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The Pattern and Pace of Urbanization and  
Socio-economic Development : A Cross-Sectional  
Analysis of Development Since 1960

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by  
Koichi Mera

University of Tsukuba

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## 1. Introduction

It has been well documented that urbanization is closely associated with economic development, Chenery and Talyor [ 1968 ], World Bank [ 1972 ] and Chenery and Syrquin [ 1975 ]. In addition, I, Mera [ 1973 ], argued that from the viewpoint of economic development the expansion of urban agglomeration at a few locations would be beneficial and "even the largest metropolitan area in the world is likely to be less than the 'optimal size'"( p. 309 ). However, since then policy orientation in developing countries has shifted considerably from economic development to social development. Hence, there arises a need to examine the relationship of urbanization and urban agglomeration with social development.

The purpose of this paper is threefold : (1) to reexamine the above proposition with more recent and more comprehensive data, (2) to examine social as well as economic implications of urbanization and urban agglomeration and (3) to identify desirable policies on urbanization and urban agglomeration for specific types of developing countries classified by major characteristics of the countries.

The method of analysis is similar to the one used earlier ; the association of change in socio-economic development indices since 1960 with change in urbanization indices during the same period was examined for up to 103 developing countries. Four economic and six social development indices were used for measuring socio-economic development of each country. Changes in urbanization and expansion in urban agglomeration are measured by nine urbanization indices, which are aimed at measuring the overall urbanization, the growth of relative

or absolute large cities, the growth of medium-sized cities and that of small cities.

Each of the socio-economic development index was related to each of the urbanization index to see the degree of correlation. On the basis of the degree of correlation an attempt was made to group countries on major characteristics such as income level, the size of population and the degree of urbanization. Finally, policy implications are derived for each group of countries.

## 2. Data

The World Bank published a booklet, World Development Indicators, World Bank [ 1978 ], which contains measurements of change in a number of socio-economic indicators for 125 countries in the world from 1960 to about 1976. The book contains not only usual economic indicator, but also demographic and social indicators. Among the countries, "Industrialized Countries" and "Capital Surplus Oil Exporters" totalling 22 countries were excluded from consideration. The countries examined are listed in Appendix Table 1.

Out of the numerous indicators, the following indicators were selected as indices for representing the changes of the socio-economic status of the country. The changes are measured either by the growth rate or the difference in the level at two time points.<sup>1/</sup>

(1) RGNC : Average annual growth rate of real GNP per capita in percent from 1960 to 1973.

(2) RGDP : Average annual growth rate of real GDP in percent from 1960 to 1970.

- (3) DSIN : Difference in the percentage share of industry in GDP from 1960 to 1976.
- (4) DMEX : Difference in the percentage share of manufactured exports in merchandise exports from 1960 to 1975.
- (5) DSCH : Difference in the percentage of population enrolled in the primary school in the age group from 1960 to 1975.
- (6) DLTR : Difference in the percentage adult literacy rate from 1960 to 1974.
- (7) DLIF : Difference in the life expectancy in years at birth from 1960 to 1975.
- (8) DINF : Difference in infant mortality rate per thousand from 1960 to 1975.
- (9) DBTH : Difference in birth rate per thousand persons from 1960 to 1975.
- (10) DDTH: Difference in death rate per thousand persons from 1960 to 1975

The first four indices are considered for measuring economic aspects of development and the remaining six are for social aspects of development.<sup>2/</sup>

As variables for measuring changes in the pattern and pace of urbanization, the following variables are used :<sup>3/</sup>

- (1) DSUP : Difference in the percentage share of urban population from 1960 to 1975
- (2) GRUP : Average annual growth rate of urban population in percentage from 1960 to 1975.
- (3) RGUP : Average annual rate of " net rural-urban migration" in percentage from 1960 to 1975.<sup>4/</sup>

- (4) DPR1 : Difference in the percentage population share of the largest city in the country from 1960 to 1970.
- (5) DPR3 : Difference in the percentage population share of the three largest cities in the country from 1960 to 1970.
- (6) DPRM : Difference in the percentage population share of the cities with population of 100,000 and above in 1960 and excluding the three largest cities, from 1960 to 1970.
- (7) DLRG : Difference in the percentage population share of the cities with population of one million and above in 1960, from 1960 to 1970.
- (8) DMED : Difference in the percentage population share of the cities with population of 100,000 and above but less than one million in 1960, from 1960 to 1970.
- (9) DSML : Difference in the percentage population share of the urban population excluding those in the cities with population of 100,000 and above in 1960, from 1960 to 1970.

