

Report No. 16211-KO

Korea Impact Evaluation Report Delayed Development of the Cholla Region: An Institutional Study

December 31, 1996

Operations Evaluation Department



Document of the World Bank

Currency Equivalents

Currency Unit = Won

US\$1.00 = Won 814 (July 1996)

Won 1.00 = US\$0.0012

Abbreviations and Acronyms

CPI	Consumer Price Index
EDI	Economic Development Institute
ERR	Economic Rate of Return
GAO	General Accounting Office
GDP	Gross Domestic Product
GNP	Gross National Product
GRP	Gross Regional Product
IDD	Industrial Development Division
IER	Impact Evaluation Report
KCDI	Kwangju-Chunnam Development Institute
KIET	Korea Institute for Industrial Economics and Trade
KLDC	Korea Land Development Corporation
KRIHS	Korea Research Institute for Human Settlements
LG	Lucky-Goldstar, Ltd.
MOC	Ministry of Construction (now MOCT)
MOCT	Ministry of Construction and Transportation
OED	Operations Evaluation Department
PCR	Project Completion Report
SAR	Staff Appraisal Report
SCP	South Cholla Province

Fiscal Year

January 1 - December 31

Vice President	: Robert Picciotto
Director	: Francisco Aguirre-Sacasa
Division	: Yves Albouy
Staff Member	: Kyu Sik Lee

The World Bank
Washington, D.C. 20433
U.S.A.

Office of the Director-General
Operations Evaluation

MEMORANDUM TO THE EXECUTIVE DIRECTORS AND THE PRESIDENT

**SUBJECT: Impact Evaluation Report on Korea
Delayed Development of the Cholla Region
Secondary Cities Regional Project (Loan 1070-KO)
Second Gwangju Regional Project (Loan 1758-KO)
Jeonju Regional Development Project (Loan 2388-KO)**


Attached is the Impact Evaluation Report (IER) on the above mentioned regional development projects in the Cholla region. The main objective of the impact evaluation was to assess the medium and long-term impacts of the projects, five to fifteen years after completion. The study focused on (i) industrial development in the region; (ii) institutional learning at both the national and local levels of government; and (iii) the impact of bridges on the development of island economies.

The Cholla region did not develop early on because of the policy bias of the national government. The Government played an important role in the first two decades of Korea's development, but the people of Cholla were excluded from participating in the process of development and institutional learning until the 1980s. This study offered an opportunity to examine the nexus of the role of government, of institutions, and development in Cholla as a specific case study, since, by default, Cholla could be viewed as a "controlled area" in the early phase of Korea's development "experiment."

The study documents that the Bank intervention acted as a catalyst in triggering the industrialization process in the Gwangju area. It made a strong and positive impact on the development of the island economies: by linking the Tolsan Island to Yeosu city, the bridge expanded the urban area of Yeosu and helped transform Tolsan into an urban community; the Chindo bridge brought a significant change to the Chindo Island's economy by increasing the share of cash crops for export to the mainland. Institutional development was substantial at all levels of government. The overall project impacts are expected to be sustained.

The study showed the "centrality of side-effects" in project-induced development. The projects' success and spillover effects over time in Gwangju were due to a series of side-effects which contributed to the growth, expansion, and sustainability of the projects: (i) The local authorities learned how to plan, finance, build and operate a large-scale industrial estate, and executed three more estates after the initial Bank-financed project was completed. Backward and forward industrial linkages were established. (ii) The extension of the first industrial estate to the second phase by the city alone was a significant turning point for the city government's institutional learning which involved many organizational changes and improved its capacity and quality of project management. (iii) New rules, through a series of devolution and deregulation, changed the incentive structure to the benefit of the industrialists, and resulted in close cooperation and coordination between the local governments and the private sector.

Attachment



Contents

Preface	3
Evaluation Summary	5
1. Introduction	11
Regional Bias in Korea's Development	11
Korea's Experience with Industrial Location Policy.....	11
World Bank Projects Description.....	12
Rationale and Objectives of the Study.....	13
Scope of the Study and Two Distinct Approaches.....	13
Information and Data Collection.....	14
 PART I. INDUSTRIAL DEVELOPMENT AND INSTITUTIONAL LEARNING	
2. Direct Impacts: "Triggering" the Industrialization Process	15
Baseline Conditions in the 1970s.....	15
Evaluation Framework	16
Impact on Industrial Infrastructure: Hanam Phase I	18
Impact on Manufacturing.....	19
<i>Manufacturing Establishment Survey Results</i>	20
Impact on National-Local Government Relations and Management Capacity	22
Impact on Public-Private Sector Interaction	23
3. Side Effects and Spillovers	25
Industrial Base and Linkages	25
<i>Industrial Infrastructure: Hanam II, III, and Pyung-Dong Follow-up Projects</i>	25
<i>Backward and Forward Industrial Linkages</i>	26
Local Bureaucracy's Behavior and Capacity Building.....	28
"Rules of the Game", Private Sector Confidence, and Public-Private Partnership	29
Ultimate Impact: Regional Growth.....	30
Necessary Conditions for Success	32
A Caveat on Attribution	33
4. Lessons from Industrial Development	35
Centrality of Side-Effects: the Hirschman Effect.....	35
"Rules of the Game" and Private Sector Responses: the Baumol Effect.....	35
"Piloting" and "Mainstreaming"	36

This Report was prepared by Mr. Kyu Sik Lee (Task Manager), Mr. Roy Gilbert (consultant), and a study team at the Kwangju-Chunnam Development Institute consisting of Messrs. Chang Soo Moon (President), Jong-Pyung Jeon (Team Leader), Jae-Oh Kim, and Sangho Kim; and Messrs. Dong Ho Shin and Yang-Jae Lee at Wonkwang University in Iksan, Korea. Ms. Stacy Ward provided administrative assistance.

Shortcomings of Industrial Estate Development Strategy	36
Transferability	37

PART II. INTEGRATING ISLAND ECONOMIES INTO REGIONAL DEVELOPMENT

5. Project Rationale for Improved Transport Linkages	39
Island Development: The Baseline	39
Evaluation Framework	40
6. Tolsan Island: A New Threshold for Urban Development.....	43
A Solution to Yeosu City's Acute Shortage of Urban Land	43
Transforming Tolsan's Population into an Urban Community	43
New Patterns of Urban Living on Tolsan Island.....	45
Increased Tourism	47
Bridge Impact Upon Activities in Rural Areas	48
Environmental Impacts	49
Impacts Upon Local Government	49
Need for Complementary Infrastructure	50
Economic Rate of Return	50
7. Chindo Island: Incorporating as Part of the Mainland.....	51
Chindo: No Longer an Island	51
Restructuring Chindo's Rural Economy.....	51
Impact Upon Islanders' Standard of Living	52
Modest Urban Development Impacts.....	54
Accelerated Out-Migration	54
Impact on Tourism	55
Environmental and Social Vulnerability.....	56
Impacts Upon Local Government	56
Is Chindo Better or Worse-off?.....	56
Economic Rate of Return	57
8. Lessons from Integrating Island Economies.....	59
References	61
Annexes	
1. Statistical Tables.....	65
2. Project Description and Timelines	83
3. Institutional Development Timelines.....	91
4. Summary of Establishment Survey Results.....	95
5. Study Questionnaire.....	115
6. List of People Interviewed	127

Preface

This is an Impact Evaluation Report (IER) for three World Bank supported regional development projects in Korea: Secondary Cities Regional Project (Loan 1070); Second Gwangju Regional Project (Loan 1758); and Jeonju Regional Development Project (Loan 2388).¹ The main objective of the impact evaluation study was to assess the projects' medium and long-term impacts, five to fifteen years after the completion of the projects.

The Bank-supported regional development program in Korea was unique in that no such sustained efforts extending over a period of two decades can be found elsewhere. Among more than twenty project components included, this study focused on (i) industrial development in the Cholla region; (ii) institutional learning at both national and local levels of government; and (iii) development of island economies via bridge connections.

The IER was prepared by the Operations Evaluation Department (OED) of the World Bank. The study was launched during the first impact evaluation mission to Korea in June 1995. A local study team at the Kwangju-Chonnam Development Institute participated in all phases of the study: formulating hypotheses, collecting the data, participating in informant interviews, and providing inputs to drafting the report. During the second mission in February 1996, a preliminary draft report was discussed with the local team and government officials, and additional information needed was collected.

The kind assistance and cooperation for this study given by the local government officials in project cities, the officials of the Ministry of Construction and Transportation in Seoul and Iksan, members of local Chambers of Commerce and Industry, local industrialists, and researchers are gratefully acknowledged. In particular, the staff of the Korea Research Institute for Human Settlements (KRIHS) interacted with the study mission and provided invaluable information. The staff of the Korea Institute for Industrial Economics and Trade (KIET) kindly provided regional data for key economic variables used in the study.

The study results were reviewed and discussed at an internal seminar held at the Kwangju-Chonnam Development Institute, and also presented at a 1977 World Development Report workshop on the "Role of the State in Development" in Tokyo in October 1996.

Basic Loan Data

<u>Ln Number</u>	<u>Project Name</u>	<u>US\$ million</u>	<u>Approval</u>	<u>Completion</u>
Ln 1070	Secondary Cities Regional	15	1/75	12/80
Ln 1758	Second Gwangju Regional	65	9/79	6/85
Ln 2388	Jeonju Regional Development	60	3/84	6/90

(Amounts are as appraised.)

1. Henceforth these three projects will be referred to as Kwangju I (Loan 1070), Kwangju II (Loan 1758) and Chonju project (Loan 2388). Current English names of the cities are used in this report: Kwangju and Chonju instead of Gwangju and Jeonju.

Evaluation Summary

"Nothing is lasting without institutions."

Jean Monnet

Background

1. Korea's "economic miracle" has diverted attention from a heavy regional bias in Korea's development strategy stretching over three decades from the 1960s to the 1980s. The Cholla region lagged behind the impressive economic development that was taking place in other parts of Korea. Any significant infrastructure investment for industrial development did not come into South Cholla province until the early 1980s, 20 years behind the rival Kyungsang provinces (*paras. 2.5-2.6*). Today, Kwangju, the capital city of South Cholla province, is the fastest growing city in Korea with its population increasing at a rate of 4.5 percent per year. Moreover, Kwangju is the only city, among the six largest cities in Korea, which is gaining manufacturing employment (*para. 3.21*). This study attempts to document the process of development of the region during the past two decades based on the experiences of World Bank financed projects, identifying the elements of success, and drawing lessons to be learned.

2. That the Cholla region was not developing early on was not a manifestation of the traditional characteristics of a "lagging region", a resource-poor region without any potential for development. Cholla's case was largely due to the policy bias of the national government in Korea's development. The World Bank (1993) sponsored study on the East Asian Miracle documented that the Government played an important role at the early stages of Korea's economic development. It created the necessary "rules of the game", i.e., the institutional framework for the private sector to respond and grow, that is, it filled the "institutional vacuum" created after the Korean war. But such vacuum continued to prevail in Cholla for a long time, and the people of Cholla were excluded from participating in the process of development and institutional learning. This study offered an opportunity to examine the nexus of the role of government, institutions and development in Cholla as a specific case study, since, by default, Cholla can be viewed as a "controlled area" in the Korean development "experiment".

The Projects

3. The main objectives of the three projects were to support the government's efforts to develop the Cholla region and reduce inter-regional disparities. Kwangju I, the first World Bank financed regional development project world-wide, actually initiated Korea's first regional investment program as a pilot project. Kwangju II and the Chonju project explicitly aimed at industrial development through investment in industrial estates and increasing employment and income of island population, while Kwangju I was limited to improving urban infrastructure including housing and roads. Even though all three projects were complex, together covering seven cities, five islands, and two provinces, and with a total of 22 project components, most of the physical targets were met and institutional development was substantial, one of the areas covered in this study.

4. *The main hypothesis* tested in this study is that the government-invited World Bank intervention "triggered" the industrialization process in South Cholla (*para. 2.7*) and that it brought the opportunity to extend the "rules of the development game" to the region. This study shows that "setting institutions right" was a condition perhaps more crucial for development than "setting the prices right".

5. The study confirms the Baumol and North's framework for "institutional analysis" that asserts:

The rules of the game that specify the relative payoffs to different entrepreneurial activities play a key role in determining whether entrepreneurship will be allocated in productive or unproductive directions and that this can significantly affect the vigor of the economy's growth (Baumol, 1990, p. 918).

In his Nobel Prize lecture, North stated that:

It is the interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations and their entrepreneurs are the players...if the institutional framework rewards productive activities then organizations—firms—will come into existence to engage in productive activities (North, 1994, p. 361).

Scope of the Study

6. The study assesses (i) "direct" project impacts on the beneficiaries as anticipated by the projects, and (ii) long-term "side-effects" on the industrialization process and institutional learning. Part I of the report covers "industrial development" and "institutional learning" using a case study approach (*para. 1.18*). Part II which covers the impacts of bridges on the island economies, not only relies on historical data to compare the *before* and *after* the project conditions, but also contrasts the "project" islands with other islands.

Findings

7. In the case of industrial development and institutional learning (Part I), the key findings are as follows (*para. 2.13*):

(i) Industrial infrastructure expanded more than five times the original investment of the Hanam Industrial Estate component of Kwangju II. The Kwangju city government, without the help of the national government or the World Bank, replicated the Hanam component in a second and third phases, and in a fourth phase at Pyung Dong during a ten-year period (*paras. 3.2-3.6*).

(ii) A solid industrial base has been established in Kwangju with backward and forward industrial linkages (*paras. 3.7-3.9*). In 1995, 39 percent of manufacturing jobs in Kwangju were at Hanam, and 44 percent of manufacturing output and 60 percent of exports were produced by firms in Hanam (*para. 3.29*).

(iii) Local government management capacity reached the level of sophistication needed to support a rapid industrialization process. The local government officials became "task-oriented" as the partners of economic development of the region (*paras. 3.10-3.11*). The management capacity of Kwangju city officials now equals that of other cities in Korea (*paras. 3.14-3.15*).

(iv) The "rules of the game" (government bureaucracy and regulations) became more conducive to private investment and growth (*paras. 3.16-3.17*). They evolved from those of a national government-directed to those of a local government- and market-based development with strong private sector responses in the region. The diminishing role of the Hanam Management Office at the site, which left most of its previous functions to the markets, is a strong indication of that evolution over the decade (*para. 3.20*).

8. In the case of integrating the island economies into regional development (Part II), the major findings are as follows:

(i) By linking the Tolsan Island to Yeosu city, the bridge expanded the urban area of Yeosu, a dynamic medium-sized city facing acute land constraints. The bridge helped transform Tolsan into an urban community linked to Yeosu. Daily commuting from the island to the city became feasible and efficient after the bridge (*para. 6.3*). Far from arresting out-migration, though, the bridge appears to have accelerated it from Tolsan (*para. 6.7*), but population decline, including debilitated family structures following the departure of younger breadwinners, was more serious on other islands still unconnected by bridges. After the bridge, Tolsan islanders enjoyed ease of access to urban services that other islanders didn't have (*paras. 6.10-6.13*). There has been a real estate boom on Tolsan (*para. 6.14*). Tourism flows have increased dramatically there as have services on the island for visitors (*paras. 6.16-6.17*). Entirely new lines of business, such as floriculture, appeared now that perishable products like fresh flowers can be reliably exported from the island (*para. 6.20*).

(ii) In the case of Chindo Island, an important side-effect of the bridge was to re-structure the island economy giving it characteristics typical of a rural economy on the mainland. Labor intensive subsistence farming was replaced by the more mechanized production of cash crops, which could be reliably and more cheaply exported from the island (*paras. 7.5-7.6*). Land prices on the island increased dramatically when compared with the sluggish real estate of other islands still unconnected by bridges (*para. 7.9*). As happened in Tolsan, an indirect impact of the bridge to Chindo was to accelerate out-migration (*paras. 7.11-7.12*). Tourism expanded dramatically with the bridge, although with some negative environmental side effects (*paras. 7.13-7.16*). But on the whole, the island population is better off today than before the bridge was opened.

Lessons

9. *Centrality of Side-effects.* This study shows the "centrality of side-effects" in the project-induced development as noted by Hirschman. The project's success and its spillover effects over time was due to a series of side-effects which contributed to the growth, expansion and sustainability of the project, which included:

- (i) *Replicating Industrial Estates:* The local authorities learned how to plan, finance, build and operate large-scale industrial estates on the model of the Hanam Phase I and they executed three more large-scale industrial estate projects (*paras. 3.2-3.6*).
- (ii) *Backward and Forward Industrial Linkages:* Satellite industries have been established in Hanam. With a strong locational advantage of being near the parent industry, they use as a principal input an output of the parent industry or their principal outputs are used as an input of the parent industry (*paras. 3.7-3.9*).
- (iii) *"Task-oriented" Bureaucratic Behavior:* The extension of Hanam I to the second phase without the help of MOC or the World Bank was a significant turning point for the city government's institutional learning. Local governments' responsibilities grew rapidly as promoters and partners of industrial development (*paras. 3.10-3.11*).
- (iv) *Evolution of Local Government Organization and Capacity Building:* City governments made many internal changes to their organizations to help change the rules and provide more incentives for industrialists to invest (*paras. 3.12-3.13*). Moreover, through the implementation of Bank-financed projects, local government officials improved the capacity and quality of project management (*paras. 3.14-3.15*).

- (v) *Private Sector Confidence and Public-Private Partnership*: With a series of devolution and deregulation, local governments assumed responsibilities as guarantors and managers of "rules of the manufacturing game" for private industrial development (*paras. 3.16-3.18*). Local governments' passion and commitment to industrial development in the region, together with changing regulatory and institutional environment, enhanced the private sector's confidence in the local governments and a strong public-private partnership emerged (*paras. 3.19-3.20*).

10. *Importance of the "Rules of the Game"*. The new rules, through a series of devolution and deregulation over time, changed the incentive structure to the benefit of the industrialists. They also changed the behavior of the bureaucracy and led to the creation of an enabling environment where close cooperation and coordination between the local government and the private sector materialized. These side-effects were initially triggered by the Bank-financed projects. They became central to the economic development in the Kwangju region. The project strengthened the growth- and task-oriented behavior of government officials. The Bank's 57 missions over twenty years provided a sustained period of institutional learning at all levels of government.

11. *"Piloting" and "mainstreaming"*. The modestly sized Bank project for Hanam Phase I served as a "pilot". It resulted in opportunities for the city government to pursue on its own the "mainstreaming" of industrial development with its follow-up projects.

12. *Shortcomings of Industrial Estate Development Strategy*.

The Incubator Hypothesis. Small new firms with five to ten employees tend to locate in the central area of cities to exploit all the benefits of externalities there (Lee, 1989). The project-financed industrial estates are located outside the central city far away from the city center. They may not help reducing site constraints for small firms.

Costs of Location Distortion. When the land market is functioning efficiently, infrastructure investment tends to follow the market. When a large infrastructure project such as an industrial estate is put in place by the public sector as is this case, the following negative impacts could occur:

(i) *Lack of Complementary Investments*: The main road connection to Hanam estate was not expanded until 1992. Most establishments in the Hanam Industrial Estate operate a large fleet of company buses for workers' commuting because of the lack of public transportation. When complementary investments were not included in the project design, such unintended negative impacts would result.

(ii) *Negative Environmental Effects*: Even though pollution control is strictly enforced, wind blows toward the city center carrying smoke from the industrial areas.

(iii) *Land Use Patterns*: Because the cities grew and expanded rapidly, the industrial complexes are now close to the newly developed expanding commercial centers preventing further expansion of the cities outward.

13. *Lessons from Tolsan and Chindo Bridges*. The lessons for integrating island economies as an instrument of regional development policy are as follows:

(i) Territorial incorporation by building bridges is easy to achieve, but it may require ingenious and costly engineering solutions.

(ii) Despite identical engineering solutions, long-term side-effects in urban and rural areas are quite different: urban areas offer better prospects for economic returns as expected, but the territorial incorporation of rural islands could be justified as a national policy for equitable growth.

(iii) Public sector responses with investment in complementary infrastructure—access roads and utilities in particular—should be swift to realize long-term side effects to the maximum extent.

(vi) Forward looking plans should be made from the project planning stage onward. Such an exercise should include attempts to identify likely project impacts, opportunities for private investment, and the needs for complementary infrastructure.

14. *An important caveat* of this case study is that it documents project impacts in a country with a sustained economic growth. The same projects may fail to generate such impacts in a slow growing economy. Also, other regions of Korea developed early on without a similar World Bank intervention. The process of "learning by doing" in other regions provided lessons for the Cholla region. Using a case study (historical) approach (*para. 1.18*) and the Hirschman-Baumol framework (*paras. 2.8-2.10*), however, this study shows that the World Bank intervention acted as a catalyst in triggering the industrialization process in the Cholla region which had been excluded from Korea's development process in the first two decades.

15. *On transferability.* This report supports the proposition that the patterns of behavioral responses of individual actors to the rules of the game transcend time and places, i.e., regional or national boundaries.² What varies across regions or countries is the quality of the rules of the game, for example, "the use of incentives and organizational design within the public sector to enhance efficiency and to reduce the likelihood of corruption" (Stiglitz, 1996, p. 174). Such an organizational design, however, can be learned from experiences of other countries. The challenge is to find a mechanism, political or otherwise, to "trigger" the process of such organizational learning. Wade (1993) suggests that "... from time to time opportunities to make major organizational changes do occur in any society, and at that time it matters what knowledge of alternative arrangements key policy makers have in their heads." But such opportunities were created by policy makers themselves in Korea and other East Asian countries. They did not merely wait for the opportunities to come.

2. Baumol (1990) shows historical evidence from Ancient Rome, Medieval China and through the Middle Ages.

1. Introduction

Regional Bias in Korea's Development

1.1 Korea's "economic miracle" diverted attention from a heavy regional bias in Korea's development strategy stretching over three decades from the 1960s to the 1980s. The regional imbalance can be attributed to two factors: (i) comparative advantage, and (ii) regional rivalry. Historically, Korea's industry and commerce developed along the Seoul-Pusan axis from the capital region in the northwestern part of the peninsula to the Kyungsang provinces in the southeast. These regions offered comparative advantages for industrial development, while the Cholla provinces in the southwestern part of the country relied on a rich and productive agricultural tradition.

1.2 The regional rivalry, going back a thousand years, intensified once the late President Park, a native of Kyungsang, came to power in 1961. His government ruled the country until 1979 and launched almost all major industrial development projects in the Kyungsang region, including the Ulsan Industrial Estate (in 1962) where the Hyundai automobile plant and shipyards were established, the Pohang Steel Mills (in 1971), and the Seoul-Pusan Expressway, the first major highway in Korea, which was completed in the early 1970s.

1.3 During the 1960s, industrial development began expanding from the capital region to the Kyungsang region, while the southwestern region of Cholla provinces lagged. As the Korean economy continued to expand at a real growth rate of nearly 10 percent per year, the regional income disparities, especially between the Cholla region and the Seoul and Kyungsang regions widened, the regional rivalry deepened, and regional equity emerged as an important political issue. In 1975, 73 percent of South Cholla's employment was in agriculture and fishery, the largest proportion among the nine provinces.³ Only 6 percent was in manufacturing (Table A1.1).⁴

1.4 In parallel, popular anger and frustration rose in the Cholla provinces, especially in Kwangju, the provincial capital of South Cholla. Distrust of local government and antagonism toward the national government accentuated. Table A1.2 shows a steady out-migration of population from the Cholla region.

Korea's Experience with Industrial Location Policy

1.5 Confronted with the increasing concentration of population and economic activity in the capital region, the Korean Government, as was the case in many other developing countries in the 1970s, implemented explicit spatial policies to decentralize population and employment to less developed regions. A previous World Bank sponsored study (Lee, 1985a, and 1985b; Lee and Choe, 1990) evaluated the effectiveness and impacts of such policies which were intended to influence the location patterns of manufacturing industries by various financial schemes to relocate industries to outlying areas or less developed regions.

1.6 The study found that the majority of relocating firms moved within the same region because firms find it very costly to move long distances. The 1982 manufacturing survey showed that of those

3. In this study, 15 geographic regions are used for comparative analysis: six "Direct Administration Cities" (Jikhalsi)—Seoul, Pusan, Taegu, Incheon, Kwangju, and Taechon—and nine provinces. The status of a Direct Administration City is equal to that of a province.

4. Tables with an "A" in front of the number are in Annex 1.

moved, only 6.5 percent did so influenced by government incentives like tax breaks.⁵ Most moved for internal reasons such as the need for more plant space. The study concluded that government spatial policies had a relatively minor impact on the location choices of manufacturing firms.

1.7 Since firms do not move long distances and relocation policies did not work, it was difficult for the Kwangju region to attract industries from outside. The regional bias in infrastructure investment mentioned above did not help attract industries to the Kwangju region. The establishment of the Hanam Industrial Estate as part of the World Bank project became a turning point in "triggering" the process of industrial development in the region, as documented below.

World Bank Projects Description

1.8 In 1972, the Korean government requested assistance from the World Bank in developing South Cholla, then the poorest region in Korea, to attract employment generating industries. *The Secondary Cities Regional Project* (Loan 1070), approved in 1975, was followed by a *Second Kwangju Regional Project* (Loan 1758) approved in 1979, also in South Cholla (Chonnam) Province. In 1984, World Bank operations expanded to North Cholla (Chonbuk) Province with the *Chonju Regional Development Project* (Loan 2388).

1.9 *Objectives and Components.* The main objectives of the above mentioned three projects were to support the Government's efforts to develop the Cholla region and reduce inter-regional disparities. Kwangju I with a loan amount of US\$15 million, actually initiated Korea's first regional investment program as part of the Third Five Year Economic Plan, 1972-76. While Kwangju I focused on improving urban infrastructure, including housing sites and access roads, Kwangju II with a loan amount of US\$65 million, explicitly aimed at "promoting industrialization in the region's cities to expand employment opportunities" and "increasing the income earning opportunities of the region's island population" (PCR, p. v). It included the first phase of the Hanam Industrial Estate and the technically complex Tolsan and Chindo bridges that were instruments of the Government's island development policy, the two components chosen for this study. The third (Chonju) project with a loan amount of US\$60 million had similar objectives for developing North Cholla province with an investment package similar to that of Kwangju II.

1.10 All three projects were complex, together covering seven cities and five islands in two provinces and each project had a half dozen project components (displaying the "Christmas-tree" characteristics of many Bank-financed urban projects). They included industrial estates, housing estates, tourism estates (including national parks), market places, bridges connecting islands with the mainland, fishery complexes, urban services components such as water supply and drainage systems, and both national and urban road improvements (see Annex 2 for detailed project description).

1.11 *Implementation and Performance.* Most of the physical targets of all three projects were met. Implementation of the physical components was in general satisfactory although Kwangju II took two more years to complete than planned, mainly because of the technical complexity of the Tolsan and Chindo bridges (*para 5.3*). According to the Kwangju II PCR, the project had "a positive effect in strengthening the economic base of the region through industrial development in Kwangju" (p. 15). The Chonju project PCR concluded that "the project was generally successful in promoting economic development and creating employment opportunities in the Chonju region" (p. 6). Institutional

5. The relative efficiency of various location subsidy schemes in the form of credit, wage and land subsidies was simulated as part of the World Bank study (Murray, 1988).

development at all levels of government was significant. The Kwangju Regional Development Unit, established by Presidential Decree in 1975 as the project management unit for Kwangju I (PCR, p. 41), was the seed for institutional learning for regional development in Korea that occurred over the two decades of World Bank-financed project implementation, another subject of this impact evaluation study.

1.12 Earlier the OED had rated the project (Kwangju II) outcome as satisfactory, its sustainability as likely, but its institutional development was not rated.⁶ This impact evaluation study confirmed the first two ratings and documented that institutional development was substantial. Furthermore, the study demonstrated the importance of understanding Hirschman's concept of "centrality of side-effects" in project work (see Chapter 3). For example, predicting such side-effects would make it possible to plan complementary investments that would be required for a realization of fuller development impacts of a project (*para. 4.5*).

Rationale and Objectives of the Study

1.13 Regional income disparities and inequities in resource allocation constitute a major challenge to sustained development. Nevertheless, regional development projects are rare in the Bank urban lending portfolio. The Bank-supported regional development program in Korea is unique: no such sustained efforts extending over a period of two decades can be found elsewhere.

