorts of certificates are issued automatically without checking their student ID card or ID number. Class attendance is automatically taken when they pass the classroom door. Such is the Ubiquitous Campus. Dongseo University, which is leading the ubiquitous application technology, is aiming to become the "u-Leader University". Students will experience the ubiquitous computing environment and can learn about the academic and technological factors of the "u-environment". Researchers will develop applied services and relevant contents. Professors will promote governmental-industrial-academic-research cooperative projects and will carry out joint research.

In establishing the "U-campus", Dongseo University is striving to become a world-famous university by contributing to IT 839 Strategy, the core strategy of "u-Korea", in the fields of communication, design, digital contents, u-TIC, and international logistics which are Dongseo's essential competitive power.

These general trends are likely to cause serious problems for universities in the future as the nation's birth rates continue to decline, and demand for lifelong education is likely to increase. This is an indication that universities appear not yet to have grasped the need for fundamental reconsideration in order to take the future seriously.

We can now depict an alternative model of a university in Busan based on the institutional activities mentioned in the SER, as follows. Many universities deliver cyber education and expand lifelong learning, which is offered by independent lifelong learning centres and institutes for social education, and run on market principles. In this way, higher education in Busan would move from the traditional model to a free-market model through the enterprise model (see below). This has a relationship to but falls short of grasping the full implications of the six scenarios sketched in the OECD work cited below, in that universities in Busan generally and unquestionably continue to conduct research activities and compete across the spectrum of activities.

To decide where the universities in Busan should go, and why, requires intensive national and regional discussion and consensus building. As a preliminary thought and one starting point, it will be more effective to adapt to the environmental change of the future when universities focus more on lifelong education and learning, and more on teaching rather than mainly on research.

The Peer Review Team recommends that Busan universities establish a regional learning system, focus more on lifelong learning, and collaborate more with one another.

The Peer Review Team further recommends that Korea engages at national and regional levels in a sustained process of scenario-building to develop a flexible, diversified higher education system fit for the purposes of a modern society in the competitive global economy. It may also wish to take the OECD HE scenario as one basis, and to offer to play a leadership role regionally and internationally in such scenario-building and planning.

Box 6.3. The OECD University Futures Project: six scenarios for the future of universities

The University Future project, which OECD started in 2003, aims to inform and facilitate strategic decision-making by government officials and other key stakeholders in higher education. Figure below maps six scenarios for universities. The two key dimensions used to design and organise the scenarios are the range of recognised educational supply, and the range of educational participation The range of educational participation is about the age composition of the student population. At the end of the axis, initial education refers to universities focusing on the initial education of young students coming directly from high school. At the other end, lifelong learning refers to a situation where adults attend university at different times of their life. The range of recognised educational supply is about the strength of the university monopoly over degrees. At one end, a restricted number of institutions grants degrees and have a say on the kind on knowledge that can lead to these degrees. At the other end, a variety of institutions confer degrees and a wide range of knowledge can thus be recognised by a degree (Miller, 2003). The six scenarios for the future of universities are the following:

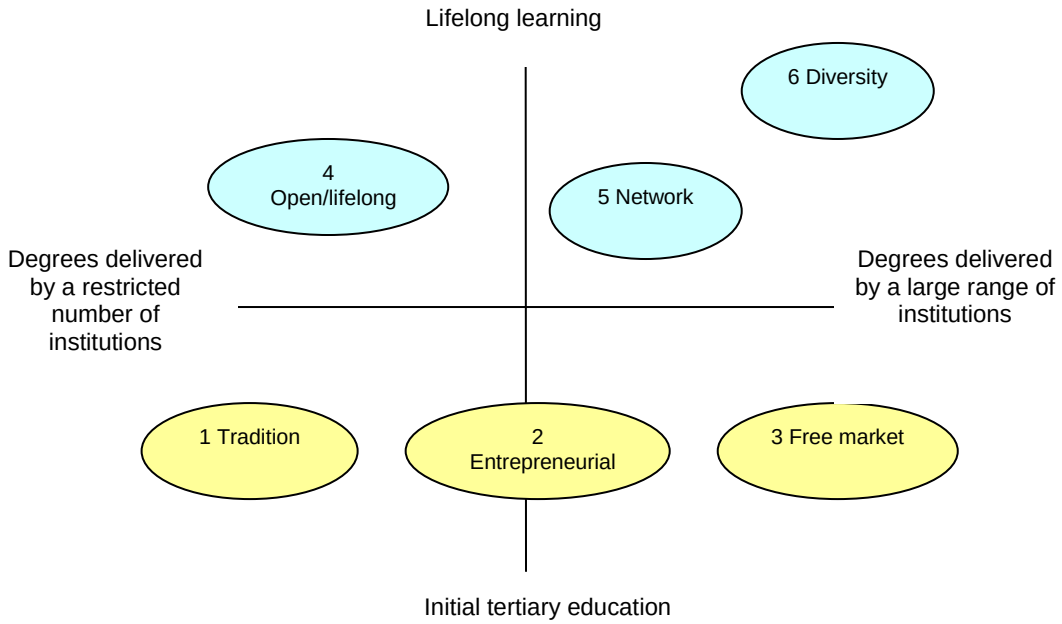

Table6.1. Six scenarios for the future of universities

Scenario	Description
1. Tradition	Universities are mostly like today, catering to a relatively small share of the youth population for the purposes of job selection credentials. Universities pursue both teaching and research, as now, without excessive dependence or involvement with the private sector. Government continues, in most OECD countries, to play a prominent role in funding, regulating and managing universities. Lifelong and e-learning both develop largely outside of the university sphere.
2. Entrepreneurial universities	Selective institutions cater largely to young people in their initial preparation for life. The key difference with the previous scenario is that universities (public or private) can respond with greater autonomy to a variety of funding sources. Given the prestige and income accorded to research the teaching side remains quite elitist. As for lifelong learning it occurs within a university setting but in teaching-only institutions with lower status. The three missions of the university – teaching, research and community service – are well balanced, although there is greater differentiation across institutions due to enhanced autonomy and greater responsiveness. Links to the local economy are strong.
3. Free market	Market forces are the main drivers of this scenario with a private tertiary sector regulated by private companies as far as quality assurance and accreditation are concerned and mostly funded through market mechanisms. Market forces give rise to institutions that become specialized by function, field, audience while business firms grant degrees to their employees for their corporate training. Technology is widely used in teaching methods. The international dimension of the market becomes important. And, since majority of students and their parents are not interested in research, refusing to bear the costs, research moves out to public research centers and corporate R&D divisions.
4. Lifelong learning and open education	Universities are marked by universal access for all ages and much less research. Universities become more learner- and demand-oriented, more teaching oriented, with short courses, more distance learning, and more e-learning. Governments or independent accrediting bodies are responsible for quality assurance and accreditation. Most research is done outside of the higher education system, with the best researchers moving to private companies, specialized institutes or the few remaining elite universities.
5. Global network of institutions	Post-secondary studies become demand- and mostly market-driven. The two main innovations are 1) that learners define their own course of study from across all available courses throughout the global post-secondary education network and design themselves their degrees; 2) that higher education institutions partner increasingly, including with industry. The provision of and market for lifelong learning becomes very large, especially as education takes a multiplicity of new forms. Most research is carried out outside the higher education system, and faculty in mostly teaching institutions becomes less qualified than today but use more sophisticated teaching techniques.
6. Diversity of recognised learning – disappearance of universities	The formal tertiary education sector disappears. People learn throughout their life, at work, at home, for personal and professional motivations, more and more by themselves and by sharing their expertise with other people interested in the same field.

7. CAPACITY BUILDING – TOWARDS A LEARNING REGION IN BUSAN AND SOUTH EAST KOREA

The idea of a learning region, and especially of a learning city-region, is attracting keen and widespread interest among policy-makers as well as scholars in many countries. Many towns and cities pronounce themselves to be learning regions. It is certainly an appropriate aspiration for Busan as it seeks to remake itself with the new economy of a knowledge society. Given the policies of South Korea's central government for both regional development and a changed role and quality of the higher education sector, it is timely for the city now to use the learning city-region notion to frame and give focus to its plans. Almost inevitably, universities as key knowledge centres must feature centrally in such planning.

