

Study on Impact and Efficiency of Family Planning Program in Korea

Final Report

**Submitted
to
U.N. Economic and Social Commission
for Asia and the Pacific**

**by
Hyun Sang Moon
Kong-Kyun Ro (consultant)✓
Sang Young Lee**

Korea Institute for Population and Health

October 1986

Preface

This volume is the final research report on impact and efficiency of family planning program in Korea, supported by U.N. Economic and Social Commission for Asia and the Pacific (ESCAP).

The objective of this international comparative study was to develop measures for a more efficient implementation of family planning programmes in the ESCAP region through evaluative studies on on-going family planning programmes. This study tried to identify relevant variables enhancing program efficiency through an analysis of the interrelationship between input and output and to examine factors promoting program efficiency in various components of the family planning program in Korea.

I would like to thank the U.N. ESCAP for sponsoring the research on impact and efficiency of family planning program in Korea. Dr. A.R. Khan and Dr. I. Alam, Population Division of U.N. ESCAP, provided us advice and encouragement throughout the entire course of the research. Dr. K.K. Ro, Korea Advanced Institute of Science and Technology, gave us advice and guidance at the crucial stages of the study.

October 1986



Chan Moo Park
Korea Institute for Population
and Health

TABLE OF CONTENTS

	Page No.
Chapter I. Introduction	1
1.1 Summary of the Study	1
1.2 Setting of the Problems	1
1.3 Objectives of the Study	3
1.3.1 Goals	3
1.3.2 Objectives	3
Chapter II. Review of Korea's Demographic and Socio-Economic Developments and Population Programmes	5
2.1 Review of Korea's Population and Socio-Economic Developments	5
2.2 Review of Korea's Population Programmes	13
2.3 Structure of Population Policy Making and Implementation in Korea	15
2.3.1 The Administrative System of Family Planning Program — Program Evaluation and Supervision	19
2.4 Supports from Rural Development Program	22
Chapter III. Multivariate Areal Analysis of the Fertility Decline	25
3.1 Conceptual Framework of Analysis	25
3.2 Sources of Data and Definition of Variables	26
3.3 Results of the Data Analysis	27
Chapter IV. Determinants of the Efficiency of the Family Planning Programmes	38
4.1 Areal Efficiency Index	38
4.2 Programme Features Associated with High vs. Low Performance Area (According to	

Ranking by the Efficiency Index)	40
4.2.1 Program Staff Characteristics of High vs. Low Performance Program Areas	40
4.2.2 Program Support from Rural Development Programmes	41
4.2.3 Administrative Factors Influencing the Program Performance	43
4.3 Multivariate Analysis of Organizational Efficiency of the Family Planning Programmes	45
Appendix to Chapter IV	49
Chapter V. Summary and Conclusions	56
5.1 Summary of the Findings	56
5.1.1 Relative Contribution of the Family Planning Program vs. Socio-Economic Development to the Fertility Decline	56
5.1.2 Analysis of the Operational Efficiency of the Family Planning Programmes	57
5.2 Conclusion and Policy Recommendations	59

LIST OF TABLES

	Page No.
Table 2.1.1 : Trends in Population, Crude Birth Rate and Death Rate of the Republic of Korea, 1960-85	5
Table 2.1.2 : Trend of Population for Korea: Urban vs. Rural, 1966-85	6
Table 2.1.3 : GNP and Per Capita GNP of the Republic of Korea, 1960-84	8
Table 2.1.4 : Trend of Sectorial Changes in terms of Sector Output, the Republic of Korea, 1960-84	8
Table 2.1.5a: Household Consumption Expenditure as Percent of Total Budget in Cities, the Republic of Korea, 1964-84	9
Table 2.1.5b: Farm Household Consumption Expenditure as Percent of Total Budget, the Republic of Korea, 1964-83	9
Table 2.1.6 : Geographical Distribution of Health Manpower, the Republic of Korea, 1983	10
Table 2.1.7 : Medical Facilities per 100,000 persons, the Republic of Korea, 1970-84	12
Table 2.1.8 : Distribution of Health Facilities, the Republic of Korea, 1983	12
Table 2.2.1 : Age Specific Fertility Rate, the Republic of Korea, 1960-1984	14
Table 2.3.1 : Fertility Control Program in Korea	16
Table 2.3.2 : Family Planning Evaluation for 1983 (Cities and Provinces)	21
Table 2.3.3 : Method of Family Planning Evaluation in Korea	22
Table 3.1 : Path Coefficients of the Socio-Economic Developments and Family Planning Program on TFR	32
Table 3.2 : Path Coefficients of the Impact of the Socio-Economic Developments and Family Planning Program on Fertility Decline: 1970-80	33

Table 3.2a	: R ² of Various Factors Affecting Fertility Decline	33
Table 3.3	: Path Coefficients of the Impact of the Socio-Economic Development, Level of Fertility and Family Planning Program on Fertility Decline: 1979-80	34
Table 3.3a	: R ² of Various Factors Affecting Fertility Decline	35
Table 3.4	: Path Coefficients of the Impact of the Socio-Economic Development and Family Planning Worker Density on Couple Years of Protection (CYP) per 1,000 Eligible Women: 1979-80	36
Table 3.5	: Changes in R ² of the Regression where the Dependent Variable is the Program Acceptance Level	37
Table 4.1	: Percent Distribution of Program Staff's Personal Characteristics in the High vs. Low Performance Areas ...	41
Table 4.2	: Percent Distribution of Program Staff's Professional Characteristics in the High vs. Low Performance Areas	42
Table 4.3	: Percent Distribution of Staff Relationship in the High vs. Low Performance Areas	43
Table 4.4	: Establishment Dates and Activities of Saemaul Mother's Clubs in the High vs. Low Performance Areas	44
Table 4.5	: Level of Interest of the Local Government Officials in their Family Planning Work	45
Table 4.6	: Regression Analysis of the Organizational Factors Affecting Program Performance. The Performance is represented by a Dummy Variable Where the High Efficiency Area = 1, the Low Efficiency Area = 0	46
Table 4.7	: Regression Analysis of the Organizational Factors Affecting the Program Performance. The Performance is represented by the Areal Efficiency Index	47

LIST OF FIGURES

	Page No.
Figure 2.1.1 : Changes in Urban, Rural and National Total Fertility Rate of the Republic of Korea, 1973-84	7
Figure 2.1.2 : Health Manpower in the Republic of Korea, 1974-84.....	11
Figure 2.2.1 : Family Planning Practice Rate in the Republic of Korea, 1973-85.....	15
Figure 2.3.1 : Organization Chart of Family Planning System.....	18
Figure 2.3.2 : Organization Chart for Implementing Korea's Population Policy	19
Figure 3.1 : Path Model for the Measurement of Impact of Development and Family Planning Program on TFR, 1976-80, Korea	29
Figure 3.2 : Path Model for the Measurement of Impact of Development and Family Planning Program on Fertility Decline, 1970-80, Korea	30
Figure 3.3 : Path Model for the Measurement of Impact of Development, Level of Fertility and Family Planning Program on Fertility Decline, 1979-80, Korea	31
Figure 4.1 : Path Model for the Measurement of Impact of Socio-Economic Developments and Fertility Level on Couple Years of Protection per Family Planning Worker, 1970-80, Korea	39

I. Introduction

1.1 Summary of the Study

There has been an ongoing and still unresolved debate as to the relative contribution to the fertility decline of the implemented family planning programmes vs. changes in socio-economic conditions in developing countries. In the past with a varying degree of success, attempts have been made to separate the effects of the implemented family planning programme on the fertility from those of socio-economic changes. Since controlled experiment cannot be conducted, the issue is not expected to be resolved to everyone's satisfaction.

This study is more than another attempt for Korea to separate the impacts of the programme from those of socio-economic changes. In addition to sorting out the relative contribution of the above two, this study analyzes the input-output relationship of individual sub-units of Korea's programmes to assess how well the resources are used to accomplish the immediate programme objectives.

Two types of analyses are carried out. First, multivariate analyses of the impacts of the programme on the fertility are conducted holding those of socio-economic and demographic factors constant. Second, the determinants of programme efficiency are analyzed for individual sub-units of Korea's national family planning programmes. For this purpose, the subunits are classified into three categories of performance, i.e., efficient, less efficient and inefficient units.

The goal of this study is to make Korea's population policy more effective. It is hoped that the results of the study will accomplish this goal by providing an useful information in determining programme design and strategy and deployment of personnel and other resources.

1.2 Setting of the Problems

The central issue addressed by this study may be looked upon as that of

allocative and operation efficiency. Even if the fertility decline itself is the ultimate goal, the issue of paramount importance for allocative efficiency is whether more resources should be allocated to the family planning programmes or more to those investments designed to accelerate socio-economic changes conducive to the fertility decline.

Market oriented libertarian economists have argued that the family planning programmes have little real impacts on the fertility. Decisions on having more or less number of children are made in the context of the behavior to maximize the individual family's utility under conditions determined by its socio-economic characteristics. They argue that the family planning programmes may improve contraceptive efficiency but they hardly affect the family decision making equation.

On the other hand, the advocates of more resources for the family planning programmes argue that the programmes do make real impacts on the fertility. Although they recognize the importance of role being played by socio-economic changes in the fertility decline, the programmes are said to make a significant difference in the speed by which the fertility declines.

As for the operational efficiency, the issue is whether the resources spent for the family planning programmes are utilized efficiently to achieve the goals of the programmes. Expressed in terms of programme efficiency, the issue should be addressed in terms of maximizing the output for given input (resources) or minimizing input for given output.

This study addresses the above two issues, namely, allocative and operational efficiency. By estimating the relative contribution to the fertility decline of the family planning programmes and changes in socio-economic condition, the study would provide policy makers with an useful information to make a sound decision on resource allocation between the family planning programmes and the programmes designed to improve socio-economic conditions conducive to the fertility reduction.

Secondly, by assessing the determinants of programme efficiency, this study would provide policy makers with an information on how to design an optimum strategy to maximize the programme output (performance) with the given programme resources.

The Republic of Korea has witnessed a rapid decline in fertility in the six-

ties and seventies. During the same period, there has also been a rapid change in socio-economic conditions. At the same time, the family planning programmes have been actively supported by the national government. Given this concurrent development, it is particularly important to sort out the relative contribution of the family planning programmes to the fertility decline from that of changes in socio-economic condition.

Secondly, there is a significant regional difference in the fertility decline within Korea, which, therefore, provides a good site to assess what determines the operational programme efficiency, holding the regional differences in socio-economic conditions constant.

1.3 Objectives of the Study

1.3.1 Goals

There are two goals of the study. They are:

(a) To improve the efficiency in allocating resources between the family planning programmes and programmes designed to accelerate those changes in socio-economic conditions conducive for the fertility decline.

(b) To improve the operational efficiency of the family planning programmes in terms of maximizing the output (performance) for the resources allocated for the programmes.

1.3.2 Objectives

This study aims at helping policy makers to achieve the above stated goals by providing the information to be obtained by the followings.

(a) To separate the impacts of the family planning programmes on the fertility from those of changes in socio-economic conditions. For this end, the multivariate areal analysis is conducted.

(b) To analyze all the factors which influence the output (performance) of the family planning programmes. For this end, the subunits of Korea's programmes are classified into three types: efficient, less efficient and inefficient. Then, through regression and path analysis, the factors which contribute toward

making a programme more or less efficient are analyzed.

(c) To provide a Korean data to be a part of the ESCAP regional data base on the allocative and operational efficiency of the family planning programmes.

II. Review of Korea's Demographic and Socio-Economic Developments and Population Programmes

During the last decade, Korea's fertility rate declined from 3.9 in 1973 to 2.1 in 1984. Is this rapid decline mainly attributable to the rapid changes in socio-economic conditions or Korea's family planning programmes? In this section, the data on Korea's fertility, socio-economic development and population programmes during the last two decades are presented. The data provide the dimension of the changes and a general view of the interrelationship among the three.

2.1 Review of Korea's Population and Socio-Economic Developments

The latest estimate, March, 1986, of the Republic of Korea's population is about 42 million, which is nearly a double of that of 1955. In population density, Korea ranks fourth in the world. Taking habitability and arability into account,

Table 2.1.1. Trends in Population, Crude Birth Rate and Death Rate of the Republic of Korea, 1960-85

Year	Population*	Annual growth rate**	Crude birth rate***	Crude death rate***	Natural increase rate***
1960	24,987	3.03	42.0	13.0	29.0
1966	29,193	2.62	35.0	10.0	25.0
1970	31,466	1.89	27.0	7.6	19.4
1975	34,707	1.98	24.0	7.0	17.0
1980	37,436	1.53	23.4	6.7	16.7
1985	41,057	1.25	19.7	6.2	13.5

* Unit: 1,000 persons

** Unit: percent

*** Unit: per 1,000 persons

Sources: The Korean Institute for Family Planning, Statistics for Population and Family Planning, Vol. 1, 1977, and Ministry of Health and Social Affairs, Statistical Yearbook, 1985, and National Bureau of Statistics, Korea Statistical Yearbook, 1985, and Preliminary Report of 1985 Population and Housing Census, 1986.

Korea probably tops the ranking with 1,217 persons per square kilometer.

This unenviable situation has come into being in spite of the fact that the rate of population growth has rapidly declined in the sixties from 3.03 percent per annum in 1962 to 1.89 in 1970. Thereafter, there has been a less rapid but steady decline in the growth rate. In 1985, it is estimated at 1.25 percent per annum (See Table 2.1.1).