1.14 The main objectives of the study are two-fold: to assess (i) short-run "direct" project impacts on the beneficiaries as anticipated by the projects, and (ii) long-run "side-effects"⁷ (indirect impacts) on the industrialization process and institutional learning.

Scope of the Study and Two Distinct Approaches

1.15 The amount of Bank project financing was substantial in the region when the projects started in the mid-1970s, but the amount was only a small portion of the total accumulated infrastructure investment in the region during the two decades of project implementation. Therefore, the physical impacts of these complex projects (total of 22 components) were negligibly small considering the fact that the country's economy grew at such a high rate over a sustained period, accompanied by a rapid growth of cities. During the study mission, many of the project components were not visible or recognizable at the individual project sites because of the overall development that had taken place in the surrounding areas, e.g., Ycosu's access roads to the business district are now part of the fully developed city center. An impact evaluation of these types of project components would be impractical.

1.16 The study's coverage had to be very selective and focused. It concentrated on the Kwangju region where the first two projects were located. The experiences of the third project in Chonju are compared with those of the Kwangju projects as appropriate. The study focused on: (i) impacts of the Hanam industrial estate on industrial development in the region; (ii) impacts on institutional development at both national and local levels, and (iii) impacts of the Tolsan and Chindo bridges on integrating the island economies into the regional development. These three investment components, a total of \$103 million, accounted for 48 percent of Kwangju II's total project costs of \$216 million (PCR, p. 22). Chapters 2 to 4 of the report present items (i) and (ii), and Chapters 5 to 8 present (iii).

6. The Project Performance Audit Report (No. 9610) was issued in May 1991 when OED's ratings were not included in the Evaluative Memorandum. This rating information was obtained from the Bank's OED Data File.

7. Hirschman (1995). See the discussion in Chapter 3.

1.17 *Two Distinct Approaches.* Even after decades of research on regional development, there is no widely accepted analytical framework to assess project impacts. For the study of industrial development and institutional learning in Part I, a case study approach is followed. It focuses on the catalytic role of the World Bank projects in "triggering" the process of industrialization and sustained institutional learning (*see para. 1.18*). In Part II, however, the approach comparing the conditions "before" and "after" the bridges is complemented by a comparison of the project islands with the "other" islands without bridge connections.

1.18 *A Case Study Method: Historical Approach.* The evaluation methodology used for institutional development in this study is a case study method which is "for learning about a complex instance" (U.S. General Accounting Office, 1990, p. 14). "Case studies are frequently used in public policy analysis to examine the effects of non-experimental events such as political decisions by cities and towns" (GAO, 1992, p. 48; Yin and Heald, 1975). Such studies heavily rely on qualitative (non-quantitative) and historical information. Baumol's view on the historical approach is that: "it is surely a standard tenet of scientific method that tentative confirmation of a hypothesis is provided by observation of phenomena that the hypothesis helps to explain and that could not easily be accounted for if that hypothesis were invalid" (Baumol, 1990, p. 895). Two principles to help establish validity and reliability in a case study are: (i) use multiple sources of evidence, e.g., via triangulation⁸ of data; and (ii) maintain a chain of evidence (GAO, 1991, p. 43).

Information and Data Collection

1.19 *Data Needs.* The design of the World Bank projects did not contain any data collection schemes for evaluation such as baseline data and monitoring and evaluation. This study therefore resorts to secondary data and the information collected during two study missions. A small survey of manufacturing establishments was conducted for the firms located within and outside the industrial estates (*see Chapter 2 and Annexes 4 and 5*). Wherever data would permit, quantitative analyses based on the "before/after" and "with/without" methods were followed.

1.20 *Sources of Information.* The information collected during the two study missions included secondary data and interview results. There were three groups of informants: (i) national government officials (including a focus group meeting with Division Chiefs who had implemented the projects); (ii) local government officials at both provincial and city governments; and (iii) private sector people including manufacturers within and outside industrial estates, representatives of local Chambers of Commerce and Industries, local university professors and researchers (*see Annex 6 for a list of the people interviewed*). In addition, information was obtained by site visits and interviews with beneficiaries at the project sites, and also from review of project documents and other related secondary data.

8. To obtain and confirm corroborating evidence from multiple sources.

PART I. INDUSTRIAL DEVELOPMENT AND INSTITUTIONAL LEARNING

2. Direct Impacts: "Triggering" the Industrialization Process

Baseline Conditions in the 1970s

2.1 *National Government-Directed Institutional Environment.* The Korean Government's conscious development effort started with the First Five-Year Economic Plan in 1962 immediately after the late President Park took power through a military coup. The Plan was prepared and implemented by a small group of American-educated technocrats in the national government under the direction of the "Blue House" (the presidential mansion). The institutional environment for development was completely dominated by a classic command system of decision making: almost 100 percent of the country's loanable funds was allocated by the Blue House according to the investment priority set in the Economic Plan (for materials on the modern history of Korean economic development, see Amsden, 1989; Song, 1990; Sakong, 1993; Cho, 1994; Kim and Leipziger, 1993).

2.2 Recovery from the complete destruction of Korea's socio-economic infrastructure during the Korean war (which ended in 1953) was slow. With the country's annual per capita GNP of \$87, Korea was still dependent on foreign aid. The country completely lacked the basic "institutional" infrastructure, i.e., the "rules of the game", by which different actors can play to achieve the goal of economic development. The new set of "rules of the game" was quickly established by the Park government.

2.3 During the First Five Year Plan period, the government established a set of basic principles for development policies, i.e., "rules of the game": (i) the government should determine the direction of policies, and the goals of economic development should be achieved both by the price mechanism and government investment and financing, but the government may employ other means than the price mechanism for promoting priority industries; (ii) the government could complement and replace private decisions in the case of major investments; (iii) for economic development, growth should have a higher priority than redressing imbalances in income distribution and uneven industrial development across geographical regions (Cho, 1994, pp. 31-32).

2.4 *Exclusion of Cholla from Development Process.* Not sharing the benefits of the national government's industrialization strategy and infrastructure investment programs, the Cholla region was left behind Korea's rapid economic growth in the 1960s and 1970s. Cholla was not a "lagging region" in the traditional sense of lacking any development potential with no resources; rather it was "lagging" because of the policy bias as much as from market failures (especially in utilizing the high quality labor force). The rapidly changing incentive structure (i.e., the rules of the game) in Korea for business operations did not reach entrepreneurs in Cholla whereas the economy was picking up speed along the Seoul-Pusan axis.

2.5 *Lack of Industrial Infrastructure.* The manufacturing base in the city of Kwangju in the 1970s was rather weak having only several large indigenous manufacturing establishments (e.g., Kumho Tire; Kia Automobiles) and several industrial areas in the central city where small and medium scale firms were concentrated. Table A1.3 shows that in 1978, the industrial area in the Cholla provinces was only a quarter that of the Kyongsang provinces. In the 1975 Kwangju City Master Plan, the spatial planning strategy for the future expansion of the city was outlined including the designation of the Hanam area as an industrial area which was then outside the city boundary.

2.6 Large scale industrial estates in Kwangju and the Cholla region came only in 1983 when the Hanam Industrial Estate opened as part of the World Bank's second Kwangju project. In fact, this large scale industrial estate development came to the Cholla region 20 years(!) after the establishment of the Ulsan industrial complex in Kyungsang province in 1962 that was part of the First Five Year Economic Plan (Choe and Song, 1984, p. 79).

Evaluation Framework

2.7 *The hypotheses* tested here relate to direct impacts (propositions 1 and 2) and long-term side-effects (propositions 3 and 4):

Proposition 1: The Hanam Industrial Estate as a component of Kwangju II had the "triggering" effect on the process of industrialization in the region.

Proposition 2: The World Bank projects offered both national and local government officials the first opportunity of its kind for learning project preparation and implementation for industrial development in the region.

Proposition 3: Hanam Phase I, as a component of Kwangju II, led to three additional phases of industrial estate development (in a period of 10 years), and resulted in the ultimate impact of establishing the region's industrial base with "backward and forward linkages".

Proposition 4: The "rules of the game" evolved from national government-directed institutional environment for development to local government-based, enabling environment to which the private sector actively responded in the region.

2.8 *Hirschman's "Centrality of Side-Effects"*. According to Hirschman (1995, p. 161): "...some of the so-called side-effects thus turn out, a bit surprisingly, to be inputs essential to the realization of the project's principal effect and purpose." In other words, many unexpected side-effects of development projects are central to the purpose of the project itself, sometimes even becoming inputs to the sustainability of the project. Hirschman's concept of "backward and forward linkages" is a good example of the centrality of side-effects (Ibid, p. 165) and it provides an analytical framework for explaining the success of the Hanam Industrial Estate and its expansion to the subsequent phases of development.

2.9 *Baumol-North Framework: "Rules of the Game" and Entrepreneurship*. The analysis of institutional learning in this study corroborates the Baumol theory of entrepreneurial behavior which states that "one of the prime determinants of entrepreneurial behavior at any particular time and place is the prevailing 'rules of the game' that govern the payoff of one entrepreneurial activity relative to another" (Baumol, 1990, p. 898). The resulting policy guidance is that:

"The rules of the game that specify the relative payoffs to different entrepreneurial activities play a key role in determining whether entrepreneurship will be allocated in productive or unproductive directions and that this can significantly affect the vigor of the economy's productive growth" (Ibid., p. 918).⁹

2.10 In this study, "institution" is broadly defined as "rules of the game" which were changed over time by the national and the local governments in such a way that the incentive systems improved and

9. Baumol (1986) showed that implicit incentive structures matter in explaining patterns of growth among countries. For a recent study on manufacturers' responses to infrastructure deficiencies and regulatory constraints; see Lee, Anas and Oh (1996), and Baumol and Lee (1991).

the private sector responded in the productive direction. One of the key elements in this study is to document the "process by which those rules 'were' modified" (Ibid., p. 916) over the study period and to understand how private businesses responded to the changing rules. The theoretical foundation for institutional analysis has been advanced by North¹⁰ (1990). In his Nobel Prize lecture, North stated that:

It is the interaction between institutions and organizations that shapes the institutional evolution of an economy. If institutions are the rules of the game, organizations and their entrepreneurs are the players...if the institutional framework rewards productive activities then organizations—firms—will come into existence to engage in productive activities...the most fundamental long-run source of change is learning by individuals and entrepreneurs of organizations (North, 1994, p. 361).

2.11 *Aoki's "Market Enhancing View" of the Role of Government.* According to Aoki, "...the government's role is to facilitate the development of private sector institutions that can overcome these [market] failures..." (Aoki, 1995, p. 11). In other words, its "coordination" role enhances the functioning of the market. This is what the governments did in the Cholla region, that is, induce the private sector to participate in the industrialization process in that region. Aoki's proposition complements the Baumol-North framework which is based on the behavior of individual actors and organizations.¹¹

2.12 The construction of the industrial estate in Hanam began in January 1981 and was completed in December 1983. The time period set for the study of long-term impacts (mostly side-effects) is the ten-year period after project completion, 1986-1995, as shown in Table 2.1.

2.13 The study documents the following four major outcomes: (1) industrial infrastructure expanded more than five times the original investment of Hanam I; (2) a solid industrial base has been established with backward and forward linkages; (3) local government capacity reached the level of sophistication to support a rapid industrialization process; and (4) the "rules of the game" (government, bureaucracy and regulations) evolved to an incentive structure conducive to private investment. As shown in Table 2.1, direct impacts and longer-term side-effects are traced and analyzed to substantiate these outcomes. The study of the "Direct Impacts" is presented in the sequel of Chapter 2 and its longer-term "Side-Effects" (indirect impacts) in Chapter 3.

10. North (1973) refers to Baumol's Welfare Economics and the Theory of the State (1952), as part of the intellectual origin of the theory in institutional analysis.

11. Aoki's ongoing research with EDI (Aoki, 1995) is an attempt to extend the analysis of the role of government addressed in The East Asian Miracle (World Bank, 1993). In his pioneering work, North (1973, pp. 1-8) showed that the role of governments in establishing and enforcing property rights is the key to efficient economic organization and growth.

Table 2.1: Evaluation Logic for Hanam Impacts

	Direct Impacts	Long-term Side-Effects
Time Period	1978-1985	1986-1995
Bank Intervention	Kwangju II	None in Kwangju
1) Industrial Infrastructure	Hanam Industrial Estate Phase I	Hanam Phase II, III and Pyung-Dong Phase
2) Manufacturing Industries (Private sector responses)	Large "anchor firms"; relocation of small and medium size firms	Industrial linkages, expansion, and diversification, including exports
3) Institutional Environment	National Government-led development; mandates and orders	City government-led development; responses to markets
4) Institutional Learning	a) Intergovernmental relations; b) Public-private sector interaction; c) Local government management challenge	a) Devolution and jurisdiction b) Laws and regulations; c) Organization and responsibilities; d) Local government capacity building; e) Private sector confidence

Impact on Industrial Infrastructure: Hanam Phase I

2.14 The Hanam Industrial Estate Phase I, completed in 1983, was the largest project investment component of Kwangju II in an amount of 20 billion won (US\$41 million), which was about 20 percent of the total project costs.¹² This component alone constituted 15 percent of the total amount of capital formation of 132 billion won (PCR, p. 19) for the city of Kwangju during the five-year period 1980-1985. The land area of the estate was 460,000 pyongs (1.5 million square meters) which was about the same as the sum of all industrial areas that existed in the city before the project (Table 2.2).

2.15 Recently completed World Bank studies show that when publicly provided infrastructure services are deficient, manufacturers undertake significant expenditures to substitute or complement these deficiencies, and smaller firms, and those in regional cities, sustain heavier burdens (Lee and Anas 1992; Anas, Lee and Murray, 1996). The low level of infrastructure investment in the Cholla

12. The actual amount disbursed was US\$51.2 million after cancellation of US\$13.8 million due to the cost savings from a substantial devaluation. But the total project cost at completion was US\$216 million, 40 percent larger than the appraisal estimate of US\$154 owing to additional investments by the borrower (PCR, p. 22).

region in the 1960s and 1970s, especially the lack of industrial sites (Table A1.3), was one of the major constraints on the birth and growth of manufacturing in the region. The coming of the Hanam Industrial Estate clearly marked the beginning of a new era for industrialists in the region.

Table 2.2: Expansion of Industrial Estates in Kwangju

Industrial Estate	Land Area		Development Costs		Construction Completion Date
	1,000 pyong	percent	billion won	percent	
Hanam I	460	12.5	25.5	7.5	Dec. 1983
Hanam II	617	16.8	39.7	11.7	Dec. 1988
Hanam III	727	19.8	91.4	26.9	Feb. 1991
Pyong-dong	820	22.3	156.0	45.8	Jun. 1995
Science Complex (1)	494	13.4	-	-	2001
All Other Ind. Areas (2)	557	15.2	27.7	8.1	n.a.
Total	3,675	100.0	340.3	100.0	

(1) Total land area including R&D complex, university, and residential and commercial areas will be 2,980,000 pyongs with total development cost of 727.7 billion won for Phase I, to be completed in 2001.

(2) Includes Bonchon, Songnam, and Sochon industrial areas, but excludes Kumho Tire and Asia Automobiles.

Sources: National Industrial Estate Status, Korea Chamber of Commerce and Industries, June 10, 1994.
Regional Economic White Paper 1994, Kwangju City, December 1994.
Industrial Estate Status, Kwangju City, March 1995.

Impact on Manufacturing

2.16 As indicated above, firms do not move long distances because of high expected costs and uncertainties at new location. Infrastructure and tax breaks alone are not sufficient to attract industries to less developed remote areas. Therefore, the major challenge for the project's success was to induce firms, especially several large-scale ones, to the newly developed industrial estates. The city and provincial governments actively promoted the estate nationwide aiming at attracting several large scale "anchor" firms, supported by the help of the central government's clout for moral suasion (including that of the "Blue House"). The following contributed to the success of Hanam Phase I as critical factors.

2.17 *"Anchor" Firms.* Daewoo Electronics, LG (Goldstar) and three other firms came as the "anchor firms". The availability of low price land and high quality labor and their marketing strategy influenced their decisions to locate in the Hanam Industrial Estate, but the active promotion activities by local government officials, and local business groups (Chamber of Commerce and Industries) and the pressure from the national government (the Blue House) influenced their decisions.

2.18 *City Planning and Zoning as Instruments.* Small and medium size firms relocated from the old industrial areas in Kwangju's central city due to city planning and zoning changes. Their capital gains from selling old factory sites were substantial enough for relocating to the Hanam Industrial Estate and investing in new plant and equipment. The land price at Hanam was several times lower than their previous locations at the central city.

2.19 *Subcontracting Small and Medium Size Firms.* A large number of subcontracting firms came with Daewoo and LG. Backward and forward linkages were beginning to be established. In the case of Daewoo, 35 small and medium size firms came with it to Hanam, 20 from Seoul. (See Chapter 3 on linkage effects.)

2.20 On the whole, all of the new industrial sites in the Hanam Industrial Estate completed in December 1983 were occupied quickly, due to the pent-up demand accumulated over the past two decades. As the estate was being filled up in 1984, development of the second phase of Hanam was proposed and its construction began in 1986 (see more details in chapter 3).

Manufacturing Establishment Survey Results

2.21 *Sample Design and Sampling Strategy.* A survey of manufacturing establishments was conducted in Kwangju to learn about the characteristics of the firms in the Hanam Industrial Estate and at other locations in the city. A stratified random sample of 80 manufacturing establishments was selected using location and firm size as stratification variables: (i) 50 percent was selected from each "within" the Hanam Industrial Estate, the project site, and from "outside", respectively; and (ii) large firms were oversampled. In 1995, Kwangju had only 25 manufacturing establishments with more than 200 employees, 10 of them at Hanam. All 25 firms except two were included in the sample (Table A1.5). There were a total of 1,945 manufacturing establishments in Kwangju in 1995, of which 395 were located in Hanam, 256 in other small industrial estates closer to the central city, and 1,294 outside industrial estates. Of those outside, 975 (75 percent) were microenterprises with less than 5 employees (Table 2.3). The sample was 10 percent of those with 5 or more employees. The survey outcome produced 44 establishments located in Hanam and 36 "outside" (Table A1.6). More details of the survey results appear in Annex 4.

Table 2.3: Firm Size Distribution Within and Outside Hanam Industrial Estates, 1995

Industrial Estate	Firm Size					Number of Workers
	Large (300 or more)	Medium (20-299)	Small (6-19)	Micro (Less than 5)	Total	
Hanam I	5	51	45	15	116	10,344
Hanam II	2	55	51	6	114	4,442
Hanam III	-	65	84	16	165	3,607
Sub-total	7	171	180	37	395	18,393
Bonchon	2	38	45	7	92	3,888
Songnam	-	28	35	4	67	2,410
Sochon IE	-	12	23	22	57	999
Sochon AIE	-	26	13	1	40	1,583
Sub-total	2	104	116	34	256	8,880
Outside of IE	6	62	251	975	1,294	19,488
Total	15	337	547	1,046	1,945	46,761

Source: Kwangju Industrial Estate Status, 1995.

2.22 *Survey Instruments.* The survey questionnaire was designed using the questionnaires from two previous World Bank studies on industrial location in Colombia and Korea (Lee, 1989; Lee and Choe, 1990). The underlying analytical framework was to relate manufacturing firm attributes with location attributes. Government policies and infrastructure investment tend to influence the location attributes to which individual firms respond. The questionnaire is attached as Annex 5. The survey was conducted by the study team at Kwangju-Chonnam Development Institute in the summer of 1995.

2.23 Firm attributes included employment size, industry type, age, and whether newly established or moved from other locations. Location attributes included access to input and output markets, industrial linkages, means of shipments of goods and commuting of employees, and quality of various infrastructure services.

2.24 *Survey Findings.* The survey results are tabulated (i) for the sample as a whole, and (ii) by location: Hanam I, Hanam II and III, and "outside". Some of the highlights of the survey results can be summarized as follows. The majority (62.6 percent) of the sample firms were in the medium size category of having 50 to 199 employees (Table A1.5); 60 percent of the firms were founded since 1983 (when Hanam I was completed); 36 firms were newly established while 44 moved from other locations (6 came from outside Cholla). Of the 44 firms in Hanam, 28 (63.6 percent) moved from other locations (Table A1.6). New firms had more advanced technology than the relocated firms (Table A4.6). The sample firms were concentrated in the fabricated metal industries (61 percent) indicating their links to large firms as suppliers of intermediate products (Table A1.7). The extent of backward and forward linkages was significant (Tables 3.1 and 3.2), which is discussed in Chapter 3.

2.25 The quality of electricity supply was better in Hanam than "outside" (Table A4.12). The sample firms reported that utility and other infrastructure services improved after relocation (Table A4.15). The firms in Hanam were "very satisfied" with road access, proximity to clients, and plant capacity, while those "outside" were satisfied with the availability of workers (Table A4.11), which reflects the central location of those firms outside Hanam. Indeed, large firms moved long distances (Table A4.13) and the shipping distances and the availability of workers became worse after relocation. Also, only a small portion of relocated firms reported any improvements of commuting distances (Table A4.15). About 80 percent of sample firms use trucks as the means of shipping outputs and receiving inputs (Table A4.8). Only a small portion of their outputs was sold in Kwangju (i.e., manufacturing is an export sector in Kwangju) and a small portion of inputs originates within the city (Table A4.8). We may conclude that the quality of various infrastructure services improved with the establishment of the Hanam Industrial Estate, but logistics costs, especially for shipping and commuting, increased because of the distance factor. Possible location distortions resulting from the establishment of Hanam are discussed in paragraph 4.5.

Impact on National-Local Government Relations and Management Capacity

2.26 One of the most significant direct impacts of World Bank intervention was to establish a new working relationship between national and local governments. For mobilizing much needed resources and symbolizing the long awaited government commitment to the region's development, the World Bank projects were welcomed by the provincial and the city governments as much as the national government. Nearly all principal project components came from proposals submitted by local governments, which generated strong project ownership at the local level. For MOC, committed to regional development in Korea since 1971, the projects were an opportunity to put into practice and implement the many plans and study recommendations made over the years. For local governments, the projects not only provided an opportunity to work closely with MOC as one team but also forged a new alliance with the private sector for the benefit of the region's development, which neither provincial or local governments alone could bring about by themselves.¹³

2.27 To implement the project, MOC set up a special project implementation unit called Kwangju Regional Development Unit (*para. 1.11*) which was relocated to Iri in 1981 as part of a government reorganization in that year (Kwangju II PCR, para. 1.3). The Regional Development Bureau of MOC still existing in Iri (now called Iksan) with a total of 200 employees, is a direct result of the Bank project. Initially, this unit supervised the construction of all project facilities, giving instructions to local authorities to carry out the details. As local governments acquired a stronger voice with subsequent projects, the Regional Development Bureau provided an important channel of communication between different levels and departments of governments and a source of advice. Indeed, it played the crucial role of interagency coordination for the development efforts in the region. Most of the Bureau's advice concerned the *construction* of industrial infrastructure, one of the main lines of business of MOC. For the operation of the completed industrial estates, a different kind of interaction developed as the city government became responsible for its management.

2.28 After the completion of the Hanam Industrial Estate, the city of Kwangju inherited the project and had the mandate to manage it. The Hanam Industrial Estate Management Office was created to operate the estate under the direction of the Industry Development Division of the city government. At

13. The sources of evidence in this and the following section and the two sections on the side-effects in Chapter 3 are based on the triangulation of information from multiple sources (*para. 1.18*). The list of people met in the national and local governments and the private sector during the two study missions is attached in Annex 6.

the outset, this office with a staff of 17 took care of all the details for the operations and maintenance of the estate facilities in addition to its role of promotion and sale of the vacant lots. Over the 20 year period which saw the expansion of the estate to the second and third phases, the size and the function of this office have been reduced rather than increased, owing to (i) a series of regulatory reforms in the areas of industrial and urban development which reduced the workload of this office; (ii) better access of information to the local manufacturers; and (iii) their improved efficiency in business operations. This diminishing role of the Hanam Industrial Estate Management Office illustrates the evolution of the "rules of the game" from government-led to market-led institutional environment over the study period, which is elaborated in Chapter 3 (*see para. 3.20*).

Impact on Public-Private Sector Interaction

2.29 For the private sector, the projects were the first strong signals coming from the Blue House indicating that the "rules of the game" for industrial development in the region were about to change. Private industrialists interviewed during the study mission always highlighted the World Bank's catalytic role in initiating the industrial development process in the region and bringing the three stakeholders, national and local governments and private sector, together through the projects.

2.30 The direct contact between local governments who operated the industrial estates, and private manufacturers located in them, changed the nature of public-private sector interaction in the context of the region's industrial development. New actors on the scene, the city government and private entrepreneurs, meant that new relationships had to be forged. Different criteria for business decision making meant that the "rules of the game" had to be changed to induce private entrepreneurs from within and outside the region to invest in the expanding manufacturing activities there. This process of institutional learning on both sides is documented further in Chapter 3 using Hirschman's concept of the "centrality of side-effects" in impact evaluation.

2.31 In interviews with the impact evaluation study team, many businessmen in the region expressed that local government officials became increasingly knowledgeable about industrial development. Local governments indeed became partners in this process of industrialization for the first time, owing to the exposure to private sector interests through World Bank project implementation. For example, cooperation between the coalition of government agencies and the private sector itself took the form of joint local government/Chamber of Commerce and Industry delegations to lobby for the interests of the region at government agencies (including the "Blue House") and "chaebols" (business conglomerates) in Seoul.

3. Side Effects and Spillovers

3.1 "Impacts on the ground" are often longer-term, indirect, and unintended. Using Hirschman's conceptual framework of the "centrality of side-effects", this chapter will document three types of "side-effects" observed from the World Bank projects: (i) establishing an industrial base through backward and forward linkages (Hirschman, 1958); (ii) changing the "behavior of the bureaucracy" (Hirschman, 1995, pp. 166-167) especially of the local governments and their institutional learning; and (iii) increasing private sector confidence and participation in the development process in response to changing "rules of the game". For the latter, Hirschman's conceptual framework is complemented by Baumol's paradigm on the entrepreneurial responses to the "rules of the game" (Baumol, 1990).

Industrial Base and Linkages

Industrial Infrastructure: Hanam II, III, and Pyung Dong Follow-up Projects

3.2 One of the most significant—and yet unexpected—side effects of the Kwangju II project was for the local authorities to learn how to plan, finance, build and operate large-scale industrial estates on the model of Hanam Phase I. Since they had to operate the project facilities and expand them urgently to meet additional demand, the governments of Kwangju city and South Cholla province had to learn quickly to put their newly acquired knowledge and skills into practice.

3.3 The World Bank's estimate of the future demand for industrial sites was below the Korean projection. Korean officials wished to build a larger estate at Hanam. The final outcome, 66 percent of all sites sold before completion and the rest quickly occupied, proved the bullish Korean estimate to be closer to the mark. Had the World Bank agreed to build a much larger first phase estate at Hanam, the Bank's decision would have deprived the local authorities of much of their rich learning experiences in the planning and construction of large industrial estates. Hanam I turned out to be a "pilot" phase that led to the "mainstreaming" phase of Hanam II, III, and Pyung-Dong, three more industrial estate projects executed by the city alone in only a ten-year period (Picciotto and Weaving, 1994).

3.4 The institutional learning discussed earlier—including strong compact and coordination between MOC and local governments, local government participation and ownership, private sector confidence and participation, and local government capacity building—were "side-effects" from the initial phase of the project which became, as Hirschman put it, "inputs essential to the realization of the project's principal effects and purpose." "They increase[d] and spread with and through use so that the resulting increment [could] then be channeled to new ventures" (Hirschman, 1995, p. 161)—in our case, the follow-up projects of Hanam Phase II, III, and Pyung-Dong, the ultimate long-run side effects.