The first three variables are based on figures in World Development Indicators. Data on population of individual cities, needed for (4) through (9) were obtained from U.N. Demographic Yearbook. The population figures for specific cities are available only for once in several years, and therefore an attempt was made to obtain one for about 1960 and another between 1970 and 1975. On the basis of these population figures at two different time points, differences were computed for the

period of 1960 to 1970 with the assumption that city population changes at a constant rate. Therefore, the differences represented by the variables, DPR1 through DSML, should be interpreted to refer to changes from 1960 to sometime between 1970 and 1976, a period which is very close to the one in which the socio-economic development indices were measured.<sup>54/</sup>

In addition, the following three variables are used to characterize countries : <sup>6/</sup>

- (1) YPC : GNP per capita in 1960 in 1973 US dollars.
- (2) POP : Size of population in 1960 in 1000 persons.
- (3) SUP : Percentage share of urban population in 1960.

### 3. Correlation Analysis for All Countries

Association of the socio-economic development indices with the urbanization indices was identified by the level of significance of positive or negative correlation for each pair of a socio-economic development index and an urbanization index. The results are shown in Table 1. 33 pairs out of 90, 37 %, are found to have significant correlation at 5 % level. When a reduction in infant mortality, birth rate and death rate and an increase in all the other socio-economic development indices are defined to be a favorable change, as shown at the right columns of Table 1, then we are able to identify the desirability of each urbanization index.

Table 1 Significance of Correlation between Socio-economic Development Indices and Urbanization Indices : All Countries

	Significance of Correlation between Socio-economic Development Indices and Urbanization Indices : All Countries											Frequency of Pairs having Significant correlation		Range of Sample Sizes
	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Favorable	Unfavorable	Total	
DSUP	+	+	.	+	.	.	.	.	+	+	4	1	5	48-103
GRUP	-	.	.	+	+	.	.	+	-	-	3	2	5	48-103
RGUP	.	.	.	.	.	.	-	+	-	-	2	1	3	48-103
DPR1	.	.	.	+	.	+	-	.	-	-	5	0	5	38-73
DPR3	.	.	.	+	.	.	.	.	.	.	1	0	1	18-31
DPRM	.	.	.	.	.	.	.	.	.	.	0	0	0	18-31
DLRG	+	+	.	+	+	+	.	.	.	.	5	0	0	13-22
DMED	.	.	-	.	.	.	-	+	-	-	2	2	4	38-73
DSML	.	.	+	.	.	-	.	-	+	+	2	3	5	38-73
Frequency of Significant Correlation	3	2	2	4	2	3	3	3	5	6	24	9	33	

Notes; + refers to positive correlation at 5 % level of significance  
 - refers to negative correlation at 5 % level of significance  
 . refers to correlation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level  
 "favorable" refers to significant positive correlation for variables RGNC through DLIF and significant negative correlation for DINF, DBTH and DDTH.  
 "Unfavorable" refers to significant negative correlation for variables RGNC through DLIF and significant positive correlation for DINF, DBTH and DDTH.

Source : Appendix Table 1 and 2



The table shows that DPR 1 and DLRG are unambiguously associated with favorable socio-economic changes. In other words, the growth of the largest city and the growth of cities with more than one million inhabitants are desirable from the viewpoint of socio-economic development of the country as a whole. If we look the table in more detail, it can be said that the growth of the largest city tends to be associated more closely with social development and the growth of large cities ( greater than one million ) is more closely associated with economic development. General urbanization as represented by DSUP, GRUP or RGUP is generally related to socio-economic improvement, but the growth of medium and small cities, DMED and DSML, is more or less equally related to favorable and unfavorable changes.

#### 4. Classification of Countries by Country Characteristics

The results obtained so far are useful to some extent for formulating urbanization policies, but there are some ambiguity as to the association of some urbanization indices. Such ambiguity could be lessened by classifying countries by some common characteristics. Below, GNP per capita, the size of population and the share of urban population will be used as criteria for classifying countries.