The current policy calls for bringing down the growth rate to below 1 percent by 1993. The Republic hopes to achieve a stationary population of about 52 million by 2023 (Korea Herald, March 29, 1986).

The decline in the rate of population growth has been achieved by a rapid decline in birth rate, accompanied by a less rapid but steady decline in mortality rate. The crude birth rate declined from 42 per 1,000 population in 1960 to 20 in 1985, whereas the crude death rate declined from 13 per 1,000 to 6.2 during the same period (For age specific and total fertility rate, see Table 2.2.1).

The above demographic trend has been accompanied by a massive movement of people from the rural to urban area. In 1966, about the two-thirds of Korean people resided in the rural area. In 1985, it is in the urban area that a slightly less than the two-thirds resided (See Table 2.1.2).

The redistribution of population in such a massive scale in the last two-decades has occurred in spite of the fact that the rural fertility rate has been substantially higher than the urban fertility rate during the same period. The total fertility rate for the rural area is estimated at 5.0 per eligible woman in 1973, it declined

Table 2.1.2. Trend of Population for Korea: Urban vs. Rural — 1966-85

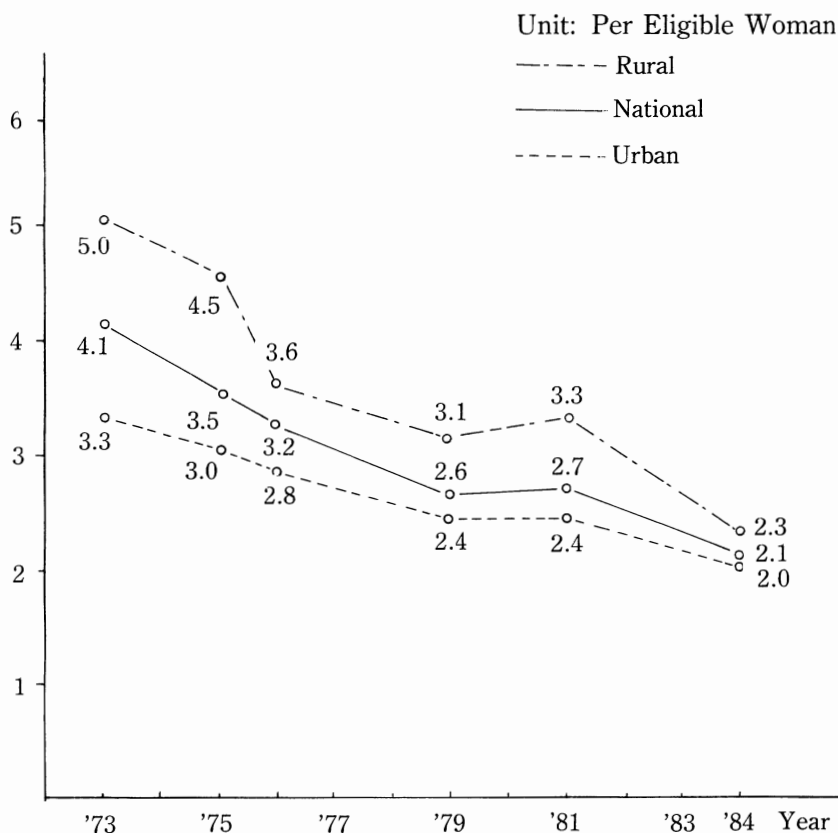
Unit: percent

Years	Urban		Rural	
	Population	Percent	Population	Percent
1966	9,781	33.5	19,379	66.5
1970	12,953	41.2	18,512	58.8
1975	16,793	48.4	17,910	51.6
1980	21,434	57.3	16,002	42.7
1985	26,458	65.4	14,009	34.6

Source: National Bureau of Statistics, Economic Planning Board, Korean Statistical Yearbook, 1985, and Preliminary Report of 1985 Population of Housing Census, 1986.

to 3.1 in 1979, and further to 2.3 in 1984. The total fertility rate for the urban area is 3.3 in 1973 and 2.0 in 1981 (See Figure 2.1.1).

Figure 2.1.1. Changes in Urban, Rural and National Total Fertility Rates of the Republic of Korea, 1973-84



Source: The Korea Institute for Population and Health, 1985, 1985 National Fertility and Family Health Survey Report, Seoul, Korea

The decline in the birth and death rate and an increasing urbanization in Korea has been accompanied by the familiar pattern of socio-economic developments. The per capita GNP of the R.O.K. increased from 291 thousand Won to 1.2 million Won at 1980 price. This more than fourfold increase in per capita GNP is accomplished as the GNP increased about 6.8 times during the same period (See

Table 2.1.3).

The GNP growth has been accompanied by the also familiar pattern of sectorial change. During 1960 to 1984, the share of manufacturing sector in the economy increased from 12 to 32 percent, whereas the agricultural sector declined from about 43 percent to 16 percent (See Table 2.1.4).

Table 2.1.3. GNP and Per Capita GNP of the Republic of Korea, 1960-84

Unit: percent

Year	GNP		Per capita GNP	
	Amount*	Growth rate	Amount**	Growth rate
1960	7,271		290.7	
1965	9,846	6.3	343.0	3.4
1970	16,666	11.1	511.7	8.3
1975	26,113	9.4	740.2	7.6
1980	37,204	7.3	975.9	5.7
1984	49,168	7.2	1,211.7	5.6

* Unit: Billion Won at 1980 price (U.S. \$1=850 Won in 1984)

** Unit: Thousand Won at 1980 price

Source: National Bureau of Statistics, Economic Planning Board, Korea Statistical Yearbook, 1985 and, The Bank of Korea, Economic Statistic Yearbook, 1977.

Table 2.1.4. Trend of Sectorial Changes in Terms of Sector Output, the Republic of Korea, 1960-84

Unit: percent

Year	Agriculture, forestry and fishery		Mining and manufacturing		Social overhead cap. and other service	
	Growth rate*	Percent of GNP	Growth rate*	Percent of GNP	Growth rate*	Percent of GNP
1960		42.7		12.1		18.7
1965	5.5	41.2	11.7	15.5	4.1	17.0
1970	4.1	29.8	14.8	22.8	7.3	14.2
1975	5.8	26.0	16.9	23.6	3.0	14.6
1980	1.3	15.8	12.8	30.2	4.4	12.6
1984	8.1	16.4	9.0	32.2	3.7	11.0

* Average annual growth rate for the respective periods.

Source: The Bank of Korea, Economic Statistical Yearbook, 1978, and National Bureau of Statistics, Economic Planning Board, Korea Statistical Yearbook, 1985.

The consumer spending pattern in terms of Engel Curves also followed that shown in other developing countries. The household expenditure for food as percent of total budget decreased from 59.5 percent in the urban area and 59.3 percent in farming area in 1964 to 35.3 percent urban and 30.4 percent farming in 1984.

Table 2.1.5a. Household Consumption Expenditure as Percent of Total Budget in Cities, the Republic of Korea, 1964-84

Unit: percent

Year	Food	Housing	Utility	Clothing	Medical	Sch'ing and leisure	Others
1964	59.5	12.9	5.3	5.0	2.1	5.5	9.7
1965	56.8	13.8	5.8	6.4	1.1	5.8	10.3
1970	40.5	18.4	5.5	10.1	3.1	8.5	13.9
1975	43.6	17.5	5.4	8.7	4.0	8.2	12.6
1978	43.9	9.5*	6.0	9.4	5.0	8.9	17.3
1980	41.3	9.2	7.4	8.8	6.1	8.5	18.7
1982	38.3	8.3	7.7	7.7	6.7	10.0	21.3
1983	35.3	9.0	7.0	7.3	6.7	10.1	24.6

* In 1978 official methods of measuring the urban housing costs changed.

Source: The Bank of Korea, Economic Statistical Yearbook, 1972, 1977 and 1985.

Table 2.1.5b. Farm Household Consumption Expenditure as Percent of Total Budget, the Republic of Korea, 1964-83

Unit: percent

Year	Food	Housing	Utility	Clothing	Medical	Sch'ing and leisure	Others
1964	59.3	3.2	7.4	7.0	2.6	4.2	16.3
1965	53.1	3.8	7.8	8.0	2.9	5.0	19.4
1970	45.9	4.2	7.9	8.4	3.4	7.4	22.8
1975	47.3	7.0	6.3	6.9	3.8	6.8	21.9
1978	38.3	8.7	4.6	7.0	4.6	9.3	27.5
1980	36.9	6.8	4.7	6.2	4.5	11.1	29.8
1983	30.4	7.6	4.2	4.6	5.3	—	—

Source: The Bank of Korea, Economic Statistical Yearbook, 1972, 1977 and 1985.

During the same period, the share of the expenditures for medical care, schooling and leisure activities increased about twofold, except for farming household expenditure for the schooling and leisure activities. It increased about threefold (See Table 2.1.5a and Table 2.1.5b).

The health care available to Korean people has also improved both in quantity and quality. In the last decade, 1974-84, the increase in quantity has been most dramatic for allied health personnel such as medical technician and nurses (See Figure 2.1.2). For all categories of health manpower, the number of personnel available increased steadily.

The increase in health manpower has, however, not occurred evenly throughout the Republic. The urban-rural difference continues to be significant. In 1983, there was about one physician for 1,162 persons in Seoul. For the rural areas, the average was one physician for 6,917 persons (See Table 2.1.6).

The availability of health facilities over the years and their geographical distribution in 1983 are similar to those of manpower. The health facilities, mainly hospital (beds), increased rapidly (See Table 2.1.7). However, the urban-rural difference has persisted (See Table 2.1.8).

Table 2.1.6. Geographical Distribution of Health Manpower, the Republic of Korea, 1983

Unit: per 100,000 persons

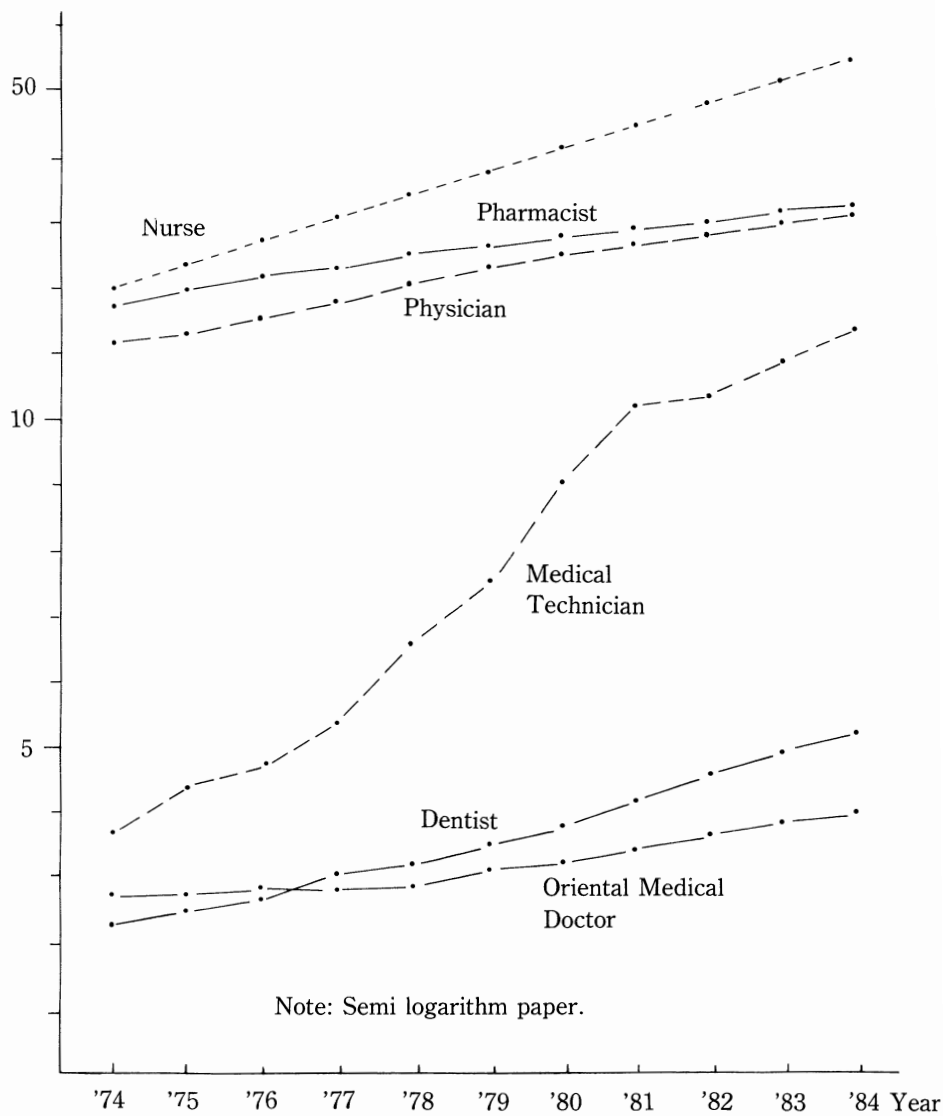
	5 Major cities			47 Cities			140 Counties (Guns)		
	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.
Physicians	67.4	86.0	46.9	39.2	108.7	13.0	14.5	42.5	1.1
Dentists	11.2	17.7	7.0	6.3	11.8	0	2.7	15.6	0
Nurses*	62.3	87.5	46.9	42.8	110.0	0	12.8	58.6	0
Pharmacists	61.6	74.4	43.3	28.9	59.5	0	8.9	22.0	0
Herb doctors	8.0	13.6	5.4	6.2	24.4	0	2.6	12.1	0
Midwives	5.2	7.9	2.4	4.2	21.8	0	1.8	18.5	0

* indicates registered number.