3.5 As Hanam Phase I was already fully occupied by 1984, and industrialists had expressed interest in acquiring further land, the local authorities began work on the Hanam Phase II extension in 1986 and completed in 1988, but this time without the help of MOC and World Bank involvement, only assisted by the Korea Land Development Corporation (KLDC). To meet the increasing demand for sites, the Kwangju city authorities launched Hanam Phase III in 1989 by the city alone without MOC, KLDC, or the World Bank, and completed in 1991. When the study mission visited the site, 85 percent of the sites were occupied. As the Phase III sites were sold out even before completion of the project, the city continued expansion of industrial sites by the construction of Pyung-Dong Industrial Estate, an area south of Hanam including an area for foreign direct investment that was completed in 1995 (Table 2.2). The land area of Hanam II and III together is 1,344,000 pyongs (1 pyong=3.3 square meters), three times

larger than that of Hanam I (460,000 pyongs). In addition, the land area of Pyung-Dong is 820,000 pyongs (Table 2.2).

3.6 This sequence of massive industrial estate development during a little over ten years by the city alone is a remarkable achievement for the city government of Kwangju. On the whole, developing Hanam Phase II, a land area of 617,000 pyongs (2 million square meters), without the help of MOC, was the most important benchmark in the local government's capacity building for managing a large industrial development project.

Backward and Forward Industrial Linkages

3.7 Table 2.3 shows the size distribution of manufacturing firms located within and outside Hanam Industrial Estates in 1995. It is striking to see that 81 percent of medium and large scale firms are located in the industrial estates while only 23 percent of small firms (with less than 20 employees) are located in the estates. This implies that the industrial estates provide both economies of scale and scope of infrastructure and other services that are vital for medium and large scale operations. In terms of employment, three Hanam estates offered 40 percent of Kwangju's total number of manufacturing jobs in 1995. It is clear that Hanam Industrial Estate had a significant impact on the city's employment growth.

3.8 One important contribution by Hirschman is the analytical framework of "backward and forward linkages" in the industrial development process (Hirschman, 1958). This linkage effect is one of the key examples of the "centrality of side-effects". According to Hirschman (1995, p. 165):

[backward and forward linkage effects] are not ordinarily required for the proper functioning of the project as such. Forward linkages that increase the demand for the project's outputs will, however, be very useful and in some cases essential for the future growth of the project...Backward linkage effects have a similar function: they reduce the import-intensity of the project whose future growth...may well be conditioned on such a reduction; thus both linkage effects may play an important role in enabling the project expand [and grow].

3.9 In this study, three of Hirschman's linkage effects are observed:

(i) *"Satellite" Industry Effect on Establishing an Industrial Base.* A satellite industry can be established through backward or forward linkages. Such an industry enjoys a strong locational advantage of being near the parent industry and it uses as a principal input an output of the parent industry, or its principal output is used as an input of the parent industry (Hirschman 1958, p. 102). Our establishment survey shows the following linkage effects: Table 3.1 shows that more than 60 percent of the establishments at Hanam supply their outputs as intermediate inputs of other industries; 28 percent of them send 100 percent of their outputs to other industries, a strong indication of forward linkages. Table 3.2 shows the extent of backward linkages: at Hanam nearly 80 percent of establishments receive outputs of other industries as intermediate inputs, a strong indication of backward linkages.

Table 3.1: Proportion of Outputs Used as Inputs to Other Industries: Forward Linkages									
	0 %	1-20 %	21-40 %	41-60 %	61-80 %	81-99 %	100 %	n.a.	Total
Industrial Estate	----- (percent of establishments) -----								
Hanam I	34.8	13.0	4.4	0.0	0.0	8.7	34.8	4.4	100.0
Hanam II & III	42.9	14.3	0.0	4.8	4.8	0.0	23.8	9.5	100.0
Outside	38.9	16.7	5.6	0.0	5.6	8.3	25.0	0.0	100.0
Total	38.8	15.0	3.8	1.3	3.8	6.3	27.5	3.8	100.0

Source: Impact Evaluation Establishment Survey, 1995.

Table 3.2: Proportion of Inputs from Outputs of Other Industries: Backward Linkages									
	0 %	1-20 %	21-40 %	41-60 %	61-80 %	81-99 %	100 %	n.a.	Total
Industrial Estate	----- (percent of establishments) -----								
Hanam I	21.7	17.4	17.4	0.0	4.4	17.4	17.4	4.4	100.0
Hanam II & III	14.3	23.8	9.5	14.3	14.3	9.5	4.8	9.5	100.0
Outside	25.0	16.7	5.6	16.7	5.6	11.1	16.7	0.0	100.0
Total	21.3	18.8	10.0	11.2	7.5	12.5	13.8	5.0	100.0

Source: Impact Evaluation Establishment Survey, 1995.

(ii) *"Last stage" Industry Effect of the "Anchor" Firms.* When an input-output matrix is arranged in a triangular form, there is a "last" sector whose output goes entirely to final demand and which takes in inputs from a number of other sectors (Ibid., p. 110). The backward linkage effects of such "last stage" industries are of considerable importance for industrial development. The "anchor" firms in the Hanam Industrial Estate (Phase I) produced such effects (although they were not "last" in a literal sense since some of their outputs were inputs of other industries). For example, Daewoo Electronics which produces household appliances for final demand such as refrigerators, microwave ovens, color TVs, has established 1,200 subcontracting firms, of which 180 are located in Kwangju, 35 in the Hanam Industrial Estate (*para. 3.30*). The firm's linkage effects on manufacturing employment and income are remarkable considering that Daewoo's own plant has only 1,800 employees.

(iii) *Multiple Linkage Effects on "Acceleration" of Industrial Growth.* According to Hirschman "the fact that the linkage effects of two industries viewed in combination are larger than the sum of the linkage effects of each industry in isolation helps to account for the cumulative character of development." (Ibid., p. 104) The data in Table 2.3 shows that only 7 out of 395 establishments located at Hanam are large scale firms (having more than 300 employees). This may imply that more than half of those small firms (assuming that each of the seven large firms have subcontracting arrangements with about 20 to 30 small firms) came into existence as the result of "secondary linkage effects" with no direct connections to the seven anchor firms. This experience in Kwangju tends to support Hirschman's hypothesis on the "acceleration of industrial growth" at an early stage of development (Ibid., p. 104).

Local Bureaucracy's Behavior and Capacity Building

3.10 *"Task-oriented" Bureaucratic Behavior.* Local governments began to replicate and expand the project infrastructure on their own account, mobilizing their own financial resources, soon after the World Bank funded projects were completed. Local governments' growing responsibilities, as the guardians and managers of industrial development in the region, led them to assume ever greater responsibilities over the projects and follow-on operations. In other words, local governments became promoters and partners of industrial development.

3.11 Industrialists interviewed by the impact evaluation mission reported that in the 1960s and 1970s, local governments were synonymous with red tape, for example, obtaining building permits and licenses was a challenging if not impossible job. In the case of Kwangju, the implementation of the World Bank project with Hanam I and its extension to the second phase without the help of MOC was the most significant turning point for the city government's institutional learning. Hirschman characterizes such a change (in this case very drastic) in the behavior and role of government bureaucracy as "a most impressive side-effect of development projects in the public sector [as] a growth- and task-oriented group of public officials [emerged]" (Hirschman, 1995, pp. 166-167).

3.12 *Evolution in Local Government Organization, Functions, and Responsibilities.* This study found that city governments, especially, made many internal changes to their organizations to help change the rules and provide more incentives for entrepreneurs to invest in industry in the Cholla region. The first phase of the Hanam Industrial Estate was completed in 1983 and, up to that time, there was no specific unit or department within the Kwangju city administration where interested entrepreneurs could direct their inquiries about acquiring a plot and setting up a manufacturing establishment. Steps taken to fill this gap included (see Annex 3):

1985 - the creation of a special Industrial Estates Planning Sub-Division within Kwangju city government, to plan, finance and market the estates and staffed initially by five professionals.

1986 - Kwangju city status upgraded to that of autonomous Direct Administration City (a national government decision that coincided with the project implementation).

1987 - the establishment of the Hanam Industrial Estate Management Office as a "one-stop shop" at the site.

1987 - industrial development rises in the organizational hierarchy as the Industrial Development Section was elevated to a full division.

3.13 Within the Kwangju city government, the Industrial Development Division is responsible for the promotion and marketing of opportunities for private sector industrialists within the region. This function did not even exist within the city government *before* the World Bank projects. During interviews for this study, IDD officials explained that marketing of industrial estates is done on a bigger scale today than ever before, using a whole range of methods from newspaper advertisements, flyers and visits to interested firms. As the need arises, the Kwangju city mayor himself becomes directly involved in promoting the sale of the sites. Administrative changes such as these were the result of side-effects of the Kwangju II project especially.

3.14 More significant side-effects of the projects, however, are on the capacity and quality of project management of the local government officials. According to the officials who actually implemented the

Bank financed projects, they are now using the approaches and methods they learned from the Bank projects in project preparation, appraisal, and implementation: taking the formal steps of feasibility studies, engineering design and economic analysis is now the standard practice while this did not exist before the Bank projects. With so many World Bank missions—57 in all, over a period of twenty years—there was plenty of opportunity for interaction with Bank missions, exchanges of experience and learning on both sides.

3.15 The city government of Kwangju not only successfully managed the first phase of the Hanam Industrial Estate, it carried out the second and the third phase expansion of the Hanam estate without MOC and Bank involvement and kept expanding to the Pyung-Dong Industrial Estate aimed at inducing direct foreign investment. The level of managerial sophistication of the staff of the Kwangju city government now appears equal to that of any city in Korea, catching up with the rest of the country in only a ten year period.

"Rules of the Game", Private Sector Confidence, and Public-Private Partnership

3.16 *Evolution of the "Rules of the Game"*. A series of devolution with changes in jurisdictional boundaries and laws and regulations during the twenty year period (see Timelines in Annex 3) coincided with the important benchmarks of the implementation of the Bank financed projects. Consequently, local governments assumed responsibilities as guarantors and managers of "rules of the game" for private industrial development, a responsibility that had formerly been the monopoly of the national government. Kwangju city government, having to operate the industrial estate they inherited from the World Bank financed project from the early 1980s, was obliged then for the first time to consider what incentives industrial entrepreneurs might need in order to participate in the development of the region. Thanks to the project experience, therefore, the city government embarked upon industrial development as a means of making the "rules of the manufacturing game" more attractive for private investment. The city government's promoting industrial development in the region discussed above was something that they never did in the 1970s *before* the Bank-financed regional development projects were implemented.

3.17 As in most other countries, city governments in Korea are responsible for granting building permits and licensing the use of the completed facilities. Industrialists interviewed by the impact evaluation mission reported that obtaining building permits and licenses is much easier today than it was *before* the Kwangju II project. City governments also became adept at re-assigning agricultural land on the urban periphery for industrial use, especially after they were given the previous KLDC responsibilities for land use regulation in 1990. In practice, there has been more conversion of agricultural land for industrial use under these local autonomy arrangements. In 1994, Hanam Industrial Estate Management Office functions were simplified to only register applications for industrial development which are all automatically approved. The office no longer tries to assess the economic or financial feasibility of the proposed operation. When it was established, the primary function of the Hanam site office was to promote the sale of plots in the industrial estate and the "one-stop-shop" function for industrialists mentioned above. Owing to a series of devolution and deregulations, its administrative workload has decreased lately and its staffing was reduced from 17 in 1987 to only 9 today (*paras. 2.28, 3.20*).

3.18 For their part, private sector industrialists came to recognize local governments in the region as guarantors and managers of the "rules of the game" and arbiters of the conditions of entrepreneurial participation in industrial development in the region. Business managers interviewed for this study confirmed that local officials' understanding of the needs of private sector industrial development had improved significantly *after* the completion of the World Bank-financed projects. Similar reports were

made about city governments in Iksan and Chonju cities, the Chonju Regional Development Project sites in neighboring North Cholla province. Entrepreneurs also reported that they noted a reduction of city government red-tape following the creation of the Industrial Development Division. Significant changes in rules gave them new incentives to invest in Kwangju. Industries setting up within an industrial estate were exempt from municipal taxes from two to five years. Perhaps just as important, these industries could feel equally exempted from many of the tight land uses and building controls that effectively suffocated industrial development in other parts of the urban areas. The project experience provided a vital schooling for city governments that they should develop rules that allow private industrialists to reap benefits from their investments without undue hindrance from regulations.

3.19 *Private Sector Confidence and Public-Private Partnership.* The local government's passion and commitment to industrial development in the region, together with changing regulatory and institutional environment, enhanced the private sector's confidence in the local governments and a strong public-private partnership emerged—another significant side-effect of the projects (Hirschman, 1995, p. 166). In the case of Kwangju, the city government is now able to maintain an "enabling environment" for the private entrepreneurs to invest and grow, to the extent that the city is now actively promoting direct foreign investment in newly opened Pyung-Dong Industrial Estate (the fourth phase after Hanam III). Recently, Kwangju city's stature and reputation rose markedly when it won from a severe competition among major cities a national government financed project to locate a Science Park with a hi-tech complex in Kwangju (see Table 2.2), which is now under construction for completion in 2001. Private cooperation has been forthcoming in big ways. For example, Kumho Tire Company, one of the largest indigenous business conglomerates, sponsored the establishment of an engineering college in the Science Park.

3.20 The overall picture emerging from the analysis is that over the twenty year study period, the "rules of the game" evolved from those of national government-directed development to those of local government- and market-based development with strong private sector responses in the region with their confidence and cooperation. As indicated above (*paras. 2.28 and 3.17*), this process can be illustrated by the diminishing role of the Hanam site office by leaving most of its previous functions to the markets. This experience confirms Baumol's proposition that entrepreneurial responses are productive when the "rules of the game" provide positive incentives (*paras. 2.9-2.10*).¹⁴ What was observed in the Cholla region through the Bank-financed projects tells such a story.

Ultimate Impact: Regional Growth

3.21 *Kwangju is Now the Fastest Growing City in Korea.* Population grows at a rate of 4.5 percent per year, which comes close to the growth rate of Seoul (5 percent) in the 1970s (see Table A1.2).¹⁵ According to the Industrial Census statistics, Kwangju was the only Direct Administration city where manufacturing employment grew during 1988-1993 (Table A1.8). In the other five Direct Administration cities, the level of manufacturing employment (in establishments with 5 or more employees) during this period actually declined.¹⁶ In terms of growth of both regional product and

14. This outcome could be interpreted as a case where the evolution of efficient institutions (rules of the game) led to the reduction of transaction costs, which resulted in productive private sector responses (North, 1990 and 1994; Coase, 1960; Williamson, 1995).

15. The population growth rates of the Direct Administration cities and provinces not appearing in Table 2.1 for the 1975-1990 period were: Inchon=1.96; Taechon=3.14; Kangwon=0.81; Chungbug=0.99; Chungnam=0.99; and Cheju=3.65.

manufacturing output, South Cholla (including Kwangju) was second only to Kyonggi (Table A1.9, and Table A1.10). These two provinces were the only ones that gained the output share in the country during that period (Table A1.9).

3.22 *Cholla Region is Still Far Behind.* In Table 3.3, the 15 regions are ranked in descending order according to each region's manufacturing share of its total regional product in 1992. South Cholla and Kwangju ranked the 6th and 7th respectively with a little over a quarter of their output coming from manufacturing. South Kyongsang where Pusan is located had the largest share of 54.4 percent. The second column of Table 3.3 shows the per capita gross regional product (GRP) of each region. Its rank correlation with manufacturing output share is almost perfect with the exception of Seoul and Taechon. South Kyongsang had the largest per capita GRP. Cholla ranked the 7th and Kwangju the 10th. Cholla's per capita GRP was 95.3 percent of the country's average of 5.5 million won (about US\$7,000) and Kwangju's was only 81.9 percent, among the lowest (Table 3.3).

Region	Rank	Manufacturing Share	Per Capita GRP	
		percent	1,000 won	percent
S. Kyongsang	1	54.4	7,894	143.6
Inchon	2	48.6	6,116	111.3
Kyonggi	3	45.6	5,740	104.4
N. Kyongsang	4	37.0	5,752	104.7
Chungbug	5	34.8	5,245	95.4
S. Cholla	6	28.1	5,235	95.3
Kwangju	7	25.4	4,504	81.9
Pusan	8	25.3	4,457	81.1
N. Cholla	9	25.2	4,420	80.4
Taeku	10	24.7	4,180	76.1
Taechon	11	24.4	5,151	93.7
Chungnam	12	22.4	4,605	83.8
Kangwon	13	22.2	4,444	80.9
Seoul	14	12.5	5,762	104.8
Cheju	15	4.2	3,553	82.8
Korea		30.8	5,496	100.0

Source: *Gross Regional Product 1994*, National Statistical Office.
Korea Institute for Economics and Technology, 1995.

3.23 Table 3.3 shows that manufacturing is closely related to the level of income. Even though South Cholla, especially Kwangju, showed an impressive growth of manufacturing (Tables A1.8 and A1.10),

16. The data in Table A1.8 shows that the number of manufacturing establishments increased in all 15 regions during the same period. This implies that the new establishments created in this period were relatively small and existing large establishments went through "down-sizing" with technological changes. The average manufacturing firm size in the country declined from 52 in 1988 to 32 in 1993.

the Cholla region still has a lot of catching-up to do. Table A1.1 shows that the agricultural share of employment of South Cholla declined markedly from 73.1 percent in 1975 to 60.9 percent in 1990, but this share is still the largest among the 15 regions in Korea.

3.24 During the impact evaluation study mission, many people in both governments and private sector mentioned that the Seoul and the Pusan regions are now saturated and polluted with no more room for development and that the era for "delayed industrialization" has come to Cholla with the opportunities for developing with environmental conservation. The public officials and local entrepreneurs are optimistic about the future prospects:

- (i) The "western coast era" with increasing economic ties with China is just beginning (Lee and Kim, 1995).
- (ii) A half dozen foreign firms have already signed contracts to locate in the Pyung-Dong Industrial Estate. Technology-intensive non-polluting industries are envisaged in the newly developed, national government-financed Science Park with a hi-tech complex.
- (iii) Cholla has the comparative advantage of high quality labor and the potential for "eco-tourism" along the southern archipelago.

Necessary Conditions for Success

3.25 The successful implementation of Bank projects, especially the Hanam Industrial Estate component, cannot be explained by the government efforts and operations of the local land market alone. There were critical institutional elements that were exogenous to the region: Korea's civil service system and education system which did not have regional bias.

3.26 *Existing Government Bureaucracy and the System of Career Government Officials (Civil Service System).* Korea had a long tradition of a highly regarded public administration system going back to the Yi dynasty, partly owing to the informal caste system which ranked "scholar/bureaucrats" at the top. Even now, the entry level management positions are filled by taking the national "high civil service examinations". Competition for passing these examinations always has been intense. Between 1963 and 1985, 157,000 persons took them and only 2,600 (1.7 percent) succeeded (Kim and Leipziger, 1993). Because of this rigorous selection process, a high quality of government officials has been maintained.

3.27 Until the local elections in 1995 (the first since the late President Park abolished them in 1962) the heads of local governments, including mayors and county executives, were on the payroll of the Ministry of Interior and they were periodically rotated with those in the central offices in Seoul. The legal and administrative systems were also well developed long before the World Bank project intervention. Even though provincial and city government officials had no previous experiences of implementing World Bank projects or managing a large scale industrial development project, their learning was quick (as discussed in chapter 3).

3.28 *Strong Education System and Educated Labor Force.* Korea has had a long tradition of putting a high priority on education. Korea's spending on public education in the 1980s was 3.4 percent of GNP, comparable to other Asian countries, but Korea's spending on private education was 2.5 times more than other countries. The country's total spending including private education was 10 percent of GNP in 1990 (Kim and Leipziger, 1993). Korea's high level of educational attainment did not have regional bias. Cholla's education system, including national universities, was as good as anywhere in Korea. Hence,

the region had highly educated manpower and provided a high quality trainable labor force.¹⁷

A Caveat on Attribution

3.29 Kwangju's strong economic growth cannot be attributed solely to the World Bank projects per se, but the Hanam Industrial Estate played a major role in the region's industrialization process. Tables 2.3 and A1.4 show that 39.3 percent of manufacturing jobs in Kwangju were in Hanam (in 1995); 43.6 percent of manufacturing output and 60.7 percent of exports (to foreign countries) were produced by the establishments located in Hanam (in 1994). Almost all of the exports (98 percent) were from Hanam Phase I, the World Bank financed project.

3.30 What actually happened on the ground can be seen by an example of Daewoo Electronics. Its plant which was established at Hanam I in 1983, is now the largest in Korea with an annual sale of US\$2 billion in 1995, of which 70 percent was exported worldwide (including refrigerators, microwave ovens, color TVs, and other home appliances). The plant has 1,800 employees of whom 800 are women. (It had 3,800 employees until 1990 when it was downsized with the adoption of new advanced technology.) Within Korea, it has established 1,200 subcontracting firms of which 180 are located in Kwangju and 35 at Hanam. The rest are mostly in Seoul and Pusan. Recently, Daewoo Electronics established plants in Mexico and China in addition to 22 factories overseas and 47 dealerships worldwide. Daewoo Electronics became a world class establishment in merely a little over ten years!¹⁸ A similar story can be told about LG (Goldstar) and Samsung also located in the Hanam Industrial Estate. On the whole, the project's impacts on the region's manufacturing base, employment and income generation, and general living standard were highly significant. Indeed, this experience illustrates the "centrality of side-effects" in project impact evaluation.

3.31 *An important caveat* of this case study is that it documents project impacts in a country with a sustained economic growth. The same projects may fail to generate such impacts in a slow growing economy. Also, other regions of Korea developed early on without a similar World Bank intervention. The process of "learning by doing" in other regions provided lessons for the Cholla region. Using a case study (historical) approach (*para. 1.18*) and the Hirschman-Baumol framework (*paras. 2.8-2.10*), however, this study shows that the World Bank intervention acted as a catalyst in triggering the industrialization process in the Cholla region which had been excluded from Korea's development process in the first two decades.¹⁹

17. The World Bank's (1993) East Asian Miracle Study singled out education as one of the most important mechanisms for achieving "shared growth". But it did not cover regional disparities in Korea even though the benefits were not "shared" by Cholla.

18. Mr. Kyung Suk Seo, Manager, Daewoo Electronics Co., who participated in the construction of its plant at Hanam in 1983 kindly met with the impact evaluation mission twice and provided valuable information not only about his firm but also on the estate development in general.

19. During the second impact study mission, a focus group meeting was held at the Ministry of Construction and Transportation with the five Division Chiefs of MOCT who had implemented the three regional development projects. At the end of the meeting after the four-hour session where the mission presented our findings and tentative conclusions, the following consensus was reached: (i) the World Bank intervention had the "triggering" effect on the industrialization process in the Cholla region, and (ii) the project implementation significantly contributed to institutional learning at both the national and the local levels, and the lessons learned became the basis for preparing more World Bank projects in urban and infrastructure subsectors that followed in subsequent years.

4. Lessons from Industrial Development

Centrality of Side-Effects: the Hirschman Effect

4.1 This study shows the "centrality of side-effects" in projects. The World Bank-financed project in Kwangju triggered the process of industrialization in the region. The project's success and its spillover effects over time were due to a series of side-effects which contributed to the growth, expansion, and sustainability of the project, which included:

- (i) *Replicating Industrial Estates*: The local authorities learned how to plan, finance, build and operate large-scale industrial estates on the model of the Hanam Phase I and executed by the city alone three more large-scale industrial estate projects (*paras. 3.2-3.6*).
- (ii) *Backward and Forward Industrial Linkages*: Satellite industries have been established in Hanam. With a strong locational advantage of being near the parent industry, they use as a principal input an output of the parent industry or their principal outputs are used as an input of the parent industry (*paras. 3.7-3.9*).
- (iii) *"Task-oriented" Bureaucratic Behavior*: The extension of Hanam I to the second phase without the help of MOC or the World Bank was a significant turning point for the city government's institutional learning. Local governments' responsibilities grew rapidly as promoters and partners of industrial development (*paras. 3.10 -3.11*).
- (iv) *Evolution of Local Government Organization and Capacity Building*: City governments made many internal changes to their organizations to help change the rules and provide more incentives for industrialists to invest (*paras. 3.12-3.13*). Moreover, through the implementation of Bank-financed projects, local government officials improved the capacity and quality of project management (*paras. 3.14-3.15*).
- (v) *Private Sector Confidence and Public-Private Partnership*: With a series of devolution and deregulation, local governments assumed responsibilities as guarantors and managers of "rules of the manufacturing game" for private industrial development (*paras. 3.16-3.18*). Local governments' passion and commitment to industrial development in the region, together with changing regulatory and institutional environment, enhanced the private sector's confidence in the local governments and a strong public-private partnership emerged (*paras. 3.19-3.20*).

"Rules of the Game" and Private Sector Responses: the Baumol Effect

4.2 The study shows that the private sector responded in a most productive way to the changing "rules of the game" for industrial development in the region. Not only did the rules change the incentive structure to the benefits of the industrialists such as a series of devolution and deregulation over time, but they also changed the behavior of the bureaucracy that led to the creation of an enabling environment where close cooperation and coordination between the local government and the private sector were materialized. Our analysis shows that these side-effects were initially triggered by the World Bank-financed project which offered such an opportunity to occur. The World Bank-financed project strengthened the growth- and task-oriented behavior of government officials. The Bank's 57 missions

over twenty years provided a sustained period of institutional learning at all levels of government to the point of creating an enabling environment for the private sector in the region.

"Piloting" and "Mainstreaming"

4.3 The risk minimizing project size (Hanam Phase I) turned into a "pilot" and created opportunities for the city government (without MOC or the World Bank) "mainstream" industrial development with its own follow-up projects. This experience illustrates how a "new project cycle" (Picciotto and Weaving, 1994) can achieve the twin objectives of (i) reducing the project risk and lowering the Bank project failure rate, and (ii) providing opportunities for institutional learning on the borrower side.

Shortcomings of Industrial Estate Development Strategy

4.4 *The Incubator Hypothesis.* Previous Bank studies on the "incubator hypothesis" (Lee, 1985a, 1985b, and 1989) showed that small new firms with five to ten employees tend to locate in the central areas of cities to get all the benefits of externalities there. As they grow and need to expand, they tend to move to outer areas but moving a short distance at a time. The project-financed industrial estates are located outside the central city far away from the city center where small new firms cannot afford to locate. Possible site constraints for small and micro-enterprises and the project's possible negative impacts on the growth patterns of small firms are not covered in this study because of the limited scope and budget.

4.5 *Costs of Location Distortions.* Previous Bank studies found that in counties like Colombia (Lee, 1989) and Thailand (Lee, 1992) where the land market is functioning efficiently, infrastructure investment tends to follow the market (Hirschman, 1958, Chapter 5). In the case of the Hanam Industrial Estate, the Bank-financed project "triggered" the development process stimulating the idle market. As mentioned earlier, this role of the public sector could be supported by Aoki's (1995) "market enhancing view" and also by North and Thomas' (1973) earlier view of institutional requirements for markets to function. Nevertheless, the following negative impacts were observed during the impact evaluation mission:

(i) *Lack of Complementary Investments:* The main road connection to the Hanam estate was not expanded until 1992. This was also true in Chonju. Residential and commercial development in the Hanam industrial area which is only 9.5 kilometers from the city center started only recently. Consequently, most establishments in the Hanam Industrial Estate operate a large fleet of company buses for workers' commuting because of the lack of public transportation. Some large firms have fifty to a hundred buses. This is a good example of shortcomings of infrastructure projects where complementary investments were not included in the project design or their probable negative side-effects ignored.

(ii) *Negative Environmental Effects:* Even though pollution control is strictly enforced, wind blows toward the city center carrying smoke from the industrial areas in both Kwangju and Chonju.

(iii) *Land use Patterns:* Ten years ago, the location of industrial estates was outside of the city in both Kwangju and Chonju. Because the cities grew and expanded rapidly, the industrial complexes are now close to the newly developed expanding commercial centers. Such location distortions may have serious negative impacts in the long run preventing further expansion of the cities outward.

Transferability

4.6 *On transferability.* This report supports the proposition that the patterns of behavioral responses of individual actors to the rules of the game transcend time and places. i.e. regional or national boundaries.²⁰ What varies across regions or countries is the quality of the rules of the game, for example, "the use of incentives and organizational design within the public sector to enhance efficiency and to reduce the likelihood of corruption" (Stiglitz, 1996, p. 174). Such an organizational design, however, can be learned from experiences of other countries. The challenge is to find a mechanism, political or otherwise, to "trigger" the process of such organizational learning. Wade (1993) suggests that "... from time to time opportunities to make major organizational changes do occur in any society, and at that time it matters what knowledge of alternative arrangements key policy makers have in their heads." But such opportunities were created by policy makers themselves in Korea and other East Asian countries. They did not merely wait for the opportunities to come.