We shall try to divide the countries into two groups by one criterion such as population size. The process of identifying the dividing size of population is as follows : let us imagine that the countries are divided by an arbitrary size such as 5 million, and examine the significance of positive or negative correlation for each pair of a socio-economic and an urbanization index. Then, for each specific pair, if

the level of significance obtained for one group such as "large countries" is improved relative to the one obtained for all countries, then the group of large countries is considered to be a more homogeneous group. By examining alternative size for division, the optimal dividing size can be identified for large countries. Similarly, the optimal dividing size for small countries can be identified for one pair of indices. Although there is no guarantee that countries can be divided mutually exclusively or exhaustively, an optimal dividing size can be found for large and small countries for each pair. Since there are at maximum 90 pairs, the optimal dividing size could be found by looking at the frequency distribution of optimal dividing sizes.

To simplify the procedure, the variables used for this purpose have been reduced to eight socio-economic development indices and three urbanization indices, yielding the total of 24 pairs. This reduction has been made on the basis of factor analysis of the nineteen variables. Among the factors identified, the variables which are highly correlated to the seven most significant factors have been selected, while paying attention not to represent any single factor by more than two. The selected variables are RGNC, RGDP, DSIN, DMEX, DSCH, DLTR, DBTH, DDTH and DSUP, RGUP, DPR1. The resulting frequency distribution are shown in Tables 2 through 4.

Table 2 shows that the countries need not necessarily be divided, i.e., the dividing GNP per capita is zero for higher income group and infinity for lower income group, but if they are to be divided, the dividing level should be somewhere between \$300 and \$400. Similarly,

Table 2

Frequency Distribution of  
Optimal Dividing Levels for  
Higher and Lower GNP per Capita  
Groups

GNP per capita in 1960 in 1976 US\$	Higher Group	Lower Group
0	9	n.a.
50	0	1
100	0	1
150	3	3
200	1	2
250	0	0
300	4	1
400	4	3
500	1	0
600	2	2
∞	n.a.	11
Total	24	24

Note: n.a. refers to not applicable.

Table 3

Frequency Distribution of  
Optimal Dividing Sizes for Larger  
and Smaller Country Groups

Population Size in 1960 in 1000 Persons	Larger Group	Smaller Group
0	2	n.a.
2,000	4	0
4,000	3	1
5,000	1	3
6,000	0	1
8,000	2	4
10,000	6	2
12,000	4	2
15,000	0	0
20,000	0	1
25,000	1	1
30,000	1	1
∞	n.a.	8
Total	24	24

Note: n.a. refers to not applicable.

Table 4

Frequency Distribution of  
Optimal dividing Levels for Country Groups

Share of Urban Population in 1960 in Percentage	Higher Group	Lower Group
0	6	n.a.
5	1	2
10	3	5
15	0	0
20	3	2
25	1	1
30	2	3
40	2	2
50	1	1
60	5	2
100	n.a.	6
Total	24	24

Note: n.a. refers to not applicable.

Table 3 indicates that if countries should be divided on the basis of population size, the dividing size is about 10 million. In terms of the level of urbanization, there is no clear indication of the optimal dividing level. But, 10 percent appears to be one good candidate.

##### 5. Corelation Analysis by Country Type

On the basis of analysis presented above, the countries are divided into two groups by each of GNP per capita, the size of population and the share of urban population observed at the beginning of the period of examination. The countries are divided into low income group and medium income group at GNP per capita of \$300 in 1960 in 1973 US dollars; and small and large country groups at the population of 10 million in 1960; and little urbanized and urbanized country groups at the share of urban population of 10 percent in 1960. The number of the pairs which have significant corelation are summarized by each urbanization index and by country type and shown in Table 5, and the original tables are contained in Appendix.

The division of the countries into two groups did not necessarily increased the incidence of significant corelation. The percentage of pairs having significant corelation ranges from 20 to 30, a significant reduction from 37 obtained for the "all countries" analysis.