A learning city-region is more than a place where much individual learning and training takes place and is supported. For young people if not for older adults, Busan already scores very well by such criteria. At the heart of the concept is the capacity of the city itself as an evolving system to learn from and build on its experience. This means that the city's governance must be capable of reflection and of using the results of evaluation, flexible, open to and engaged with the ideas and energies contained in the many sectors, elements and networks that make up the complex city region.

Decentralisation by Korea's central more participatory government puts a heavy onus as well as a formal responsibility on city regions like Busan to take control of their destiny, and in turn to operate in an open and participatory manner. This requires good levels of trust between the city administration and the different elements or stakeholders in the region, based on the experience of working successfully together. This takes time. It should enable the city and its communities together to release the potential of public, private and community agencies, and enable each of these to contribute to the planning and achievement of a desirable and prosperous future for the region. New national policies for higher education, well exemplified by NURI, require universities to play a major role in that process. This chapter suggests ways that Busan together with its universities might build the capacity to become a learning region, and to connect with the city's different networks in tapping into the social capital and the talent that the region contains. Both formal and informal arrangements and networks are required.

The Peer Review Team recommends that Busan examines the idea of a learning city region and considers actively adopting it so as to develop itself into a strongly collaborative intelligent territory, firmly and openly led, with universities as key partners.

The universities in Korea have been destined to become central vehicles of regional development, in large part through efforts made by the current national administration that took power in 2003. This "participatory government" has set balanced development and decentralisation as key goals, making regional development a key national task. Universities are identified as important vehicles for accomplishing this. The OECD review has taken place at a most interesting and critical time on the national and regional policy landscape of South Korea, with the implementation of both *Balanced National Development* and the NURI Programme. In fact, learning and capacity-building activities were being undertaken among regional stakeholders all through the OECD process, with wide

consultation in preparation of the SER, and during the review visit by the international Peer Review Team. The OECD review may be seen as one interim phase in the building of partnerships between regional stakeholders.

Earlier chapters have illustrated the significant contribution that the universities, individually and prospectively collectively, are already making to the Busan region. Working together is not easy in a context of fierce competition, when the most important relations have been between each separate university and the national capital. Likewise taking full responsibility is not easy for the city after decades of strongly centralised national decision-making and management. Recent central government's initiatives, especially NURI, however are accelerating and supporting universities" engagement in building regional innovation systems and human resource development. This Report has noted some universities" interest in wider approaches to regional development that go beyond narrowly economic development. The Report has shown not only economic but also social, cultural and civic agendas which the city of Busan along with its neighbouring cities and provinces need to tackle.

Here the Review Team, recognising the strengths of the universities, suggests how this can be further harnessed so as to prepare the region to act better in the global knowledge economy. This chapter focuses on processes and issues to do with capacity-building for regional cooperation in the Busan region. It adopts the now commonly held view that leading edge knowledge, and especially its constructive sharing with business, industry and the community, will be the key driver for economic growth, development in the quality of life of the region's communities, and socially inclusive wealth creation. Ways, means and timelines suggested below show how the growing thinking between all regional stakeholders can be enhanced to ensure early success for all in the region.

7.1 Enhancing institutional capacity-building for a learning region

Capacity-building is important across several dimensions. It includes the capacity to work together between universities, and indeed between different groups and divisions within each university. It also includes the capacity to work with other kinds of regional partners or stake-holders. These relationships may be differentiated as between the capacity for whole-region multilateral collaboration, and the capacity for productive sub-regional and one-to-one relationships. A city the size of Busan needs to be energised and effective at levels below the whole city administration if participatory development is to work; and yet for some purposes the whole city may not be large enough, and planning is required at the larger south east Korea regional level. All levels of capacity to plan and work together are required. The role of different colleges in such a system will vary but should be complementary.

Linking the internal arrangements and external governance mechanisms of universities is an important aspect of development that is often overlooked. Universities can look and behave rather like "black boxes" to the outside world; and they may be no better than public administrations about working in boxes or silos rather than joining up their efforts across faculties, schools, departments, centres etc. The creation of University-Industry Cooperation Units in each university is an important recognition and practical response to this tendency. University leaders need to bend their efforts to raising levels of cooperation and joint working across traditional disciplines within HEIs; and to requiring academic staff and units to renew teaching curricula and research programmes that reflect the needs of the society and region, rather than being strongly driven and controlled by disciplinary traditions and boundaries. A generally direct and positive correlation can be hypothesised between capacity for collaboration within the university and its capacity to engage and collaborate productively with partners outside.

The Peer Review Team recommends that university leaders work to open up collaborative relations within Busan universities, and develop and monitor arrangements that will build universities" capacity for productive partnership with the city administration and with many sectors of society in the region.

Whole-region multilateral collaboration may be built notably but not exclusively through public forums such as Busan Regional Innovation Committee and its sub-committees; with public bodies such as Busan Metropolitan City and Busan Metropolitan Council; through intermediary agencies such as the Regional Innovation Agency, and Busan Techno Park; and through intelligence-sharing with regional think tank organisations such as the Busan Development Institute (BDI), Busan Human Resource Development Institute (BHRDI), public research institutes and research centres at regional universities. For a regional collaboration case study, see Box 6.1 about Environmental Techno Centre in Chapter 6.

Productive sub-regional and one-to-one forms of relationships may be promoted through various partnerships for regeneration at autonomous district level within the city, and individual partnerships including with NGOs and local communities. The Peer Review Team believe that communicating these two scales is vital both for sharing national and regional strategic visions for the future, and for scaling up key aspects of local bottom-up initiatives to higher orders of magnitude and quality, for the good of the region. In sum, capacity-building will be best achieved by integrating different scales of partnerships and relationships, both horizontally and vertically.

One of the characteristics of recent capacity-building for regional cooperation in Busan is that the process was initiated centrally through the Roh government's *Balanced National Development* principle. From the Peer Review Team's observations the process seems to have been principally led by the public sector. It is important now also to involve the private sector. Given the overwhelming preponderance of SMEs this is a difficult task. In addition the third or voluntary sector should be more fully involved; the Peer Review Team gained the impression that this might prove less difficult, but lacked the information to be clear about this.

The NURI Programme, with national government funding requiring matching funding from the city government and industry, has played a significant role as a new incentive mechanism for the regional universities and their regional partners to work collaboratively. As the focus of NURI projects is on the strategic areas of each region's economic strategies, universities in the region are increasingly recognised as important actors in the strategic thinking for regional economic development processes. Busan will benefit by ensuring that the HE sector is strongly represented in its policy-making and implementation.

The Peer Review Team recommends that since Busan region needs to become a learning region, universities should be treated as equal players in regional decision-making and development along with local government and other regional stakeholders.

Within the Regional Innovation Committee, which is intended to function as a core of regional strategy formation, business voices are represented by the Busan Chamber of Commerce and Industry (BCCI) and Busan Employers Federation, also Busan-Ulsan Regional Office of Small & Medium Business Administration. There needs to be more collaboration, and an integrated and proactive approach to including the business sector in regional strategic thinking, including finding future directions for further university-industry linkages. This means that it will be necessary to nurture professionals who can formulate and implement strategies at regional level, now often referred to as *boundary spanners*. This would include those who work as technology transfer officer at universities, staff at Techno Park, and other regional strategic organisations such as BDI and BHRDI.

The Peer Review Team recommends that deliberate efforts be made to nurture the development of people who are able to operate across multiple arenas and to connect policy-making and its implementation in different sectors and at different levels.