20. Baumol (1990) shows historical evidence from Ancient Rome, Medieval China and through the Middle Ages.

PART II. INTEGRATING ISLAND ECONOMIES INTO REGIONAL DEVELOPMENT

5. Project Rationale for Improved Transport Linkages

Island Development: The Baseline

5.1 The Kwangju II project bridges supported the then Ministry of Construction's (MOC) national policy of island development in a country which has over three thousand islands altogether. The objective of this policy is to physically integrate island territory with the mainland through permanent road bridge connections, where technically feasible, and to extend the development process to the islands. This was the case of coastal islands such as Tolsan and Chindo. The policy also aims to link together groups of islands that are too far offshore to be connected to the mainland.

5.2 South Cholla Province (SCP) was an appropriate place to implement MOC's policy. Nearly two-thirds of Korea's islands are situated along the irregular coastline of the province. Increasing the income-earning opportunities of the region's island population was an explicit objective of the Kwangju II project when appraised in 1979 (Kwangju II SAR para. 2.01). At that time, 459,773 people, some 11.5 percent of SCP's population, lived on 318 of the province's 1,921 islands. Physically isolated from economic development on the mainland, SCP island people were an appropriate poverty target group for the project. In 1979, their average income was less than half the national average.

5.3 Chindo and Tolsan (the third and the seventh largest islands in Korea) were priority locations for MOC to build access bridges. Through building bridges to Tolsan and Chindo, the largest and most populous coastal islands still without permanent access to the mainland at that time, the Kwangju II project aimed to benefit some 25 percent of this target group. Both bridges used an identical cable stay suspension design, the first time such technology had been used in Korea.²¹ There were long implementation delays and considerable cost overruns, largely because of the lack of experience in building this kind of bridge in Korea.²² Both bridges were open to traffic at the beginning of 1985, about two years behind schedule. Each having a single cable span of nearly 400 meters, the bridges were noteworthy engineering achievements.

5.4 *Baseline Situation for Tolsan.* Tolsan, the seventh largest among Korea's many offshore islands, is separated from Yeosu city on the mainland only by a narrow sea channel four hundred meters wide. Despite its closeness to Yeosu, a major fishing port and third most populous urban center in the South Cholla region, Tolsan Island was not fully part of the dynamic urban development of the neighboring city *before* the bridge. The lack of a permanent access to the mainland city meant that Tolsan did not provide a suitable location for Yeosu workers to live, even though these people were hard put to find affordable housing within the city of Yeosu itself. Yeosu's rapid population growth and the constraints to topography of the site imposed upon urban development placed a premium upon urban land there.

21. A cable stay suspension design for the Tolsan Bridge replaced the Kwangju II project's original design for a less expensive girder box design. Site conditions and heavy marine traffic along the sea channel precluded the construction of supporting pillars midstream that a girder bridge would have required (Kwangju II PCR para. 4.5). The cable stay suspension technology transfer was effectively replicated in Korea with the construction of the Olympic Bridge over the Han River in Seoul.

22. According to the PCR, causes of implementation delays included: (i) Bank suspension of disbursements on the Tolsan bridge until qualified supervisory consultants were appointed (Kwangju II PCR para. 4.7); (ii) interruption of Chindo bridge construction in September 1981 because of lack of government counterpart funds (Kwangju II PCR para. 4.7); and (iii) disagreements between the Korean contractors and the bridge supervisory consultants (Kwangju II PCR para. 4.14).

Before the bridge, Tolsan residents had only a short ferry boat crossing, but normal delays in embarking and disembarking precluded efficient commuting from Tolsan as an acceptable urban way of life for many. Tolsan Island was, nevertheless, the last major area close to Yeosu that was ripe for urban development; all that was needed to trigger urban occupation was a permanent link to the mainland that a bridge was to provide. *Before* such a link, traditional agricultural and fishing activities—always with an eye to the neighboring, if somewhat inaccessible urban market—figured strongly in the island's economy. Through its proximity to Yeosu, though, Tolsan's rural economy was different from that found on more remote islands elsewhere in Korea. Tolsan farmers already produced cash crops on a small scale, in contrast to the subsistence farming for local consumption typically found in isolated island communities.

5.5 *Baseline Situation for Chindo.* Chindo is the third largest among Korea's many coastal islands. Although like Tolsan, it is separated from the mainland only by a narrow marine channel, Chindo Island is more remote than Tolsan for two reasons. First, there is no major urban center adjacent to Chindo on the mainland itself. Second, abruptly shifting tides in the area can make shipping along the channel difficult and the ferry crossing unreliable if not dangerous at times. Chindo's isolation ensured that the island economy *before* the bridge was different from that found in rural areas on the mainland. Thus, Chindo's population was mostly engaged in agricultural production destined for the local island market, sustained by a population twice as large as found today on the island. *Before* the bridge, this was not a growing economy, however. The island population was falling as younger people, especially, sought more rewarding opportunities for employment in mainland cities. With falling local demand, Chindo farmers had to retrench. *Before* the bridge, they could not supply mainland markets, as access using the ferry boats was unreliable and costly.

Evaluation Framework

5.6 The direct impacts are limited to territorial incorporation by connecting the islands to the mainland and subsequent improvements of transport access. The study focuses on the impacts of the bridges upon regional development. By highlighting income creation among low-income islanders, the Kwangju II project itself was pointing towards poverty reduction as an important example of a possible "side-effect" of the bridges. As in the case of industrial development, "impacts on the ground" are long-term, indirect, and often unintended. Indirect "side-effects" of the bridges on the islands' socio-economic conditions are documented in Chapters 6 and 7. Times series data allow us to compare the *before project* and *after project* situations. Cross-sectional data describe *with project* and *without project* situations since other islands adjacent to Tolsan and Chindo that were still unconnected by bridges can be used for the comparison group. The underlying analytical framework in Part II is also that of Hirschman's "centrality of side effects" as described in Part I (*para. 2.8*).

5.7 Thanks to the bridges, 65,757 people now living on Tolsan and Chindo Islands have permanent links to mainland Korea and ready access to the opportunities of Korea's rapidly developing economy. Identical engineering solutions for the bridges were used to end the isolation of each island, but the impacts were quite different in each case. The Tolsan bridge opened up a new threshold for the expansion of neighboring Yeosu city, made it possible for the island to become part of that city's larger urban area, and helped an urban community to develop on the island itself. For Chindo, the bridge allowed the island's economy and community to develop in much the same way as those in rural areas of mainland Korea did. Chindo residents *before* the bridge had felt truly isolated. Thus, the bridge's direct impacts succeeded in incorporating both these islands' territories and their indirect impacts led to changes over time in the way they developed. The different ways in which this happened, however, call for a separate treatment of each.

5.8 Bridges were not a sufficient condition for growth to occur. Tolsan's prosperity over the past decade would not have occurred without the rapid growth of the Yeosu urban economy and that of Korea as a whole. Similarly, Chindo's transformation would not have taken place without the rapid industrial development and urbanization that has continued in Korea since the bridge opened ten years ago.

6. Tolsan Island: A New Threshold for Urban Development

A Solution to Yeosu City's Acute Shortage of Urban Land

6.1 Tolsan Island lies just offshore from the port city of Yeosu on the southern coast of SCP, some 110 kilometers to the south-east of Kwangju city. With a current population of some 190,000, Yeosu is the third largest city in the region. It has one of SCP's most dynamic urban economies that benefits from the city's strategic location near to the Kwangyang steel plant, one of the country's most modern, and the Yeochon chemical complex, one of the largest. As an important fishing port, 117,000 tons total catch in 1994, or 3.4 percent of the nation's total, the city's fisheries sector is a key provider of employment to local people. Recognizing the importance of this sector, the Kwangju I project invested US\$8.4 million in the city's fisheries complex to extend harbor quays and piers to allow larger vessels to berth there.

6.2 Yeosu's population was growing rapidly, at about 3.2 percent per annum during the 1970s when the Kwangju II project was being prepared (Kwangju II SAR para. 1.07). To help the city cope with its growing population, the Kwangju II project included components to improve: (i) the city's water supply—US\$4.6 million; (ii) low-income housing—US\$1.0 million; and (iii) the main city commercial road—US\$1.5 million. While these and other investments provided urban services and infrastructure for the people of Yeosu, they did not address the basic problem of land shortage facing the city. The uneven topography of Yeosu's site imposed severe physical constraints upon a city needing to open a new threshold for expansion. This was not only to accommodate its growing population, but also to enhance the quality of the urban environment by avoiding excessive densities and the overcrowding that these imply.

6.3 Tolsan Island, just 400 meters across a maritime strait from the city, was a new threshold for the urban expansion of Yeosu. In spite of its large unoccupied space,²³ Yeosu city could not spill over on to Tolsan Island for the lack of permanent access to the area. When it opened to traffic at the beginning of 1985, the Tolsan Bridge provided the necessary link. Now located right within the urban area of Yeosu, just five minutes by car from the city center, the bridge allowed Tolsan Island to become a part of the urban agglomeration of Yeosu. *After* the bridge, residents of Tolsan had ready access to Yeosu's urban services and to the opportunities of its urban economy. Tolsan began to transform itself into an urban community, with all the advantages, and some of the disadvantages, that this implied. These transformations could not take place *before* the bridge. Despite close physical proximity, the limited capacity of the ferry service prevented effective integration of the island into Yeosu's urban development. A car journey from Tolsan to Yeosu involving a ferry crossing would take 20-30 minutes *before* the bridge. The same trip *after* the bridge would take only 5 minutes. At its peak traffic in 1984, the ferries carried only 1,300 vehicles per day, barely 10 percent of the daily trips made across the Tolsan Bridge today.

Transforming Tolsan's Population into an Urban Community

6.4 Although the Tolsan Bridge is now part of the urban transport network of Yeosu City, the indirect impacts of this bridge upon the population of Tolsan Island itself are more readily discernible. This is because of the different scale of the communities on either side of the bridge. Yeosu's population is more than ten times larger than Tolsan's. Moreover, Yeosu is a complex medium-sized urban center in which the impacts of a single project component like the bridge would be difficult to separate from the

23. Tolsan island—the seventh largest in Korea—has an area of 71.6 square kilometers, 59 percent larger than the built up area of Yeosu City. In 1974, it had a population of 24,015, eight times less than Yeosu's at that time.

many other factors at work within the city's economy and community. Tolsan, on the other hand, had a relatively small community of 21,922 people who suddenly found the opportunities and challenges of Yeosu literally at their doorstep uniquely because of the bridge.

6.5 *After* the bridge, most of Tolsan Island came within a 20-30 minute car commuting radius of Yeosu. Currently the bridge carries some 12,841 vehicles per day, mostly daily commuters. The island's empty spaces, especially where the bridge makes landfall, can develop as over-spill suburban residential areas for the first time. On the island's east coast, attractive beach areas have the potential to become residential neighborhoods for higher income commuters. Of course, by itself, the bridge investment was not a sufficient condition to transform Tolsan into an urban community. Complementary infrastructure investment was also necessary. This included the widening and paving National Highway 17 across the island during 1984-88 and extending water supply services throughout the island by 1985. These complementary investments were not financed through the Kwangju II project although the appraisal document recognized that they would become necessary (Kwangju II SAR para. 7.02 and 7.06).

6.6 Today, some ten years *after* the bridge was opened, Tolsan population indicators reveal some of the indirect impacts of the bridge. Table A1.11 summarizes key population data for Yeochon County, which includes Tolsan Island, *before* and *after* the bridge. Tolsan indicators are compared and contrasted with those of the County's Other Islands²⁴ which remain without bridge connections to the mainland, and whose situation describes what we call a "without-project" scenario.

6.7 *After* the bridge, Tolsan's population continued to fall. MOC had hoped that its island development policy might arrest local population decline, but this was not achieved in the case of Tolsan.²⁵ Out-migration from Tolsan continued at a even higher rate *after* the bridge than *before*. Out-migration from Other Islands not connected by bridges—the *without-project* scenario—was twice as high as Tolsan's during 1984-1994. But, *before* the Tolsan bridge, these Other Islands' rate of out-migration during 1974-1984 was already very high, nearly four times Tolsan's. Thus out-migration from Tolsan accelerated more rapidly than from Other Islands *after* the Tolsan bridge opened. These findings show us that, contrary to arresting population decline, a bridge such as Tolsan's actually stimulates it. Timely complementary investments such as housing infrastructure could have reversed this trend, however (*see para. 6.23*).

6.8 While the total population on Tolsan fell, the number of households actually increased *after* the bridge, reversing a decline that had set in *before* the bridge (Table A1.11). Such a result would be consistent with new, smaller urban families moving onto the island. Average household size on Tolsan did indeed fall from 6.4 persons per household in 1974 *before* the bridge to 4.0 persons per household *after* the bridge in 1994. The shrinkage of household size on the other Islands was even faster, however, from 6.4 to 3.4 persons per household over the same period. A household size of only 3.4 persons is similar to that found in the predominantly rural Chindo island group (Table A1.14), where there is evidence of families debilitated by the out-migration of their younger working members. Since the average Tolsan Island household is significantly larger, with 4.0 members today, we may conclude that urban settlement made possible by the bridge helped stall households' aging and weakening characteristic of rural islands in Korea. By incorporating the territory of Tolsan into Yeosu's functional urban area, the Tolsan bridge helped give a significantly urban look to one aspect of the island's demographics.

24. These islands belong mostly to the Kumogundo group and Kaedo island adjacent to Tolsan. .

25. Continued population loss seems to be a key feature of islands in the South Cholla province still. The SCP island population had fallen from 459,773 in 1979 to 159,411 in 1994. SCP had 318 inhabited islands in 1979, down to 273 in 1994. In 1979, 11.5 percent of the SCP population lived on the islands; in 1994, only 7.0 percent did.

New Patterns of Urban Living on Tolsan Island

6.9 Officially, most of the population of Tolsan is now classified as urban. In 1994, 22.4 percent of the economically active population of Tolsan worked in the industrial and service sectors, economic activities typical of an urban economy. *Before* the bridge, such urban employment was negligible among the Tolsan population. Agriculture, which employed nearly all of Tolsan's economically active population *before* the bridge, now employs 77.5 percent.

6.10 *Access.* Daily commuting by Tolsan residents in urban employment in Yeosu's industries and services became a common pattern *after* the bridge. Most manufacturing and service industry employees who live on Tolsan go to work every day in Yeosu city. *Before* the bridge, the ferryboat service could not support such a commuting pattern efficiently. Today's pattern of journeys to work is typical of any mature urban economy and was made possible through the Tolsan Bridge and its complementary transport infrastructure (Table 6.1).

Table 6.1: Tolsan Island Road and Traffic Indicators, 1974-1993					
INDICATORS	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1993
Road network (length in kms.)	23.7	23.7	54.8	58.3	58.3
Registered vehicles (number)	1	19	68	271	1,674
Traffic flows (vehicles per annum)	-	10,000	476,000	1,498,000	4,687,000

Notes: Traffic data refer to 1974, 79, 84, 90, and 94. 1979 figures are KCDI estimates.
Source: Yeochon Statistical Yearbooks.

6.11 Due to this complementary investment—made to coincide with the opening of the bridge, but not financed through the Kwangju II project—the Tolsan Island road network is now twice as long as it was *before* the bridge. Meantime, the Other Islands in Yeochon County, the *without project* scenario, continue to have no paved roads outside the main villages. The number of registered vehicles also increased dramatically on Tolsan, but much of the growth may be due simply to the transfer of registration procedures from the mainland to the island. Traffic flows on Tolsan island are nevertheless *ten times* higher today than they were *before* the bridge. Although precise data does not exist, traffic flows on the Other Islands continue to be negligible.

6.12 On weekdays, 12,841 vehicles per day now use the Tolsan bridge. Owing to daily commuting trips that it encourages, traffic flows peak during the two to three hour rush in both the morning and evening to some 2,200 vehicles per hour, exceeding the design capacity of the bridge's two-lane roadway of 2,000 vehicles per hour.²⁶ Only ten years after its opening and with a long useful life ahead of it, the

26. For being part of the urban road network of Yeosu, the carrying capacity of the Tolsan bridge is evidently affected by the capacity of related links elsewhere in the network. Our study did not review the efficiency of the Yeosu network as a whole. We assumed that access to the bridge was unimpeded at all times and that there were no bottlenecks in other parts of the network that could lead to traffic congestion to "tail back" on to the bridge itself. Under these assumptions, a 2,000 vehicle per hour capacity flow of mixed mode urban traffic on one lane and in one direction alternating between the morning and then evening commute would be possible. Six hours of peak traffic per day (three in the morning and three in the afternoon) could carry 12,000 vehicles (6 x 2,000), accounting for 93.5 percent of the daily traffic count reported. Of course, this would mean

Tolsan Bridge has itself become a bottleneck. Traffic congestion and tailbacks delay bridge crossings today at peak hours. Some Korean officials wanted a four-lane bridge built at the time of appraisal, but Bank missions were not convinced that the growth in traffic would be as fast as projected. A second bridge was, however, approved by MOC in 1996 and needs to be completed soon to allow commuting to continue to expand and Tolsan's newly formed urban community to consolidate.

6.13 *Urban Services.* Better access *after* the bridge also meant that Tolsan residents could make daily use of Yeosu City's urban services, particularly for health and education, just as easily as people living in Yeosu city itself. Yeosu City authorities reported to the impact evaluation mission, however, that actual use of these services by Tolsan residents did not increase dramatically *after* the bridge. The fact that the Tolsan community now has better services *of its own* on the island itself may explain this apparent lack of growth. *After* the bridge opened, three new schools and 3 new health clinics opened on Tolsan, for instance. With a smaller population, urban service per family living on Tolsan has increased significantly. Meantime, there has been no significant improvement in the provision of these services on the Other Islands that, without bridge connections, remain in a situation of rural isolation. That Tolsan residents *could* readily use Yeosu's services may be very important to them in a psychological sense, even if they do not fully avail themselves of their new opportunities. Thanks to the bridge, people in Tolsan can now reliably use emergency services available in Yeosu twenty four hours per day, should the need arise. Those living on other Coastal Islands without a permanent link to the mainland still have to face a sea crossing which, however short, still poses a major barrier to access to such services, especially at night.

6.14 *Land Prices.* Another important indicator of an urban community in the making is the buoyant demand for urban homes on Tolsan. In real terms, residential land values on Tolsan increased at an annual rate of 10.6 percent during the 1974-94 period, somewhat less than the 11.7 percent annual rate for Yeosu City itself (Table 6.2). There was such a strong demand for the residential land on Tolsan that its price increased more than seven-fold in real terms during 1979-1984, a period of only five years. Unfortunately, data was not available to illustrate comparative trends for the *without project* scenario since the Other Islands in this area had practically no market in urban real estate to speak of during this period. Yeosu city itself still remains the preferred residential location for urban living in this area. The value of land for residential development in the city was nearly three times higher than equivalent land on Tolsan in 1994. This helps to make Tolsan housing less expensive than Yeosu's, so that Tolsan is a place where younger families—including those from Yeosu itself—can more easily acquire their first urban home. Furthermore, with its attractive natural environment of beaches and open space, Tolsan could become one of Yeosu's prime residential areas in the future. These natural assets were always there, but they only became accessible *after* the bridge. The Tolsan Woodoo housing scheme, once the KLDC sewerage impasse is resolved, should give a great boost to residential development. Built next to the Yeochon County office and near the Tolsan Bridge, the development covers 96 hectares. When completed, it will provide 4,602 houses for 18,000 people, practically doubling the island population.

negligible traffic flows outside the peak hours. Visits of the impact evaluation mission to the Tolsan took place at an off-peak time, when there was little traffic using the bridge.

	Constant 1994 won per pyong				
	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1994
TOLSAN ISLAND					
Serviced housing land	19,690	12,227	87,924	116,524	128,000
Serviced commercial land	131,269	61,135	106,888	110,909	149,000
YEOSU CITY					
Serviced housing land	45,944	183,404	149,988	210,586	373,000
Serviced commercial land	328,173	305,674	508,580	477,329	998,000

Notes: CPI to convert from current to constant prices: 1974=19.7; 1979=42.3; 1984=75.0; 1989=92.1; 1994=129.3; 1 pyong = 3.3058 square meters.
Source: Yeochon County Office.

6.15 The value of commercial land on Tolsan, on the other hand, barely rose at all—only 0.6 percent per annum during 1974-1994. Yeosu city's commercial land value, by contrast, grew at a steady 5.7 percent per annum over the same period. The relatively slack demand for this kind of land on Tolsan reflects the still embryonic stage of the urban economy there. An urban community is indeed in the process of formation, but it is still a predominantly suburban residential one at the present stage.

Increased Tourism

6.16 There are many tourist attractions on Tolsan Island, including extensive beaches and a number of historical sites. These places existed *before* the Tolsan bridge was opened, but they were inaccessible to all but a few, more adventurous tourists or sailors. Tourists visiting Tolsan *before* the bridge were so few that statistics were only kept from 1984 onwards (Table 6.3). In that last year prior to the bridge opening, only 84,000 tourists came to Tolsan. Since then, growth has been dramatic, reaching 1.6 million visitors in 1993. Since the bridge, tourism to Tolsan increased ten times faster than in Korea as a whole.²⁷ Most of the visitors to Tolsan make day trips. Despite their short stay, tourists on Tolsan help inject some 2.5 billion won (US\$3.1 million)²⁸ into the island economy each year, according to the Yeochon County Yearbook. The sharp increase in the number of restaurants operating on the Island *after* the bridge, and the lack of new hotels is evidence of the kind of day-trip excursion the tourists make. More than one third of these visitors, 590,000 each year, make a trip to the nationally famous Hangilam site. The Pangjukpo beach area is also popular with visitors.

27. Between 1989 (343.2) and 1996 (449.8), the number of tourists in Korea will grow at an annual rate of 3.9 percent, according to the Korean Transport Institute's Medium and Long Term Plan for Tourism, dated 1995.

28. Throughout this report, we convert 1994 and more recent won to US dollars using an exchange rate of 800:1.

INDICATORS	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1993
	number	number	number	number	number
Tourists	-	-	84,000	1,182,000 (1)	1,585,000 (2)
Hotels/inns in operation	1	1	2	2	2
Restaurants in operation	15	15	33	60	121
Restaurants planned (3)	-	1	1	3	16
Other facilities planned (3)	9	20	4	25	18

Notes: (1) 1990 data; (2) 1994 data; (3) Construction permits awarded.
Source: Yeochon Statistical Yearbooks.

6.17 Private investors, perceiving the potential for further expansion of tourism on Tolsan, have begun to invest in the sector on the island. Of particular note is the Musulmok Resort Development Plan in the south-east of Tolsan, planned to open in the year 2000. To support this development, the Yeochon County government plans to invest 10.2 billion won (US\$12.8 million) in infrastructure (access roads and parking lots) over the next four years. This project, with a total government expenditure of US\$18 million is expected to trigger US\$147 million of private investment—eight times the initial public sector outlay—in the form of the construction of tourism facilities. The Kwangju II project itself made no direct investment in tourism in Tolsan, but none of the tourism development we have discussed would have been feasible without the Tolsan bridge provided through the project, a significant side-effect.

Bridge Impact Upon Activities in Rural Areas

6.18 *Fisheries:* Before the bridge, Tolsan Island was a traditional fishing and farming community. By improving access to markets on the mainland and beyond, the bridge helped the local fisheries industry develop by allowing it to supply distant urban markets more easily. Output increased substantially after the bridge opened. In 1994, 15,908 tons of fish products were shipped out of Tolsan, nearly twice the last before bridge shipment of 8,750 tons in 1984. The 10.9 percent annual growth of Tolsan's catch is considerably higher than the average of 2.7 percent per annum for the country as a whole. In order to further stimulate the local fishery industry, the provincial government is planning to invest 3,900 million won (US\$4.9 million) to build a Comprehensive Fishery Exhibition Center.

6.19 Not only did the bridge make the shipment of perishable products—such as fresh fish—more reliable, it also led to a reduction of transport costs from Tolsan by an average of some 40 percent, according to the Yeochon County authority. New high value products, such as clams, lobsters and crabs now account for 6.9 percent of the volume of fishing products shipped. Some even make their way through Yeosu to Seoul and even to export markets, especially in Japan. At the same time, these products are appreciated by tourists to the island, who can savor them at one of the many new restaurants that have recently opened there.

6.20 *Floriculture:* Within the agricultural sector, the opening of the Tolsan bridge allowed an entirely new agricultural activity to prosper, namely the production of cut flowers. Tolsan's farmers were always

able to ship vegetable products to Yeosu *before* the bridge, using the available ferry service. *After* the bridge, though, they were able to ship higher value perishable products, like cut flowers, more reliably and cheaply. Floriculture thus became firmly established on the island *after* the opening of the Tolsan Bridge (Table 6.4). *Before* the bridge, there were practically no commercial shipments of flowers to the mainland. Activities began to pick up in 1984, in anticipation of the bridge opening. *After* the bridge, output in 1994 had risen to 6.3 million stems, generating annual sales of 2.1 billion won (US\$2.7 million). In the years *before* the bridge, there had been no flower producers on Tolsan. By 1994, 74 establishments were engaged in the business, cultivating an area of 33.6 hectares. From the evidence of this case, we can see how the bridge was able to provide conditions for an entirely new economic activity to develop.

Table 6.4: Tolsan Island Production of Cut Flowers, 1974-1993					
INDICATORS	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1993
Producers (number)	-	-	3	37	74
Cultivated area (hectares)	-	-	1	18	34
Output (thousands of stems)	-	-	151	5,492	6,349
Total income (thousands of constant 1994 won)	-	-	33,527	1,344,102	2,142,957
Notes: CPI series used to convert from current to constant prices: 1984=75.0; 1989=92.1; 1993 = 121.7; 1994=129.3.					
Source: Yeochon County Office.					

Environmental Impacts

6.21 So many changes in Tolsan's economy and the consolidation of an urban life style are bound to affect the island's environment. Evidence of serious island environmental degradation *after* the opening of the Tolsan Bridge is scarce, however. Pressure upon the land from residential development is still relatively small on an island whose population density is still only 238 persons per square kilometer. Even so, reports of environmental violations became much more common *after* the Tolsan Bridge (Table A1.12). *Before* the bridge, there were no such reports at all. From the limited data available, though, we cannot be sure whether increased environmental violations are due to more rigorous enforcement of environmental standards in recent years or whether they are due to a real deterioration of the Tolsan environment.

Impacts Upon Local Government

6.22 *After* the Tolsan Bridge opened in 1985, Yeochon County's administrative capacity strengthened as its responsibilities and workload grew. *Before* the bridge in 1984, the County employed only 35 engineers to supervise urban development projects. Today, the County employs 60. Now, the County is very active in reviewing and approving applications for urban development, a function that was practically non-existent *before* the bridge. In 1993, the County received 183 applications to approve projects for residential and commercial development. In the meantime, local administration on the Other Islands not connected by bridges has remained weak and unchanged over the years. From this

evidence, we may conclude that an important side effect of the Tolsan Bridge was to hasten changes in local government on the island in preparation of the challenge of managing urban development.

Need for Complementary Infrastructure

6.23 Much additional investment, in access roads, utilities and community equipment, was necessary for the bridge impacts to be felt on the island. With its strong ownership of the Kwangju II project, central government made funds readily available to finance infrastructure not formally within the scope of the project itself. Thus, for the most part, the central government and local authorities recognized that the Tolsan Bridge was a necessary condition for island development but not a sufficient one. An important exception was the delayed implementation by KLDC of the sewerage system for the Woodoo residential development on Tolsan island. Although all other infrastructure and utilities were implemented at the site, occupation certificates could still not be awarded to the site owners at Woodoo because of the lack of sewerage to the area. As a result, a major investment project remains tied up at the time of writing without delivering any real services to its potential beneficiaries. The opportunity cost of such an idle investment is considerable, with annual benefits foregone of the order of US\$ 6.9 million.²⁹ A clear lesson of the project experience is that complementary public investment must be provided in a timely fashion if project impacts are to be fully realized.