However, the umbiguity of the direction of corelation with urbanization indices has been reduced for most country groups. The only country group which leaves substantial umbiguity is "small countries". For them, urbanization as a whole cannot be ascertained if it is a favorable or unfavorable change. Also the growth of medium and small

Table 5 Frequency of Pairs Having Significant Correlation of Socio-economic Development Indices with Urbanization Indices

Urbanization Index	Low Income Countries		Medium Income Countries		Small Countries		Large Countries		Little Urbanized Countries		Urbanized Countries			
	Fav.	Unf. Total	Fav.	Unf. Total	Fav.	Unf. Total	Fav.	Unf. Total	Fav.	Unf. Total	Fav.	Unf. Total		
DSUP	3	0	3	0	1	0	1	6	0	0	4	0	4	
GRUP	0	0	0	3	3	0	4	0	4	1	2	4	0	
GUP	0	0	0	3	3	2	1	3	1	0	1	2	3	
DPR1	2	0	2	4	4	2	1	3	6	0	6	5	0	
DPR3	4	0	4	0	0	0	1	3	0	0	0	1	0	
DPRM	4	0	4	0	0	0	1	1	2	0	0	0	0	
DLRG	3	0	3	4	4	0	0	2	0	2	0	5	0	
DMED	2	0	2	0	2	1	2	3	0	0	5	1	2	
DSML	0	0	0	1	2	3	5	1	1	2	2	0	2	
Total	18	0	18	16	4	20	8	11	19	23	3	26	13	4
Percentage of Pairs Having Significant Correlation	20		22	21	29	29	30							

Notes: " Fav." refers to significant positive correlation at 5 % level with variables from RGNC through DLIF and significant negative correlation at 5 % level with DINF, DBTH and DDTH.  
 "Unf." refers to significant negative correlation at 5 % level with variable from RGNC through DLIF and significant positive correlation at 5 % level with DINF, DBTH and DDTH.  
 " Total" refers to the sum of favorable and unfavorable frequencies.  
 "Low Income Countries" are those with per capita GNP in 1960 in 1973 US dollars of \$300 or less.  
 "Medium Income Countries" are those with per capita GNP in 1960 in 1973 US dollars above \$300.  
 "Small Countries" are those with population in 1960 of 10 million or less.  
 " Large Countries" are those with population in 1960 above 10 million.  
 " Little Urbanized Countries" are those with the share of urban population in 1960 of 10 % or less.  
 " Urbanized Countries " are those with the share of urban population in 1960 above 10 %.

cities should be viewed at least as mixed blessing and possibly unwelcome.

Fairly clear conclusions can be drawn for the other country groups. The general trend of urbanization, in whichever way it is measured as an increase in the share of urban population, the growth rate of urban population or the rate of net rural-urban migration, is overwhelmingly associated with favorable socio-economic changes of the country. A stronger case can be made for the large and primate cities. An increase in the population share of cities with more than one million population, DLRG, is found invariably associated with favorable socio-economic changes, and outside of small countries, an increase in the population share of the largest city in the country, DPRL, is also consistently associated with favorable socio-economic changes. The relationship of small cities is not so clear, but the evidence indicates that the growth of cities less than the population of 100,000, DSML, is more frequently associated with adverse socio-economic changes than otherwise.

More specifically, for low income countries, urbanization in any form is considered as a desirable change with possible exception of the growth of small cities, DSML. But, for medium income countries, the growth of small and medium-sized cities, DSML and DMED, would not be regarded as a favorable change. For large countries, urbanization in general is a welcome change and the growth in share of the three largest cities is also a good sign, but the growth of medium and small cities should receive mixed blessing. For countries with the share of urban population less than 10 percent, the urbanization itself may or may not be a welcome sign, but the growth of the largest city and the growth of the cities with population of 100,000 to one million

are definitely associated with desirable socio-economic changes. For this group, too, the growth of smaller cities does not appear to be a welcome change. The urbanized countries behave very much like the medium income countries, but with less ambiguity. There, in addition to general urbanization, the growth of the largest and large cities, the growth of the three largest cities appears to be a favorable phenomenon. But, the growth of medium and small cities does not appear promising.

#### 6. Economic Development versus Social Development

Let us now examine if the changes in the pattern and pace of urbanization favorable for economic development are also favorable or detrimental to social development and vice versa. Table 6 presents the frequency distribution of pairs of a socio-economic development index and urbanization index having significant correlation for the total of seven groups of countries shown in Tables 1 and 5. The cases of significant correlation are divided into two groups : those related to economic development indices which are RGNC, GRDP, DSIN and DMEX representing the growth of GNP per capita, the growth of GDP, the relative expansion of the industrial sector and the relative expansion of manufactures' export, and those related to social development indices which are the remaining six variables, representing the increase in primary school enrollment, literacy rate, life expectancy, and the reduction in infant mortality, birth rate and death rate.