0 indicates less than 0.5 per 100,000 persons.

Source: Respective Professional Associations and the Ministry of Health and Social Affairs.

Figure 2.1.2. Health Manpower in the Republic of Korea, 1974-84



Source: Ministry of Health and social Affairs, Statistical Yearbook, 1985.

Table 2.1.7. Medical Facilities per 100,000 Persons, the Republic of Korea, 1970-84

	Hospital*(Bed)	Clinic**	Oriental clinic	Midwifery
1970	0.70(51.3)	19.40	7.40	2.30
1973	0.63(53.7)	22.11	7.09	2.30
1975	0.49(60.2)	21.48	6.64	2.09
1977	0.66(72.8)	20.86	6.36	1.67
1978	0.77(82.3)	21.17	6.23	1.55
1979	0.82(87.8)	21.37	5.80	1.48
1980	0.86(99.7)	21.97	6.11	1.28
1982	0.98(114.4)	23.27	6.41	1.47
1984	1.21(169.9)	25.46	6.47	1.24

* indicates General Hospital, Hospital and Specialized Hospital.

** indicates Clinic, Dental Hospital and Dental Clinic.

Oriental Clinic includes Oriental Hospital Hospital also.

Source: The Ministry of Health and Social Affairs, Statistical Yearbook, 1977, 1981, and 1985.

Table 2.1.8. Distribution of Health Facilities, the Republic of Korea, 1983

Unit: per 100,000 persons

	5 Major cities			47 Cities			140 Counties(Guns)		
	Mean	Max.	Min.	Mean	Max.	Min.	Mean	Max.	Min.
Hospital	1.3	1.8	0.6	1.6	3.5	0	0.5	5.1	0
Clinic	24.7	27.5	18.4	19.3	27.3	7.0	8.0	19.4	1.1
Dental clinic	8.3	14.0	5.5	5.2	8.7	0	1.5	6.5	0
Herb clinic	7.2	12.5	3.0	5.8	18.7	0	2.3	7.7	0
Midwifery	2.2	3.1	0.7	2.2	8.4	0	0.8	5.2	0
Health center	0.4	0.6	0.2	0.7	2.8	0	11.8	35.7	0.7
Drug store	49.7	66.9	41.3	34.1	55.8	0	12.8	36.1	0
Bed	196.8	238.9	150.9	170.1	410.5	0	31.3	249.7	0

Health Center includes Health Sub-Centers.

0 indicates less than 0.5 per 100,000 persons.

Source: Respective Professional Associations and the Ministry of Health and Social Affairs.

2.2 Review of Korea's Population Programs*

A national family planning program in Korea was initiated and organized by the Ministry of Health and Social Affairs in 1962. Its goal was to reduce population growth rate as a means of accelerating economic development. Although there have been many changes in the program since its inception, the goal still remains the same, as restated by the successive Five-Year Plans.

In the development of Korea's population programs, the first half of 1960s was called the "clinical era" as most programs were clinically oriented. During this period, there was no substructure under the Gun (county) for providing contraceptive services and information. Population programs played a passive role as clients had to come to program centers.

The second half of 1960s was called the "field era" as the program structure was expanded into Eup (town) and Myon (township) level. During this period, family planning services were taken to clients in the field as field workers were posted in every Eup and mobile service clinics were organized in 1964 to take contraceptive services to remote areas.

The first half of 1970s may be called as the "expansion era" as existing programs were expanded in width and in depth. During this period, as family planning services were taken to the field in an increasing coverage and expanded in the scope of service, an ever increasing resources were expanded for population programs.

The second half of the 1970s may be called the "reorientation era." It was during this era that there was a growing awareness of the shortcomings of doing more of the same things. Policies designed to increase contraceptive efficiency and coverage and those designed to improve public information were thought to have reached a point of rapidly diminishing return. Fresh approaches designed to alter fertility behavior were felt to be called for. New channels, such as taxation, housing priority, tuition incentive system, etc., were used to change fertility behavior patterns.

The first half of the 1980s may be called the era of comprehensive "incentive

* This section and the following consist of up-dating and revisions of section 2.2 and 2.3 of the Chapter II of Kong Kyung Ro, *et al.*, "Integrated Population Program: Korean Country Report," August, 1982, Research Report submitted to International Development Research Center.

and disincentive systems.” The incentive systems introduced in the 1970s are expanded and formalized. Loan, housing, education, health care and welfare assistance programs are consolidated and expanded.

It is to be noted here that the family planning in Korea has often been cited as a success story. This is because it has received a main credit for the reduction of total fertility rate from 6.0 per woman in 1960 to 2.7 in 1981. In 1984, total fertility rate was 2.1 (See Table 2.2.1).

According to various surveys, the family planning practice rate reached 70 percent among the eligible families in 1985. It was 36 percent in 1973 (See Figure 2.2.1).

Table 2.2.1. Age Specific Fertility Rate

Age	1960 ¹⁾	1966 ¹⁾	1968 ²⁾	1970 ¹⁾	1973 ²⁾	1976 ²⁾	1978 ³⁾	1981 ⁴⁾	1984 ⁵⁾
15-19	37	15	7	13	10	10	11	12	7
20-24	233	205	146	168	146	147	167	161	162
25-29	330	380	301	278	301	275	273	245	187
30-34	257	242	201	189	220	142	104	94	52
35-39	196	150	120	101	88	49	35	23	8
40-44	80	58	65	39	19	18	11	3	1
45-49	14	7	7	7	3	1	1	0	—
TFR	6.0	4.2	3.9	3.9	3.9	3.2	3.0	2.7	2.1

Sources: 1) National Bureau of Statistics (NBS).

2) The Korean Institute for Family Planning (KIFP).

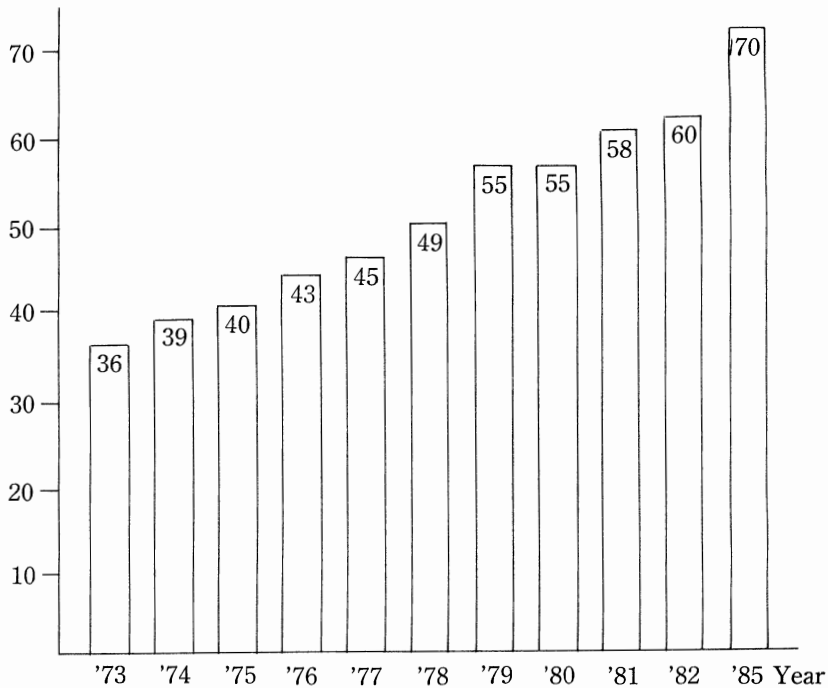
3) NBS and KIFP, 1974 Korean Fertility Survey.

4) The Korea Institute for Population and Health (KIPH), 1982 National Family Health Survey.

5) KIPH, 1985 National Fertility and Family Health Survey.

Figure 2.1.1. Family Planning Practice Rate in the Republic of Korea, 1973-85

Percent of
eligible women



Source: Fertility and KAP Survey in 1973, 76, 78, 79 (KIFP) Data Estimated in 74, 75, 77, 80, 83, (KIFP, KIPH) National Fertility and Family Health Survey in 1985 (KIPH).

2.3 Structure of Population Policy Making and Implementation in Korea

Since World War II until 1961, there has been little or no interest on the part of the Korean government in family planning. Even the importation of contraceptive devices had been banned in the fifties. The turning point came in 1961 when the Supreme Council for National Reconstruction initiated government's participation in family planning. In the following year, the Ministry of Health and Social Affairs (MOHSA) organized a national family planning program. The goal of the national population control program was to reduce the

population growth rate as a means of maximizing economic development. This goal, as restated in the successive Five-Year Plans, still remains the major objective of governmental programs of population control.

As the population control programs expanded, the number of government

Table 2.3.1. Fertility Control Programs in Korea

Policy measure	Program	Sponsoring Agency
Family Planning Program	Contractive service (1962)	MOHSA
	Information and education (1962)	MOHSA
Strengthening of Family Planning Program	Expansion of Delivery System (1971)	MOHSA
	Legalization of induced abortion (1973)	MOHSA
	Adoption of menstrual regulation (1974)	MOHSA
Population Education	Formal School education (1974)	MOE
	Non formal adult education (1977)	MOE
Institutionalization of Incentive and Disincentive Program	Income tax exemption for the small family (1976)	MOHSA
	Public housing priorities to the sterilized family (1977)	MOHSA
Augmented Incentive Program	Loan, housing and welfare assistance for the sterilized with two children or less (1982)	MOHSA
	Providing primary medical care to the children whose parent have been sterilized (1982)	MOHSA
	Providing free delivery service to the sterilized with one child and free medical care to this child until he/she is six years old (1985)	MOHSA

MOHSA : Ministry of Health and Social Affairs.

MOE : Ministry of Education.

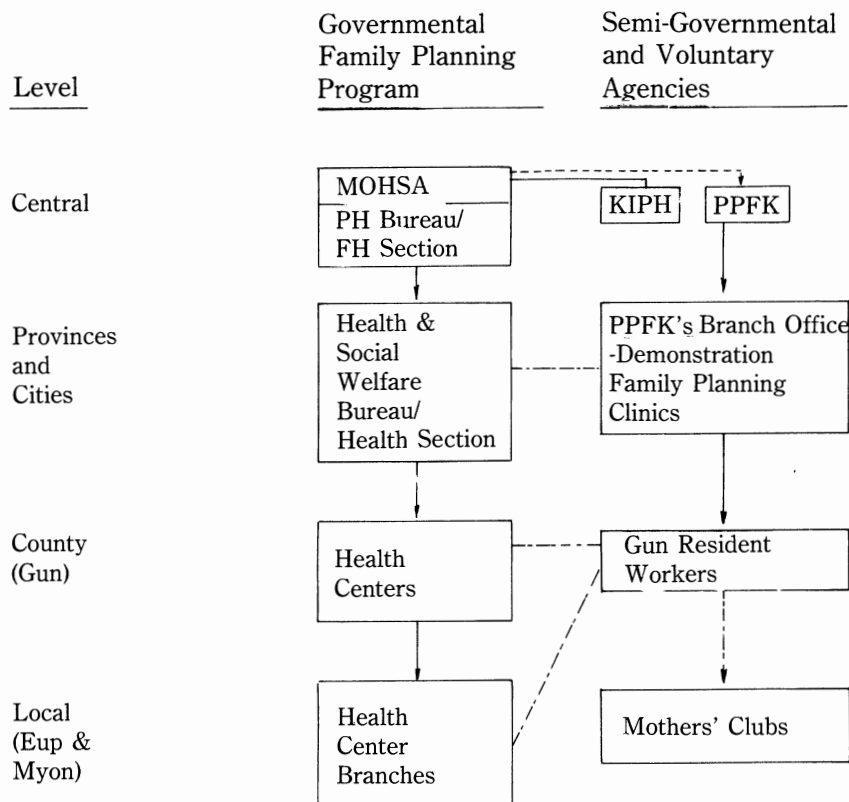
Sources: MOHSA, Statistical Yearbook, 1985, and Hong, S., Population Status report, Korean Development Institute, Seoul, 1978, p. 46.

and non-government agencies involved also increased. For example, the implementation of national programs at local level has been made through the Ministry of Home Affairs (MOHA). Population education has been conducted through the Ministry of Education (MOE). In carrying out incentive and disincentive programs for population policies, Economic Planning Board (EPB) is responsible for formulation of tax exemption system, but MOHA is responsible for implementing it. In assigning public housing priorities for population policies, the Ministry of Construction (MOC) and MOHA are both involved. Table 2.3.1 shows the historical development of population growth control programs and their sponsoring agencies.

In early seventies as the (agencies involved in) population programs increased, the government began to express an interest in and to recognize a need for a systematic and effective program management. Responding to this interest and need, the National Family Planning Center was established in 1970 to perform evaluation, research and training functions. In the following year, 1971, the Center was reorganized into the Korean Institute for Family Planning (KIFP). In 1981, KIFP was merged with Korean Health Development Institute (KHDI) to become the Korea Institute for Population and Health (KIPH). KIPH combines the twin functions of research evaluation and training in family planning and in health.