Economic Rate of Return

6.24 The PCR lower re-estimate of the Tolsan Bridge of 11.5 percent, compared with the appraisal's 29.0 percent, indicated that this was, nevertheless, still a worthwhile investment from an economic point of view (Kwangju II PCR p. 32). This was in spite of the seven-fold increase in the cost of the bridge, resulting from the replacement of the cheaper girder box design by the much more expensive cable stay structure and the higher than expected costs of materials. The PCR treated benefits as consisting of vehicle operating cost savings (about 70 percent of total) and time savings (about 30 percent of the total). The continuing economic feasibility of this investment in adverse cost conditions probably derives from: (i) higher unit value of benefits in line with the trend of rising costs in the Korean economy; (ii) importance of time savings through the improvement to an essential intra-urban link used primarily for commercial and journey-to-work purposes; and (iii) heavier than expected traffic flows leading the Tolsan Bridge to reach design capacity sooner than expected. Thus, traditional cost-benefit analysis on its own regards the Tolsan Bridge as a worthwhile investment, even if the many beneficial side-effects identified by our impact evaluation study were not taken into consideration.

29. A very conservative estimate based upon 4,602 deposits of 10 million won (for 100 square meter units) yielding an annual interest of 12 percent. The estimated value of the deposit is only one quarter of what is required for a similar dwelling in Kwangju city, for instance. At the same time, it must be recognized that the Tolsan bridge's traffic capacity for commuters is saturated and it would not be able to handle the doubling of commuting flows that the full occupation of the Woodoo site would imply (details: para. 6.12).

7. Chindo Island: Incorporating as Part of the Mainland

Chindo: No Longer an Island

7.1 Chindo Island is located at the south-western tip of the Korean peninsula. The nearest important city is Mokpo (231,519 population in 1994), now some 90 kilometers by road. Kwangju City (1,273,854 population in 1994) is 132 kilometers away. Dependence upon coastal shipping *before* the bridge made Chindo look to Mokpo as the principal external focus of its economy. *After* the bridge, with the road journey taking less than two-and-a half hours, Kwangju took on this role.

7.2 With an area of 427 square kilometers, Chindo is Korea's third largest island. At the time of the Kwangju II project appraisal, it was the largest coastal island in Korea still without a bridge connection to the mainland.³⁰ Being rich in natural resources and with fertile agricultural land covering 29.7 percent of its area, Chindo was easily self-sufficient in local agricultural produce. Only a narrow sea channel separates Chindo from the mainland, but strong maritime currents along that channel made ferry crossings dangerous under certain tide conditions, fostering the sense of isolation of the island community.³¹ This led many Chindo islanders to seek opportunities on the mainland. Out-migration, of younger people in particular, ensured the steady decline of the island population since its peak of 110,351 inhabitants in 1968-69.

7.3 *Before* the bridge, Chindo's isolation gave the island economy a different structure from that found in rural areas on the mainland. Whereas mainland rural areas in Korea began to supply rapidly growing urban markets with cash crops, vegetables and fruits in the 1960s and 1970s, inaccessibility cut Chindo off from these markets. *Before* the bridge, therefore, little agricultural produce was sent off the island and similarly, few processed goods were imported from the mainland. The Chindo bridge changed all that and in 1985 provided a permanent link between the island and the mainland for the first time, effectively ending Chindo's isolation. *After* Chindo's bridge access to Korea's main urban centers, the island's economy and community took on similar characteristics to those rural areas on the mainland that were equally distant from main urban markets. Chindo's farm and fishery products, for instance, gained access to these rapidly expanding markets on the same terms as those produced on the mainland. Shipping times from Chindo to main urban centers such as Kwangju and Mokpo were halved. Costs were reduced. In addition, regular bus services, for example, now ply between Chindo and Kwangju City three times an hour every day of the week, just as they do between cities and towns on the mainland. *Before* the bridge, even a simple public transport service such as this was not possible.

Restructuring Chindo's Rural Economy

7.4 In allowing trade in agricultural products to take place between Chindo island and the mainland on a large scale for the first time, an important side effect of the bridge was to encourage a shift of island agricultural production in favor of higher value cash crops for sale to urban markets. Labor intensive subsistence farming almost vanished. As a result, a smaller share of the population was engaged in agriculture *after* the bridge. Even so, output increased significantly. Cash cropping was much more productive and mechanized, as can be seen from the sharp increase of agricultural machinery on Chindo *after* the bridge (Table A1.13).

30. Large islands off Korea's southern coast that already had bridge connections were Koje and Namhae. A bridge connection to Korea's largest island. Cheju is not feasible, however. Cheju lies some 70 kilometers off the southern tip of the peninsula.

31. It was in this sea channel that Korean admiral Soon Shin Lee inflicted a celebrated defeat upon Japanese naval forces at the Battle of U1 Tol Mok in 1597.

7.5 *Before* the bridge in 1974, only 14.8 percent of Chindo's farm output was cash crops, fruit and vegetables, for shipment to the mainland. At the same time, 85.2 percent of agricultural output was made up of traditional crops, such as rice and barley, mostly for consumption on the island itself. By 1994, ten years *after* the bridge opened, the proportions of cash and traditional crops in the total were inverted: 60.3 percent cash crops and 39.7 percent for local consumption. The growing demand from the mainland was not for Chindo's traditional crops, such as rice and barley. It was for peppers, garlic, onions, Chinese lemons and fruits of the Chinese matrimony vine, all of them products that Chindo could supply on a large scale. Another factor that encouraged the shift into cash crops was export. Chindo's declining population (Table A1.14) meant that the island's own market for food products was itself shrinking. There were simply fewer people to feed.

7.6 Total agricultural output on Chindo almost doubled between 1974 and 1994, from 50,325 tons to 99,828 tons (Table A1.13). During that period the total cultivated area barely increased at all and the number of people engaged in agriculture fell significantly, both trends indicating productivity gains. The changes were most rapid from 1984 onwards, *after* the bridge was opened. We may conclude therefore, that an important side-effect of the bridge was to accelerate the modernization and restructuring of agriculture on the island.

Impact Upon Islanders' Standard of Living

7.7 Expanding more productive agriculture, the mainstay of the Chindo economy should translate into higher absolute levels of income per capita for the population that remains on the island. Since 1980, when data first became available, the gross regional product (GRP) of Chindo has grown very little in real terms, however (Table 7.1). There was a rise of GRP per capita *after* the bridge opened, but this increase was largely due to the decline of Chindo's population. Chindo's increase in GRP per capita was also much slower than for Korea as a whole over the same period, meaning that, in relative terms, incomes have declined on Chindo. *Before* the bridge in 1980, Chindo's GRP per capita was 48.6 percent of the national average. By 1992, *after* the bridge, it was only 32.8 percent of the national average. Chindo's income per head had risen with the bridge but not as fast as in the country as a whole. The bridge brought only modest prosperity to Chindo, not as much as developed on the increasingly urbanized mainland. As it intended, therefore, the Kwangju II project did succeed in increasing the income earning opportunities of the islanders but did not prevent income disparities with the mainland from widening even further. The urban/industrial economy of the mainland was simply moving ahead too fast for that to happen.

CHINDO ISLAND	Before Chindo Bridge			After Chindo Bridge	
	1974	1980	1984	1991	1992
Population (number)	104,031	83,423	75,389	56,975	52,890
GRP (millions of won)	n.a.	96,062	119,732	115,677	106,249
GRP per capita (thousands of won)	n.a.	1,152	1,588	2,030	2,009
KOREA	1974	1980	1984	1991	1992
Population (thousands)	34,692	38,124	40,513	43,268	43,663
GDP (billions of won)	50,335	90,251	125,238	255,210	267,723
GDP per capita (thousands of won)	1,451	2,367	3,091	5,898	6,132

Notes: CPI series used to convert from current to constant prices: 1974=19.7; 1980=54.5; 1984=75.0; 1991=109.3; 1992 = 116.1; 1994=129.3.
Sources: Korea Statistical Yearbook, National Statistical Office.
Chindo Comprehensive Plan, 1994-2002, Chindo County Office, 1994.

7.8 An additional factor that helped improve the standard of living of island residents *after* the bridge is the generally lower level of consumer prices, according to Chindo County officials. Detailed historical data for Chindo price levels is not available, but it is reasonable to expect that, *after* the bridge, prices would approach those of the mainland, following integration of mainland and island wholesale and retail markets and the reduction of transport costs. As well as allowing Chindo's produce to be exported more reliably and cheaply, the bridge permitted industrialized goods from the mainland and further afield to be imported to the island more efficiently. The impact evaluation mission's inquiries confirmed that the prices of many consumer goods in Chindo were similar to those prevailing in nearby urban markets on the mainland. Chindo County officials reported that island prices had been higher than those on the mainland *before* the bridge.

7.9 The impact of the Chindo Bridge upon land prices is worthy of attention in view of the dramatic changes that occurred on the island. Serviced residential land on Chindo in 1994 was worth, in real terms, one hundred times its value in 1974. The value of commercial land increased even more rapidly, multiplying more than two hundred times between 1974 and 1994 (Table 7.2). Although actual price levels in Chindo are still much below land values in cities throughout the region, the bridge did bring Chindo territory within the scope of the modern real estate market in Korea. By contrast, the very modest price increases of real estate on the Other Islands in the Chindo area highlights the sluggishness of still isolated markets in inaccessible places. In 1974 *before* the bridge, Chindo residential land was worth two-and-a-half times similar land on the Other Islands. By 1994 *after* the bridge, Chindo land was worth fifteen times as much. With more buoyant agriculture on the island, the demand for rural land on Chindo led to an increase in agricultural land prices, which are now at a similar level to those found in rural areas throughout mainland Korea. Without bridge access, the price of island farming land grows only very slowly, as the data for the other Islands in the Chindo area show (Table 7.2).

Table 7.2: Chindo Island and Other Islands: Average Urban and Rural Land Prices, 1974-1994					
	Constant 1994 won per pyong				
With-project Scenario	Before Chindo Bridge			After Chindo Bridge	
	1974	1979	1984	1989	1994
CHINDO ISLAND					
Serviced housing land	177	86	11,316	-	181,500
Serviced commercial land	249	134	40,209	-	547,525
Agricultural land	72	37	116	-	34,485
Without-project Scenario	Before Chindo Bridge			After Chindo Bridge	
	1974	1979	1984	1989	1994
OTHER ISLANDS (1) (without bridges)					
Serviced housing land	66	34	222	-	1,189
Serviced commercial land	85	40	222	-	1,225
Agricultural land	53	24	55	-	750
Notes: (1) Shin Nan County covering a neighboring island group. CPI series used to convert from current to constant prices: 1974=19.7; 1979=42.3; 1984=75.0; 1989=92.1; 1994=129.3. 1 pyong = 3.3058 square meters. Source: Yeochon County Office.					

Modest Urban Development Impacts

7.10 Chindo is still predominantly a rural economy, and the bridge stimulated only modest urban development. The County capital, Chindo Town, administered as a district ('myon') council under Korea's local government arrangements, has nevertheless become a key service center for the island economy. Although its population has fallen, Chindo Town remains the largest urban center on the island, with a population of 12,159 in 1994 (Table A1.14). The rate of decline of the town's population has been much less than that of the population of the island as a whole. *Before* the bridge in 1974, it was where 15.7 percent of the island residents lived. *After* the bridge in 1994, Chindo Town accounted for 24.0 percent of the total island population. Chindo Town today provides important communications and financial services for an island economy firmly integrated into mainland markets. It is also the principal service center for the population as a whole. In 1994, Chindo had eleven hospitals and clinics, more than twice the number it had in 1974 when the island population was twice as large.

Accelerated Out-Migration

7.11 By ending the isolation of Chindo and helping to incorporate the island economy into that of the mainland, the bridge had a major indirect impact upon the people living there. Contrary to stalling the departure of residents from Chindo, the bridge seems to have helped accelerate out-migration modestly. Island residents continued to search for even better economic opportunities on the mainland (Table A1.14). In the decade *after* the bridge was completed (1984-94), Chindo's population fell at an annual rate of 0.9 percent. During the decade *before* the bridge (1974-84) the rate of decline was slower, 0.5 percent per annum. Chindo had 50,659 inhabitants in 1994, barely half the 1979 population of 92,168 when the Kwangju II project was appraised. On the other hand, declining population is a characteristic of rural Korea in general.³² Despite its acceleration immediately *after* the bridge, the decline of the

Chindo population has been slower than the rural average for Korea and for the Other Islands still unconnected by bridges.

7.12 Since younger breadwinners are the ones most likely to migrate, they leave behind them smaller households and an aging population. In 1974, the average Chindo household had 5.8 members; the equivalent figure for 1994 is only 3.3 persons. Chindo's household shrinkage occurred more rapidly than it did in rural Korea as a whole (5.7 persons in 1974; 3.4 persons in 1993), but the present household size on Chindo is now close to the national average for rural areas. At 14.7 percent of the total in 1993, the share of people over 60 years old in the population in Chindo is nearly twice as large as in Korea as a whole, which was only 7.7 percent in 1990. One Chindo resident told the impact evaluation mission that "a 50 year old is considered to be a young man here". A businessman running a small construction firm reported that it was difficult to keep younger workers who were "always attracted to the bright city lights" on the mainland. An indirect indicator of the aging of Chindo's population has been the drop in the number of primary schools from 41 in 1974 to only 27 in 1994. Examples of trends such as these from Chindo may be found in many rural areas on the Korean peninsula.

Impact on Tourism

7.13 Tourism to Chindo benefited enormously with the advent of the bridge. Chindo island has many tourist attractions, the most important of which is the tidal phenomenon known in Korea as the "miracle of Moses". At certain times of the year, strong neap tides expose a causeway, allowing visitors to walk two kilometers "through the sea" from Chindo to a small adjacent island. On peak days, traffic jams of visitors to this phenomenon tail back 2 kilometers from the site, where the county authorities have built an enormous car park, with unfortunately adverse environmental impacts through the sheer volume of visitors that it allows. In 1994, 1.5 million visitors came to Chindo, an annual increase of 4.6 percent since the bridge opened (Table 7.3).

INDICATORS	Before Chindo Bridge			After Chindo Bridge	
	1974	1979	1984	1989	1994
	number	number	number	number	number
Tourists	-	39,000 (1)	942,650	890,312 (2)	1,476,471 (3)
Hotels/inns in operation	7	9	19	29	29
Tea houses in operation	14	7	42	59	58
Bars in operation	-	-	2	16	17
Restaurants/eateries authorized	306	248	222	246	442

Notes: (1) data for 1982; (2) data for 1990; (3) data for 1993.
Sources: Chindo County June 1995 Mission Briefing Note.

32. In 1974, Korea had a rural population of 13,459,000 (2,381,000 households). In 1993, it was only 5,407,000 (1,592,000 households). During 1972-76, agriculture, forestry and fishing accounted for 24.7 percent of GDP. During 1987-91, this sector accounted for only 9.4 percent.

7.14 Facilities for tourists have increased substantially (Table 7.3). Before the bridge in 1974, Chindo had only 7 hotels/inns and 14 tea-houses. In 1994, ten years after the bridge opening, there were 29 and 58 respectively. A better road system *after* the bridge opening helped tourism considerably. *Before* the bridge in 1974, only 3.4 kilometers of the island's 168 kilometer road network was paved. By 1994, 55 kilometers out of a 199.8 kilometer network were. Current tourism projects under way include two national resorts, at Hae-Dong and Nokjin, covering a total area of 195 hectares (590,000 pyongs). Altogether, it is expected that these will involve public investments to the value of US\$ 2.6 million on top of the US\$2.2 million already invested so far. The bridge and its complementary infrastructure made it possible to exploit Chindo's natural beauty for the purposes of tourism on a large scale.

Environmental and Social Vulnerability

7.15 As a result of the large influx of tourists to Chindo made possible by the bridge, the natural environment of some coastal areas has suffered from heavy vehicular traffic especially. Although air pollution from vehicle emissions has not proved yet to be a serious problem, irregular parking of private vehicles has damaged the natural vegetation cover and accelerated the erosion of the sea-front and beach areas in many places. *After* the bridge, there have been a number of reported violations of air and water pollution norms. *Before* the bridge, there were none at all (Table A1.15). With respect to the environment, the bridge ended Chindo's isolation, bringing the island face to face with kind of challenge confronted by rural areas that have a tourism vocation throughout mainland Korea.

7.16 County officials also report higher crime rates on Chindo since the opening of the bridge. Clearly, many unoccupied houses still containing household possessions are attractive and easy prey for burglars. Also, alcoholism may be a factor in crime on an island that now has 17 bars, when before the bridge it had at most only two. From the data available, crime rates on Chindo were higher *after* the bridge than *before* (Table A1.15). At the same time, it should be acknowledged that crime is only a minor problem on Chindo compared with that of mainland cities. Traffic accidents increased together with traffic flows, but again at much lower levels than on the mainland.

Impacts Upon Local Government

7.17 Despite the dramatic impacts of the bridge on Chindo Island, and the growing revenues of the Chindo County authority, the formal administrative organization of local government on the island has remained unchanged for more than two decades. Responsibilities and workloads nevertheless increased *after* the bridge. *Before* the bridge and shortly after its completion, the Chindo County authority was only an observer, albeit an astute one, of events unfolding on the island. Major public investments on Chindo *after* the bridge, such as the paving of the national highway across the island, were made by the national government. Recently, the County Government has developed a more forward looking planning function through the preparation of the 1994-2002 Chindo Comprehensive Plan. In hindsight, a more active stance by local authorities could have been achieved earlier if an operation like the Kwangju II project had provided greater technical assistance support for local government. This would have helped them anticipate unintended side-effects and formulate and implement plans to curtail unsatisfactory impacts and ensure that the satisfactory ones are sustained.

Is Chindo Better or Worse-Off?

7.18 Having identified the many impacts of the bridge upon the island economy and community, an important question that remains unanswered is whether the Chindo people are better off—in a broad sense—today than they were without the bridge. We can begin to answer this question if two issues are

initially clarified. First of all, we must recognize that, in addition to affecting those people who still live on Chindo today, the bridge's impacts also affected the lives of a large number of former residents who are now living somewhere else in Korea. In assessing the overall impact of the bridge, we should ideally want to learn how well off *both* groups are. Today's residents, in terms of income, are somewhat better off than they were *before* the bridge, although their incomes have increased more slowly than for Koreans as a whole over the 1974-1994 period. As for former residents of Chindo now departed from the island, we unfortunately do not have any data on their present economic and social status on the mainland.

7.19 Secondly, we have to make a judgment upon the quality of rural life in modern Korea today. For those who believe the quality of rural life has improved, the impact of the bridge would thus have made Chindo people better off, since the islanders now live and work in similar ways to those living in other rural parts of Korea. There can be no doubt that the impact of the bridge has severely disrupted the traditional way of life of Chindo Island, though. Many Chindo people have gone away, houses are left empty and a huge influx of tourists places parts of the island under severe environmental and social stress. On the other hand, as incomes on the island are higher than *before* the bridge, the remaining population has more opportunities to earn a decent living today and enjoys greater access to goods and services in today's urban centered economic development of Korea. The bridge allowed these developments to take place and bring Chindo into the mainstream of modern rural development, even though improvements on the island still come more slowly than in urban areas on the mainland. On balance, we conclude that the islanders are better off thanks to the territorial incorporation made possible by the bridge.

Economic Rate of Return

7.20 According to the PCR re-estimate of the ERR of the Chindo Bridge of 18.3 percent, compared with the appraisal's 16.0 percent, this was a worthwhile investment from an economic point of view (Kwangju II PCR p. 32). That the PCR found a higher ERR than at appraisal, in spite of cost overruns of 263 percent due to increased materials costs, is surprising. For the PCR estimate, benefits consisted of vehicle operating costs savings (about 8 percent of total) and time savings (about 92 percent of the total). As in the case of the Tolsan Bridge, benefits were valued more highly in the PCR estimate in line with generally rising cost levels in Korea. Traffic flows on Chindo are, however, less than half Tolsan's. Since the majority of Chindo's traffic is for tourism purposes only, the time saved by these visitors to the island has little economic value for two reasons: (i) tourists would not have visited Chindo without the bridge, preferring to visit more accessible areas on the mainland and, therefore, do not save any time in a meaningful sense; and (ii) whatever time loss there may be has little opportunity cost. If time savings were removed from the benefit equation, the ERR for the Chindo Bridge falls to only 0.03 percent as the present value of the benefits barely exceeds the present value of the costs.³³ Clearly, a traditional cost-benefit analysis would not recommend the Chindo Bridge as a worthwhile investment without heavily factoring in supposed time savings. A positive assessment of the many side-effects that our study has identified would nevertheless support investment in the Chindo Bridge. There can also be no doubt that the bridge fully and immediately achieved its intended direct impact of physically incorporating new territory.

33. By contrast, the ERR of the Tolsan Bridge would fall to only 8.3 percent if time saving benefits were excluded from the benefit stream on that case.

8. Lessons from Integrating Island Economics

8.1 *Territorial Incorporation Itself is Immediate.* By permanently linking these islands to the mainland, both bridges succeeded in incorporating new territory on which the urban and industrial-based process of economic development in Korea could eventually be played out. Physical isolation immediately ceased, especially on Chindo, where people suddenly found themselves within the mainstream of Korean development for the first time. The experience of implementing these bridges and the awareness of their impacts gave governments at all levels increasing confidence to incorporate more territory through bridge construction among the many coastal islands still isolated from the mainland and from each other.

8.2 *Impacts in Urban and Rural Areas are Different.* Tolsan Island was very close to the important urban area of Yeosu city. Chindo was remote from urban centers. The impacts of the bridges were quite distinct in each case. Contiguous with the Yeosu City urban area *after* the bridge was built, Tolsan Island became part of it. The Chindo Bridge's main impact was to allow the transformation of a rural subsistence economy into an export-based agriculture producing cash crops for urban markets on the mainland. *After* the Chindo bridge, the island economy became much like the local economies of mainland rural areas in Korea.

8.3 *Profound Structural Change can be an Important Side-Effect.* *After* the bridges the isolation of the residents of the islands ended. In an economic and social sense, they ceased to be "islanders". Psychologically, the horizons of both the Tolsan and Chindo communities were broadened. Chindo islanders especially broke with the stigma of feeling cut off from the mainstream of contemporary Korean society and modern economic development. While many residents left the islands altogether to seek better economic opportunities on the mainland, those who remained could enjoy a somewhat higher standard of living through new economic opportunities on the islands themselves. For Tolsan islanders, this involved daily commuting to Yeosu that the bridge made possible up to the point that its capacity became saturated. In the case of Chindo, it involved working in a modernized agricultural sector or in the rapidly growing tourism business on the island. The structural changes in the respective island economies also brought some social disruption and pose environmental challenges to them. These negative impacts are but one more indicator, albeit an undesirable one, of the incorporation of the islands into the mainstream of Korea's rapid economic development.

8.4 *Anticipating Opportunities for the Private Sector.* Private sector agents seized new economic opportunities that the bridge impacts provided. In Tolsan, major private investment is under way in real estate development of urban housing *after* the bridge. Significant private sector ventures are also being launched in the tourism sector of both islands. Farmers on both Tolsan and Chindo have made significant investments in machinery to increase output. For territorial incorporation to succeed in helping economic development, it is essential that opportunities for profitable private sector investment be unleashed. Reviewing the likelihood of such opportunities arising should be part of the planning and appraisal exercise of such projects. This exercise would be one of trying to identify *ex ante* some of the possible indirect impacts, which most development projects tend to omit.

8.5 *Forward Looking Plans with Complementary Infrastructure.* New prospects can induce speed of change that exceeds the public sector's ability to respond. The bridges fulfill a necessary but not sufficient condition for the beneficial impacts discussed in this report to occur. It is essential for complementary infrastructure investment to be made in access roads and utilities, for instance. From the evidence gathered by our study, the indirect impacts of the bridges were many and varied. While the actual form that these impacts take cannot always be foreseen accurately, scenarios should be drawn at

least of their likely thrust and general direction. The experience of these two bridges shows that forward looking impact plans should be part of design of projects aimed at territorial integration. As a minimum, these plans should indicate: (i) necessary complementary investment project by the public sector; and (ii) identification of opportunities for private sector investment. The lack of a plan for the "day after" from the Kwangju II project may have prevented some of the projects' positive indirect impacts from being fully realized, particularly in the case of the residential development in Tolsan noted above (*para.* 6.23). Technical assistance to prepare and monitor a forward looking impact plan ought to be a standard feature of projects of this kind in the future.

References

- Amsden, Alice H. 1989. Asia's Next Giant: South Korea and Late Industrialization. Oxford University Press.
- Anas, Alex; Kyu Sik Lee and Michael Murray. 1996. Infrastructure Bottlenecks, Private Provision, and Industrial Productivity: A Study of Indonesian and Thai Cities. Policy Research Working Paper No. 1603. The World Bank, Washington, D.C.
- Aoki, Masahiko; Kevin Murdock, and Masahiro Okuno-Fujiwara. 1995. "Beyond the East Asian Miracle: Introducing the Market Enhancing View." Center for Economic Policy Research Publication No.442, Stanford University.
- Baumol, William J. 1952. Welfare Economics and the Theory of the State. Harvard University Press.
- Baumol, William J. 1986. "Productivity Growth, Convergence, and Welfare: What the Long Run Data Show." The American Economic Review. 76:1072-1085.
- Baumol, William J. 1990. "Entrepreneurship: Productive, Unproductive and Destructive." Journal of Political Economy. 98:893-921.
- Baumol, William J. and Kyu Sik Lee. 1991. "Contestable Markets, Trade and Development." The World Bank Research Observer. 6:1-17.
- Cho, Soon. 1994. The Dynamics of Korean Economic Development. Institute for International Economics, Washington, D.C.
- Choe, Sang-Chuel and Byung-Nak Song. 1984. "An Evaluation of Industrial Location Policies for Urban Deconcentration in Seoul Region." Journal of Environmental Studies. 14:73-116.
- Coase, Ronald. 1960. "The Problem of Social Cost." Journal of Law and Economics. 3:1-44.
- Hirschman, Albert O. 1958. The Strategy of Economic Development. Yale University Press.
- Hirschman, Albert O. 1995. Development Projects Observed. The Brookings Institution, Washington, D.C.
- Kim, Kihwan and Danny M. Leipziger. 1993. Korea: A Case of Government-Led Development (The Lessons of East Asia). The World Bank, Washington, D.C.
- Korea Institute for Economics and Technology. 1995. Metropolitan Development Plan: Industrial Infrastructure and Promotion. (Interim Report in Korean) Seoul.
- Lee, Gun Young and Yong Woong Kim. 1995. Globalization and Regional Development in Southeast Asia and Pacific Rim. Korea Research Institute for Human Settlements.
- Lee, Kyu Sik. 1985a. "Decentralization Trends of Employment Location and Spatial Policies in LDC Cities." Urban Studies. 22:151-162.

- Lee, Kyu Sik. 1985b. An Evaluation of Decentralization Policies in Light of Changing Location Patterns of Employment in the Seoul Regions. Report No. UDD-60, Water Supply and Urban Development Department, The World Bank, Washington, D.C.
- Lee, Kyu Sik. 1989. The Location of Jobs in a Developing Metropolis: Patterns of Growth in Bogota and Cali, Colombia. Oxford University Press.
- Lee, Kyu Sik. 1992. "Spatial Policy and Infrastructure Constraints on Industrial Growth in Thailand." Review of Urban and Regional Development Studies. 4:17-31.
- Lee, Kyu Sik and Alex Anas. 1992. "Costs of Deficient Infrastructure: The Case of Nigerian Manufacturing." Urban Studies. 29:1071-1092.
- Lee, Kyu Sik; Alex Anas and Gi-Taik Oh. 1996. Costs of Infrastructure Deficiencies in Manufacturing in Indonesia, Nigeria, and Thailand. Policy Research Working Paper 1604, The World Bank, Washington, D.C.
- Lee, Kyu Sik and Sang-Chuel Choe. 1990. "Changing Location Patterns of Industries and Urban Decentralization Policies in Korea," in Jene K. Kwon, ed. Korean Economic Development. Greenwood Press, New York.
- Monnet, Jean. 1978. Memoirs. Doubleday (translated into English by Richard Mayne).
- Murray, Michael. 1988. Subsidizing Industrial Location: A Conceptual Framework with Application to Korea. Johns Hopkins University Press.
- North, Douglass C. 1990. Institutions, Institutional Change, and Economic Performance. Cambridge University Press.
- North, Douglass C. 1994. "Economic Performance Through Time," The American Economic Review. 84:359-368.
- North, Douglass C. and Robert P. Thomas. 1973. The Rise of the Western World. Cambridge University Press.
- Picciotto, Robert and Rachel Weaving. 1994. "New Project Cycle for the World Bank?" Finance and Development. The World Bank, Washington, D.C.
- SaKong, Il. 1993. Korea in the World Economy. Kim Yong Sa, Seoul, Korea.
- Song, Byung-Nak. 1990. The Rise of the Korean Economy. Oxford University Press.
- Stiglitz, Joseph E. 1996. "Some Lessons from the East Asian Miracle." The World Bank Research Observer. 11:151-177.
- United States General Accounting Office. 1990. Case Study Evaluations. Program Evaluation and Methodology Division (Transfer Paper 10.1.9).
- United States General Accounting Office. 1991. Designing Evaluations. Program Evaluation and Methodology Division (GAO/PEMD-10.1.4).