The table does not show much inconsistency in the movement of social development indices and economic ones. The most clear-cut case is the increase in population share of cities over one million,

Table 6 Frequency of Pairs Having Significant Correlation of Socio-economic Development Indices with Urbanization Indices

	Economic Development Indices		Social Development Indices		All Development Indices		Percentage of Significant Countries
	Favorable	Un-F	Favorable	Un-F	Favorable	Un-F	
DSUP	12	0	5	2	17	2	27.1
GRUP	0	2	16	3	16	5	30.0
RGUP	0	0	12	3	12	3	21.4
DPR1	9	0	21	1	30	1	44.9
DPR3	7	0	2	1	9	1	16.7
DPRM	3	0	2	2	5	2	11.7
DLRG	8	0	11	0	19	0	31.7
DMED	2	4	9	4	11	8	27.5
DSML	2	2	4	11	6	13	27.5
Total	43	8	82	27	125	35	26.8
Percentage of Pairs Having Significant Correlation		21.3		30.5		26.8	

Notes : "Favorable" refers to significant positive correlation at 5 % level with variables from RGNC through DLIF and significant negative correlation at 5 % with DINF, DBTH and DDTH. "Un-F" refers to significant negative correlation at 5 % level with variables from RGNC through DLIF and significant positive correlation at 5 % level with DINF, DBTH and DDTH.



DLRG. In terms of economic as well as social development, it is associated with favorable changes. Another convincing case is the increase in the population share of the largest city, DPR1. It is also overwhelmingly favorably associated with economic and social development. Also, these two variables have highest probability of significant correlation.

The notable difference between economic and social development is found in the overall urbanization. Economic development is closely related to an increase in the share of urban population, i.e., DSUP, but social development is more closely related to the rate of urban population, i.e., GRUP and RGUP. The former variable can increase readily when the share of the urban population is in the middle range, but the latter group of variables can increase rapidly when it is in the lower range. Therefore, the above finding can be interpreted that the early stage of urbanization is related to rapid social development and the next stage of urbanization is more related to economic development. Finally, the growth of medium and small cities is frequently adversely related both to economic and social development.

On the whole, it can be concluded that although there appears to be some difference in timing between social and economic development, there is no observable tradeoff relationship between the two as far as urbanization issues are concerned. The concentration of urban population at a few large cities is found to be conducive to both economic and social development.

Finally, social development indices have higher probability of significant correlation with urbanization indices than economic development indices. Therefore, it can be said that urbanization is more of a social phenomenon than of an economic. A stronger case can be made for urbanization and urban concentration on social grounds than economic.

## 7. Conclusions

On the basis of the wealth of socio-economic development data provided by the World Bank and others, the indices of socio-economic development since 1960 were related to the indices of change in the pattern and pace of urbanization during the same period for up to 103 countries excluding industrialized and capital surplus oil exporting countries. The following conclusions can be drawn.

First, with wealthier and more recent data, the earlier finding of mine has been reconfirmed, i.e., the expansion of the largest city or of the cities with population above one million is found to be unambiguously related to economic development, with possible exception of small countries. Second, tradeoff relationship was hardly found between economic and social development. The expansion of the largest city or of the cities with population above one million is conducive to social development as well as economic development, and the general trend of urbanization is usually a favorable phenomenon for social and economic development. Third, the relative growth of cities with population below 100,000 and sometimes of those between 100,000 and one million are more frequently associated with unfavorable changes than with favorable socio-economic changes. The direction of causation is not clear, but the current orientation of many of urban policy makers to the development of small cities deserves serious re-examination.

Finally, the present paper presents a basis for classifying countries for the purpose of developing urbanization policies. Although the dividing lines used in this paper are tentative, it indicates that regularity of association is hardly identifiable for small countries, i.e., those with population of 10 million or less.

This paper presents a strong case for encouraging the growth of large cities on the grounds of both social and economic improvements. However, one important factor was not touched in this paper, the question of distribution of welfare as related to the pattern and pace of urbanization. This is totally due to unavailability of comparable data for a large number of countries.