Figure 2.3.1 presents the organizational structure of family planning systems as existed in today (1985). Starting in 1970, there emerged many organizations involved in the population and other related programs. Therefore, the need to coordinate all population activities and to develop a comprehensive national population policy was widely recognized. In response to this recognized need, Population Policy Coordinators Committee (PPCC) was established in 1976. The PPCC is a cabinet level population committee chaired by Deputy Prime Minister-cum-Minister of EPB. This committee is an outgrowth of the Population Policy section established in the EPB in 1974 to coordinate the ministry's activities in the population field. In addition, to ensure that demographic variables and population policy be incorporated into development planning, the population Policy Secretariate (PPS) was established in the Korean Development Institute (KDI) in 1976. The PPCC never met, however, after its first organizing meeting, and its role fell de facto to the Population Policy Secretariat (PPS) of the Korean

Figure 2.3.1. Organization Chart of Family Planning System



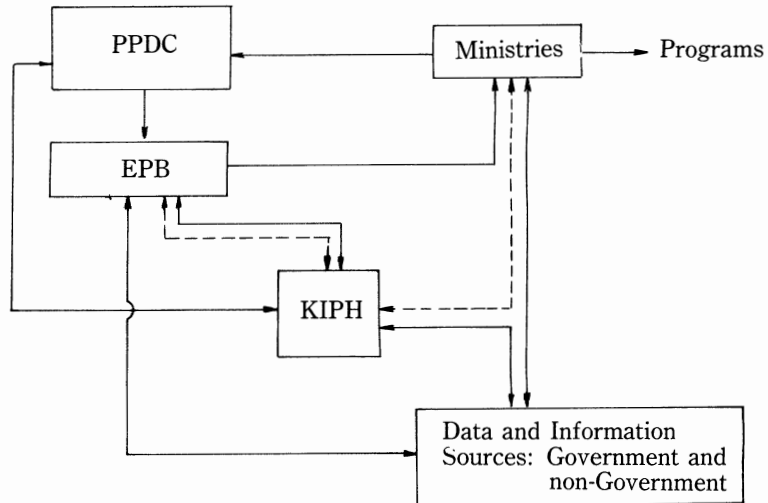
NB. _____ direct relationship
 indirect relationship
 - · - · - Cooperative relationship

KIPH : The Korea Institute for Population and Health.
 PPFK : Planned Parenthood Federation of Korea
 MOHSA : The Ministry of Health and Social Affairs

Development Institute (KDI). Today the PPCC has been replaced by the Population Policy Deliberating Committee (PPDC) and the KDI by two organizations, namely, the Korea Institute for Population and Health and the Korea Research

Institute for Human Settlement (See Figure 2.3.2).

2.3.2. Organizational Chart for Implementing Korea's Population Policy



----- Technical Assistance
 _____ Information Flows

PPDC : Population Policy Deliberating Committee
 EPB : Economic Planning Board
 KIPH : The Korea Institute for Population and Health.

Ministries: Ministry of Health and Social Affairs,
 Ministry of Home Affairs,
 Ministry of Education, Ministry of Construction, and Ministry of Agriculture.

Source: The Korea Institute for Population and Health.

2.3.1 The Administrative System of Family Planning Program-Program Evaluation and Supervision

The efficiency of the family planning work could be realized through the institution of the family planning target system and the program evaluation.

The target system alerts the family planning workers in all aspects of performing their services. The major concern of every worker is to achieve the monthly and annual target assigned to her. It is crucial for them to achieve the target because it becomes the standard for the assessment of their service performance. In a sense, the immediate goal for their job performance determines the scope of their activities.

Every year the national target for the number of acceptors of contraceptives is decided on the basis of the number of births averted by contraception in the year which will be necessary for achieving the national goal of fertility rate reduction. This is closely related to the national economic development plans. For example, during the fourth 5-year plan period of 1977-1982, the total fertility rate is planned to be reduced from 3.36 to 3.00. In order to achieve this goal it is estimated that at least 52 percent of the total married women must practice contraception. In terms of the national target of contraception, this is translated into 408,000-486,000 IUD's, 172,000-196,000 tubal ligations and 98,000-114,000 vasectomies per year and 467,000-537,000 cycles of oral pills and 249,000-287,000 condoms per month.

The total annual targets by methods are divided and assigned to each health clinic according to the population size and the previous year's achievement. Once the target is assigned to a clinic, it is more or less fixed. The assigned target is usually sub-divided to allocate a shared load to individual family planning workers. Every rural fieldworker and some general workers at urban health clinics have individual annual targets for each contraceptive method. Other urban workers have a collective target to achieve by group cooperation.

Every month, the monthly report from the city and province governments and the coupons sent from the health centers are evaluated at the Korea Institute for Population and Health and the evaluation results shown in Table 2.3.2 and 2.3.3 are sent back to the individual health centers.

The formal work organization of the field operation of the national family planning programme is centered around district health clinics. Under the leadership of the clinic director, family planning senior workers, general workers and field workers are lined up. The vertical order of the positions is clear showing a strict hierarchy of authority and functions. Senior workers and other are also supervised by the family planning section chief at the clinics on administrative

Table 2.3.2. Family Planning Evaluation for 1983 (City and Provinces)

City, province	Loop	Vasectomy	Female sterilization	Contraceptives	Target Vs performance (%)	Proportion of those who accepted sterilization with less than two children (%)	Program management	Total Points		
Seoul	47.7	92.5	99.5	728	749,249	672,521	89.8	73.1	5.0	70.3
Pusan	83.1	126.4	109.4	149.0	279,699	312,664	118.8	70.6	5.0	81.3
Taegu	125.3	110.6	97.8	109.6	148,620	155,541	104.7	68.0	4.8	78.4
Inchun	103.4	104.2	105.2	103.6	94,156	98,542	104.7	76.6	5.0	94.0
Kyonggi	111.6	156.3	135.7	120.5	324,938	440,937	135.7	70.8	4.9	98.7
Kwangwon	114.4	122.4	101.7	131.8	136,612	149,296	109.3	53.2	4.7	87.5
Chungbuk	117.3	99.9	96.0	116.9	107,990	108,892	100.8	55.3	5.0	84.4
Chungnam	245.4	121.9	117.3	106.7	228,320	306,365	134.2	61.5	4.7	97.3
Chungbuk	111.7	135.4	107.9	103.4	172,312	195,712	113.6	42.6	4.7	81.7
Chunnam	103.7	101.6	105.0	106.2	281,238	293,250	104.3	39.1	4.5	77.4
Kyongbuk	113.8	88.6	83.3	105.6	252,936	226,905	89.7	48.9	4.9	74.3
Kyongnam	137.1	114.5	106.5	161.1	264,320	305,155	155.4	57.1	4.7	87.9
Jeju	179.5	53.4	58.8	167.1	36,610	29,327	80.1	52.4	4.6	64.7
Total	106.6	111.7	105.4	110.3	3,007,000	3,295,118	107.1	61.3	4.8	82.9

Table 2.3.3. Family Planning Evaluation

Method of evaluation	Point	Reference	No. of evaluation
(1) Target vs. performance	62 points	Monthly report	Quarterly
– Loop	15 points		
– Sterilization	30 points		
– Contraceptives	15 points		
(2) Over-achievement of target	10 points		
(3) Proportion who accepted sterilization with less than two children	25 points		
(4) Program management	3 points		
Total	100 points		

matters, and fieldworkers located at Myon sub-centers are also supervised by Myon officials.

There appears a dual system of supervision which is a result of local health administration. That is, the health clinic and its personnel are technically supervised by the Ministry of Health and Social Affairs on the one hand, and on the other, all local staffs are administrated under the domain of the Ministry of Home Affairs concerning the personnel recruitment and payment.

The efficiency in the organization support in the family planning work depends to a large extent on the communication between the staff members of the health centers, the efficiency in the decision-making and the apportionment of the family planning target. In the high performance area, the communication between the staff members was more efficient in that the opinion of the low-level staff members was held in esteem by the high-level staffs, and the vertical and the horizontal communication was in effect.

2.4 Supports from Rural Development Programmes

In Korea, the family planning program was efficiently conducted in conjunc-

tion with the Saemaul Movement and with the public health services in the rural areas.

The Saemaul Movement emphasizes the principle of hard work, self-help, and cooperation among the community members for the development of the village, community, and the country as a whole. It is through practice rather than through pure theory. Under the strong leadership of community member, the Saemaul Movement presupposes the active participation by every community member.

In a sense, the family planning program can serve as a means of realizing the principle of the Saemaul Movement, because like the Saemaul Movement, the family planning program aims at changing attitudes of the community members for the development of the community, and hence need a strong administrative support.

The followings are the summary of the family planning works being carried out through the Saemaul community development movement.

- (1) The family planning supply system has fully made use of the Saemaul community development organization network.
- (2) The family planning work has been incorporated into the Saemaul community development project.
- (3) The family planning education has been designated as the required course in the Saemaul education programs.
- (4) The family planning supervision has been strengthened, since the evaluation of the annual family planning program performance has been included in the annual evaluation program for the Saemaul Movement.
- (5) In the industrial sites, the family planning program has been integrated into the industrial site Saemaul Movement program.
- (6) The exemplary villages and districts where the family planning programs are rated high are cited by the local governments, and a detailed analysis of the factors that contributed to the high family planning performance is made

The Saemaul Movement participates in the national family planning programmes through its mother's clubs. In 1967, mother's clubs were organized in the 16,868 villages throughout the country in an effort to induce the local people to actively participate in the village family planning activities. Up to that period,

the family planning works were mainly controlled by the central government with the result that the local people had no initiative in their local-level family planning programs.

For the organization of the mother's clubs, the Planned Parenthood Federation of Korea (PPFK) had designated the county family planning supervisors in the 139 counties in the country, and it is due to this mother's club organizations that Korea's family planning program made a great progress in the rural areas.

In an interview, a mother's club leader said of the activities of her mother's club in the following manner:

“In the village level the mother's club leaders have strong influence in the family planning activities, and therefore the family planning worker should seek an intimate cooperation with the mother's club leaders if they are to succeed in the family planning programs. For instance, when the family planning worker approaches a local village clients, the clients get much more open-minded to the family planning worker if accompanied by the village mother's club leader. The local people listen more carefully to what the mother's club leader says about contraception. They believe in what the mother's club leader says, even if they do not believe in what the medical doctors or the family planning workers say. The mother's club leaders keep open the channel of communication between the local clients and the family planning workers.”

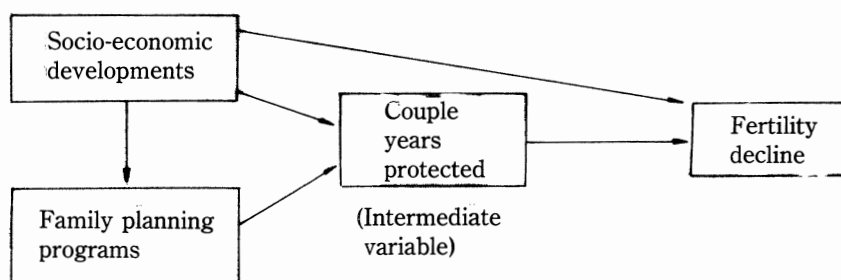
III. Multivariate Areal Analysis of the Fertility Decline

This section presents an analysis of the impact of the national family planning program and socio-economic development on recent fertility decline in Korea. To disentangle the effect of socio-economic and program factors on fertility, multivariate areal analysis was applied. This approach uses aggregate fertility level rather than individual level, using the geographical area as the unit of analysis, and it attempts to explain the variance of fertility among the different areas in terms of their socio-economic and program differences.

Areal analysis of this sort has been used for entire countries (Maudin & Berelson, 1978). The present study examines fertility differentials among administrative districts within the country. 169 administrative districts* are covered in this study.

3.1 Conceptual Framework of Analysis

The multivariate analysis conducted for this study consists of multiple regressions and path analyses. The model used for these analyses is as follows.



* Administratively, Republic of Korea is divided into 9 provinces and 4 metropolitan special areas. Each metropolitan special area is further divided into Gu and each province is divided into cities and Guns. Gun is a small administrative district in rural area.

According to this model, socio-economic developments influence the fertility decline through two channels: (a) directly which may or may not show in the couple years protected and (b) indirectly by influencing the establishment and performance of the family planning programmes.

3.2 Sources of Data and Definition of Variables

As the sources of data, we relied heavily on the publications resulting from the population census and the annual statistics compiled by local governments for their administrative purposes. We made numerous trips to local governments to obtain the data and clarification. Service statistics of the national family planning program are obtained from the data bank of Korea Institute for Population and Health. Estimates of fertility rates in small geographical areas are obtained from Bureau of Statistics, Economic Planning Board. Fertility estimates by the Bureau of Statistics derived from the population census using Own-Children Method. The types of data used for this study are as follows.