- United States General Accounting Office. 1992. The Evaluation Synthesis. Program evaluation and Methodology Division (GAO/PEMD-10.1.2)
- Wade, Robert. 1993. "The Governance of Infrastructure: Organizational Issues in the Operation and Maintenance of Irrigation Canals." Background paper for 1994 World Development Report, The World Bank.
- Williamson, Oliver E. 1995. "Transaction Cost Economics and Organization Theory." in O.E. Williamson ed., Organization Theory. Oxford University Press.
- World Bank. 1993. The East Asian Miracle: Economic Growth and Public Policy. World Bank Policy Research Report, Oxford University Press.
- World Bank. 1994. Twenty Years of Lending for Urban Development Operations. Report No. 13117. Operations Evaluation Department, Washington, D.C.
- Yin, R.K., and K.A. Heald. 1975. "Using the Case Survey Method to Analyze Policy Studies." Administrative Science Quarterly. 20:371-381.

Annex 1. Statistical Tables

Table A1.1: Sectoral Composition of Employment, 1975 and 1990

Region	1975			1990		
	Agriculture and Fishery	Manufacturing	Services	Agriculture and Fishery	Manufacturing	Services
Korea	48.9	18.2	32.9	20.8	27.8	51.4
Seoul	2.0	34.4	63.6	0.5	30.0	69.5
Pusan	3.1	41.2	55.7	2.6	40.1	57.3
Taeku	-	-	-	2.2	37.7	60.1
Inchon	-	-	-	2.1	45.3	52.6
Kwangju	-	-	-	8.3	20.9	70.8
Taechon	-	-	-	3.8	24.6	71.6
Kyonggi	44.8	22.5	32.7	13.9	38.2	47.9
Kangwon	61.1	12.1	26.7	32.6	15.7	51.7
Chungbug	72.0	7.5	20.5	39.7	18.1	42.2
Chungnam	68.7	10.4	20.9	55.0	12.3	32.7
N. Cholla	70.6	8.2	21.2	48.8	12.7	38.5
S. Cholla	73.1	6.2	20.7	60.9	9.7	29.4
N. Kyongsang	55.3	17.0	27.7	46.7	19.9	33.4
S. Kyongsang	65.9	13.5	20.6	29.7	31.5	38.8
Cheju	68.1	4.5	27.4	41.7	3.7	54.6

Source: Population Census, 1975, 1990, National Statistical Office.

Table A1.2: Population Changes in Project Regions and Other Comparator Regions, 1975-1990

Region	1975		1980		1985		1990		Annual Growth Rate			
	1,000 persons	%	1,000 persons	%	1,000 persons	%	1,000 persons	%	1975-1980	1980-1985	1985-1990	1975-1990 (1)
Korea	34,679	100.0	37,449	100.0	40,448	100.0	43,411	100.0	1.55	1.55	1.42	1.51
Seoul	6,542	18.9	8,367	22.3	9,639	23.8	10,613	24.4	5.04	2.87	1.94	3.28
S. Cholla	3,983	11.5	3,779	10.1	3,748	9.3	2,507	5.8	-1.05	-0.16	-7.73	-3.04
Kwangju	589	1.7	728	1.9	906	2.2	1,139	2.6	4.33	4.47	4.68	4.49
Mokpo	195	0.6	222	0.6	236	0.6	243	0.6	2.63	1.23	0.59	1.48
Yeosu	128	0.4	161	0.4	172	0.4	173	0.4	4.69	1.33	0.12	2.03
Yeochon	-	-	102	0.3	87	0.2	64	0.1	n.a.	-3.13	-5.96	-4.55
Chindo	-	-	83	0.2	73	0.2	55	0.1	n.a.	-2.53	-5.51	-4.03
N. Cholla	2,455	7.1	2,288	6.1	2,202	5.4	2,070	4.8	-1.40	-0.76	-1.23	-1.13
Chonju	303	0.9	337	0.9	426	1.1	517	1.2	2.15	4.80	3.95	3.63
Iri	112	0.3	145	0.4	192	0.5	203	0.5	5.30	5.78	1.12	4.04
Iksan	-	-	156	0.4	128	0.3	106	0.2	n.a.	-3.88	-3.70	-3.79
Kyonggi	4,035	11.6	4,930	13.2	4,793	11.8	6,154	14.2	4.09	-0.56	5.13	2.85
N. Kyongsang	4,856	14.0	3,379	9.0	3,010	7.4	2,860	6.6	-7.00	-2.29	-1.02	-3.47
Taeku	1,266	3.7	1,573	4.2	2,028	5.0	2,228	5.1	4.44	5.21	1.90	3.84
S. Kyongsang	3,279	9.5	3,321	8.9	3,515	8.7	3,672	8.5	0.25	1.14	0.88	0.76
Pusan	2,306	6.6	3,157	8.4	3,512	8.7	3,796	8.7	6.48	2.15	1.57	3.38

(1) For Yeochon, Chindo, and Iksan, the annual growth rate is for 1980-1990.

Source: Korea Statistical Yearbook 1980-1992, National Statistical Office.

Table A1.3: Land for Industrial Use, 1978-1991

Region	1978	1986	1991
Korea	100.0	100.0	100.0
Seoul	9.5	5.2	4.2
Pusan	6.8	4.5	4.1
Kyonggi	28.4	27.0	25.5
Kangwon	2.3	2.3	2.4
Chungbug	3.6	2.8	3.0
Chungnam	4.9	4.7	5.0
N. Cholla	3.3	3.4	4.9
S. Cholla	5.5	7.0	9.9
N. Kyongsang	17.4	19.1	18.1
S. Kyongsang	18.1	23.6	22.6
Cheju	0.3	0.3	0.2

Source: Mining and Manufacturing Survey 1978-1991. National Statistical Office.

Table A1.4: Manufacturing Production and Exports in Kwangju, 1990-1994

Industrial Estate	Production (billion won)					Exports (million US dollars)				
	1990	1991	1992	1993	1994	1990	1991	1992	1993	1994
Hanam I	891.3	837.8	882.4	1,317.4	1,276.1	508.3	499.1	438.7	654.9	879.7
Hanam II	132.8	135.1	203.6	392.3	362.9	22.2	7.2	18.8	31.1	17.3
Hanam. III	-	-	-	567.7	663.4	-	-	-	7.4	2.7
Sub-total	1,024.1	972.9	1,086.0	2,277.4	2,302.4	530.5	506.3	457.5	693.4	899.7
Bonchon	221.9	323.2	316.9	603.4	773.8	37.0	29.7	29.8	50.8	44.7
Songnam	58.3	85.9	130.0	200.0	199.6	5.4	2.8	-	-	-
Sochon IE	24.5	31.6	21.5	60.0	76.2	2.5	2.0	3.2	60.0	8.9
Sochon AIE	46.5	54.9	54.6	150.0	167.9	2.9	2.5	4.7	10.0	10.1
Sub-total	351.2	495.6	523.0	1,013.4	1,217.5	47.8	37.0	37.7	120.8	63.7
Outside of IE	1,629.6	2,173.3	2,506.0	1,250.2	1,756.7	356.6	548.5	657.5	529.0	519.1
Total	3,004.9	3,641.8	4,115.0	4,541.0	5,276.6	934.9	1,091.8	1,152.7	1,343.2	1,482.5

Source: Kwangju Industrial Estate Status, 1991-1995.

Table A1.5: Sample Establishments by Location and Employment Size (percent)									
Industrial Estate	Number of Employees								Total
	5-19	20-49	50-99	100-199	200-499	500-999	1000-2999	3000 or more	
Hanam I	4.4	17.4	13.0	30.4	13.0	8.7	13.0	0.0	100.0
Hanam II & III	19.1	14.3	28.6	23.8	9.5	4.8	0.0	0.0	100.0
Outside	5.6	16.7	22.2	22.2	22.2	2.8	5.6	2.8	100.0
Total	8.8	16.3	21.3	25.0	16.3	5.0	6.3	1.3	100.0
Number of Establishments	7	13	17	20	13	4	5	1	80
Source: Impact Evaluation Establishment Survey, 1995.									

Table A1.6: Sample Establishments by Location and Type

Industrial Estate		Newly Established	Moved from S. Cholla	Moved from Other Regions	Total
Hanam I	Number	12	11	0	23
	Row percentage	52.17	47.83	0.00	100.00
	Column percentage	33.33	28.95	0.00	28.75
Hanam II & III	Number	4	13	4	21
	Row percentage	19.05	61.90	19.05	100.00
	Column percentage	11.11	34.21	66.67	26.25
Outside	Number	20	14	2	36
	Row percentage	55.56	38.89	5.56	100.00
	Column percentage	55.56	36.84	33.33	45.00
Total	Number	36	38	6	80
	Row percentage	45.00	47.50	7.50	100.00
	Column percentage	100.00	100.00	100.00	100.00

Source: Impact Evaluation Establishment Survey, 1995.

Table A1.7: Sample Establishments by Location and Industry

Industrial Estate		Industry								Total
		31	32	33	35	36	37	38	39	
Hanam I	Number	1	1	0	4	1	0	16	0	23
	Row percentage	4.35	4.35	0.00	17.39	4.35	0.00	69.57	0.00	100.00
	Column percentage	10.00	16.67	0.00	40.00	100.00	0.00	32.65	0.00	28.75
Hanam II & III	Number	0	1	1	2	0	1	15	1	21
	Row percentage	0.00	4.76	4.76	9.52	0.00	4.76	71.43	4.76	100.00
	Column percentage	0.00	16.67	100.00	20.00	0.00	100.00	30.61	50.00	26.25
Outside	Number	9	4	0.00	4	0	0	18	1	36
	Row percentage	25.00	11.11	0.00	11.11	0.00	0.00	50.00	2.78	100.00
	Column percentage	90.00	66.67	0.00	40.00	0.00	0.00	36.73	50.00	45.00
Total	Number	10	6	1	10	1	1	49	2	80
	Row percentage	12.50	7.50	1.25	12.50	1.25	1.25	61.25	2.50	100.00
	Column percentage	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: 31=food and beverage; 32=textile; 33=wood products; 34=paper; 35=chemicals;
 36=mineral products; 37=basic metal; 38=fabricated metal; 39=other.
 Source: Impact Evaluation Establishment Survey, 1995.

Table A1.8: Changes in Manufacturing Establishments and Employment, 1988-1993

Region	Establishments					Employment (1,000 persons)				
	1988		1993		Annual Growth Rate 1988-1993	1988		1993		Annual Growth Rate 1988-1993
	numbers	percent	numbers	percent		numbers	percent	numbers	percent	
Korea	61,723	100.0	90,506	100.0	7.96	3,208	100.0	2,931	100.0	-1.79
Seoul	17,130	27.8	20,532	22.7	3.69	553	17.2	414	14.1	-5.63
Pusan	6,554	10.6	9,262	10.2	7.16	413	12.9	266	9.1	-8.42
Taegu	4,542	7.4	6,089	6.7	6.04	184	5.7	152	5.2	-3.75
Inchon	3,586	5.8	6,403	7.1	12.29	240	7.5	226	7.7	-1.19
Kwangju	693	1.1	1,103	1.2	9.74	42	1.3	47	1.6	2.28
Taechon	950	1.5	1,342	1.5	7.15	56	1.7	46	1.6	-3.86
Kyonggi	14,363	23.3	22,914	25.3	9.79	726	22.6	729	24.9	0.08
Kangwon	1,201	1.9	1,476	1.6	4.21	76	2.4	58	2.0	-5.26
Chungbug	931	1.5	1,827	2.0	14.43	77	2.4	98	3.3	4.94
Chungnam	1,508	2.4	2,601	2.9	11.52	71	2.2	100	3.4	7.09
N. Cholla	1,724	2.8	2,252	2.5	5.49	81	2.5	76	2.6	-1.27
S. Cholla	2,347	3.8	3,113	3.4	5.81	70	2.2	79	2.7	2.45
N. Kyongsang	2,552	4.1	4,965	5.5	14.24	211	6.6	224	7.6	1.20
S. Kyongsang	3,449	5.6	6,334	7.0	12.93	403	12.6	411	14.0	0.39
Cheju	193	0.3	293	0.3	8.71	4	0.1	5	0.2	4.56

Note: Establishment with 5 or more employees.

Source: Korea Industrial Census, 1993, National Statistical Office.

Table A1.9: Gross Regional Product, 1985-1991 (current price)					
Region	1985		1991		Annual Growth Rate 1985-1991
	billion won	percent	billion won	percent	
Korea	78,235	100.0	207,398	100.0	17.64
Seoul	19,424	24.8	51,102	24.6	17.49
Pusan	6,317	8.1	15,762	7.6	16.46
Taeku	3,157	4.0	8,490	4.1	17.92
Kwangju	-	-	4,860	2.3	n.a.
Kyonggi	10,261	13.1	33,697	16.2	21.92
N. Cholla	3,173	4.1	7,713	3.7	15.96
S. Cholla	5,778	7.4	15,679	7.6	18.10
N. Kyongsang	6,057	7.7	14,594	7.0	15.79
S. Kyongsang	9,369	12.0	23,009	11.1	16.15

Note: (1) S. Cholla includes Kwangju.
(2) Price deflator for 1991 was 141.6 when 1985=100 for Korea.
Source: Gross Provincial Domestic Product, 1993, National Statistical Office.

Table A1.10: Gross Regional Product Originating from Manufacturing, 1985-1991 (current price)					
Region	1985		1991		Annual Growth Rate 1985-1991
	billion won	percent	billion won	percent	
Korea	25,485	100.0	69,977	100.0	18.33
Seoul	3,699	14.5	7,361	10.5	12.15
Pusan	2,064	8.1	4,683	6.7	14.63
Taegu	1,120	4.4	2,822	4.0	16.65
Kwangju	-	-	1,578	2.3	n.a.
Kyonggi	5,065	19.9	17,894	25.6	23.41
N. Cholla	720	2.8	2,086	3.0	19.40
S. Cholla	1,523	6.0	4,616	6.6	20.30
N. Kyongsang	2,170	8.5	5,955	8.5	18.32
S. Kyongsang	4,851	19.0	11,995	17.1	16.29

Note: (1) S. Cholla includes Kwangju.
(2) Price deflator for 1991 was 141.6 when 1985=100 for Korea.
Source: Gross Provincial Domestic Product, 1993, National Statistical Office.

Table A1.11: Tolsan Island and Other Islands: Population Indicators, 1974-1994

With-project Scenario	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1994
TOLSAN ISLAND					
Households (number)	3,740	-	4,034	-	4,280
Population (number)	24,015	-	21,922	-	17,073
Household size (number of persons per household)	6.4	-	5.4	-	4.0
Net out-migration (number during previous decade)	n.a.	n.a.	-2,093	n.a.	-4,849
Net out-migration (% of population for a decade)	n.a.	n.a.	-8.7%	n.a.	-22.1%
Without-project Scenario	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989	1994
OTHER ISLANDS (1) (no bridge connection)					
Households (number)	6,322	-	5,583	-	4,628
Population (number)	40,154	-	26,880	-	15,677
Household size (number of persons per household)	6.4	-	4.8	-	3.4
Net out-migration (number during previous decade)	n.a.	n.a.	-13,274	n.a.	-11,203
Net out-migration (% of population for a decade)	n.a.	n.a.	-33.1%	n.a.	-41.7%
Notes: (1) Nine neighboring inhabited islands within village (myun) jurisdictions of Nam, Wha Jung and Sam San.					
Sources: Yeochon County Statistical Yearbooks; July 1995 mission briefing.					

Table A1.12: Tolsan Island Environmental Violations Reported, 1974-1994

	Number of cases per 10,000 people				
	Before Tolsan Bridge			After Tolsan Bridge	
	1974	1979	1984	1989 (1)	1994 (2)
Air pollution	-	-	-	2	54
Water pollution	-	-	-	13	25
Deforestation (hectares)	-	-	16	4	13

Note: (1) 1990 data; (2) 1993 data.
Source: Yeochon Statistical Yearbook.

Table A1.13: Chindo Island Rural Sector Indicators, 1974-1994

	Before Chindo Bridge			After Chindo Bridge	
	1974	1979	1984	1989	1994
POPULATION					
Agricultural households (number)	15,518	14,594	n.a.	11,251(2)	10,612
As share of all households (%)	85.9%	82.6%	n.a.	68.3%	68.2%
AGRICULTURAL MACHINERY (number)					
Motor vehicles	236	1,477 (1)	2,235	4,256	4,196
Tractors	1	3 (1)	21	121	325
Rice planting machines	-	31 (1)	80	580	1,016
Combine harvesters	-	71 (1)	44	217	346
Irrigation pumps	367	1,242 (1)	1,618	2,002	2,132
Dryers	3	4 (1)	9	311	839
TOTAL CULTIVATED AREA (hectares)					
Rice	4,984	4,984	5,141	6,270	6,355
Barley	8,542	5,550	4,033	4,711	3,492
Fruit	2	79	94	325	634
Vegetables	897	793	2,088	1,717	1,819
TOTAL OUTPUT (tonnes):					
Rice	19,319	26,789	25,858	27,525	29,169
Barley	23,534	17,038	11,454	14,932	10,455
Fruit	19	58	1,094	482	4,917
Vegetables	7,453	2,125	50,019	52,187 (3)	55,287
Notes: (1) 1981 data; (2) 1990 data; (3) KCDI team estimate based upon land area and 1994 level of productivity per hectare.					
Sources: Chindo Statistical Yearbooks, Chindo County. Data on agricultural machinery taken from Chindo County June 95 briefing note.					

Table A1.14: Chindo Island and Other Islands Population Indicators, 1974-1994

With-project Scenario	Before Chindo bridge			After Chindo Bridge	
	1974	1979	1984	1989	1994
CHINDO ISLAND (Kun or County)	1974	1979	1984	1989	1994
Households (number)	18,056	17,666	17,192	16,957	15,570
Population (number)	104,031	92,168	75,398	70,582	50,659
Household size (number of persons per household)	5.8	5.2	4.4	4.2	3.3
Population in 0-19 yr. cohort (number)	46,501	-	34,598	27,035	16,567
Population in 0-19yr. cohort (% of total population)	44.7%	-	45.9%	38.3%	32.7%
Net out-migration (number in previous decade)	n.a.	n.a.	-28,633	-21,586	-24,739
Net out-migration (% of population for a decade)	n.a.	n.a.	-27.5%	-23.4%	-32.8%
CHINDO TOWN (myun or village)	1974	1979	1984	1989	1994
Population (number)	16,358	15,042	14,459	15,383	12,159
Town's share of Island population (%)	15.7%	16.3%	19.2%	21.8%	24.0%
Without-project Scenario	Before Chindo bridge			After Chindo Bridge	
OTHER ISLANDS (1) (without bridges)	1974	1979	1984	1989	1994
Households (number)	27,776	27,303	24,773	23,702	21,508
Population (number)	163,626	151,515	115,413	109,223	71,175
Household size (number of persons per household)	5.9	5.5	4.6	4.6	3.3
Population in 0-19 yr. cohort (number)	86,282	-	-	42,168	22,487
Population in 0-19yr. cohort (% of total population)	52.7%	-	-	38.6%	31.6%
Net out-migration (number in previous decade)	n.a.	n.a.	-48,213	-42,292	-44,238
Net out-migration (% of population for a decade)	n.a.	n.a.	-29.5%	-27.9%	-38.3%
Note: (1) Jurisdiction of Shin Nan County covering a neighboring island group.					
Sources: Gross Regional Product Yearbook, Ministry of Internal Affairs. Chindo Comprehensive Plan, 1994-2002, Chindo County Office, 1994. Shin Nan County Statistical Yearbook.					

Table A1.15: Chindo Island Environmental and Social Order Violations Reported 1974-1994					
	Number of cases per 10,000 people				
	Before Chindo Bridge			After Chindo Bridge	
ENVIRONMENTAL VIOLATIONS	1974	1979	1984	1989	1994
Air pollution	-	-	-	1	23 (1)
Water pollution	-	-	4	5	25 (1)
Deforestation (hectares)	108	-	19	63	-
SOCIAL ORDER VIOLATIONS	1974	1979	1984	1989	1994
Reported crimes	-	-	513	574	1,014
Traffic accidents	-	-	42	130	243
Note: (1) Data for 1993. Source: Chindo County Statistical Yearbook.					

Project Description and Timelines

Korea: Secondary Cities Regional Project (Loan 1070-KO) "Kwangju I Project"	
Objective/costs:	Components:
<p>Assist the Borrower in establishing a regional development program in Gwangju region</p>	<p>Part A</p> <p>(i) Preparation of housing sites with services in Gwangju city covering a total area of about 37 ha and providing about 1370 lots of 35 py about 350 lots of 50 py and about 180 lots of py (US\$4.5 million - 18.0% of total)</p> <p>(ii) Construction of a fishery harbor complex in the Gukdong area of Yeosu including: the construction of about 829m of landing and berthing quays, and about 240m of piers and abutments; the construction of fishery harbor buildings and infrastructure for the harbor complex; the development of industrial sites with services for the establishment of fish processing plants for the fishing industry; and the procurement and installation of handling equipment and navigational aids (US\$ 8.5 million - 34.0% of total)</p> <p>(iii) Construction of a city market in Suncheon covering an area of about 3.3 ha with a building space providing for retail stalls, a sheltered area for fresh produce and additional unpaved surface for the market held every fifth day (US\$0.8 million - 3.2% of total)</p> <p>(iv) Construction and improvement of about 6.6 km of access roads (including five bridges) in Yeosu and Mogpo to connect the housing sites to industrial or commercial sites and to other centers of activity of the two cities (US\$2.8 million - 11.2% of total)</p>
<p>Estimated total cost: US\$25.0m. (inc. US\$4.6m. price and US\$2.1m physical contingencies) Bank Loan: US\$15m.</p>	<p>Part B. Provision of Consultants' services</p> <p>(i) to assist GRDU' Project Manager in the formulation and implementation of the work program referred to in Section 3.02 of this Agreement (US\$0.3 million - 1.2% of total)</p> <p>(ii) to assist MOC in the review of regional development policies at the national level of Government, the evaluation of the housing sites and services experience, the formulation of a housing policy and training of MOC's regional planning staff (US\$0.5 million - 2.0% of total);</p> <p>(iii) to assist the Borrower's Office of Fisheries in the management and operation of the Yeosu fishery harbor complex, including the assessment of costs and charges, the preparation of a financial plan and of a planning program for future expansion of the harbor complex (US\$0.5 million - 2.0% of total);</p> <p>(iv) for the preparation of a program to improve the operation and management of water supply systems in Gwangju City, Mogpo, Yeosu and Suncheon, including short-term improvements to be financed by available resources under the budgets of GCG, MCG, YCG and SCG respectively; and:</p> <p>(v) to carry out feasibility studies and the preparation of selected projects to be identified under regional physical planning studies which are being carried out by the United Nations Development Program and MOC, including, <i>inter alia</i>, the preparation of plans for sewerage and night soil disposal in Gwangju City and Mogpo (US\$0.5 million -2.0% of total)</p>

Annex 2

Korea: Second Gwangju Regional Project (Loan 1758-KO) "Kwangju II Project"	
Objective/costs:	Components:
To further enhance the development of the Gwangju Region	a. Housing: nearly 3,950 serviced residential plots in Gwangju, Mogpo and Yeosu with expandable core-houses designed mostly for low-income families (\$44.6 million - 28.8% of total)
	b. Industrial Estates: about 200 ha of serviced industrial land in Gwangju and Mogpo to accommodate 16,000-20,000 employees (cost: \$64.7 million - 41.8% of total)
	c. Water Supply: improvements to water supply systems in Mogpo, Yeosu and Narudo including transmission, treatment, distribution and operations (cost: \$13.4 million - 8.7% of total)
	d. Transportation: construction of two bridges to link Dolsan and Jindo islands to the mainland and improvements to a 1.9 km commercial road in Yeosu and ferry service between Narodo and mainland (\$19.5 million - 12.6% of total)
	e. Fisheries: an aquaculture development program aimed at enhancing fishermen's incomes and a storage facility at Imja Island for tiny salted shrimp to prepare Kimche (national dish) (\$7.0 million - 4.5% of total)
Estimated total cost: US\$ 154.8 m. Bank Loan US\$65 million	f. Technical Assistance in the areas of regional planning, including an island development study, aquaculture development, water supply system operation and management, and preparation of a third regional project (\$5.6 million - 3.6% of total)

**Korea: Jeonju Regional Development Project (Loan 2388-KO)
"Chonju Project"**

Objectives/costs:	Components:
<p>To assist in promoting economic development and creating employment opportunities in the Jeonju Region, particularly through the improvement of infrastructure and living conditions in major urban centers and the promotion of economic development in the poorer mountain areas and islands</p>	<p><u>Part A: Housing Estate (US\$9.1 million - 6.4% of total)</u> (1) preparation of a housing site in Iri City covering an estate of about 60,000 py consisting of low-income, middle-income and commercial plots and complete with public facilities including water, sewerage, power, telephones and streets. (2) Provision of loan facilities for purchase of, and construction on, low income plots.</p> <p><u>Part B: Industrial Estates (US\$18.3 million - 12.8% of total)</u> Preparation of industrial sites complete with public facilities including water, sewerage, power, telephones and streets in (a) Iri City covering an estate of about 140,000 py consisting of plots ranging in area from 400 py to 10,000 py each, and (b) Jeonju City covering an estate of about 200,000 py consisting of plots ranging in area from 400 py to 10,000 py each.</p> <p><u>Part C: Water Supply (US\$14.6 million - 10.2% of total)</u> Upgrading of the water supply system of Jeonju City through the construction of the service reservoir of 7,000 cu.m capacity and about 21 km of distribution pipelines.</p> <p><u>Part D: Drainage Improvement and Flood Control (included in water supply above)</u> Construction of a retention basin and a network of interceptor and drainage channels and provision of additional lift pumps to control flood waters from the Mangyeong River flowing south of Iri City</p>

Annex 2

	<p>Part E: Tourism Development (US\$ 36.0 million - 25.1% of total)</p> <p>(1) Development of the Mt. Jiri National Park tourist resort area through: (a) preparation of a tourist site and construction of an access road in Namweon City to accommodate construction of about 700 rooms for lodging including basic infrastructure such as water, sewerage, power, streets, parking and landscaping and supporting tourist facilities; and (b) construction of mountain tourist roads from Yugmojeong to Deogdong (about 19 km) and from Banseon to Cheonunsa (about 25 km).</p> <p>(2) Development of the Mt. Naejang National Park tourist resort area through construction of a tourist access road between Naejangsa and Baegyangsa (consisting of upgrading of about 10 km of existing road & construction of about 6 km of new road).</p> <p>(3) Development of the Seonyu Island tourist resort area through the construction of two foot bridges linking Seonyu Island with the neighboring two islands in the Seonyu Island group and extension of the existing landing jetties on the three islands</p>
<p>Estimated total cost: US\$ 143.3m. (inc. US\$27.m. price and US\$8.5 m. physical contingencies) Bank Loan: US\$60m</p>	<p>Part F: Transportation Development (US\$26.6 million - 18.6% of total)</p> <p>(1) Construction of a bridge, approximately 350m. long and 10m wide, to connect sections of National Road No. 27 at Woonam, inc. about 3 km of approach roads.</p> <p>(2) Upgrading of about 32 km of National Road No. 19 between Namweon and Gurye in Jeon Nam Province.</p> <p>(3) Construction of a road of about 11 km long and 10m wide to provide a link between the proposed industrial estate in Iri City and National Road No. 26.</p> <p>Part G. Technical Assistance (US\$2.2 million - 1.5% of total) Carrying out of a preparation study and training for future regional and urban development projects</p>