Notes :

- 1/ See Appendix Table 1 for definition and sources as well as figures of the variables shown below.
- 2/ As an indicator for measuring social development, one for income or wealth distribution was sought, but none was available.
- 3/ See Appendix Table 2 for definition and sources as well as figures of the variables shown below.
- 4/ This variable is defined as the difference of the average annual growth rate of urban population from the country-wide average annual growth rate of population as a whole. To the extent the natural rate of population growth differs from rural to urban areas, the variable deviates from the net rural-urban migration rate.
- 5/ U.N. Demographic Yearbook sometimes contains two population figures for a specific city, city proper and urban agglomeration. Whenever available at two different years within two period examined, the figures for urban agglomeration are used.
- 6/ See Appendix Table 2 for definition and sources as well as figures of the variables shown below.

## REFERENCES

- [1] Beier, George, A. Churchill, M. Cohen and B. Renand, [1976] " The Task Ahead for the Cities of the Developing Countries," World Development 4:5 ( May ), pp. 363-409
- [2] Chenery, H. and Lance Taylor [1968], " Development Patterns: Among Countries and Over Time," Review of Economics and Statistics 50: 4 ( November ), pp.
- [3] Chenery, H and M. Syrquin [1975], Patterns of Development 1950-1970 ( London, Oxford University Press )
- [4] Mera, Koichi [1973] " On the Urban Agglomeration and Economic Efficiency," Economic Development and Cultural Change 21: 2 ( January ), pp. 309-324
- [5] U.N. Statistical Office [annual] Demographic Yearbook ( New York, United Nations )
- [6] World Bank (IBRD) [1972], World Bank Operations: Sectoral Programs and Policies ( Baltimore, Johns Hopkins University Press )
- [7] World Bank (IBRD) [1975], World Bank Atlas (Washington D.C., World Bank)
- [8] World Bank (IBRD) [1978], World Development Indicators ( Washington, D.C., World Bank )