- 1) Output variables
 - (1) Estimates of TFR from BOS
- 2) Intermediate variables
 - (1) Program acceptors (by method)
 - (2) CYP (all method combined)
- 3) Input variables
 - (1) Program personnel
 - Number of family planning workers
 - (2) Physical facilities
 - Number of family planning service facilities classified by type
 - Physicians
- 4) Environmental variables
 - (1) Demographic variables
 - Percent of married women in ages 20-24
 - TFR (with time lag)
 - (2) Socio-economic development variables
 - Proportion of female who finished high school education
 - Percent of farm population

- Proportion of households having refrigerator
- Female labor force participation rate
- Industrial structure
- Farm mechanization
- Proportion of households having TV
- Number of telephone
- Percent of paved road
- Proportion of households with electricity
- Proportion of households having water supply facilities

3.3 Results of the Data Analysis

A series of multiple regressions are run to estimate the impacts of the family planning programmes and socio-economic developments on the fertility. These regressions may be grouped into the following three categories.

$$(1) \text{ Intermediate variable} = a + b_1 (\text{Socio-economic development}) + b_2 (\text{Family planning program}) + u$$

$$(2) \text{ Fertility decline} = a + b_1 (\text{Intermediate variables}) + b_2 (\text{Socio-economic development}) + b_3 (\text{Family planning program}) + u$$

$$(3) \text{ Fertility decline} = a + b_1 (\text{Intermediate variable}) + b_2 (\text{Socio-economic development}) + b_3 (\text{Family planning program}) + b_4 (\text{Fertility level}) + u$$

On the basis of the results of the above regressions, the three path models are developed and presented in Figures 3.1 through 3.3

The result of the first path analysis, when the output variable is represented by total fertility rate, is shown in a diagram (Figure 3.1), showing the variables in order of causal sequence. Each variable occurs earlier in time than those appearing to the right of it and can be affected by all the variables that precede it. The model assumes that the total fertility rate of an area is affected, among other things, by four sources: (1) percent of married women at ages 20-24, (2) the program performance as represented by couple years of protection, (3) program input, which is measured by family planning workers per 1,000 women

in reproductive ages, and (4) socio-economic development level of the area represented by the educational level of women, physicians per 100,000 population, the improvement of transportation mass media exposure and the proportion of farm households.

The proportion of married women at ages 20-24 serves as a control for nuptiality differences among areas which affect age-specific fertility rates. In addition, the intermediate variable, namely, program performance (CYP) is viewed as being affected by program input. It is also assumed that the above five selected development variables influence fertility directly or indirectly through nuptiality, program performance and program input.

The second path analysis is conducted using the fertility decline as the final output variable. The third analysis includes the variable representing the current level of fertility. The path models for the above are presented in Figure 3.2 and 3.3. They need no further explanation.

The path coefficients for the first path model is presented in Table 3.1. As shown in the table, among the eight (8) variables which are found to significantly influence the output variable (TFR), path coefficient between educational level of women and fertility level is the highest (-0.63). The second most significant factor influencing fertility level is percent of married women in ages 20-24 (0.31). The third most important factor is percent of farm population residing in the area (0.22). The path coefficient between the program performance and fertility level is 0.04 , after controlling for the socio-economic development variables and nuptiality differences. Statistically, this indicates that the effect of the program performance is relatively less important in explaining the variance of TFR of each area than socio-economic development variables. However, we need a caution in interpreting the above path coefficients. Since we are discussing fertility level, note that this is the result of cumulative effects of the socio-economic change and program performance since the start of the national family planning program in 1961. As explained, the acceptance of the government family planning program was high in the rural area during 1970s, and in this area, fertility level is still high. Therefore, it is expected that the effect of the program on fertility variation is less important when controlled for major socio-economic factors.

To eliminate cumulative effects of both the socio-economic factors and program effort on fertility, fertility change is inserted as the final output variable

Figure 3.1. Path Model for the Measurement of Impact of Development and Family Planning Program on TFR, 1976-80, Korea

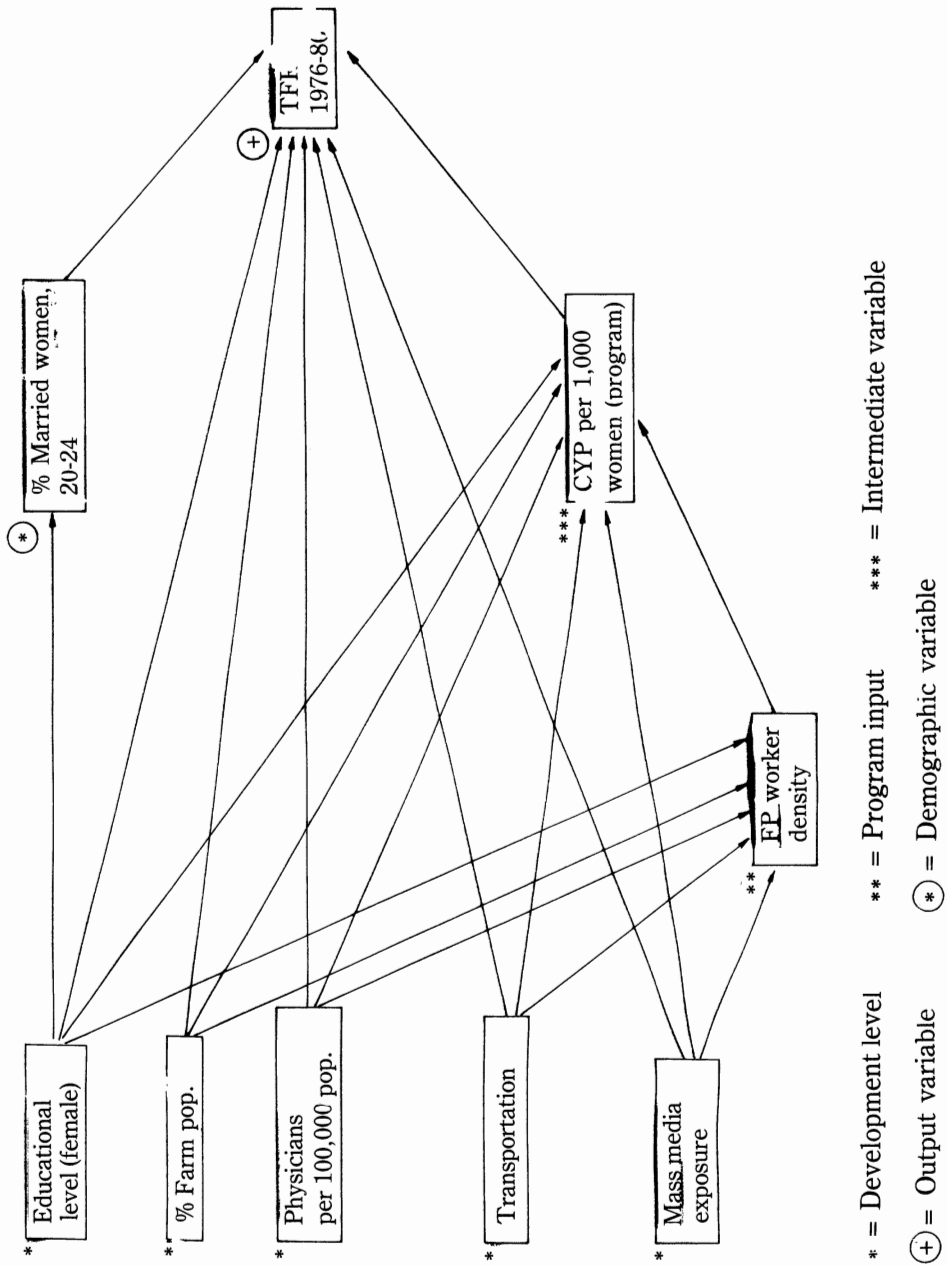


Figure 3.2. Path Model for the Measurement of Impact of Development and Family Planning Program of Fertility Decline, 1970-1980, Korea

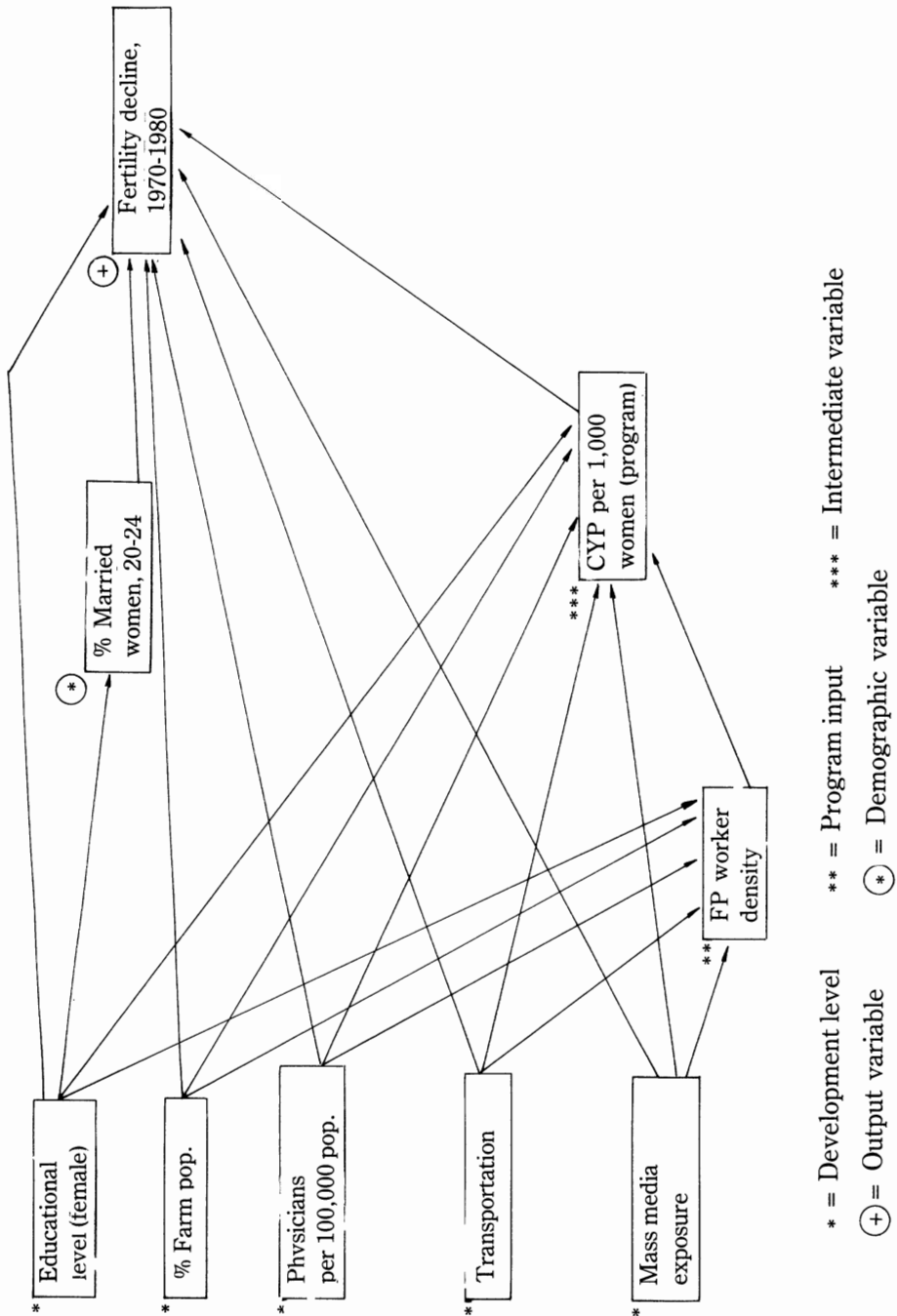


Figure 3.3 Path Model for the Measurement of Impact of Development, Level of Fertility and Family Planning Program on Fertility Decline, 1970-1980, Korea

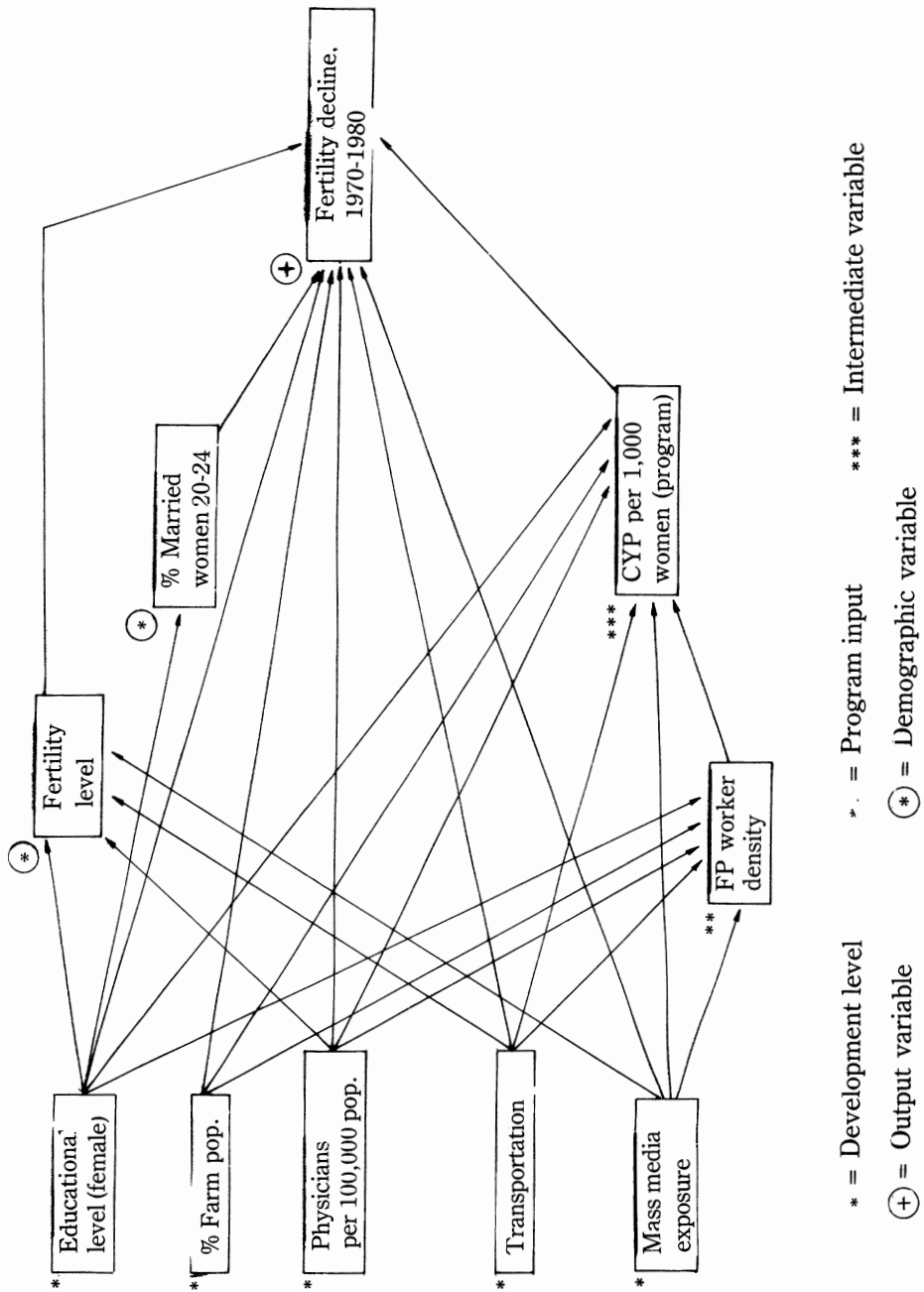


Table 3.1. Path Coefficients of the Socio-Economic Developments and Family Planning Program on TFR