Project Timelines

Kwangju-I (Loan 1070-KO)					
Date:	Process:	Missions:	Disbursements:	Works ending:	Comments
1972		(06) ident. I (11) ident. II			
1973		(02) prep. I (05) prep. II (07) pre-app. (11) appraisal			
1974	(10) negotiations	(03) post-app.I (07) post-app.II			
1975	(01) loan approval (08) effectiveness	(01) spn I (06) spn II (11) spn III	0.1		
1976		(03) spn IV (11) spn V	2.1		
1977		(03) spn VI (06) spn VII (10) spn VIII	5.5		
1978		(03) spn IX	2.0		
1979		(07) spn X (10) spn XI	2.1		
1980	(12) loan closing	(05) pcr	3.2		

Annex 2

Kwangju-II (Loan 1758-KO)					
Date:	Process:	Missions:	Disbursements:	Works ending:	Comments
1976		(12) identif.			
1978	(10) appraisal	(03) prep. (07) pre-app. (10) appraisal			
1979	(06) negotiations (09) loan approval	(02) post app. (10) spn I			
1980	(02) effectiveness	(05) spn II (08) spn III	1.4		
1981		(04) spn IV (09) spn V	6.6	(09) Narodo tourism (12) Mokpo water (12) Yeosu water (12) Narodo water	
1982		(01) spn VI (05) spn VII (11) spn VIII	10.2	(08) shrimp storage	
1983		(10) spn IX	23.1	(02) Yeosu com. road (05) Yeoso housing (07) Mokpo housing (10) Hanam IE	
1984		(07) spn X (11) spn XI	9.0	(05) Mokpo drainage (07) Kwangju hsing (10) Chindo bridge	
1985	(06) loan closing	(04) spn XI	0.9	(03) Tolsan bridge (10) Juksan land readj	

Chonju-I (Loan 2388-KO)					
Date:	Process:	Missions:	Disbursements:	Works ending:	Comments
1979		(10) ident.			
1980		(05) prep. I (09) prep. II			
1981		(04) prep. III (06) prep. IV (09) prep. V (11) prep. VI			
1982		(05) pre-app.			
1983	(03) appraisal	(03) appraisal			
1984	(01) negotiation (03) loan approval (07) effectiveness	(07) spn I (10) spn II	0.2		
1985		(04) spn III	3.6		
1986		(03) spn IV (11) spn V	13.2	(12) Seonyu Is. dev. (12) Chonju water	
1987		(04) spn VI	10.9	(04) Namweon access (06) Iri IE (07) Chonju IE (08) Iri IE access rd. (10) Namweon TE	
1988		(06) spn VII	12.0	(05) Iri drainage (08) Yukmo J. road (08) Naejangsa road (12) Benseon road	
1989		(07) spn VIII	3.0	(06) Woonam road (08) Namweon roa (09) Woonam bridge (11) Iri IE int'change	
1990	(06) loan closing	(06) spn IX (07) spn X			

Institutional Development Timelines

1. Devolution	
Date:	Event:
1972	- First IE at Iri was built by Ministry of Industry
1973	- National government designates five special metropolitan areas in Korea, including Kwangju. - Tolsan Is. administered from Yeosu city.
1975	- MOC Kwangju RDD opened with staff of 25.
1976	- MOC Kwangju RDD absorbed in Chonnam provincial Land Management Office (CLMO). - Yeochon jurisdiction upgraded by incorporating two more districts ("dongs").
1977	- MOC policy of more active involvement in provision of infrastructure in Chonbuk.
1979	- CLMO changed its name to K(wangju)LMO - Chindo jurisdiction upgraded from village to district administration ("myun" to "eup").
1980	- General Chun seizes power in military coup. Kwangju riots begin. - Yolsan jurisdiction upgraded from village to district administration ("myun" to "eup").
1981	- KLMO closed and absorbed into MOC Iri Land Dev. Office (ILDO) - Namwon was upgraded as a city ("shi") administration of Chonbuk province.
1986	- Kwangju city jurisdiction upgraded to become a 'direct administration' city ("jickhalsi"), with greater autonomy from central government, and city area extended to absorb four neighboring counties ("ku"). - Yeochon jurisdiction upgraded to a city ("shi")
1987	- MOC Iri ILDO coordination dept. abolished. - Students riots nationwide. - Democratization with election of Pres. Roh.
1988	- Kwangju city absorbed one more county (Kwangsan Ku) - Mokpo City jurisdiction upgraded through addition of one more county
1992	- MOC Iri ILDO became a Regional Development Division (RDD)
1994	- MOC Iri RDD down-sized to 2 depts/19 staff. - Yeochon County office relocated to Tolsan Is.
1995	- Dismemberment of Seo county in Kwangju creating Namgoo as Kwangju city's sixth.

Annex 3

2. Laws and Regulations affecting Industrial Development	
Date:	Event:
1971	- First National Land Development Plan (1972-1981) formulated.
1973	- National "Land and zoning arrangement" law determined urban land zoning by local govt. - Designation of green belt around Kwangju City.
1974	- Central govt. designates six industrial bases nationwide (Song 1990 p. xvi)
1975	- Kwangju City Master Plan prepared and approved by MOC.
1977	- Chonju City Master Plan prepared and approved by MOC. Indicated land for industrial use.
1978	- Hanam area zoned for industrial use.
1981	- Set of national laws supporting: (i) private sector development; (ii) private funding; (iii) balanced regional development; (iv) small and medium-sized businesses; and (v) industrial location. - Chonnam Province development plan was prepared for the first time.
1982	- Second National Land Development Plan (1982-1991) formulated.
1985	- Kwangju City zoned more industrial land.
1987	- New Chonju Master Plan.
1990	- National law completely delegated land use planning and zoning responsibilities from KLDC to local governments.
1991	- Kwangju City zoned land for Hi-tech IE for industrial use. - Construction Technology Quality Control Law. - Industrial Location and Development Law.
1992	- President Kim announces new policy of de-regulation for industrial development. - Kwangju City zoned land for Pyung Dong IE for industrial use.
1993	- Kwangju City zoned some 25% of former agricultural land for industrial use. - De-regulation: old law allowing only one LPG supplier per district was revoked.
1994	- Regionally Balanced Development and Small/Medium-sized Industry Development Law
1995	- Kwangju's "direct administration" status consolidated under national Autonomy Law. - Establishment and Management of Regional Development Fund Law. Kwangju city increased the "set-back" on IEs, allowing plot coverage by building to increase from 60% to 80%. - National Environment Law (enacting provisions of Rio Earth Summit of 1992). - Attempts to update Chonju's Master Plan.

3. Reorganization within Local Government	
Date:	Event:
1980	- MOC minister came from Kwangju.
1981	- Public sector development group set up within Chonnam province to promote infrastructure development in the region.
1985	- Kwangju City established a special Industrial Estate Planning Division with a staff of five.
1986	- Kwangju City issued bonds to value of US\$49.6 million (39.7 billion won) to help finance new Pyong Dong IE.
1987	- Hanam IE Site Office opened as a "one-stop shop" with a staff of 17.
1994	- Chonbuk Province established an International Trade Office in order to attract FDI.
1995	- Chonbuk Province established Chonbuk Development Corporation. - Chonju City set up a Finance and Economic Bureau (FBB) for industrial and small business promotion. - Iksan City set up a similar FBB. - Hanam IE Site Office staffing down to 9.

Annex 3

4. Strengthening Capabilities of Local Government	
Date:	Event:
1979	- Saemael education and training program for administrators and engineers in Chonnam province.
1980	- "Developmental administration" given for the first time to 120 local government employees. - Chonnam Province computer section opened.
1981	- Governor of Chonnam Province (until 1984) was an entrepreneur for the first time. - Chonnam Province computer room facility completed. - Kwangju City acquired its first main-frame IBM computer.
1983	- Staffing of Kwangju City Industrial Development Division (IDD) began to decline. - Chonnam Province office room of computerization personnel opened and promoted.
1985	- Local government training course for junior high level staff given.
1987	- Local government training course for high level staff in charge of regional economic given.
1988	- Local government training course for "local administration in autonomy" given. - Kwangju City collects taxes from most of Hanam IE phase I occupants as five year tax holiday ends.
1990	- Local government training courses in (i) local legislation; (ii) local economy; and (iii) foreign languages given.
1992	- Office automation and computers course given to local government officials for the first time. - Chonju City began selling plots in Chonju-III IE.
1995	- Local government elections held for the first time.
1996	- Final repayment of IBRD loan for Kwangju-II due.

Annex 4. Summary of Establishment Survey Results

Table A4.1 Number and Percentage of Establishments in the Sample by Zone and Type

Zone	New	Movers within Kwangju	Movers from Outside	Total
Hanam 1				
Number	12	11	0	23
Percentage of row total	52.2	47.8	0.0	100.0
Percentage of column total	33.3	28.9	0.0	28.8
Hanam 2				
Number	2	8	4	14
Percentage of row total	14.3	57.1	28.6	100.0
Percentage of column total	5.6	21.1	66.7	17.5
Hanam 3				
Number	2	5	0	7
Percentage of row total	28.6	71.4	0.0	100.0
Percentage of column total	5.6	13.2	0.0	8.8
Bonchon				
Number	5	4	1	10
Percentage of row total	50.0	40.0	10.0	100.0
Percentage of column total	13.9	10.5	16.7	12.5
Sochon				
Number	4	5	1	10
Percentage of row total	40.0	50.0	10.0	100.0
Percentage of column total	11.1	13.2	16.7	12.5
Songam				
Number	1	3	0	4
Percentage of row total	25.0	3.75	0.0	100.0
Percentage of column total	2.8	7.9	0.0	5.0
Other				
Number	10	2	0	12
Percentage of row total	83.3	16.7	0.0	100.0
Percentage of column total	27.8	5.3	0.0	15.0
All zones				
Number	36	38	6	80
Percentage of row total	45.0	47.5	7.5	100.0
Percentage of column total	100.0	100.0	100.0	100.0

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.2 Number and Percentage of Establishments in the Sample by Type and Industry

Type of firm	Food	Tex- tile	Wood	Chem- icals	Non- Metal	Basic Metal	Fab. Metal	Other	Total
New									
Number	7	4	1	3	0	1	20	0	36
% of row total	19	11	3	8	0	3	56	0	100
% of col total	70	67	100	30	0	100	41	0	45
Movers within Kwangju/Jeonnam									
Number	2	2	0	6	1	0	26	1	38
% of row total	5	5	0	16	3	0	68	3	100
% of col total	20	33	0	60	100	0	53	50	48
Movers from outside									
Number	1	0	0	1	0	0	3	1	6
% of row total	17	0	0	17	0	0	50	17	100
% of col total	10	0	0	10	0	0	6	50	8
Total									
Number	10	6	1	10	1	1	49	2	80
% of row total	13	8	1	13	1	1	61	3	100
% of col total	100	100	100	100	100	100	100	100	100

Source: Impact Evaluation establishment survey, 1995.

Table A4.3 Number and Percentage of Establishments in the Sample by Zone and Industry

Zone	Food	Tex- tile	Wood	Chem- icals	Non- Metal	Basic Metal	Fab. Metal	Other	Total
Hanam 1									
Number	1	1	0	4	1	0	16	0	23
% of row total	4	4	0	17	4	0	70	0	100
% of col total	10	17	0	40	100	0	33	0	29
Hanam 2									
Number	0	0	0	1	0	0	12	1	14
% of row total	0	0	0	7	0	0	86	7	100
% of col total	0	0	0	10	0	0	24	50	18
Hanam 3									
Number	0	1	1	1	0	1	3	0	7
% of row total	0	14	14	14	0	14	43	0	100
% of col total	0	17	100	10	0	100	6	0	9
Bonchon									
Number	5	1	0	0	0	0	4	0	10
% of row total	50	10	0	0	0	0	40	0	100
% of col total	50	17	0	0	0	0	8	0	13
Sochon									
Number	0	0	0	2	0	0	7	1	10
% of row total	0	0	0	20	0	0	70	10	100
% of col total	0	0	0	20	0	0	14	50	13
Songam									
Number	1	0	0	1	0	0	2	0	4
% of row total	25	0	0	25	0	0	50	0	100
% of col total	10	0	0	10	0	0	4	0	5
Other									
Number	3	3	0	1	0	0	5	0	12
% of row total	25	25	0	8	0	0	42	0	100
% of col total	30	50	0	10	0	0	10	0	15
Total									
Number	10	6	1	10	1	1	49	2	80
% of row total	12	8	1	12	1	1	61	3	100
% of col total	100	100	100	100	100	100	100	100	100

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.4 Number and Percentage of Establishments in the Sample by Type and Size

Type of firm	Size(number of employees)						Total
	1-49	50-99	100-199	200-299	300-499	500+	
New							
Number	7	8	6	6	1	8	36
% of row total	19	22	17	17	3	22	100
% of col total	35	47	30	75	33	67	45
Average size	34	73	135	268	344	1775	494
Movers within Kwangju/Jeonnam							
Number	13	8	12	2	0	3	38
% of row total	34	21	32	5	0	8	100
% of col total	65	47	60	25	0	25	47
Average size	25	81	142	261	0	1266	184
Movers from Outside							
Number	0	1	2	0	2	1	6
% of row total	0	17	33	0	33	17	100
% of col total	0	6	10	0	67	8	8
Average size	0	60	125	0	439	869	343
All Types							
Number	20	17	20	8	3	12	80
% of row total	25	21	25	10	4	15	100
% of col total	100	100	100	100	100	100	100
Average Size	28	76	138	266	407	1572	335

Note: The Average size represents the average number of employees of firms in each cell.

Source: Impact Evaluation establishment survey, 1995.

Table A4.5 Number and percentage of Establishment in the Sample by Zone and Size

Zone	Size(number of employees)						Total
	1-49	50-99	100-199	200-299	300-499	500+	
Hanam 1							
Number	5	3	7	2	1	5	23
% of row total	22	13	30	9	4	22	100
% of col total	25	18	35	25	33	42	29
Average size	31	80	156	259	344	1198	362
Hanam 2							
Number	3	5	4	0	1	1	14
% of row total	21	36	29	0	7	7	100
% of col total	15	29	20	0	33	8	18
Average size	19	83	136	0	385	869	162
Hanam 3							
Number	4	1	1	1	0	0	7
% of row total	57	14	14	14	0	0	100
% of col total	20	6	5	13	0	0	9
Average size	25	60	160	271	0	0	84
Bochon							
Number	1	2	2	2	1	2	10
% of row total	10	20	20	20	10	20	100
% of col total	5	12	10	25	33	17	13
Average size	43	87	123	284	492	589	270
Sochon							
Number	1	2	6	0	0	1	10
% of row total	10	20	60	0	0	10	100
% of col total	5	12	30	0	0	8	13
Average size	44	68	121	0	0	2704	361
Songam							
Number	2	2	0	0	0	0	4
% of row total	50	50	0	0	0	0	100
% of col total	10	12	0	0	0	0	5
Average size	19	61	0	0	0	0	40
Other							
Number	4	2	0	3	0	3	12
% of row total	33	17	0	25	0	25	100
% of col total	20	12	0	38	0	25	15
Average size	33	74	0	259	0	2708	765
Total							
Number	20	17	20	8	3	12	80
% of row total	25	21	25	10	4	15	100
% of col total	100	100	100	100	100	100	100
Average size	28	76	138	266	407	1572	335

Note: The average size represents the average number of employees of firms in each cell.

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.6 Plant Characteristics by Type of Firm
(percentage of total in each category)

Plant characteristics	New	Movers within Kwangju/Jeonnam	Movers from Outside	All
Land for expansion				
Yes	56	53	83	56
No	44	45	17	43
No answer	0	3	0	1
Total	100	100	100	100
Number of eight-hour shifts				
one	44	76	67	61
two	36	19	17	26
three	20	5	17	13
Total	100	100	100	100
Average number of employees	494	184	343	335
Number of establishments	36	38	6	80

Source: Impact Evaluation establishment survey, 1995.

Table A4.7 Plant Characteristics by Zone
(percentage of total in each category)

Plant Char	Hanam 1	Hanam 2	Hanam 3	Bonchon	Sochon	Songam	Other	All
Land for expansion								
Yes	57	71	57	30	80	50	42	56
No	39	29	43	70	20	50	58	43
No answer	4	0	0	0	0	0	0	1
Total	100	100	100	100	100	100	100	100
Number of eight-hour shifts								
One	52	79	71	80	50	100	33	61
Two	39	21	14	0	40	0	33	26
Three	9	0	14	20	10	0	33	13
Total	100	100	100	100	100	100	100	100
Ave # empl	362	162	84	270	361	40	765	335
# establ	23	14	7	10	10	4	12	80

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.8 Shipments of Output and Inputs by Type of Firm
(percentage of total in each category)

Shipments	New	Movers within Kwangju	Movers from Outside	All
Output shipped by truck				
Less than 50 percent	8	18	17	14
50-94 percent	6	11	0	7
95-100 percent	86	71	83	79
Total	100	100	100	100
Average	92	81	86	86
Inputs shipped by truck				
Less than 50 percent	11	8	17	10
50-94 percent	11	10	0	10
95-100 percent	78	82	83	80
Total	100	100	100	100
Average	87	90	84	89
Output sold in Kwangju				
Less than 25 percent	50	50	83	52
25-49 percent	11	5	0	8
50-74 percent	6	8	0	6
75-100 percent	25	34	17	29
No answer	8	3	0	5
Total	100	100	100	100
Average	38	43	22	39
Inputs bought in Kwangju				
Less than 25 percent	69	47	50	58
25-49 percent	6	11	50	11
50-74 percent	17	18	0	16
75-100 percent	8	21	0	14
No answer	0	3	0	1
Total	100	100	100	100
Average	25	40	23	32
Number of establishments	36	38	6	80

Note: The average represents the average percentage of the value of output or inputs for each type of firm.

Source: Impact Evaluation establishment survey, 1995.

Table A4.9 Shipments of Output and Inputs by Type of Firm
(percentage of total in each category)

Shipments	Hanam 1	Hanam 2	Hanam 3	Bochon	Sochon	Songam	Other	Total
Output shipped by truck								
< 50 percent	4	7	43	20	10	0	25	14
50-94 percent	22	0	0	0	0	0	8	8
95-100 percent	74	93	57	80	90	100	67	79
Total	100	100	100	100	100	100	100	100
Average	93	93	57	86	91	100	74	86
Inputs shipped by truck								
< 50 percent	13	0	14	0	10	0	25	10
50-94 percent	13	14	14	10	0	0	8	10
95-100 percent	74	86	71	90	90	100	67	80
Total	100	100	100	100	100	100	100	100
Average	85	97	84	98	91	100	74	89
Output sold in Kwangju								
< 25 percent	57	50	57	60	40	50	50	53
25-49 percent	0	0	29	20	0	0	17	8
50-74 percent	13	0	14	0	0	25	0	6
75-100 percent	22	50	0	10	60	25	25	29
No answer	9	0	0	10	0	0	8	5
Total	100	100	100	100	100	100	100	100
Average	34	50	23	23	59	48	36	39
Inputs bought in Kwangju								
< 25 percent	70	43	57	80	50	50	42	58
25-49 percent	0	21	29	0	20	0	17	11
50-74 percent	17	21	0	0	10	50	25	16
75-100 percent	9	14	14	20	20	0	17	14
No answer	4	0	0	0	0	0	0	1
Total	100	100	100	100	100	100	100	100
Average	25	40	24	25	34	38	40	32
# establishments	23	14	7	10	10	4	12	80

Note: The average represents the average percentage of the value of output or inputs for each type of firm.

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.10 Firms Very Satisfied with Present Location by Type of Firm
(percentage of total in each category)

Attribute of present location	New	Movers within Kwangju/Jeonnam	Movers from outside	All
Plant capacity	6	3	0	4
Cost of land for expansion	0	0	0	0
Availability of skilled workers	0	3	0	1
Availablility of unskilled workers	0	3	0	1
Quality of public utilities	0	3	0	1
Quality of municipal services	0	0	0	0
Road access	14	37	50	28
Proximity to clients	8	5	17	8
Proximity to suppliers	0	0	0	0
Amenities of zone	0	0	0	0
Number of establishments	36	38	6	80

Note: (1) Public utilities include electricity and water supply.

(2) Municipal services include police and fire protection.

(3) Amenities include parks, recreation facilities, and air quality.

Source: Impact Evaluation establishment survey, 1995.

Table A4.11 Firms Very Satisfied with Present Location by Zone
(percentage of total in each category)

Att of present location	Hanam 1	Hanam 2	Hanam 3	Bonchon	Sochon	Songam	Other	All
Plant capacity	4	7	0	10	0	0	0	4
Cost of land for expansion	0	0	0	0	0	0	0	0
Avail of skilled workers	0	0	0	0	0	25	0	1
Avail of unskilled workers	0	0	0	10	0	0	0	1
Quality of public utilities	0	0	0	0	10	0	0	1
Qual of municipal services	0	0	0	0	0	0	0	0
Road access	30	43	43	30	10	25	8	28
Proximity to clients	13	21	0	0	0	0	0	8
Proximity to suppliers	0	0	0	0	0	0	0	0
Amenities of zone	0	0	0	0	0	0	0	0
Number of establishments	23	14	7	10	10	4	12	80

Note: (1) Public utilities include electricity and water supply.

(2) Municipal services include police and fire protection.

(3) Amenities include parks, recreation facilities, and air quality.

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.12 Quality of Public Service by Zone
(percentage of total in each zone)

Quality of public service	Hanam 1	Hanam 2	Hanam 3	Bonchon	Sochon	Songam	Other	All
Electricity never interrupted	83	100	71	90	70	100	50	80
Excellent fire protection	9	21	14	20	0	50	8	14

Source: Impact Evaluation establishment survey, 1995.

Table A4.13 Characteristics of Movers by Industry
(percentage of total in each category)

Type of firm	Food	Textile	Chemicals	Non- Fabricated			Total
				Metallic	Metal	Other	
Condition of previous plant							
Good but cramped	0	0	14	100	24	100	25
Good but obsolete	0	50	29	0	14	0	16
Still serviceable	33	0	0	0	0	0	2
Worn out	33	0	14	0	24	0	20
No answer	33	50	43	0	38	0	36
Total	100	100	100	100	100	100	100
Percentage of workers stayed after move							
< 50 percent	33	50	14	100	14	50	20
50-99 percent	33	0	43	0	41	0	36
100 percent	0	0	0	0	7	50	7
No answer	33	50	43	0	38	0	36
Total	100	100	100	100	100	100	100
Average	60	30	61	25	73	55	65
# of establishments	3	2	7	1	29	2	44
Size(number of employees)							
	Less than 25			25-99		100 or more	All
Distance of move							
1-2 kilometers	0			6		5	5
3-5 kilometers	17			6		5	7
6-10 kilometers	17			31		14	20
11-20 kilometers	17			6		32	20
More than 20 kilometers	0			13		23	16
No answer	50			38		23	32
Total	100			100		100	100
Average kilometers	11			55		106	80
Number of establishments	6			16		22	44

Note: The average represents the average percentage of the number of workers who stayed after move.

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.14 Characteristics of Movers by Zone
(percentage of total in each category)

	Hanam 1	Hanam 2	Hanam 3	Bonchon	Sochon	Songam	Other	Total
Condition of previous plant								
Good but cramped	27	33	20	0	33	0	50	25
Good but obsolete	27	17	20	20	0	0	0	16
Still serviceable	9	0	0	0	0	0	0	2
Worn out	18	25	40	20	17	0	0	20
No answer	18	25	20	60	50	100	50	36
Total	100	100	100	100	100	100	100	100
Percentage of workers stayed after move								
< 50 percent	36	8	0	40	33	0	0	20
50-99 percent	45	50	60	0	0	0	100	36
100 percent	0	8	20	0	17	0	0	7
No answer	18	33	20	60	50	0	0	36
Total	100	100	100	100	100	100	100	100
Average	57	79	93	30	43	.	65	65
# of establishments	11	12	5	5	6	3	2	44

Size (number of employees)

	Less than 25	25-99	100 or more	All
Distance of move				
1-2 kilometers	0	6	5	5
3-5 kilometers	17	6	5	7
6-10 kilometers	17	31	14	20
11-20 kilometers	17	6	32	20
More than 20 kilome	0	13	23	16
No answer	50	38	23	32
Total	100	100	100	100
Average kilometers	11	55	106	80
Number of establishments	6	16	22	44

Note: "Average" refers to the average percentage of the number of workers who stayed after the move.

Source: Impact Evaluation establishment survey, 1995.

A4.15 Experience after Relocation

	Percentage of movers ¹			
	After<Before	After=Before	After>Before	No answer
Production	5	0	64	32
Plant space	0	2	66	32
Land space	2	2	64	32
Number of skilled workers	14	7	48	32
Wage of skilled workers	0	5	61	34
Number of unskilled workers	16	5	41	39
Wage of unskilled workers	2	5	52	41
Distance to work by managers	5	21	41	34
Distance to work by workers	7	21	39	34
Distance of product shipment	14	30	23	34
Distance of input delivery	14	30	23	34
Profits	14	2	48	36
Local tax payments	2	11	48	39
Cost of public services	7	7	48	39

¹There were 44 movers in the sample. The inequality sign indicates "better" or "worse".

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.16 Changes in Quality of Public Services after Relocation
(percentage of movers)

	Substantially improved	Somewhat improved	Unchanged	Became Worse	No answer	Total
Electricity	21	39	11	0	30	100
Water	21	32	14	2	32	100
Telephone	16	39	16	0	30	100
Telegraph	11	43	16	0	30	100
Police service	2	39	30	0	30	100
Waste removal	5	34	25	7	30	100
Road maintenance	5	34	30	2	30	100
Fire protection	5	50	16	0	30	100
Sewerage	7	50	11	2	30	100
Bank	7	43	16	5	30	100

Source: Impact Evaluation establishment survey, 1995.

Table A4.17 Expansion and Relocation Plans by Type and Size of Firm
(percentage of total)

Plan	New	Movers within Kwangju/Jeonnam	Movers from outside	All
Plan to expand in next 5 years				
No	53	50	67	53
Yes	36	42	33	39
No answer	11	8	0	9
Total	100	100	100	100
Plan to relocate in next 5 years				
No	64	74	100	71
Yes	19	16	0	16
No answer	17	10	0	13
Total	100	100	100	100
Number of establishments	36	38	6	80
Size(number of employees)				
	Less than 25	25-99	100 or more	All
Plan to expand in next 5 years				
No	63	59	47	53
Yes	37	38	39	39
No answer	0	3	14	9
Total	100	100	100	100
Plan to relocate in next 5 years				
No	63	83	65	71
Yes	25	10	19	16
No answer	12	7	16	13
Total	100	100	100	100
Average number of employees	16	60	581	335
Number of establishments	8	29	43	80

Source: Impact Evaluation establishment survey, 1995.

Annex 4

Table A4.18 Expansion and Relocation Plans by Zone and Size of Firm
(percentage of total)

	Hanam 1	Hanam 2	Hanam 3	Bonchon	Sochon	Songam	Other	Total
Plan to expand in next 5 years								
No	57	50	43	50	60	75	42	53
Yes	35	43	57	30	40	25	42	39
No answer	9	7	0	20	0	0	17	9
Total	100	100	100	100	100	100	100	100
Plan to relocate in next 5 years								
No	70	86	71	70	90	75	42	71
Yes	13	7	29	10	10	25	33	16
No answer	17	7	0	20	0	0	25	13
Total	100	100	100	100	100	100	100	100
# of establishments	23	14	7	10	10	4	12	80

Size(number of employees)

	Less than 25	25-99	100 or more	All	
Plan to expand in next 5 years					
No		63	59	47	53
Yes		37	38	39	39
No answer		0	3	14	9
Total		100	100	100	100
Plan to relocate in next 5 years					
No		63	83	65	71
Yes		25	10	19	16
No answer		12	7	16	13
Total		100	100	100	100
Average number of employees		16	60	581	335
Number of establishments		8	29	43	80

Source: Impact Evaluation establishment survey, 1995.