One of the biggest difficulties for capacity-building in the Busan region in terms of participation and effectiveness is found in its business structure. The problem is far from unique: many countries face essentially the same problem with the changed structure of industry following the collapse of traditional sectors. It may be useful for Busan, and Korea, to examine systematically how other countries are trying to address this. The dominance of SMEs in Busan makes it difficult to have the full participation of the business sector in the consultation process. As mentioned in the SER (p. 29), (e.g. University's Technology Development Center for SMEs), there are already good collaborative mechanisms between universities and SMEs functioning in this region. These good practices need to be acknowledged and shared widely within the region. Intermediary organisations such as Busan Techno Park and the Regional Innovation Agency located within Techno Park, and regional think tanks such as BDI and BHRDI, have to further develop closer networks as well developing information-sharing and intelligence systems such as regional Foresight exercises that integrate SMEs" needs into regional development structures. It is imperative to enhance the professional development of those who engage in interface activities and strategy formation between business, government and university sectors.

The Peer Review Team recommends that the Busan region constructs more effective ways to integrate business needs, especially those of SMEs, into regional strategy formation. It may be helpful systematically to examine approaches adopted elsewhere to this challenge.

7.2 Enhancing collaborative higher education mechanisms in the region

It is a recent development for a collective spirit to occur among the region's universities, to work more closely together for the mutual benefit of themselves and their regional partners. The Peer Review Team's impression is that this is now growing fast. The NURI Programme is proving a strong instrument connecting the government's principal policy of *Balanced National Development* and the current policy agenda of restructuring higher education and making HEIs more relevant to societal needs. It would be useful very soon to evaluate the impact of the first wave of NURI projects in order to extend and strengthen this clearly successful strategy in the expected second wave. It is also important that "joined up government" be practised in this respect nationally, so that the efforts of different relevant Ministries pull together and are harmonised to maximum effect.

The Peer Review Team recommends that the new strategy of the NURI Programme be reviewed, extended and consolidated, along with other relevant government funding programmes for universities provided by the Ministry of Commerce and Industry and the Ministry of Science and Technology; and a long-term vision developed and shared to make this new incentive mechanism sustainable so that universities can make long-term commitments and adopt appropriate strategies.

The contribution that universities can make to regional development is recognised by governments in many countries, and is the basis for this OECD project and the keen interest in it in many countries. In some countries HEIs are encouraged to form regional consortia. Sometimes financial support is provided from national bodies.[12] In the case of the English regions, Higher Education Research Associations (HERAs) were created as a means of encouraging cooperating in research, teaching, and access on a regional scale. Regional inter-university cooperation is also seen as creating a unified voice for the higher education sector in response to regional development agencies

12 See the North East of England SER and PRR. http://www.oecd.org/document/35/0,2340,en_2649_34859749_35602979_1_1_1_1,00.html

and other regional governance bodies. HERA-type bodies often act as a lobbying body. There are also in different countries a number of other kinds of HE collaborative mechanisms and partnerships at regional level, created for joint bidding for funding to deliver university-industry collaborative projects.

In Korea, while the NURI Programme is based on regional HE system thinking, there seem to be no strong policy instruments fostered by the central government or even at Busan local government level to create a strategic and effective body for university collaboration in the region. The Peer Review Team enquired about this during the review visit. A number of professors remarked during the Review visit that there is an increasing need for universities to lobby together at regional level.

In Busan there is a regional association of industry-university cooperation officers, which functions for practical information sharing and exchange. There is also an association of university Deans of Planning. A committee of university presidents includes 13 universities in the region, but it has no executive body and the members meet on only a few occasions a year. There is also an arrangement of informal meetings for university presidents in Busan, Ulsan and Gyongsangnam-do and Jeju-do. These informal arrangements have obvious utility, but more formal, sustained and executive-oriented arrangements are now also required in the new national policy environment.

As was referred to in Chapters 4 and 6, DIUC, a new organisational unit for university-industry relations has been required and established at each university. As mentioned above, there is a regional association of industry liaison officers in the region. One university professor told the Peer Review Team that for universities it is important to collaborate with industry beyond the administrative boundaries of the Metropolitan City of Busan, but sometimes local administrative structures hinder collaborative activities. Universities have to work with firms in wider regions for research collaboration and market niches. There is now a discussion under way to initiate a formal council covering the wider south eastern region.

The Review Team recommends that both central government and local governments in Korea consider international models to create effective regional bodies for HEIs. The local administrative boundaries do not always help universities to collaborate with business. Local governments need to recognise that businesses and universities activities go beyond administrative boundaries, but still promote intra-regional and inter-regional collaboration.

At an individual level there are probably already many productive links on the part of university professors who work for the Metropolitan City of Busan and with local industry. The Peer Review Team heard of various examples, including the deliberately planned relationships now growing up and referred to in Chapter 4 above. For example, university professors participate in Busan City strategy formation as members of various committees, and they sometime provides consultancies. Pusan National University particularly plays an active role in regional strategy formation. For example its University President sits on the Regional Innovation Committee, while the BHRDI Secretary General is from Pusan National University. University professors are also active members of the Committee of Busan Technology Park, where they investigate and discuss future directions concerning the “next technology load map”.

7.3 Sustainable innovation and HRD systems for the Busan region and South East Korea

The central mechanism for Balanced National Development is the RIS system, building capacity by developing core strategic industries in each region and growing regional universities” capacity and concentration of effort to nurture human resource development, and to retain human resources in the regions, checking and reversing the drain into greater Seoul.

We have referred earlier in this report to the unitary approach to HE system development in Korea, with two and four year colleges seen as part of the one system. This provides a good basis for the new more purposeful specialisation and collaboration between universities and the two year colleges. Keen competition characterised the rapid growth of the HE system mainly through the opening of many private colleges. This created a culture antithetical to collaboration, but the Peer Review Team was struck by the apparently strong new inclination, prompted by NURI and related regional devolution policy initiatives, to consider working together in quite different ways – "sleeping with the enemy" is becoming a more natural way forward.

Government cannot direct the behaviour of private HEIs. Indeed its interventions into the private school and college sector in 2005 were provoking hostile reactions in that sector referred to earlier in this report. The Peer Review Team gained the impression that MOE & HRD thinking favoured the amalgamation of small institutions that may become non-viable with the declining size of youth age cohorts, as well as other mergers that would give critical mass in research and R&D terms. Other different forms of affiliation short of full merger but extending beyond general agreements to cooperate may be worth considering and encouraging, such as (con)federations between similar and between different institutions on a locality or specialisation basis within the Busan and south east Korea area. Agreement to play reciprocally beneficial complementary roles with linkages to allow student progression, the exploitation of research from research-intensive universities, and the sharing of different kinds of post-experience HRD tasks and opportunities between two- and four year institutions could allow different institutions to benefit and contribute in a system where diversity and collaboration are jointly celebrated.

The Peer Review Team recommends that the Korean government, Busan city administration, and HEIs in the Busan region, consider a wide range of arrangements for specialisation, collaboration and rationalisation for regional development, including forms of linkage, federation and other affiliation that include full merger.

This concluding section of Chapter Seven returns briefly to a question raised several times in this review report: what is the "right" region for the planning of future regional development in Korea, and specifically in the greater Busan region? What is the best way forward for wider governance and social development of this region, and what is the most promising regional focus for Korea and its higher education system in the context of changing relationships between central and regional government? The Deputy Minister for Education suggested to us that 3-4 million people represented the kind of size that allowed for a reasonable measure of participation, with government administration able to be reasonably close to and open to the different communities and interest groups that represent the essential fuel for sustainable regional development. On the other hand it was suggested to the Peer Review Team on several occasions that a larger region, identifiable as south east Korea, represented a natural stronger economic region for planning in a competitive national, East Asian region and global environment; and that there were already significant economic interdependencies and higher education linkages in this larger region that favour this.

The Peer Review Team also had brought to its attention, and sought more information about, the Daegu and Gyongsanbuk-do Joint Regional Committee which represent a response across two administrative regions to the central government's new decentralisation-and-development initiative (see Box 7.1. below). It appears that there are particular historic reasons why this joint development is being attempted in the case of Daegu and Gyongsanbuk-do that do not apply with the same force in south east Korea. None the less

the Peer Review Team recommends that the three regional authorities in south east Korea take note of the Daegu and Gyongsanbuk-do Joint Regional Committee in considering their owning joint development options for the medium term.