Appendix Table 1 Data Used for Analysis: Socio-economic Development Indices

COUNTRY	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH
1 BHUTAN	+0.3	***	***	***	5.	***	8.	***	+2.	+7.
2 CAMBODIA	+1.8	3.8	***	***	-26.	***	4.	***	+2.	+4.
3 LAO PDR.	1.9	***	***	***	32.	***	0.	***	+2.	+1.
4 ETHIOPIA	2.4	4.4	3.	2.	18.	***	4.	***	+2.	+6.
5 MALI	1.0	2.9	7.	5.	15.	5.	3.	+3.	0.	+5.
6 BANGLADESH	+0.2	3.6	0.	***	26.	***	3.	***	+5.	+7.
7 RWANDA	0.3	***	15.	***	9.	13.	5.	***	+1.	+6.
8 SOMALIA	+0.2	1.0	+9.	-9.	49.	***	6.	***	0.	+5.
9 UPPER VOLTA	+0.4	1.5	6.	6.	6.	***	6.	***	+1.	+6.
10 BURMA	0.7	2.6	+1.	1.	29.	9.	***	***	+9.	+11.
11 BURUNDI	1.3	5.4	***	***	5.	0.	5.	***	0.	+6.
12 CHAD	+2.1	2.5	2.	***	21.	***	5.	***	+1.	+2.
13 NEPAL	0.4	2.5	***	***	17.	9.	8.	***	0.	+6.
14 BENIN	1.0	2.6	***	***	18.	***	7.	***	+2.	+7.
15 MALAWI	3.5	5.2	11.	***	+2.	***	6.	***	5.	+4.
16 ZAIRE	2.6	4.7	3.	2.	30.	***	4.	***	+3.	+5.
17 GUINEA	0.1	3.2	***	1.	-2.	***	7.	***	+1.	+7.
18 INDIA	1.3	3.6	3.	1.	24.	12.	8.	+17.	+8.	+6.
19 VIET NAM	0.6	***	***	***	***	***	5.	***	+1.	+5.
20 AFGHANISTAN	0.3	2.1	***	1.	14.	6.	2.	***	3.	+3.
21 NIGER	+1.9	2.7	14.	9.	12.	***	3.	+38.	0.	+2.
22 LESOTHO	3.8	7.0	***	***	19.	***	8.	***	2.	+5.
23 MOZAMBIQUE	3.3	4.8	6.	4.	4.	***	8.	***	0.	+4.
24 PAKISTAN	3.4	6.7	8.	33.	21.	5.	9.	+29.	+2.	+7.
25 TANZANIA	2.8	5.4	5.	***	33.	46.	8.	***	+4.	+8.
26 HAITI	+0.3	0.7	5.	34.	4.	10.	7.	+50.	+6.	+4.
27 MADAGASCAR	0.3	***	10.	-1.	28.	***	8.	+16.	0.	+7.
28 SIERRA LEONE	1.6	3.5	***	7.	12.	8.	8.	***	0.	+5.
29 SRI LANKA	2.0	4.6	5.	10.	-18.	17.	7.	+12.	+9.	+1.
30 CENTRAL AFR. EMP.	0.4	1.2	11.	22.	47.	***	6.	***	+3.	+7.
31 INDONESIA	2.4	3.5	17.	1.	14.	15.	8.	***	+7.	+6.
32 KENYA	3.1	7.1	5.	1.	62.	***	7.	***	+1.	+5.
33 UGANDA	2.1	5.1	+5.	***	4.	0.	7.	***	+2.	+6.
34 YEMEN ARAB REP.	***	***	***	***	17.	0.	8.	***	+1.	+8.
35 TOGO	4.4	8.5	5.	3.	54.	2.	7.	+6.	+1.	+6.
36 EGYPT	1.5	4.5	6.	24.	6.	20.	7.	+8.	+9.	+6.
37 YEMEN PDR.	***	0.4	***	***	65.	***	8.	***	+2.	+8.
38 CAMEROON	3.2	5.2	10.	7.	46.	***	5.	***	+2.	+5.
39 SUDAN	+0.9	2.9	1.	1.	15.	***	8.	+27.	+1.	+5.
40 ANGOLA	3.8	5.1	19.	7.	58.	***	7.	***	+3.	+7.
41 MAURITANIA	4.1	8.1	16.	7.	23.	9.	5.	***	0.	+2.
42 NIGERIA	3.6	3.1	39.	+2.	13.	***	7.	+64.	+1.	+4.
43 THAILAND	4.8	8.2	6.	21.	+58.	14.	9.	+22.	+12.	+7.
44 BOLIVIA	2.5	5.2	4.	2.	8.	***	5.	***	+1.	+4.
45 HONDURAS	1.3	5.1	9.	9.	22.	14.	13.	+18.	+5.	+9.
46 SENEGAL	+1.8	2.6	4.	19.	26.	5.	4.	+35.	+1.	+3.
47 PHILIPPINES	2.3	5.1	6.	10.	10.	15.	9.	+13.	+9.	+5.
48 ZAMBIA	1.7	4.0	+22.	***	48.	2.	6.	***	+1.	+4.
49 LIBERIA	2.2	6.4	0.	2.	31.	6.	7.	***	7.	+6.
50 EL SALVADOR	1.9	5.9	2.	23.	+9.	12.	11.	+18.	+9.	+7.
51 PAPUA NEW GUINEA	4.6	***	***	***	-11.	***	9.	***	+3.	+6.
52 CONGO	1.7	4.6	25.	3.	75.	***	8.	***	+1.	+6.