	Path	Path coefficients
Educational level	→ % Married women (20-24)	-0.91
"	→ Family planning worker density	-0.57
"	→ CYP per 1,000 eligible women	-0.35
"	→ TFR	-0.63
% Farm population	→ Family planning worker density	-0.02
"	→ CYP per 1,000 eligible women	-0.01
"	→ TFR	0.22
Physicians per 100,000 population	→ Family planning worker density	-0.14
"	→ CYP per 1,000 eligible women	-0.02
"	→ TFR	0.20
Transportation	→ Family planning worker density	-0.17
"	→ CYP per 1,000 eligible women	0.05
"	→ TFR	0.05
Mass Media exposure	→ Family planning worker density	-0.05
"	→ CYP per 1,000 eligible women	-0.04
"	→ TFR	0.01
% Married women (20-24)	→ TFR	0.31
Family planning worker density	→ CYP per 1,000 eligible women	0.50
CYP per 1,000 eligible women	→ TFR	0.04

in the second path model. According to this model, the coefficient between the program performance and fertility change is found to have the highest value (0.36) among variables inserted into the model (Table 3.2). Even though the model explains only 14 percent of the variations in fertility reduction among districts, it indicates that the national family planning program is the main forces behind fertility reduction occurred during the period of 1970s in Korea, after controlling for the socio-economic factors.

Among the socio-economic variables, the density of physicians is found to be the next most important variable. This indicates that the improvement of health manpower is more influential for the fertility reduction than other development variables such as educational level, income level, the improvement of transportation and mass media exposure.

Table 3.2. Path Coefficients of the Impact of the Socio-Economic Development and Family Planning Program on Fertility Decline: 1970-1980

Path		Path coefficients
Educational level	→	Fertility decline -0.05
% Farm	→	Fertility decline 0.01
Physicians per 100,000 population	→	Fertility decline 0.20
Transportation	→	Fertility decline -0.07
Mass media exposure	→	Fertility decline 0.001
% Married women	→	Fertility decline 0.01
CYP per 1,000 eligible women	→	Fertility decline 0.36

Table 3.2a. R² of Various Factors Affecting Fertility Decline

Variables	R ²	R ² change
CYP (program)	0.110	0.110
% Farm population	0.110	0.000
Educational level	0.110	0.000
Transportation	0.119	0.009
Physicians	0.136	0.017
Mass Media exposure	0.136	0.000
% Married women	0.137	0.000

The relative contribution of the family planning programmes to the fertility decline vs. socio-economic development is analyzed from another angle using the coefficient of determination of regression, namely, R². The result as shown in Table 3.2a indicates that the intermediate (program) variable, namely, the

couple years protected has the highest R^2 with 0.11. The five socio-economic development variables have the total R^2 of 0.026. Thus, to the extent to which a district family planning program is responsible for the couple years protected of the district, the program is found to have contributed to the fertility decline more than the five socio-economic development variables combined. However, the fitness of the model as represented by the total R^2 is disappointingly small at 0.137.

In order to assess the impacts of socio-economic developments and the family planning programmes during the most recent years, the fertility level is also inserted as a factor influencing the fertility decline. The result, as shown as the path coefficient in Table 3.3, indicates that the fertility level during 1970-74 has the greatest impact on the fertility decline during 1970-80. the next most significant variable impacting on the fertility decline is housewives' educational level. The intermediate variable, namely, couple years protected, has fallen in its estimated impact to 0.07.

Table 3.3. Path Coefficients of the Impact of the Socio-Economic Development, Level of Fertility and Family Planning Program on Fertility Decline: 1970-1980

	Path	Path Coefficient
Educational level	→ Fertility level (1970-74)	-0.79
"	→ Fertility decline (1970-80)	0.42
% Farm population	→ Fertility level (1970-74)	-0.02
"	→ Fertility decline (1975-80)	-0.15
Physicians per 100,000 population	→ Fertility level (1970-74)	0.24
"	→ Fertility decline (1970-80)	-0.09
Transportation	→ Fertility level (1970-74)	-0.05
"	→ Fertility decline (1970-80)	-0.05
Mass media exposure	→ Fertility level (1970-74)	-0.01
"	→ Fertility decline (1970-80)	-0.01
% Married women (20-24)	→ Fertility decline (1970-80)	-0.21
CYP per 1,000 eligible women	→ Fertility decline (1970-80)	0.07
Fertility level (1970-74)	→ Fertility decline (1970-80)	1.09

This new model which includes the fertility level is also analyzed with an examination of R²s. The result as shown in Table 3-3a indicates that the fitness of the model improved a great deal from 0.137 to 0.760. R² for the couple years protected remains same as is the case for the socio-economic development variables.

Table 3.3a. R² of Various Factors affecting Fertility Decline

Variables	R ²	R ² change
CYP (program)	0.110	0.110
% Farm population	0.110	0.000
Educational level	0.110	0.000
Transportation	0.119	0.009
Physicians per 100,000 pop.	0.136	0.017
Mass media exposure	0.136	0.000
Fertility level	0.735	0.598
% Married women (20-24)	0.760	0.024

Finally, the factors affecting the intermediate variable, namely, the couple years protected, are studied. The result, as shown in path coefficients in Table 3.4, indicates that the most important variable impacting on the CYP is the family planning worker density. Since the CYP is shown to have the greatest impact on the fertility decline (Table 3.2), the family planning programmes, as represented by family planning worker density, is shown to exert a significant impact on the fertility decline through the intermediate variable. It is also to be noted that the most important socio-economic variable impacting on the CYP is the housewives' educational level, as was the case for its impact on the fertility decline (See Table 3.2).

However, when the current level of fertility is inserted into the model, it is the number of physicians per 100,000 population which is shown to have the greatest impact on the fertility decline among the socio-economic variables (See Table 3.3).

To look at the relative contribution of the family planning programmes and socio-economic development to the fertility reduction, a multiple regression is

Table 3.4. Path Coefficients of the Impact of the Socio-Economic Development and Family Planning Worker Density on Couple Years of Protection per 1,000 Eligible Women: 1970-1980

	Path	Path Coefficient
Educational level	→ Family planning worker density	-0.50
"	→ CYP per 1,000 eligible women	-0.19
% Farm pop.	→ Family planning worker density	-0.02
"	→ CYP per 1,000 eligible women	-0.01
Physicians per 100,000 population	→ Family planning worker density	-0.06
"	→ CYP per 1,000 eligible women	0.07
Transportation	→ Family planning worker density	-0.19
"	→ CYP per 1,000 eligible women	0.06
Mass media exposure	→ Family planning worker density	-0.06
"	→ CYP per 1,000 eligible women	-0.04
Fertility level	→ CYP per 1,000 eligible women	0.20
Family planning worker density	→ CYP per 1,000 eligible women	0.53

run with the family planning acceptance level as the dependent variable. When the coefficient of determination of the regression (i.e., R^2) is examined, about 60 percent of inter-area differences in the program acceptance level is explained by the family planning worker density (See Table 3.5). Five variables representing the socio-economic development add only 5 percent to R^2 . Of these five variables, the housewives' educational level is again the most important factor in explaining the inter-area differences in the program acceptance level.

Table 3.5. Changes in R² of the Regression Where the Dependent Variable is the Program Acceptance Level

Variables	R ²	R ² change
FP worker density	0.596	0.596
% Farm population	0.612	0.016
Educational level	0.646	0.034
Transportation	0.648	0.001
Physicians	0.648	0.000
Mass media	0.650	0.001
Fertility level	0.672	0.022

IV. Determinants of the Efficiency of the Family Planning Programmes

This section analyzes the determinants of the efficiency of the family planning programmes. In order to analyze the determinants of programme efficiency, first, one has to define the programme efficiency. In this study, program efficiency is defined in terms of input-output analysis.

4.1 Areal Efficiency Index

Out of a number of possible input-output analyses such as productivity measures (couple years of protection per man -hour) and cost effectiveness measures (cost per CYP), an efficiency index is adopted for this study. The efficiency index is based on the differences between the actual observed output of the program and the output expected on the basis of some estimated statistical relationship between environmental factors and the output.

Productivity and cost effectiveness measures are appropriate to indicate the levels of cost associated with the program scale and efficiency with which resources are used in a given program at given scale of operation. However, the principal drawbacks of these ratios are that they do not always allow for a distinction between the role of scale and other factors affecting the efficiency. They fail to take account of the particular circumstance affecting the program performance of an area.

The efficiency index described above overcomes these problems. The estimation procedure used to derive the efficiency index is that of multiple regression such as below.

$$E = f (D_i, S_j)$$

where E is program performance per family planning worker, D_i is demographic condition (fertility level), S_j is socio-economic development level.

This equation is used to calculate the expected level of program performance per worker in a program subunit area. The deviation of the actual output from

that expected is the measure of the program efficiency.

For the selection of the variables affecting the program performance per worker, the path model presented in Figure 4-1 is used. As shown in the path model, (Socio-economic) environmental variables inserted in the model are: percent of farm population, transportation condition, the educational level of women and physician density. The fertility level is also included in the prediction equation.

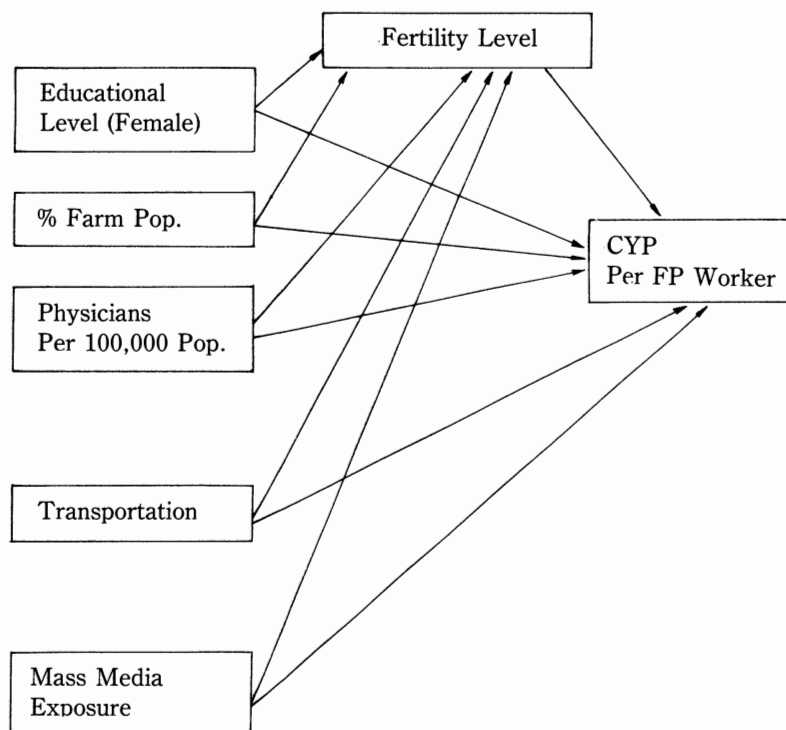
The estimated b coefficients of the prediction equation is as follows:

$$E = -1547 + 1689 \text{ TRAN} - 1005 \text{ FARMP} + 55 \text{ TFRI} + 14567 \text{ EDUCP} + 14 \text{ DOCP}$$

where E: Cumulative CYP per worker during the period of 1970-1979.

TRAN : % of paved road

Fig. 4.1. Path Model for the Measurement of Impact of Socio-economic Developments and Fertility Level on Couple Years of Protection Per Family Planning Worker, 1970-1980, Korea



FRAMP: % of farm population

TFRI : Total fertility rate in 1971-1975

EDUCP : % of women completed high school

DOCP : physicians per 100,000 population

By calculating the difference between the actual output level (CYP per FP worker) and the expected output level derived from the above equation, an efficiency index for each subunit area of the national family planning program is obtained. Then, according to the index, each subunit area is ranked. The result is presented in the appendix to this chapter.