Box 7.1. Daegu-Gyeongbuk Regional Innovation Council

The "Daegu-Gyeongbuk Decentralisation Innovation Council" was setup on 25 June 2003. When the Balanced National Development Act was setup and declared on 29 December 2003, the council was re-established as the Daegu-Gyeongbuk Regional Innovation Council on 10 May 2004 as a legal institution to carryout the important role of discussion and mediation for the consideration of regional innovation development plan and balanced national development.

The Daegu-Gyeongbuk Regional Innovation Council is a super metropolitan governance that integrates Daegu and Gyeongbuk. The council incorporates various aspects of the society such as businesses, local governments, civic groups, universities, media, research institutes and etc. It consists of five sub-committees of Regional Industry, HR Development, Science and Technology, Balanced Development, and Citizen Participation, with a hundred council members who have representative and professional qualities.

As administrative districts, Daegu and Gyeongbuk are divided into separate metropolitan regions. However, throughout history and even today they share a single zone of life. In particular, the two regions form a common economic region in which various industries are highly connected to each other. It was agreed that if key tasks from policies related to balanced national development through regional innovation and development transcend boundaries and are promoted commonly in the two regions, it would maximise the effects of those policies. Hence a super metropolitan consultative body was born.

Talks for autonomic regional changes and development through decentralisation-autonomy-innovation have led to related researches led by Taegu Institute of Social Studies, and regional movements led by Daegu-Gyeongbuk Branch of Decentralization Movement of Sustainable Korea throughout the country since around ten years ago. This has prepared the foundations for new changes. Based on such experiences, it was witnessed that regional issues can be solved by participation and practical suggestions from various entities. Hence, unlike other regions, the Daegu-Gyeongbuk Regional Innovation Council could be borne as an organisation led by civic groups with businesses, local governments, universities, media and research institutes participating.

Cross-border collaboration is taking place at the institutional level. For example, Medical Schools in Busan and its neighbouring areas are developing collaborative relationships, sometimes encompassing administrative boundaries (see Box 7.2. below; and also Box 4.1 and 5.1).

Box 7.2. Medical schools working across borders

Gyeongsangnam-do has a medical school (Gyeongsang University) in Jinju, located at the western end of Gyeonsangnam-do. In terms of medical education, medical schools in the Busan-Gyengnam area are collaborating each other. Medical schools share information about education and national health care policies. However, in terms of research and technology transfer, collaboration systems between Busan and Gyeongnman medical schools have not developed well enough. Recently, collaborative research by PNU, Dong-A and Inje medical schools in tissue regeneration using stem cells has been established. They will share knowledge, idea and information in this field and perform joint research.

Other aspects of "region" and "development" are touched on in this report, as a result of ideas raised with us during the review visit. One, featured in Chapter 4 above, concerns the development of National Network of Excellence – inter-regional networks to give the nation strength as a global economic player in important areas of science and technology. If these are deliberately developed in Korea this should be done with the distinctive characteristics strengths and ambitions of the regions so involved kept clearly in mind.

Going still further beyond the Busan and south east Korea regions, East Asia as a powerful emergent world geo-political region represents big challenges and opportunities for Korea and its economy, and huge opportunities for Korean universities working across national borders. The Peer Review Team came across examples during its visit within Busan higher education of teaching and providing workplace attachment and learning opportunities within China for undergraduates who subsequently took up employment there. The impact of China's rising industrial power is demonstrated in the case of the footwear industry: on the one hand Busan has lost mass market share, and jobs, to China; on the other hand the challenge is driving the Busan footwear industry up-market into more specialised high tech areas. The partnership of universities in this R&D and exploitation of new technology is a good example of a positive response to wider region competition.

The Peer Review Team recommends that Busan, and Korea, think about and practise regional development in flexible ways across the several levels of "region", from very local levels within Busan city, through the Busan and south east Korea regions, and into the East Asian regional setting; and that these strategic approaches are treated in connected and non-competitive ways and not as mutually excluding alternatives.

8. CONCLUSIONS AND SUMMARY OF RECOMMENDATIONS

8.1 Introduction – the Busan SER

In this concluding chapter we draw together for convenience recommendations embedded in earlier chapters, identifying in which chapter and so context they appear. They are grouped for convenience in terms of whom they most apply to: individual HE institutions; the regional level of governance; or national policy. These are not summative judgements and they should not be read in isolation from the argument in the body of the report.

The first section following this introduction collates points that relate especially to the region itself, the prime focus and intended beneficiary of the work. It is followed by sections applying mainly to individual institutions, and then to national policy. We conclude with some brief observations reflecting the comparative international nature of this OECD project.

The Busan Self-Evaluation Report (SER) concluded vigorously with a set of observations, with which in essence the Peer Review Team agrees. Some of these are reproduced here. We begin with the positive observation that "the central government's policy on regional development clearly served as a trigger for Busan's HEIs to start engaging regionally". By contrast, "as recently as 20 years ago, [the] HEI in Korea was an "ivory tower" detached from but respected by society as a centre for academic studies. However, it now has to be the society itself, and participate in the society's development."

The SER concludes about Busan that "like other regions in Korea, however, the regional contribution of HEIs is still small relative to other advanced regions in OECD countries. The increasing effort by HEIs in Busan to engage in regional development is still largely driven by the central government's policy to redress regional disparities and promote decentralisation, rather than by their own determination. Whether or not the HEIs actively work for regional development of their own will is bound to become a critical issue down the road." It suggests that "conditions have changed dramatically to the extent that HEIs in Busan themselves recognise the need to respond to regional needs and take the lead in regional development".

At present the SER finds that Busan has numerous organisations that bring together the city's government, companies, HEIs and other regional actors to share views on regional development, but that they are not yet capable of discussing regional issues in depth and coming up with joint proposals. "The challenge for regional actors in Busan is to build true partnerships not only on the outside but also in substance." The Report notes that "working closely with local governments and businesses is important, but further efforts must be made to build close links among HEIs for regional development".

The SER concluded that a council must be set up and operated specifically for the cooperation of HEIs and regional bodies, in which HEI, Busan Metropolitan City and regional stakeholders participate. The present regional reform council does not limit its focus to HEIs, but handles general aspects of human resource development. Currently there is no body in Korea through which HEIs are officially linked to regional governments and bodies. Nor are HEIs restricted by the operation of

regional governments at all. This results in a very low level of responsibility towards regional society on the part of HEIs. Given these limits, there needs to be a separate department for Busan university development within the regional reform council.

The SER also notes that "structured research or evaluation on the role of HEIs in regional development in Korea has been scarce. In fact, this type of discussion singularly devoted to Busan has been practically nonexistent." In this respect the SER "has huge significance in itself. Moreover, the peer review by international experts in this field and comparative study with other regions will be highly valuable."

The findings of the Peer Review Team essentially echo those of the SER. Recommendations developed in the course of the seven chapters above are collated below for convenience. They should be read not as bald assertions, given the limited time and hence authority of the review team, but as advice and pointers to be understood in context throughout the report.

Most of the collated recommendations have a natural relevance to one or other party, but a number by their nature require joint and collaborative attention by different "levels" and stakeholders, not only those under which they are located. Korea's big policy changes for regional rebalancing and reformed higher education are each very new. Our advice consequently reflects this formative stage of national development and renewal.

Because Korea and Busan are attempting such significant sets of changes, we frequently recommend that different approaches and experiences be considered from around the world, and that an attitude and practice of continuous reflectiveness and experimentation by adopted, perhaps emulating approaches adapted from elsewhere, with a view to "scaling up" and "rolling out" those that prove successful, while not pursuing others that seem not to work for Korea and Busan. This is part of what the now widespread idea of a learning city region is centrally about.

8.2 Possibilities and prospects for the Busan region

These points, addressed generally to "the region" and the city of Busan, need to be considered by Busan's evolving policy-making, consultative and administrative organisations and partners, including HEIs and private business as well as the government sector, and often the non-governmental third sector as well. Many depend on a growing spirit of confidence and trust gained through successful and productive partnership. They also depend on sustained support by purposeful central government. Both national and city levels of government must expect resistance from established interest groups, and from those who simply do not like to have to change. "The region" itself is not necessarily fixed; for some purposes south east Korea may be the more appropriate entity in the medium term.