Study Questionnaire

Survey Number _____
 Interviewer _____
 Date of Interview _____
 SIC/Firm Type/Size ____ / ____ / ____

EMPLOYMENT LOCATION SURVEY FOR KOREA IMPACT EVALUATION STUDY

Name of person responding to survey: _____

Position: _____

ESTABLISHMENT CHARACTERISTICS

1. Name of Establishment _____
 Telephone Number _____

2. Address of Establishment Si (Gun), Gu, _____
Dong (Eup, Myeon) _____

3. This establishment is:

- (1) a single-establishment operation. [Go to question 7]
- (2) headquarters of a multi-establishment operation.
- (3) a branch of a multi-establishment operation.

If (3), answer question 4. If (2) answer 5 and 6.

4. Name of parent company: _____
 Location:

- (1) within this city
- (2) within this province
- (3) outside this province (_____ si or gun)

5. How many establishments does your firm operate? _____

6. Where are they located? How many?

- (1) within this city _____
- (2) within this province _____
- (3) outside this province (_____ si or gun) _____

7. When was this establishment founded? 19__ year.

Annex 5

8. When did this establishment first operate at this location? 19__ year.
9. Which of the following three categories describes your establishment's location history? __
- (1) was newly founded at this location.
 - (2) was relocated from another location within this province.
 - (3) was relocated from another location outside this province.

If (1), do not answer questions (53) through (64).

[All questions from here on are with respect to the establishment located at the address as specified in Question (2) above.]

PLANT CHARACTERISTICS

10. What are the major products manufactured at this establishment? List up to three in order of importance (For example, women's clothes, leather shoes, automobile parts, etc.).

- (1) _____
- (2) _____
- (3) _____

11. Roughly, how many pyeongs is the land area of the plant site?

- (1) Rent _____ pyeong
- (2) Own _____ pyeong

12. Roughly, how many pyeongs of total floor space does your plant have?

- (1) rent _____ pyeong
- (2) own _____ pyeong

13. How much is (was) the value of your lot per pyeong?

- (1) now _____ won
- (2) when moved here _____ won

14. Do you have some land space reserved for plant extension?

At present plant site: ____
 (1) substantial (2) adequate (3) not much (4) none

Next to the present plant site: ____
 (1) substantial (2) adequate (3) not much (4) none

EMPLOYMENT

15. How many full-time employees at this establishment? (persons)

	male	female
(1) management	_____	_____
(2) skilled workers	_____	_____
(3) unskilled workers	_____	_____
(4) total	_____	_____

16. How many full-time employees did you have when you first started operation here?
 _____ persons.

17. Roughly, what will be the maximum number of employees in case of full-capacity operation (including part-time workers)? _____ persons.

18. Roughly, what are the average monthly wage rates (including bonus payment)?

- (1) skilled workers _____ (won)
- (2) unskilled workers _____ (won)

19. On the average, how many (8-hour) shifts are run at the plant?

- (1) one shift
- (2) two shifts
- (3) three shifts

20. Where do most of your employees live? Please give rough percentage estimates to the following categories:

- (1) dormitory at plant site _____ %
- (2) immediate neighborhood (Dong) _____ %
- (3) within this Gu or Gun (Si) _____ %
- (4) adjacent Gu or Gun (Si) _____ %
- (5) other Gu or Gun (Si) _____ %
- Total 100%

21. What proportion of your employees travel to work by:

- (1) dormitory or plant site _____ %
- (2) foot _____ %
- (3) bicycle (or motorcycle) _____ %
- (4) commercial bus _____ %
- (5) company bus _____ %
- (6) car _____ %
- Total 100%

Annex 5**SHIPMENT OF OUTPUTS AND INPUTS**

22. Roughly, what percentage of the value of output shipped within Korea by:

- | | |
|---------------------------------------|-------------------|
| (1) truck only | _____ % |
| (2) rail only | _____ % |
| (3) truck-rail combination | _____ % |
| (4) truck-water combination | _____ % |
| (5) air (during any part of the trip) | _____ % |
| (6) other, please specify _____ | _____ % |
| | Total 100% |

23. Roughly, the percent of the value of raw material inputs shipped within Korea by:

- | | |
|---------------------------------------|-------------------|
| (1) truck only | _____ % |
| (2) rail only | _____ % |
| (3) truck-rail combination | _____ % |
| (4) truck-water combination | _____ % |
| (5) air (during any part of the trip) | _____ % |
| (6) other, please specify _____ | _____ % |
| | Total 100% |

24. What percent of your products are sold in the following areas?

- | | |
|---|-------------------|
| (1) within this city | _____ % |
| (2) within this province | _____ % |
| (3) outside this province, but within Korea | _____ % |
| (4) internationally | _____ % |
| | Total 100% |

25. Roughly, what proportion of your products is used mainly as inputs of other industries?

- (1) 0% (2) 1-20% (3) 21-40% (4) 41-60% (5) 61-80% (5) 81-99%
(6) 100%

26. What percent of your raw materials and/or input components are bought in the following areas?

- | | |
|--|-------------------|
| (1) within this city | _____ % |
| (2) within this province | _____ % |
| (3) outside this province but within Korea | _____ % |
| (4) internationally | _____ % |
| | Total 100% |

27. Roughly, what proportion of your inputs is outputs of other industries? _____

- (1) 0% (2) 1-20% (3) 21-40% (4) 41-60% (5) 61-80% (6) 81-99% (7) 100%

28. Do your employees have problems with commuting to this location? (Choose three in order of importance) 1. _____ 2. _____ 3. _____

- (1) There is no bus or subway route.
 (2) There is a route, but needs a long wait.
 (3) The fair is too high.
 (4) Too crowded.
 (5) Takes too much time.
 (6) No problems.
 (7) Other, please specify _____

PUBLIC SERVICE AND GOVERNMENT INCENTIVE SCHEMES

29. How much public service does your plant require?

substantial=1 modest=2 little=3 almost none=4

- (1) electricity _____
 (2) water _____
 (3) telephone _____
 (4) police protection _____
 (5) fire protection _____
 (6) banking _____

30. On the average, how frequently are public utility services interrupted?

almost none=1 once a month=2 once a week=3 twice a week=4
 more than twice a week=5

- (1) electricity _____
 (2) water _____

31. Do you supply electricity or water with your own facilities?

Yes=1 No=2

- (1) electricity _____
 (2) water _____

32. What do you think of the following public service in this area?

excellent = 1 good enough = 2 not enough = 3 very poor = 4

Annex 5

- (1) electricity _____
 (2) water _____
 (3) telephone _____
 (4) police protection _____
 (5) fire protection _____
 (6) banking _____

33. Who removes and treats the waste? Please estimate the percentage of waste treated by the following:

- (1) your firm _____ %
 (2) local authority _____ %
 (3) private contractor _____ %
 (4) others _____ %
 Total 100%

34. In case the local authority removes the waste, what do you think of their service?

- (1) excellent (2) good enough (3) not enough (4) very poor

35. How is the waste water treated? Please estimate the percentage of waste-water treated by the following:

- (1) self-treatment at the plant _____ %
 (2) collective-treatment facility in the area _____ %
 (3) local authority (Si, Gun) _____ %
 (4) combination of self-treatment and local authority _____ %
 (5) other, please specify _____ %
 Total 100%

36. What types of pollution are generated by your plant operation?

- (1) air (2) water (3) noise (4) odor (5) soil
 (6) other, please specify _____

37. If your plant generates pollution, how good are your pollution control facilities?

- (1) complete (2) not enough (3) none

38. Did you receive any instruction from the government because of the pollution control problem?

- Yes=1 No=2

39. If yes, which of the following applies to your case?

- (1) to change the production process
- (2) to install pollution-control facilities
- (3) to relocate to other location
- (4) to pay a fine
- (5) other, please specify _____

40. What taxes that you pay affect your business operation most seriously? List in order of importance.

- (1) _____
- (2) _____
- (3) _____

SUMMARY EVALUATION OF PRESENT LOCATION

41. Please evaluate how you feel about your present location by the factors listed below:

very satisfactory: 1	satisfactory: 2	not satisfactory: 3	(enter in first column)
very important: 1	important: 2	not important: 3	(enter in second column)

- | | | |
|--|-------|-------|
| (1) land area: | _____ | _____ |
| (2) building space: | _____ | _____ |
| (3) rent payment (including building land): | _____ | _____ |
| (4) availability of skilled workers: | _____ | _____ |
| (5) wage of skilled workers: | _____ | _____ |
| (6) availability of unskilled workers: | _____ | _____ |
| (7) wage of unskilled workers: | _____ | _____ |
| (8) cost of public utilities (electricity, water, etc): | _____ | _____ |
| (9) quality of public utility services: | _____ | _____ |
| (10) proximity to suppliers: | _____ | _____ |
| (11) proximity to customers: | _____ | _____ |
| (12) proximity to competitors: | _____ | _____ |
| (13) highway access: | _____ | _____ |
| (14) railroad access: | _____ | _____ |
| (15) availability of nearby land for plant expansion: | _____ | _____ |
| (16) cost of nearby land for plant expansion: | _____ | _____ |
| (17) proximity to related services: repair, maintenance, banks, and other business services: | _____ | _____ |
| (18) property tax burden: | _____ | _____ |
| (19) local government services (fire protection, road maintenance, etc.): | _____ | _____ |
| (20) cost of local government services: | _____ | _____ |
| (21) security (crimes, etc.): | _____ | _____ |

Annex 5

- (22) pleasant surroundings: _____
- (23) recreational facilities: _____
- (24) local community attitudes towards this establishment: _____

PAST TRENDS AND FUTURE PROSPECTS

42. What has been the average growth rate of your establishment in terms of output (or sales) over the past 5 years?

- (1) declined: _____ % per year
- (2) no growth: _____
- (3) increased: _____ % per year

43. What was the value of sales in 1994? (million won)

- (1) domestic: _____
- (2) export: _____
- (3) total: _____

44. How much do you anticipate your establishment will grow in the next five years?

- (1) grow quite substantially
- (2) grow substantially
- (3) grow slightly
- (4) remain the same
- (5) decrease
- (6) not sure

PLANS FOR CAPACITY EXPANSION OR RELOCATION

45. Do you have any plans for expanding within the next five years?

Yes=1 No=2 [Go to 49]

46. If yes: is this expansion likely to take place:

- (1) here at this location: _____
- (2) another location in this city: Gu or Dong _____
- (3) another location in this province: Si (Gun), Gu _____
- (4) another location outside this province: Si (Gun) Gu _____

47. Roughly, how many workers will you hire as a result of this expansion? _____

48. How much additional floor space will you require? _____ pyeong
49. Do you have any plans for relocating the entire operation from the present site to another location in the next five years?
- Yes=1 No=2
50. If yes, is the new location likely to be:
- (1) in this city: Gu or Dong _____
- (2) in this province: Si (Gun), Gu _____
- (3) outside this province: Si (Gun), Gu _____
51. Roughly, how would your labor force change?
- (1) will increase by _____ persons.
- (2) will decrease by _____ persons.
52. How much additional floor space will you require?
- _____ pyeong.

COMPARISONS WITH PREVIOUS LOCATION

[Note: answer only if answered (2) or (3) in question 9.]

53. Previous location:
- (1) in this city _____
- (2) in this province _____
- (3) outside this province (Si or Gun) _____
54. Roughly, what is the distance between the present and previous location? _____ Km
55. How would you best describe the condition of your previous plant just prior to your move from it?
- (1) in good condition, but cramped _____
- (2) in good condition, but obsolete _____
- (3) still serviceable _____
- (4) worn out _____
56. Compare the situation at the present location as of one year after the move with those at the previous location for the following items:
- no change=0 increase=1 decrease=2

Annex 5

- (1) production (or sales) _____
- (2) land area _____
- (3) building space _____
- (4) rent payment per pyeong _____
- (5) number of skilled workers _____
- (6) monthly wages of skilled workers _____
- (7) number of unskilled workers _____
- (8) monthly wages of unskilled workers _____
- (9) commuting distance for managers _____
- (10) commuting distance for workers _____
- (11) output delivery distance _____
- (12) input delivery service _____
- (13) local tax payment _____
- (14) profits _____
- (15) public utility costs _____

57. Any changes in the quality of the following public services after the relocation?

Substantially improved=1 somewhat improved=2 unchanged=3 became worse=4

- (1) electricity _____
- (2) water _____
- (3) telephone _____
- (4) telegraph _____
- (5) police service _____
- (6) waste removal _____
- (7) road maintenance _____
- (8) fire protection _____
- (9) sewerage _____
- (10) banking _____

58. What was the main reason for your relocation?

- (1) received a government relocation order
- (2) to receive the benefits from government incentive schemes
- (3) land price
- (4) factors related to plant operations _____

59. Was your relocation forced because of public action? Choose three in order of importance.

1. _____ 2. _____ 3. _____

- (1) highway construction expansion
- (2) urban renewal project
- (3) relocation order because of pollution
- (4) zoning regulation

(5) other, please specify _____

(6) not applicable

60. List three location characteristics that you considered to be most important (excluding government incentive schemes such as credit subsidies or tax exemption) when you chose the present location. (List in order of importance. If needed, the interviewer should assist the respondent by referring to question 41.)

(1) _____

(2) _____

(3) _____

61. Did you consider the alternative sites before you made the decision to choose the present location?

yes=1 no=0

62. If considered, where were the locations?

(1) in this city _____

(2) in this province _____

(3) outside this province (Si or Gun) _____

63. Roughly, what percent of your labor force stayed with you when your firm moved to the new location (as of about one year after the move)?

_____ %

64. Did you receive credit subsidy or tax exemption for plant expansion because you moved from previous location?

yes=1 no=0

INTERVIEWER'S REMARKS

Immediately after the interview, write your opinions about the reliability of responses, the extent of cooperation, names and titles of other people who were present at the interview and their influences, the parts which were the most difficult to answer, and the parts with unclear answers.

If the interview was rejected, or was impossible to carry out, explain why (for example, busy; too many questions; such a firm does not exist, etc.)

LIST OF PEOPLE INTERVIEWED

The list contains the persons interviewed during the two impact evaluation missions in June 1995 and February 1996. The list does not include all of the staff members of the respective agencies and firms who were present at the meetings. (The persons marked with asterisk were visited during both missions.)

LOCAL STUDY TEAM IN KWANGJU:

Kwangju-Chonnam Development Institute, Kwangju

Dr. Chang-Soo Moon, President*

Dr. Jong-Pyung Jeon, Senior Researcher*

Honam University, Kwangju

Prof. Jae-Oh Kim, Department of Business Administration*

Prof. Sangho Kim, Department of Economics*

LOCAL STUDY TEAM IN IKSAN:

Wonkwang University, Iksan (formerly Iri)

Prof. Yang-Jae Lee, Department of Urban Planning

Prof. Dong Ho Shin, Department of Urban Engineering*

SOUTH CHOLLA PROVINCE:

Provincial Government

Mr. Jae Goo Song, Vice Governor*; Vice Mayor of Kwangju City since 1996

Mr. Ki Seung Nam, Director, Bureau of Construction*

Kwangju City

Mr. Wun-Tae Kang, Mayor

Mr. Young Shik Jeong, Vice Mayor

Mr. Young Rok Oh, Director, Industry Division*

Mr. Yong-Bong Chung, Director, Regional Economic Development

Mr. Jae Sook Ro, Director, Budget Office

Mr. Young Ju Shon, Director, City Planning Division

Mogpo City

Mr. Jae Ho Ahn, Mayor

Mr. Kyung Ju Koh, Vice Mayor

Mr. Sang-Chea Seo, Director, Construction Bureau

Yeosu City

Mr. Deok-Hyoung Moon, Mayor

Annex 6Yecheon County (Gun)

Mr. Sang Ok Lee, County Executive
 Mr. Dai Won Cho, Director, Regional Economic Development

Jindo County (Gun)

Mr. Pyung Eun Lee, County Executive

Hanam Industrial Estate, Kwangju

Mr. Seung Yong Lee, Director of Administration*

Chonnam National University, Kwangju

Prof. In-Sang Song, Department of Urban and Regional Planning

Kwangju Chamber of Commerce and Industry

Mr. Hong-Soon Ahn, Secretary General
 Mr. Soon-Hyung Park, Director of Research

Kumho & Co., Inc.

Mr. Il Ham, President*
 Mr. Cha Y. Cho, Managing Director
 Mr. Ahn Seok Kim, General Manger

LG Electro-Components Ltd. (Goldstar)

Mr. Yoon-Shik Lim, Plant Manager
 Mr. Bu-Young Park, Manager, General Administration

Daewoo Electronics Co., Ltd.

Mr. Kyung Suk Seo, Manager, General Administration*

Asia Motors Co., Inc.

Mr. Jae Hoon Kim, Plant Manager
 Mr. Bong Seoung Kim, Manager, Public Relations

Moodeung Plastic Industrial Co., Ltd.

Mr. Woo Youn Kim, Executive Director

Daeshin Chemical Co., Ltd.

Mr. Bong Sup Kim, President

Korea Federation of Small Businesses, Kwangju

Mr. On-Hi Yang, Director

Korea Small Scale Industry Promotion Corp., Kwangju

Mr. Eung-Hee Yoo, Director of Operations

Korea National Labor Federation, Kwangju

Mr. Shin Won Lee, President

Yoesu Fishery Cooperative

Mr. Sang Yong Joo, President

NORTH CHOLLA PROVINCE:

Ministry of Construction and Transportation

Mr. Young Il Ha, Director-General, Iri Regional Construction Office

Mr. Hak-Lae Son, Director-General since 1996

Mr. Su-Nam Park, Director, Iri Regional Development Bureau*.

Provincial Government

Mr. Jong-Jeong Lim, Director General, Construction Bureau*

Iksan City

Mr. Man Jong Kim, Mayor

Mr. Byung Sik Park, Vice Mayor

Chonbug National University, Chonju

Professor Eung-Kyo Ryu, Architecture Department

Chonju University

Professor Sung-Taik Lee, Chonbug Development Institute

Iri Export Processing Zone Administration

Mr. Oh-Joon Chung, Director

Mr. Young Choon Yoon, Chief of Operations

Iksan Chamber of Commerce and Industry

Mr. Hyun Kee Kim, Chairman

Mr. Hong Ki Sohn, Chairman since 1996*

Mr. Heun Jai Park, Secretary General*

Jeonju Chamber of Commerce and Industry

Mr. Hae-Sang Lee, Director General*

Hong Ik Metal Co., Ltd.

Mr. Sang Sup Kim, Managing Director

Seoul Plant Engineering & Construction Co., Ltd.

Mr. Bang-Ho Kim, Plant Manager

Annex 6Kodenshi Korea Corp. (Tae Hwa)

Mr. Sung Ik Park, Senior Managing Director

Mr. Ki-Jung Lee, Director

MEETINGS IN SEOUL:Ministry of Construction and Transportation, Seoul

Mr. Yoon Ho Ryu, Director, Regional Planning Division*

Mr. In-Kee Shin, Director, Construction Management Division*

Mr. Doyoup Kwon, Director, Industrial Site Planning Division*

Mr. Yong Hwan Kim, Director, Water Resources Policy Division

Mr. Jae Choon Lee, Director, Technical Training Division

Korea Research Institute for Human Settlements, Seoul

Dr. Gun Young Lee, President*

Dr. Kyubang Lee, Vice President

Dr. Young-Hwan Jin, Director, Research Coordination*

Dr. Yang-Soo Yun, Director, Regional Planning

Dr. Dong-ju Kim, Senior Fellow*

Dr. Yong-Woong Kim, Senior Fellow

Construction & Economy Research Institute of Korea

Dr. Sung-Woong Hong, President

Korea Environmental Technology Research Institute

Dr. Jong Gie Kim, President*

Korea Institute for Economics and Technology

Dr. Kyu Uck Lee, President

Seoul Development Institute

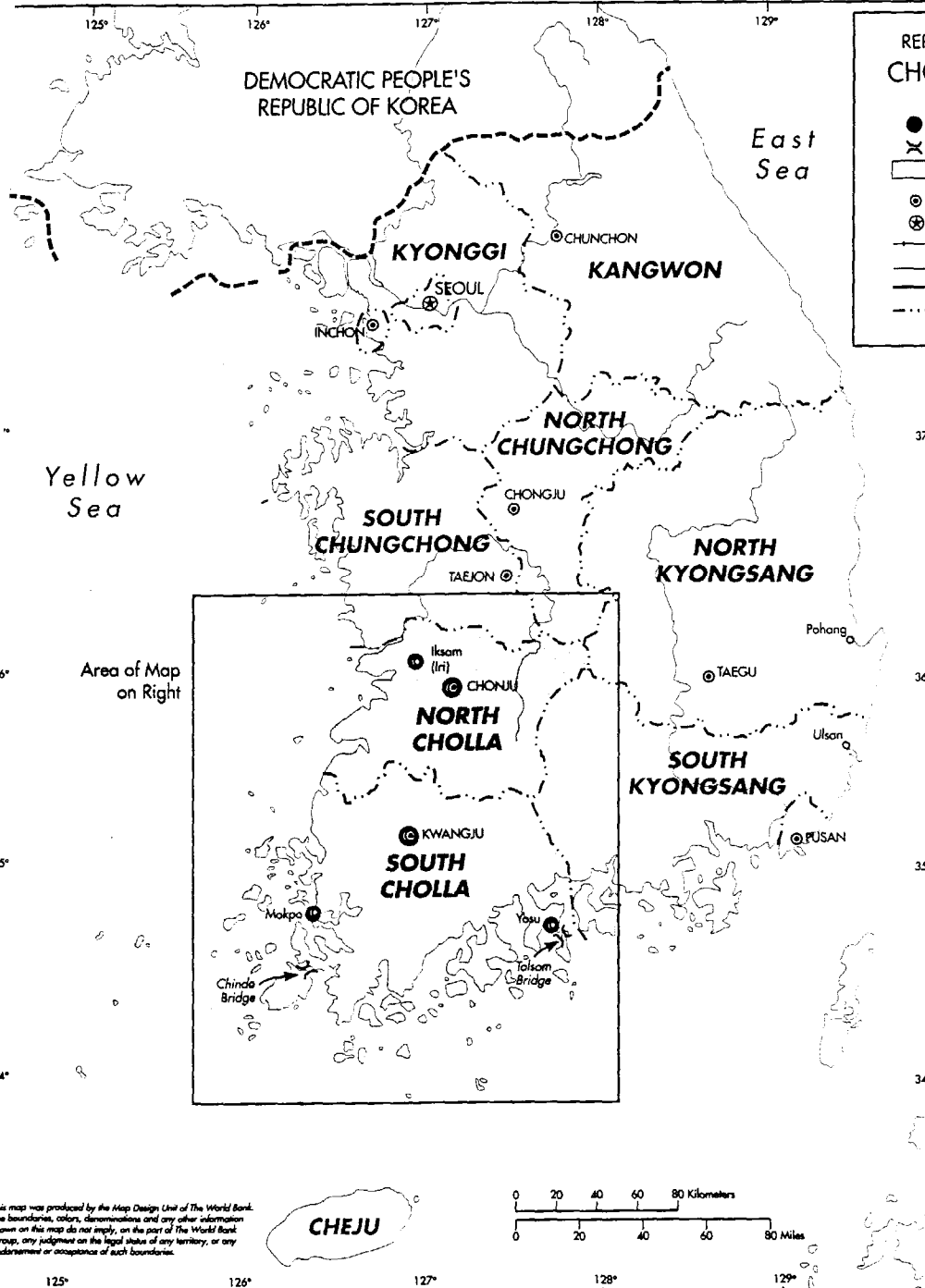
Dr. Sae-Wook Chung, President

Dr. Bun-Song Lee, President (since February 1995)*

Dr. Yeong-Joo Hahn, Director, Planning and Coordination*

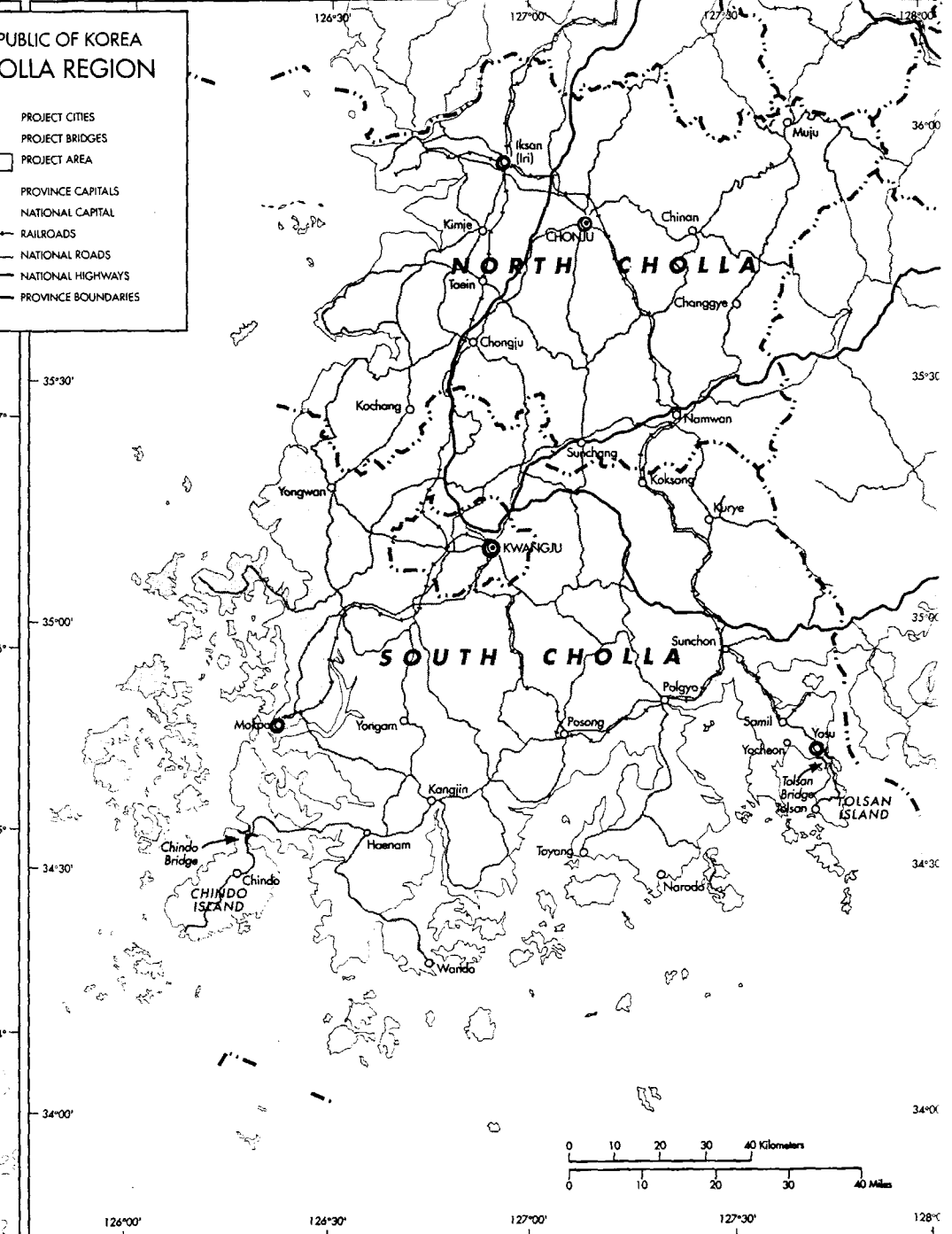
Seoul National University

Prof. Sang-Chuel Choe, Graduate School of Environmental Studies*



REPUBLIC OF KOREA
CHOLLA REGION

- PROJECT CITIES
- ⊗ PROJECT BRIDGES
- PROJECT AREA
- ⊙ PROVINCE CAPITALS
- ⊕ NATIONAL CAPITAL
- RAILROADS
- NATIONAL ROADS
- NATIONAL HIGHWAYS
- - - PROVINCE BOUNDARIES



This map was produced by the Map Design Unit of The World Bank. Its boundaries, colors, denominations and any other information shown on this map do not imply, on the part of The World Bank Group, any judgment on the legal status of any territory, or any endorsement or acceptance of such boundaries.

IMAGING

Report No.: 16211 16211
Type: IER