4.2 Programme Features Associated with High vs. Low Performance Area (According to Ranking by the Efficiency Index)

Before undertaking a cause-effect type of analysis of the factors affecting the output as measured by the efficiency index, an analysis of various aspects of the program of high and low performance area is conducted. This analysis, conducted with frequency distribution, provides the knowledge of differences in various factors between the low and high performance area and leads one to recognize what factors are likely to make an area a high performance area and another a low performance area

4.2.1 Program Staff Characteristics of High vs. Low Performance Program Areas

As expected, family planning workers in the high performance areas tend to be more educated, younger, and receive family planning training more often than those in the low performance areas (See Table 4.1).

The program staff's commitment to his or her work, job satisfaction and interpersonal relationship with the designated doctors, community leaders and Mother's Club leaders show a similar difference between the high vs. low program performance area. Those in the high performance areas tend to be more committed to their work, more happy with their job and get along better with others than those in the low performance areas (See Table 4.2).

An examination of Table 4.2 shows that the relationship with other profes-

sionals and community leaders is a very important factor associated with the program performance.

Table 4.1. Percent Distribution of Program Staff's Personal Characteristics in the High vs. Low Performance Areas

	High performance area	Low performance area
Educational level of the staff		
Middle school	10.0	25.0
High school	52.5	64.3
University and higher	37.5	10.7
Age of the staff		
15-29 years	46.4	12.5
30-34 years	21.4	35.0
35-39 years	14.3	27.5
40 years and over	17.9	25.0
Whether the staff received family planning training or not		
Received	78.6	67.5
Not received	21.4	32.5

The relationship and interaction among the program staff are also an important factor influencing the performance. As shown in Table 4.3, those in the high performance areas tend to have a more satisfactory relationship and interact more satisfactorily with their superiors.

4.2.2 Program Support from Rural Development Programmes

In addition to socio-economic developments, there are other environmental factors influencing the program output. In Korea, they are the support offered to the family planning programmes from rural development programmes.

The most prominent rural development program is Saemaul Undong (New Village Movements). The Saemaul Undong has actively supported the national family planning programmes in the rural area through its Mother's Club (See

Table 4.2. Percent Distribution of Program Staff's Professional Characteristics in the High vs. Low Performance Areas

	High performance area	Low performance area
Commitment to family planning work		
Regard as life-time work	59.0	32.1
Would stop family planning work sooner or later	41.0	67.9
Satisfaction with salary		
Dissatisfied	14.3	62.5
Neither satisfied nor dissatisfied	67.9	32.5
Satisfied	17.9	5.0
Relationship with designated medical doctors		
Not so good	7.4	2.6
Good	18.6	64.1
Very good	74.0	33.3
Relationship with community leaders		
Not so good	3.6	10.3
Good	46.4	59.0
Very good	50.0	30.7
Relationship with Mother's Club leaders		
Not so good	3.6	10.8
Good	39.3	51.4
Very good	57.1	37.8

Chapter II). As expected, the Saemaul Mother's Clubs are organized earlier, more active and strongly support family planning in the high performance areas than in the low performance areas (See Table 4.4).

4.2.3 Administrative Factors Influencing the Program Performance

The level of local government officials' interest in the family planning programmes is found to influence the performance. The level of interest in the program of the local health center directors, Eup and Myon leaders and city mayors and county chiefs is higher in the high performance areas than in the low performance areas. The difference in the level of interest between the high vs. low performance area tends to be higher for the officials in the small districts than in the large districts (See Table 4.5).

Table 4.3. Percent Distribution of Staff Relationship in the High vs. Low Performance Areas

	High performance area	Low performance area
Communication with the high-level staff		
Always freely communicate	42.5	32.1
In general, freely communicate	50.0	46.4
Not always freely communicate	7.5	17.9
No free communication at all	—	3.6
Participation in decision-making		
Lower-level staff opinions are always held in high esteem	60.4	35.7
In general, the lower-level staff opinions are heard	21.6	21.4
Sometimes, the lower-level staff opinions are never sought	15.4	35.7
The lower-level staff opinions are never sought	2.6	7.1

22

Table 4.4. Establishment Dates and Activities of the Saemaul Mother's Clubs in the High vs. Low Performance Areas

	High performance area	Low performance area
Year the mother's club was organized		
Before 1971	44.5	32.0
Between 1972 and 1975	41.3	47.9
After 1976	14.2	20.1
Level of activities of the mother's club members		
Very active	31.7	18.2
Active	25.4	36.4
Middling	36.5	40.3
Not so active	4.8	2.6
Not active at all	1.6	2.6
Types of the mother's club activities		
Family planning	29.9	19.0
Local community service	9.1	7.9
Saemaul work	13.0	12.7
Village products sales work	1.3	1.6
Lectures	11.7	14.3
Community development program	7.8	12.7
Savings and household work	27.3	31.8

Table 4.5. Level of Interest of the Local Government Officials in their Family Planning Work

	High performance area	Low performance area
City mayor and county chief's level of interest		
Low	—	—
Middle	28.6	33.3
High	71.4	66.7
Health center director's level of interest		
Low	4.8	4.8
Middle	14.3	28.6
High	81.0	66.6
Eup and Myon leader's level of interest		
Low	9.5	7.7
Middle	33.3	53.8
High	57.1	38.5

4.3 Multivariate Analysis of Organizational Efficiency of the Family Planning Programmes

In order to analyze the organizational efficiency of the family planning program, a separate survey has been undertaken. With the new data, multivariate analysis is conducted using a framework of analysis constructed on the basis of the organization theory developed in management science. The aim of this study is to examine the organizational determinants of the program efficiency.

The organizational factors examined are as follows:

- 1) Competence of program officials
- 2) Monitoring and evaluation of program performance
- 3) Responsibility and authority of program officials

- 4) Importance of the program officials' role and responsibility
- 5) Opportunity to reflect the program officials' opinion in program implementation .
- 6) Hierarchical order and flexibility in division of work
- 7) Communication among the program officials and with other government agencies.
- 8) Utilization of staff's skills and abilities
- 9) Importance of the program result vs. procedure
- 10) Job satisfaction of the program officials
- 11) Interaction between program officials and target population
- 12) Functional duplication of family planning program
- 13) Perceived adequacy of budget for family planning program
- 14) Perceived priority of family planning program in national policies

The data on the above have been collected from a sample of government family planning program officials chosen on the basis of program performance. 12 health centers are chosen from the high performance area and another 12 from the low performance area. A total of 330 family planning program officials are interviewed, including chiefs of health centers, section chiefs of family health sections and family planning workers.

How the above organizational factors affect the program performance is analyzed by a dummy variable and the areal efficiency index. The dummy variable becomes one for the high performance area or zero for the low performance area.

The results of the study as shown in Tables 4.6 and 4.7 indicate that the morale, competence and responsibility of program officials are most important factors affecting the program performance, regardless of whether the performance is represented by the dummy variable or by the efficiency index. When the program performance is represented by the efficiency index, organizational system such as the emphasis on result vs. procedure and the suitable operation of program.

Monitoring and evaluation procedure is shown to be the next most important factors affecting the program performance. The program officials perception of priority given to the program and adequacy of the program budget are also shown to be important.

The fitness of the multiple regression model adopted for this study of

organizational aspects of the program is disappointing with R^2 of about 0.12. This may partly be due to the fact that the number of observation for the independent variables are 330, whereas that for the dependent variable is 24.

Although it is unlikely that the program officials would volunteer an honest opinion about the sensitive subjects of their organizational setup, this study indicates that one of the important factors affecting the program performance is organizational efficiency. A further study is called for about the method of improving organizational efficiency of the family planning programmes.

Table 4.6. Regression Analysis of the Organizational Factors Affecting Program Performance. The Performance is represented by a Dummy Variable Where the High Efficiency Area = 1, the Low Efficiency area = 0.

Independent Variable	b	Beta	SE(b)
Morale of the program officials	0.80E-01****	0.20	0.22E-01
Competence and responsibility of the program officials	0.64E-01***	0.15	0.24E-01
Perceived priority of family planning program	0.52E-01**	0.13	0.22E-01
Perceived importance of program officials' role and responsibility	0.11**	0.13	0.46E-01
Degree of utilization of program officials' skill and ability	0.41E-01*	0.11	0.20E-01
Multiple R = 0.347	b significance level		
R ² = 0.120	****	0.001	
Adjusted R ² = 0.106	***	0.01	
N = 320	**	0.05	
	*	0.1	

Table 4.7. Regression Analysis of the Organizational Factors Affecting the Program Performance. The Performance is Represented by the Areal Efficiency Index.

Independent Variable	b	Beta	SE(b)
Morale of the program officials	0.14****	0.17	0.46E-01
Competence and responsibility of the program officials	0.90E-01***	0.10	0.50E-01
Importance of program result vs. procedure	0.90E-01***	0.14	0.37E-01
Stepwise monitoring and evaluation of program	0.92E-01***	0.10	0.50E-01
Perceived importance of program officials' role and responsibility	0.21***	0.12	0.95E-01
Perceived adequacy of budget	0.83E-1***	0.10	0.45E-01
Degree of utilization of program officials' skill and ability	0.76E-01**	0.10	0.42E-01
Multiple R = 0.338	b significance level		
R ² = 0.114	****	0.001	
Adjusted R ² = 0.094	***	0.01	
N = 320	**	0.05	
	*	0.1	

**Appendix
to
Chapter IV**

**Listing and Ranking of Each Subunit Area
of the National Family Planning Programmes
According to the Efficiency Index**

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
Kyonggi	Suweon Si	6851	5368	.22	24
	Seongnam Si	7979	4048	.49	4
	Euijeongbusi	5304	5403	-.02	85
	Anyang Si	11424	5942	.48	5
	Bucheon Si	3950	5167	-.31	140
	Yeoju Gun	1752	2128	-.21	121
	Pyongtaek Gun	3121	3069	.02	78
	Hwasung Gun	1981	2255	-.14	107
	Shihung Gun	4613	4002	.13	44
	Paju Gun	2550	3388	-.33	143
	Koyang Gun	3238	3979	-.23	129
	Kwangju Gun	1639	2761	-.68	164
	Yonchun Gun	1497	2484	-.66	163
	Pochun Gun	1725	2673	-.55	156
	Gapyong Gun	1796	2385	-.33	143
	Yangpyong Gun	1592	2456	-.54	155
	Ichun Gun	1800	2506	-.39	149
	Yongin Gun	1666	2662	-.60	160
	Ansung Gun	1631	2520	-.55	156
	Kimpo Gun	1982	2708	-.37	148
Ganghwa Gun	1332	1629	-.22	127	
Ongjin Gun	716	1656	-1.31	168	
Kwangwon	Chuncheon Si	4892	5279	-.08	98
	Weonju Si	4875	4737	.03	76
	Gangleung Si	4655	4427	.05	71
	Sogcho Si	4480	3222	.28	15
	Chunsung Gun	1685	1910	-.13	106
	Hongchun Gun	1959	2757	-.41	150
	Hyongsung Gun	1887	3475	-.84	165

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
	Wyonsung Gun	1796	2804	-.56	159
	Yongwol Gun	2302	2651	-.15	108
	Pyongchang Gun	1973	2459	-.25	133
	Jongsun Gun	2614	2416	.08	65
	Chulwon Gun	2209	2984	-.35	145
	Hwachun Gun	1779	2335	-.31	140
	Yanggu Gun	1940	2422	-.25	133
	Inje Gun	1864	2703	-.45	152
	Kosung Gun	1933	1339	.31	13
	Yangyang Gun	1418	3204	-1.26	167
	Myongju Gun	2400	2554	-.06	100
	Samchuk Gun	3576	3000	.16	40
Chungbuk	Cheongju Si	5827	4707	.19	31
	Chungju Si	5319	3862	.27	18
	Cheongwon Gun	2413	1937	.20	28
	Boeun Gun	1808	1675	.07	68
	Okchun Gun	1862	2285	-.23	129
	Yongdong Gun	1910	2272	-.19	114
	Jinchun Gun	1829	1551	.15	40
	Goesan Gun	1984	1775	.10	57
	Umsung Gun	2322	2030	.13	44
	Jungwon Gun	1948	1524	.22	24
	Jewon Gun	2900	2148	.26	19
	Danyang Gun	2136	1942	.09	63
Chungnam	Daejeon Si	4792	5023	-.05	90
	Cheonan Si	4591	4010	.13	44
	Kumsan Gun	2035	1863	.08	65
	Deduk Gun	2377	3544	-.49	153
	Yongi Gun	2254	2727	-.21	121
	Kongju Gun	2513	2489	.01	80

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
	Nonsan Gun	2464	2516	-.02	85
	Puye Gun	1962	2185	-.11	103
	Suchun Gun	2046	2390	-.17	110
	Boryong Gun	2263	2378	-.05	90
	Chungyang Gun	1526	1225	.20	28
	Hongsung Gun	2127	2551	-.20	118
	Yeson Gun	1985	2328	-.17	110
	Susan Gun	2040	2238	-.10	101
	Dangjin Gun	1969	1727	.12	49
	Asan Gun	1964	2435	-.24	131
	Chunwon Gun	1813	2198	-.21	121
Chunbuk	Jeonju Si	4390	6121	-.39	149
	Gunsan Si	5424	4864	.10	57
	Iri Si	3797	5450	-.44	151
	Wanju Gun	2498	2083	.17	34
	Jinam Gun	1670	1755	-.05	90
	Muju Gun	2250	1744	.22	24
	Changsu Gun	1905	2578	-.35	145
	Imsil Gun	1600	1720	-.08	98
	Namwon Gun	2091	2500	-.20	118
	Sunchang Gun	1419	1626	-.15	108
	Jungeup Gun	2780	1919	-.05	90
	Kochang Gun	2541	1823	.28	15
	Puan Gun	2468	2184	.11	54
	Kimje Gun	2879	2871	.003	81
	Okgu Gun	2063	2463	-.19	114
	Iksan Gun	2458	2323	.05	71
Chunnam	Gwangju Si	6444	6071	.06	70
	Mogpo Si	5278	4743	.10	57