Relevant recommendations are collated as follows.

- The Peer Review Team recommends that close coordination and collaboration between central and local governments be accorded high priority as being indispensable to implementing devolution and regional development strategies. (ch. 2)
- The Review Team recommends that Busan look closely at approaches and examples elsewhere and test some of these selectively; and that the Ministry of Education take a close and supportive watching into in such experimentation. (ch. 4)
- The Review Team recommends that the Busan region and its stakeholders look to a wide range of established, emergent and new approaches and models for innovation and technology transfer in different regions. (ch. 4)

- The Review Team recommends that both central government and local governments in Korea consider international models to create effective regional bodies for HEIs. The local administrative boundaries do not always help universities to collaborate with business. Local governments need to recognise that businesses and universities activities go beyond administrative boundaries, but still promote intra-regional and inter-regional collaboration. (ch. 7)
- The Team recommends that the Korean government, Busan city administration, and HEIs in the Busan region consider a wide range of arrangements for specialisation, collaboration and rationalisation for regional development including forms of linkage, federation and other affiliation that include full merger. (ch. 7)
- The Review Team recommends that efforts be made by Busan City in partnership with its universities and the Ministry of Education to correct the mismatch between the supply of research and the needs of firms due to sub-optimal research programmes. (ch. 2)
- In order to remove obstacles to synergistic effects, the Review Team recommends that links between education and business communities be significantly reinforced in Busan, by implementing industrial liaison programmes and other forms of liaison activities. (ch. 2)
- The Review Team, believing that active collaboration among regional stakeholders is the key to the effective regional HRD, and that establishing an effective coordinating mechanism for RHRD is essential, recommends that the role and function of BHRDI be further bolstered to serve as a knowledge centre for regional HRD. (ch. 3)
- The Review Team believes that competitive, highly respected universities attract talented people into the regions. For Busan to become a leading region in the future, the Team recommends that the City sets itself the challenge of Busan having at least two world-class universities in the region. (ch. 3)
- The Review Team recommends that Busan consider the desirable balance between research for longer term new developments and "exploitative" R&D for the use and dissemination of existing technologies, and develops more inter-institutional collaboration and partnership of a complementary nature. (ch. 4)
- The Review Team recommends that Busan develops a staged series of interactions with low- and mid-tech SMEs, using students and technicians as a first line of assistance, to conserve faculty resources for difficult cases and to expand the number of firms that can be assisted. (ch. 4)
- The Review Team recommends that Busan seeks to build on current system capability to accelerate development, in particular taking advantage of the integrated tertiary structure and the capacity for inter-HEI collaboration between 2 and 4 year institutions. (ch. 4)
- The Review Team recommends that the metropolitan Busan administration set up arrangements whereby the region can create and carry out innovation plans with universities at the heart of the process, in continuous engagement. (ch. 4)
- The Review Team recommends that Busan City give urgent consideration to encouraging its universities to be more fully involved in wider social and cultural development, and in more environmental activity. (ch. 5)
- The Review Team recommends that Busan City promotes discussion of the broader social, environmental and quality of life dimensions of regional development, as being important in themselves and vital to the long-term sustainability of economic as well as social development. (ch. 5)
- The Review Team recommends that Busan City widens its ambitions, creating a new image that celebrates and exploits its history and natural heritage as well as its current cultural capital, and the significant cultural and creative assets that its universities represent. (ch. 5)
- The Review Team recommends that Busan work with its universities purposefully to help transform the City's identity into one of cultural vibrancy, "the place to be". (ch. 5)

- The Review Team recommends that Busan gives more thought to its place/region holistically, rather than only in terms measured by economic indicators. (ch. 5)
- The Review Team recommends that a clear and explicit consensus be established among key stakeholders in the process of policy-making, in determining policy goals and implementation strategies. Also, regional stakeholders such as local government, HEIs, and industries should involve themselves actively in the consensus-building process. (ch. 6)
- The Review Team recommends that Busan examines the idea of a learning city region and considers actively adopting it so as to develop itself into a strongly collaborative intelligent territory, firmly and openly led, with universities as key partners. (ch. 7)
- The Review Team recommends that since Busan region needs to become a learning region, universities should be treated as equal players in regional decision-making and development along with local government and other regional stakeholders. (ch. 7)
- The Review Team recommends that deliberate efforts be made to nurture the development of people who are able to operate across multiple arenas and to connect policy-making and its implementation in different sectors and at different levels. (ch. 7)
- The Review Team recommends that the Busan region constructs more effective ways to integrate business needs, especially those of SMEs, into regional strategy formation. It may be helpful systematically to examine approaches adopted elsewhere to this challenge. (ch. 7)
- The Review Team recommends that the three regional authorities in south east Korea take note of the Daegu and Gyongsanbuk-do Joint Regional Committee in considering their owning joint development options for the medium term. (ch. 7)
- The Review Team commends those involved with this review at national level and in metropolitan Busan for their plans to take advantage of the review for ongoing development. It recommends that regional and national dissemination be pursued, and that the Ministry consult with OECD about the possibility of arranging an international OECD seminar, perhaps focused on taking these issues forward especially in the Asian and Pacific region. (ch. 5)

8.3 Higher educations institutions in the Busan region

This Report does not make recommendations affecting individual institutions. However, many of its observations deserve consideration by all HEIs, or by particular categories - private or public, two-year colleges or four year universities. In general, the Report advises rebalancing the existing intense competitiveness with purposeful collaboration to manage the difficult changes required by changing demography and new national policies.

HEIs can find new kinds of business in the changing national, local and global environment, using partnership to create much stronger diversity of mission, role and business, in which different institutions can complement one another to mutual advantage. Some new forms of affiliation such as (con)federation may be required, short of full merger.

More formal association across all HEIs could provide a stronger and clearer voice to represent and lobby for common elements among the diverse interests of the tertiary sector, also making it easier to learn from and exchange best practice with one another. Internally, institutions need to strengthen the capacity for cross-subject and cross-unit collaboration so that they can respond better to the needs of the society.

Relevant recommendations are collated below.

- The Peer Review Team recommends that four-year universities in the Busan region downsize their undergraduate enrolments and adjust themselves to match the regional demands for human resources. Furthermore, universities should be more active to in incorporating industrial needs into their curricula. (ch. 3)
- The Peer Review Team recommends that individual universities each establish an official mechanism to reflect their regional needs and to respond to it in an effective way. In the long run, it is crucial to revise the evaluation system so that a new culture of collaboration thrives. (ch. 3)
- The Peer Review Team recommends that serious consideration be given to a division of labour between national and private universities. National universities should downsize their graduate programmes in a significant way, leaving most of this work to private universities with teaching capabilities. (ch. 3)
- The Peer Review Team recommends that universities redouble efforts to recruit more female students into the engineering and natural science programmes, and that employment promotion activities for female students such as internship programme should be further emphasised. (ch. 3)
- The Peer Review Team recommends that universities within the region deliberately learn together from one another and emulate successful best practices. (ch. 4)
- The Peer Review Team recommends that Busan's universities and their partners plan and adopt procedures, criteria, norms ,and maximum times for the progression or graduation of new companies beyond the incubator phase. (ch. 4)
- The Peer Review Team recommends that the Korean government promote joint funding for projects, University-Industry Cooperation Centres and other commercialisation of research activities by different central government agencies. (ch. 4)
- The Peer Review Team recommends that the relationship of Busan Technopark with HEI-based incubator arrangements by clarified and developed. (ch. 4)
- The Peer Review Team recommends that the exploration of models to expand the capacity of universities to engage with business, by expanding from an individual academic-to-firm relationship to a broader organisational approach to university-industry relations, in order to expand capacity and efficiency, without replicating high cost facilities. The objective is also to reduce the potential for overloading individual faculty members, while increasing the impact of university engagement efforts. (ch. 4)
- The Peer Review Team recommends that distinct, specialised fields of study be grown, with related areas having synergistic potential. Along these lines, it is also recommended that HEIs take an interdisciplinary approach to developing educational and research programmes within the university. (ch. 6)
- The Peer Review Team's considers that without appropriate incentives it is difficult to motivate faculty members to take part in university-industry cooperation, and therefore recommends that the evaluation system for faculty performance be revised to give more credit for university-industry cooperation. (ch. 6)
- The Peer Review Team believes that it is necessary to vary and diversify the models of specialisation, and to differentiate the different ways that a university becomes specialised. The selection of specialised fields should be made with consideration of strategic alliances with institutions within and beyond the Busan region. (ch. 6)
- The Peer Review Team recommends that Busan universities establish a regional learning system, focus more on lifelong learning, and collaborate more with one another. (ch. 6)
- The Peer Review Team recommends that university leaders work to open up collaborative relations within Busan universities, and develop and monitor arrangements that will build universities" capacity for productive partnership with the city administration and with many sectors of society in the region. (ch. 7)

8.4 Developing and implementing policy at national level

The Peer Review Team was impressed by the evident determination of the Korean government to pursue by participatory and democratic means rebalanced national development through regions other than greater Seoul, and to bring about significant changes in the system of tertiary education, partly in support of more decentralised regional development. Achieving these changes calls for steely determination of purpose, combined with flexibility and openness to feedback and change in getting results. A combination of patience and persuasion, as well as firm sanction, is required to sustain the momentum of change.

As always, a major challenge for the government is to secure internal coordination between the different departments and instruments of administration ("joined-up government"). The arrangement for three Deputy Prime Ministers, one of them the Minister for Education, and of Presidential Committees, suggests a clear understanding and commitment to securing this. It will be equally important to "join up" vertically between the national government and the cities and regions, and to ensure that regions do not suffer contradictory messages and pressures from different central departments of State.

- The Peer Review Team commends those involved with this review at national level for their plans to take advantage of the review for ongoing development. It recommends that regional and national dissemination be pursued, and that the Ministry consult with OECD about the possibility of arranging an international OECD seminar, perhaps focused on taking these issues forward especially in the Asian and Pacific region. (ch. 1)
- The Review Team recommends that the national government consider as a matter of urgency the implications of Korea's changing demography and ageing population for the role of higher education, taking account of both workforce and equity considerations. (ch. 1)
- The Review Team recommends that close coordination and collaboration between central and local governments be accorded high priority as being indispensable to implementing devolution and regional development strategies. (ch. 2)
- The Review recommends that in order to enhance regional capacity and conditions for internal local development, there should be a clear division of responsibility between the centre and the regions, and upgrading of the capacity of local governments to enhance balanced regional development. (ch. 2)
- In view of local government's need to have the instruments necessary for a successful industrial policy, such as budgeting, financing, investment and authorisation, the Review Team recommends that efforts to be redoubled to enable this at regional level. (ch. 2)
- The Review Team recommends that central and local governments should continue to support the key regional stakeholders for HRD through government-funded projects like NURI. (ch. 3)
- The Review Team recommends that the Ministry of Education and Human Resource Development adopt a close and supportive watching stance in relation to city level experimentation with HE innovation approaches tried elsewhere. (ch. 4)
- The Review Team recommends that the relocation of Research Institutes be managed so as to enable the creation of critical mass for regional development. (ch. 4)
- The Review Team recommends that the Korean government led by MOE & HRD explore ways of directly stimulating research in firms, especially SMEs, in collaboration with HEIs. (ch. 4)
- The Review Team recommends that the Ministry of Education now reviews and evaluates the effects of the requirement for universities to obtain a certain proportion of funds from industry partners in order to improve their chances for government research funding. (ch. 4)

- The Review Team recommends that the Korean government through MOE & HRD considers sponsoring selective national network development for advanced R and R&D in key areas, thus combining regional and national development. (ch. 4)
- The Review Team recommends that MOE & HRD focus on advice and support to regions for alumni and diaspora strategies that will develop regional capacities, and that Busan try out different approaches for this purpose. (ch. 4)
- The Review Team recommends that consideration be given nationally, via the Ministry of Education and Human Resource Development, to creating incentives and measures for HEIs to play a wider regional, social and community role, rather than being expected to do this entirely as charitable community service. (ch. 5)
- The Peer Review Team recommends that the new strategy of the NURI Programme be reviewed, extended and consolidated, along with other relevant government funding programmes for universities provided by the Ministry of Commerce and Industry and the Ministry of Science and Technology; and a long-term vision developed and shared to make this new incentive mechanisms sustainable so that universities can make long-term commitments and adopt appropriate strategies. (ch. 7)
- The Review Team recommends that consideration be given to developing a south-east Korean administrative and economic super-region" centred on Busan, to achieve the scale and critical mass required to compete and do well nationally and internationally. (ch. 1)
- The Review Team believes that it is necessary to vary and diversify the models of specialisation, and to differentiate the different ways that a university becomes specialised. The selection of specialised fields should be made with consideration of strategic alliances with institutions within and beyond the Busan region. (ch. 6)
- The Review Team recommends that both central government and local governments in Korea consider international models to create effective regional bodies for HEIs. The local administrative boundaries do not always help universities to collaborate with business. Local governments need to recognise that businesses" and universities" activities go beyond administrative boundaries, but still promote intra-regional and inter-regional collaboration. (ch. 7)
- The Review Team recommends that the Korean government, Busan city administration, and HEIs in the Busan region, consider a wide range of arrangements for specialisation, collaboration and rationalisation for regional development including forms of linkage, federation and other affiliation through to merger. (ch. 7)
- The Review Team recommends that Busan, and Korea, think about and practise regional development in flexible ways across the several levels of "region", from very local levels within Busan city, through the Busan and south east Korea regions, and into the East Asian regional setting; and that these strategic approaches are treated in connected ways and not as mutually excluding alternatives. (ch. 7)
- The Review Team recommends that Korea engages at national and regional levels in a sustained process of scenario-building to develop a flexible, diversified higher education system fit for the purposes of a modern society in the competitive global economy. It may wish to take the OECD higher education scenario as one basis, and to offer to play a leadership role regionally and internationally in such scenario-building and planning. (ch. 6)

8.5 Learning internationally – contribution to OECD inter-regional learning

OECD developed largely within Western European, North American and otherwise Anglophone traditions and forms of government, gradually widening to other parts of the world including a wider Europe. In terms of the wider world of the future, the Republic of Korea is an OECD member of considerable significance to the Organisation and its older members. It represents the vigorous East

and North East Asian economies at a time when the balance of world economic power shifts to that region. It also offers different deep cultural and historic roots from which present-day understandings and approaches often still derive.

South Korea is also of particular interest to other partners in the "contribution of the universities to regional development" project by virtue of the keen interest of its government to take a very active part in this project and in other OECD affairs, for example in hosting further development and dissemination work. Distinctive characteristics include the recent shift from a highly centralised and authoritarian administration managing the aftermath of the Korean war to a democratic and much more participatory administration committed to the two key elements of the IMHE project: regional decentralisation and balanced development; and the reform of higher education to enhance its quality and efficiency in the face of demographic and economic change. South Korea sees these two policies as closely connected, and is trying in various ways to secure an integrated approach to making and carrying out policy. In all this, and in the difficulty for a city-region to assume responsibility not previously allowed to it over the decades, there are fascinating and important lessons from which others may learn.

Also, as stressed on several occasions in this Report, South Korea has a particular interest for others, by virtue of three characteristics. Each of these relates to major policy issues for other countries. The first is its extremely high rate of participation in higher and tertiary education; it is encountering the issues and consequences arising from achieving the near-universal participation rates to which others aspire (or which they fear) well down the road. Secondly, it has an extremely large private sector, and so has gone far down a road which others especially in Europe find themselves thrust towards, or are contemplating or tentatively exploring, often with anxiety and intra-sectoral conflict. Thirdly, it has what appears to be a thoroughly robust working model of an integrated tertiary system with a fair measure of role differentiation (but a desire for much more) in which articulation and transfer actually occurs on a significant scale. In all these ways Korea should be of great interest within this Project partnership, and more broadly.