17

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
	Yeosu Si	5117	4285	.16	38
	Suncheon Si	4794	4305	.10	57
	Kwangsan Gun	2151	2683	-.25	133
	Damyang Gun	1682	2003	-.19	112
	Koksung Gun	1652	1979	-.20	118
	Kurye Gun	1428	1821	-.28	138
	Kwangyang Gun	1927	2038	-.06	94
	Yeucheon Gun	2374	1075	.55	2
Chunnam	Sungju Gun	2039	1528	.25	22
	Kohhung Gun	2537	1039	.59	1
	Bosung Gun	2015	2560	-.27	136
	Hwasun Gun	1823	1655	.09	63
	Janghung Gun	2142	1773	.17	34
	Kangjin Gun	2034	1815	.11	54
	Henam Gun	2515	1331	.47	6
	Yongam Gun	2000	1700	.15	40
	Muan Gun	2088	1653	.21	27
	Raju Gun	2332	2020	.13	44
	Hampyong Gun	2079	2140	-.03	88
	Yongkwang Gun	2036	2412	-.18	120
	Jangsung Gun	1818	1828	-.01	82
	Yando Gun	2669	1300	.51	3
	Jindo Gun	1715	1551	.10	57
	Sinan Gun	2317	1390	.40	9
Kyongbuk	Pohang Si	5652	5355	.05	71
	Gyeongju Si	3764	4208	-.12	105
	Gimcheon Si	2913	4813	-.65	161
	Andong Si	3869	6398	-.65	161
	Dalsung Gun	2121	2556	-.21	121

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
	Gunwy Gun	1699	1094	.36	10
	Eysung Gun	1782	1417	.20	28
	Andong Gun	1783	1518	.15	40
	Chungsong Gun	1756	1424	.19	31
	Yongyang Gun	1907	1418	.26	19
	Yongduk Gun	1915	1932	-.01	82
	Yongil Gun	2445	2028	.17	34
	Wolsung Gun	2259	2080	.08	65
	Yongchun Gun	2482	1667	.33	11
	Kyongsan Gun	2352	2998	-.27	136
	Chungdo Gun	1939	1733	.12	49
	Koryong Gun	1485	1307	.12	49
	Sungju Gun	1677	1214	.28	15
	Chilkok Gun	1920	2860	-.49	154
	Kumryong Gun	1532	1628	-.06	94
	Sunsan Gun	2007	1969	.02	78
	Sangju Gun	2177	2023	.07	68
	Munkyong Gun	2326	2077	.11	54
	Yechun Gun	1929	1571	.19	31
	Yongpung Gun	2368	1299	.45	7
	Bonghwa Gun	1737	1931	-.11	103
	Woljin Gun	2120	2808	-.32	142
	Wolryong Gun	953	1785	-.87	166
Kyongnam	Masan Si	6979	6120	.12	49
	Ulsan Si	7943	4494	.43	8
	Jinju Si	6487	4377	.33	11
	Jinhae Si	5783	5041	.13	44
	Chungmu Si	3826	3911	-.02	85
	Samcheonpo Si	2948	3514	-.19	114

Province	District Name	Observed CYP per worker (X1)	Predicted CYP per worker (X2)	Efficiency Index $E = \frac{X1-X2}{X1}$	Rank
	Jinyang Gun	1447	1710	-.18	112
	Eyryong Gun	1396	1328	.05	71
	Haman Gun	1613	1776	-.10	101
	Changryong Gun	1859	1808	.03	76
	Milyang Gun	2714	2314	.15	40
	Yungsan Gun	1702	2641	-.55	156
	Wolju Gun	2020	2151	-.06	94
	Kimhe Gun	2847	2736	.04	75
	Eychang Gun	2072	1860	.10	57
	Tongyong Gun	1775	1563	.12	49
	Kuje Gun	2130	2889	-.36	147
	Kohsung Gun	1456	1476	-.01	82
	Sachun Gun	1728	1803	-.04	89
	Namhe Gun	2587	1941	.25	22
	Hadong Gun	2104	1565	.26	19
	Sanchung Gun	1831	1527	.17	34
	Hamyang Gun	1964	2403	-.22	127
	Kuchang Gun	1637	1989	-.21	121
	Hapchun Gun	1693	1193	.30	15
Jeju	Jeju Si	4738	5187	-.09	100
	Bukjeju Gun	1854	2294	-.24	131
	Namjeju Gun	2641	3189	-.21	121

V. Summary and Conclusions

This study has set out to do two things. First, the study attempts to disentangle the impacts of the family planning programs on the fertility decline from those of changes in socio-economic conditions. Second, it attempts to find out what factors influence the performance of the family planning program in what way.

5.1 Summary of the Findings

5.1.1 Relative Contribution of the Family Planning Program vs. Socio-economic Development to the Fertility Decline

As mentioned in the Introduction, since one cannot conduct a controlled experiment, it is impossible to know exactly how much of Korea's fertility decline is due to the national family planning program and how much is due to changes in socio-economic conditions. This study uses multivariate areal analysis to sort out the relative contribution of the above two factors.

The reliability of the multivariate analysis depends on the reliability of the data and the appropriateness of the model used.

The data used for the study are the local governments' data for 168 administrative districts which coincide with the subunit areas of the national family planning programmes. Korean local government's data are as reliable as any government data could be at Korea's stage of socio-economic development. We believe the possible errors involved are minimal.

As for the appropriateness of the multivariate analysis model, in terms of the fitness of the model, the coefficients of determination ranges from 0.137 to 0.76 (See Tables 3.2a and 3.3a). The R^2 of 0.76 is very satisfactory. However, the model achieved this magnitude of the coefficient of determination by including the fertility level, which added 0.598 to the total R^2 . That is, it can be said that the program performance is generally good in the area where the fertility level

is high. When this variable is excluded, R^2 reaches only as high as 0.37 in explaining the inter-area difference in the fertility decline.

Given this not very satisfactory fitness of the model, the couple years of protection is the most important variable in explaining the inter-area difference in the fertility decline with addition to R^2 of 0.11. The socio-economic development variables in the model perform less impressively. The five socio-economic variables combined contribute only 0.026 to the total R^2 .

To the extent to which the family planning program is responsible for the couple years of protection (CYP), the intermediate variable in our model, the program should take the credit for the contribution of R^2 of 0.11 to the fertility decline. In order to estimate the extent of the program's contribution to the CYP, a path and regression analyses are undertaken with the couple years of protection and the family planning acceptance level as the dependent variables. The result as shown in Tables 3.4 and 3.5 indicates that the family planning worker density is mainly responsible for its inter-area differences in the fertility decline. In terms of R^2 , the family planning worker density contributes 0.596 out of the total of 0.672. In the path analysis, its path coefficient is 0.53.

As for the socio-economic development variables, the path analysis shows that they have negative impacts on the couple years of protection. This is because the family planning worker density is higher for the less developed areas than for more developed area.

In summary, it is difficult to say whether the family planning programmes or the socio-economic developments have contribute more to the fertility decline during 1970-80 in Korea. Although the programmes have a higher R^2 than the socio-economic variables, the overall fitness of the model is too low to conclude from the relative R^2 that the former outperforms the latter in reducing the fertility.

5.1.2 Analysis of the Operational Efficiency of the Family Planning Programmes

There have been many evaluative studies of the effectiveness of the family planning programmes in Korea. This study is different from the past studies in two aspects. First, it attempts to sort out the determinants of the program

efficiency which are endogenous to the program operation itself and those which are exogenous to the program operation such as socio-economic environments in which the program operates. This is done by constructing an efficiency index which is calculated on the basis of the difference between the output expected from the socio-economic environments of the program and that actually observed. Second, the organizational determinants of the program efficiency are separately studied within the framework of analysis constructed on the basis of organization theory of the firm as developed in the management science discipline.

For the first part of the operational efficiency study, 165 subunits (areas) of the national family planning programmes are ranked. According to the above efficiency index (See the Appendix to Chapter IV), then, the areas falling into the top quartile ranking are labeled as the higher performance areas and those falling into the bottom quartile as the low performance areas. The endogenous determinants of operational efficiency are examined through a comparative analysis of various factors between the high and low performance areas.

The result of the comparative analysis shows that the program officials' professional characteristic, the staff's communication with the superiors, the relationship between the program officials and mother's club members, and the level of government interest in the programmes are shown to influence the program performance as indicated by their significant difference between the high and low performance areas (See Tables 4.2 through 4.5).

The organization efficiency study is based on a separate survey of 330 family planning program officials in the high performance areas and the low performance areas. A path and regression analysis of the data are conducted.

The result confirms what has been expected from organizational theory of the firm. The morale and competence of the program officials are found to be the most important factors influencing the program output as measured by the efficiency index. The procedural matters such as the importance of the program result vs. procedure and the instituting a systematic monitoring and evaluation of the program are found to be the next most important factors. Finally, perception of the program officials as to the priority given to the programmes, the adequacy of the budget and the importance of the officials' role and responsibility is also turned out to be important (See Table 4.6 and 4.7).

5.2 Conclusions and Policy Recommendations

The conclusion of the study offers no new startling finding. It, however, confirms the widely accepted view that both the family planning programmes and changes in socio-economic conditions have played significant role in bringing down the fertility rate in Korea during the last decade.

The finding of the study cannot refute the argument that for a country like Korea, which has reached the take-off point in economic development, even if there is no strong family planning programmes, its fertility rate will reach that of the developed country sooner or later. We believe, however, that the pace of fertility decline is very important for Korea's future socio-economic development.

An estimate has it that an increase of a little more than 1.5 percentage points in the fraction of GNP invested is needed to offset the effects of a rise of 1 per cent point in the rate of population growth (Sommers and Suits, * 1971). Sommers and Suits' estimate of the additional investment required appears to be too low. The point to be made here is that not only valuable resources have to be spent just to offset the effect of population growth but also the speed and timing of fertility reduction would change the entire growth path of a country like Korea and may irrevocably give it a comparative economic advantage to her over other developing countries for a long time. The result of the study shows that the family planning program accelerates the pace of the fertility decline.

This study also shows that as the fertility level declines, achieving an additional decline becomes more and more difficult. The Korea Institute for Population and Health's data show that Korea's fertility rate declined rapidly during the sixties and seventies — 43.0 in 1960, 32.1 in 1970 and 23.4 in 1980. Recently, however, the rate of decline has decreased considerably (KIPH, 1985)**. To offset the rapidly diminishing return to the investment in family planning programmes, more resources for the programmes doing the same thing will not be enough. A fresh look at the all aspects of the family planning programme to make

* Sommers, P.M., and D.B. Suits, 1971, "A Cross-Section Model of Economic Growth," *The Review of Economic and Statistics*, Vol. 53, No. 2, pp. 121-128.

** Korea Institute for Population and Health, 1985, *1985 National Fertility and Family Health Survey Report*, Seoul, Korea.

it more effective in the changing context of socio-economic developments is needed.

The policy implications of this study may be stated in terms of allocative and operational efficiency of the program. In terms of allocative efficiency, should relatively more resources be invested in the family planning programmes or in socio-economic development programmes? To this crucial question, this study cannot argue for one at the expense of another. Instead this study shows that a more attention be paid in improving allocative efficiency within the family planning and socio-economic programme respectively.

Within the family planning programmes, the policy emphasis should be shifted from contraceptive efficiency to a broader population policy closely coordinated with socio-economic development. Note that the results of the study show that the support from the rural development played a significant role in improving the program performance. A closer coordination with rural and urban development program is called for. This results of the multivariate study show that the educational level of the housewife is the most important socio-economic variable in increasing the couple years of protection and in reducing the fertility. Therefore, in terms of allocative efficiency within the socio-economic development programmes, a higher or the highest priority should be given to women's education. As for the operational efficiency of the family programmes, the result of the study shows there is still a room for improvement in the organizational aspects of the programmes. The widely recognized important factors in the operational efficiency of the profit oriented organization, such as staff morale, job satisfaction, communication, coordination, and the procedural matters such as the emphasis on the result vs. procedure and the evaluation and monitoring system are all found to affect the operational efficiency of the subunits of the national family planning programmes. Efficient ways to improve these factors should be found and applied to improve the organizational efficiency of the family planning programmes.

It has widely been accepted the view that the family planning programmes and the programmes designed to accelerate socio-economic development have synergic effects on socio-economic welfare of the population.

Policies designed to improve women's education and the comprehensive population programmes undertaken in close cooperation with socio-economic

development policy would make each program mutually more effective. We believe that there is also a sort of take-off point in socio-demographic development through feed-back interactions. A better educated woman would reduce the fertility and the decline in fertility would improve the woman's education and the country's socio-economic condition. The feed-back and reenforcement process would have cumulative effects to accelerate the pace of the fertility decline and socio-economic development, once take-off point has been reached. Therefore population and development policies should be formulated to fully take advantage of this process of feed-back and reenforcement interactions.