- The Peer Review Team therefore recommends that other countries participating in the OECD project look closely at the Korean system of managing its two year colleges and progression into four year universities in the context of regional planning and development. (ch. 1)
- It also recommends that other nations interested in progression through two-year vocational routes to full graduate status take note of the Korean two year college–four year university relationship and progression approach. (ch. 1)

More generally this Report invites others to examine the management and evolution of a mixed but largely private sector system with a large number of institutions, relative to total population, and very high rates of participation by the young, in terms of transition to a more fit-for-purpose and diversified universal lifelong learning system aligned with purposeful regional development rebalancing away from an overwhelmingly powerful metropolitan capital region.

Finally, the Review Team encourages IMHE to take note of Korea's keenness to contribute to ongoing work in relation to this Project, and to host international and regional meetings designed to carry understanding and dissemination forward.

REFERENCES

Birnbaum, R. (1983), Value of different kinds of colleges, in Birnbaum, R. *Maintaining Diversity in Higher Education*, San Francisco: Jossey-Bass, pp. 1-36.

Busan Metropolitan City & Busan Metropolitan City Office of Education (2003), *Busan Metropolitan City HRD Basic Plan: Human-Polis Busan*, Busan: Busan Metropolitan City.

Busan Regional Steering Committee for the OECD/IMHE regional review (2006), *Busan Case Study Report*, Self-Evaluation Report, Busan, Republic of Korea, January 2006, http://www.oecd.org/dataoecd/13/33/36040477.pdf

Casas, R., R. de Gortari and M.J. Santos (2000), The building of knowledge spaces in Mexico: a regional approach to networking, *Research Policy*, Vol. 29, Issue 2, February, pp. 225-241.

Etzkowitz, H. and M. Klofsten (2005), The Innovating Region: Towards a theory of knowledge based regional development *Research Management*. 35 (3), pp. 243-255.

Etzkowitz, H., J. Mello and M. Almeida (2005), Towards "meta-innovation" in Brazil: The evolution of the incubator and the emergence of a triple helix *Research Policy* Vol. 34, Issue 4, pp 411-424.

KEDI/MOE & HRD (2004), *Current Status of Korean Higher Education 2004 indicators*. Seoul: KEDI.

KEDI/MOE & HRD (2005), *Basic Education Statistics*, Seoul: KEDI.

Korea National Statistical Office (2004), *A Survey of Economically Active Population*, Seoul: KNSO.

Korea National Statistical Office (2005), *Regional Gross Domestic Product*, Seoul: KNSO.

Lee. H.-C. (2005), Country Report, Korea A paper delivered at the Eighth session of the Regional Committee under the Regional Convention on the Recognition of Studies, Diploma and Degrees in Higher Education in Asia and the Pacific, held in Kunming, China, May 2005. http://www.aparnet.org/documents/8th_session_country_reports/Country_Report-Korea.pdf

Lee, J.-S. (2004), New Paradigm for Balanced Regional Development: Visions and Strategies in Korea A paper presented at the KEDI-World Bank international seminar on balanced regional development and the role of tertiary education in Korea, held in Pohang, Korea, February 2004.

Lim, J.D. (2000), The Restructuring of Pusan's Economy Under the Current Economic Crisis in *Asian Geographer*, Vol.19, No.1/2. pp. 107-118.

Miller, R. (2003), The Future of the Tertiary Education Sector: Scenarios for a Learning Society, A paper presented at the OECD/Japan Seminar, Tokyo, Japan, Dec. 11, 2003.

OECD (2004), *OECD Territorial Reviews Busan, Korea*, Paris: OECD.

Ryu, J.-S.(2005), A Prospect of Mid- and Long-term Demands for Human Resources and Training & Development, Busan: Pukyung National University.

Saxenian, A. *et al.* (2002), Local and Global Networks of Immigrant Professionals in Silicon Valley, California Public Policy Institute.

Shakur, R. (2006), IIT Kanpur Incubator Project, A paper to be presented at Triple Helix Ethiopian Conference, Addis Ababa.

APPENDIX 1: THE OECD REVIEW TEAM

Lead Evaluator

Chris Duke is Director, Higher Education, for NIACE and Honorary Professor of Lifelong Learning at Leicester and Stirling in the UK, and Professor of Regional Partnerships and Learning at RMIT in Australia. He has worked at the Universities of Greenwich and Leeds, as founding Director of Continuing Education at the Australian National University, Foundation Professor Continuing Education and, Pro-Vice-Chancellor at the University of Warwick, President of the University of Western Sydney Nepean, Professor of Lifelong Learning, University of Auckland, and Director of Community and Regional Partnership at RMIT. He has worked for many years with the OECD and other international organisations, and published widely on higher education, organisation behaviour and change, the role of education in development, recurrent education and lifelong learning, equity and poverty reduction issues, and sustainable development. He is Executive Officer of the Pascal International Observatory on Learning City Regions.

International Expert

Henry Etzkowitz is chair in Management of Innovation at the Business School, University of Newcastle-Upon-Tyne and Director of the KITE (Knowledge, Innovation, Technology, Enterprise Research Centre). He is co-founder of the Triple Helix international conference series on university-industry-government relations) [www.triplehelix5.com]. Henry is author of Triple Helix: A New Model of Innovation, MIT and the Rise of Entrepreneurial Science and co-author of Athena Unbound: The Advancement of Women in Science and Technology.

National Expert

Byung-Shik Rhee is research fellow of KEDI in which he does extensive research on higher education policy. He worked at the Leadership Development Center, Samsung Electronics, serving as assistant director in 2001. He served as a member of Presidential Committee on Education Innovation (Higher Education division) in 2004, and joined in evaluating NURI projects. He also was a national coordinator for the OECD thematic review of tertiary education and has been responsible for the review on the Korea side since 2004.

Team Co-ordinator

Fumi Kitagawa holds a PhD in Urban and Regional Studies. Her research expertise includes universities and city-region development, competitiveness and productivity, and local economic and social development. In 2005 she held the Jean Monnet Fellowship at the European Forum, The Role of Universities in Innovation Systems, Robert Schuman Centre for Advanced Studies at European University Institute. Her recent work at Department for Higher Education Research, National Institute for Educational Policy Research (NIER) has focused on regional innovation systems, higher education policy, and university-industry links.

APPENDIX 2: REGIONAL COORDINATOR, REGIONAL STEERING COMMITTEE, AND THE AUTHORS OF THE REGIONAL SELF-EVALUATION REPORT

Regional Coordinator

Jang-Soo Ryu	Pukyong National University

Members of the Regional Steering Committee of the Metropolitan City of Busan

Young-Hwal Lee	Busan Metropolitan City (chair)
Young-Bohk Cho	Pusan National University (vice chair)
Pan-Sang Chun	Busan Metropolitan Council
Myung-Hoon Kim	Busan Metropolitan City Office of Education
Seok-Do Bae	Ministry of Labor Busan Regional Administration
Yung-Hyo Eo	Busan-Ulsan Regional Office, Small & Medium Business Administration
Jae-Hwan Park	Busan Chamber of Commerce & Industry
Jang-Soo Ryu	Pukyong National University
Ue-Kan Kim	Korea Maritime University
Sung-Chin Hahn	Dong-A University
Jae-Woo Lee	Dong-Eui University
Tai-Oun Kim	Kyungsung University
Jeong-Duk Jung	Dongseo University
Tae-Sung Park	Pusan University of Foreign Studies
Eui-Soo Cho	Silla University
Tae-Hung Lho	Tongmyong University of Information Technology
Il-Ju Hwang	Kyungnam College Information & Technology
Young-Do Kim	Dong-Eui Institute of Technology
Hak-Keun Ku	Tongmyong University
Ki-Hyung An	Busan College of Information Technology
Hee-Yeon Won	Busan Techno Park
Byoung-Ryul Min	Busan Human Resources Development Institute
Chae-Sook Jung	Center for Women's Policy
Seung-Min Yoon	Busan regional Office of federation of Korean Trade Union
Jun-Young Lee	Bisan Ilbo(Newspaper)
Hye-Sook Jeon	Busan Women's Center

Kwang-Hyo Bae	Busan Metropolitan City hall
Jae-Soo Suh	Ko-Sin University
Sung-Hee Huh	Busan National University of Education
Hack-Hee Lee	Young-San University
Jae-Hyun Cho	Catholic University of Pusan

Authors of the Regional Self-Evaluation Report

Jang-Soo Ryu	Pukyong National University
Sung-Joon Paik	KRIVET
Dae-Shik Lee	Pusan National University
Hyun-Joong Jun	Dongseo University
Eui-Soo Cho	Silla University
Jong-Han Kim	Kyungsung University

APPENDIX 3: PROGRAMME OF THE REVIEW VISIT

11-17 December 2005

Sunday 11 December

Panel Private Meeting

Monday 12 December

9.30am - 10.30am **Meeting with Regional Co-ordinator**
Jang-Soo Ryu(Regional Co-ordinator, Pukyong National University)
Sung-Joon Paik (KRIVET)

10.40am - 10.50am **Meeting with Vice Mayor of Busan City**
Joon-Tae Ahn, Vice Mayor for Political Affairs, Busan Metropolitan City

11.10am – 2.30pm **Meeting with Authors of the Self-Evaluation Report**
Jang-Soo Ryu (Regional Co-ordinator)
Sung-Joon Paik (KRIVET)
Dae-Shik Lee (Pusan National University)
Hyun-Joong Jun (Dongseo University)
Eui-Soo Cho (Silla University)
Jong-Han Kim (Kyungsung University)

3.00pm – 4.30pm **Meeting with the Regional Steering Committee**
Young-Bohk Cho (vice-Chair), Pusan National University
Kwang-Hyo Bae, Busan Metropolitan City Hall
Eo-Yung Hyo, Busan-Ulsan Regional Office, Small & Medium Business Administration
Jae-Hwan Park, Busan Chamber of Commerce & Industry
Jang-Soo Ryu, Pukyong National University
Ue Kan Kim, Korea Maritime University
Tai-Oun Kim, Kyungsung University
Tae-Sung Park, Pusan University of Foreign Studies
Il-Ju Hwang, Kyungnam College Information & Technology
Jun-Young Lee, Bisan Ilbo (Newspaper)
Chae-Sook Jung, Center for Women's Policy
Jae-Soo Suh, Ko-Sin University
Jae-Hyun Cho, Catholic University of Pusan

6.30pm Panel Private Meeting

Tuesday 13 December

9.00am – 12.20pm **Meeting with Key Regional Actors**

Kwang-Hyo Bae, Director, Economic Policy Division, Busan Metropolitan City
Dae-Byung Chae, Science & Technology Division, Busan Metropolitan City
Jung-Hee Kim, Science & Technology Division, Busan Metropolitan City
Myung Hoon Kim, Busan Metropolitan City Office of Education
Ji-Hyoun Lee, Ministry of Labour, Busan Regional Administration
Yung Hyo Eo, Busan-Ulsan Small & Medium Business Administration
Joo-Wan Park, Busan Employers Federation
Jae-Hwan Park, Busan Chamber of Commerce & Industry
Su-Yeol Ryu, Busan Development Institute
Jong-Keuk Lee, Busan Human Resources Development Institute

2.00pm – 4.00pm **Meeting with Representatives of Higher Education Institutions**

Sung-Kwon Chi, Dean of Research and University-Industry Cooperation, Pusan National University
Dong-Joon Kim, Dean of Office of Planning and Research, Pukyong National University
Jae-Myoung Kim, Dean of Planning and Coordination, Kyungsung University
Hwang-kyu Yang, Vice Dean, Evaluation, Dongseo University
Chae-Kwan Lim, Department of Distribution Management, Tongmyong University
Tae-kyung Yoon, Dean of Industry-Academic Cooperation Foundation, Dong-Eui University
Bae-kwan Hoh, Dean of Office of External and International Affairs, Dong-Eui University
Young-kyu Choi, Chief of Industry-Academic Cooperation Foundation, Silla University
Tae-Sung Park, Dean of Industry-Academic Cooperation Foundation, Pusan University of Foreign Studies

6.30pm **Working Dinner with Representatives of Ministry of Education & Human Resources Development**

Gwang-Jo Kim, Deputy Minister, Ministry of Education & Human Resources Development
Seong-Yu Choi, New University for Regional Innovation Team, Ministry of Education & Human Resources Development

Wednesday 14 December

10.00am – 12.00pm **Pusan National University**
Inn-Se Kim, President
Sung-Kwon Chi, Vice President, Research& University-Industry Cooperation
Chul-Heon Chung, Associate Dean, Office of Academic Affairs
Seong-Bae Moon, Associate Dean of Planning, Office of Planning Affairs
Duk-Hyun Chang, Associate Dean of Public Relations, Office of Planning Affairs
Boo-Yoon Kim, Director, Center for Lifelong Education
Keun-Mo Lee, Associate Dean, Office of Student Affairs
Jang-Su Park, Vice Dean, Research & Development
Chung-Hwan Jeon, Vice Dean, University-Industry Cooperation

2.30 pm – 4.30pm **Dongseo University**
Jeong-Duk Jung, Vice President
Jekuk Chang, Executive Director, International Cooperation Committee
Seung-Hwan Song, Dean, Industry-Academy Cooperative Development
Sang-Baek Yang, Dean, Planning and Evaluation
Dai-Sik Kim, Dean, Students Employment and Welfare
Joseph Jung, Professor, Division of International Relations
Jung-Ho Kang, Dean, Industry-Academy Cooperative Development, Kyungnam College of Information & Technology

6.30pm Panel Private Meeting

Thursday 15 December

10.00am – 11.30am **Busan Techno Park**
Jin Jeon, President, Busan Techno-Park
Seung-Jin Jung, Director, Division of Planning
Hyo-Kyoung Kang, Director, Enterprise Support, Busan Techno-Park
Dong-gyu Kim, Professor, Dong-A University
Gye-Rok Jeon, Center Leader, Busan Techno-Park, Senior Necessities Industry Center
Hee-Wan Lee, President, OneLineTech Co.

1.30pm – 3.00pm **Kyungsung University**
Jong-Won Choi, Dean of Academic& Research Affairs
Un Huh, Dean of Admissions & Public Relations
Soon-Mo Wang, Dean of Student Support
Jae-Myoung Kim, Dean of Planning & Coordination
Hee-Bok Kim, Professor, Department of Education
Jong-Hwan Oh, Professor, School of Digital Contents Digital Image Major
Yoong Kwan, Chief of Trade Incubator
Mahn-Woo Kwon, Dean of Culture Technology Human Resource Development Center
Tae-Chul Jung, Dean of International Programs

	So-Young Min, Professor. Department of Social Welfare Tai-Oun Kim, Dean of Industry-Academy cooperation
3.30pm – 5.30pm	**Pukyong National University** Yun-Soo Mok, President Ju-Hee Lee, Vice President Dong-Joon Kim, Dean, Office of Planning and Research Young-Seop Kim, Dean, Office of Academic Affairs Do-Hyung Lee, Dean, Office of Student Affairs Jong-Soo Kim, Dean, College of Engineering Young-Soo Jang, Vice Dean, College of Fisheries and Sciences Hong-Joo Yoon, Professor in Hub University for National GIS Education Hong-Soo Ryu, Dean, Center of Continuing Education Pyeng-Mu Bak, Dean, Industry-University Cooperation Foudation Suk-Mo Lee, Dean, Busan Environmental Technic Center Sung-Koo Kim, Director, Human Resource Development Center for Marine Bio Nutraceuticals
6.30pm	**Dinner hosted by Pukyong National University**

Friday 16 December

10.00am – 6.45pm	Panel Private Meeting

Saturday 17 December

10.00am – 12.00am	**Meeting with Regional Co-ordinator and Authors of the Self-Evaluation Report** Jang-Soo Ryu (Regional Co-ordinator) Hyun-Joong Jun (Dongseo University) Eui-Soo Cho (Silla University) Jong-Han Kim (Kyungsung University)