53 MOROCCO	1.6	4.1	7.	5.	14.	9.	8.	+32.	+2.	+7.
54 RHODESIA	1.7	***	5.	***	1.	***	8.	***	+1.	+3.
55 GHANA	0.	2.1	6.	+8.	1.	***	7.	+50.	+1.	+5.
56 IVORY COAST	3.1	8.0	6.	11.	40.	11.	8.	***	+1.	+5.
57 JORDAN	1.3	6.6	14.	16.	5.	30.	7.	+32.	0.	+6.
58 COLOMBIA	2.4	5.1	4.	19.	28.	***	6.	+44.	+12.	+4.
59 GUATEMALA	3.3	5.6	**	22.	17.	9.	9.	+17.	+2.	+4.
60 ECUADOR	1.9	5.9	7.	2.	19.	2.	9.	+30.	+1.	+4.
61 PARAGUAY	1.9	4.3	2.	10.	8.	7.	8.	+6.	+4.	+4.
62 KOREA REP.	7.1	8.5	15.	68.	15.	21.	8.	+20.	+17.	+5.
63 NICARAGUA	3.3	7.2	7.	15.	19.	19.	7.	+24.	+5.	+6.
64 DOMINICAN REP.	2.7	4.4	9.	15.	6.	***	9.	+58.	+11.	+4.
65 SYRIAN ARAB REP.	3.8	5.7	15.	+10.	37.	23.	8.	+9.	+1.	+4.
66 PERU	2.1	5.4	2.	4.	28.	11.	7.	+27.	+1.	+4.
67 TUNISIA	3.4	4.6	12.	10.	29.	***	8.	+11.	+13.	+6.
68 MALAYSIA	3.9	6.5	12.	12.	+3.	37.	7.	+34.	+8.	+3.
69 ALGERIA	1.7	4.4	33.	+5.	43.	***	7.	***	+3.	+6.
70 TURKEY	3.9	6.0	7.	11.	29.	15.	8.	***	+9.	+4.
71 COSTA RICA	2.7	6.5	7.	21.	13.	5.	7.	+33.	+18.	+4.
72 CHILE	1.7	4.2	1.	4.	10.	6.	7.	+46.	+14.	+4.
73 CHINA REP.	6.9	9.2	16.	***	***	28.	7.	+17.	+17.	+2.
74 JAMAICA	3.6	4.5	2.	50.	29.	4.	7.	+32.	+9.	+3.
75 LEBANON	3.0	4.9	***	6.	23.	***	6.	***	+3.	+5.
76 MEXICO	3.3	7.3	6.	40.	32.	14.	7.	+24.	+4.	+2.
77 BRAZIL	3.6	8.0	4.	24.	+5.	3.	5.	***	+2.	+3.
78 PANAMA	4.4	7.8	***	***	28.	4.	6.	+21.	+10.	+3.
79 IRAQ	2.9	6.1	14.	***	28.	11.	8.	***	+1.	+6.
80 URUGUAY	+0.2	1.2	4.	13.	+8.	1.	3.	1.	+3.	0.
81 ROMANIA	***	8.4	***	19.	11.	***	5.	***	+3.	+1.
82 ARGENTINA	2.7	4.2	3.	21.	10.	2.	3.	+3.	+3.	+1.
83 YUGOSLAVIA	4.3	6.8	+2.	28.	1.	8.	6.	+47.	+6.	+1.
84 PORTUGAL	7.4	6.3	5.	16.	+35.	8.	6.	+40.	+4.	+3.
85 IRAN	6.4	11.3	26.	+2.	49.	35.	7.	***	+2.	+6.
86 HONG KONG	7.0	10.0	0.	17.	29.	19.	7.	+23.	+17.	+2.
87 TRINIDAD TOBAGO	2.1	3.4	***	2.	1.	***	8.	+7.	+15.	+3.
88 VENEZUELA	2.0	5.9	26.	1.	4.	17.	8.	+8.	+9.	+3.
89 GREECE	7.3	6.9	5.	39.	0.	2.	4.	+16.	+3.	+2.
90 SINGAPORE	7.1	8.8	17.	17.	+1.	***	7.	+21.	+20.	+3.
91 SPAIN	5.8	7.3	0.	58.	4.	7.	4.	+32.	+2.	0.
92 ISRAEL	5.6	8.5	11.	22.	30.	0.	3.	+9.	+1.	+1.
93 CHINA PEOPLES REP.	3.8	6.2	***	***	***	***	11.	***	+5.	+7.
94 KOREA DEM. REP.	4.6	7.9	***	***	***	***	8.	***	+4.	+4.
95 ALBANIA	4.4	7.3	***	***	12.	***	8.	***	+8.	+4.
96 CUBA	+1.0	1.1	***	4.	17.	***	8.	***	+12.	+3.
97 MONGOLIA	0.6	2.8	***	***	6.	***	11.	***	+3.	+8.
98 HUNGARY	3.2	3.8	***	1.	+2.	1.	3.	***	0.	+2.
99 BULGARIA	4.7	5.9	***	21.	3.	***	5.	***	+2.	+1.
100 USSR	3.6	5.2	***	1.	-1.	1.	2.	***	+6.	0.
101 POLAND	3.9	4.3	***	15.	+9.	0.	4.	***	+6.	0.
102 CZECHOSLOVAKIA	2.4	3.1	***	1.	3.	***	1.	***	0.	1.
103 GERMAN DEM. REP.	3.2	3.1	***	2.	+17.	***	5.	***	+5.	0.

Table 1 (Continued)

Definitions, Derivations and Sources :

- RGNC - The average annual growth rate of GNP per capita from 1960 to 1973, World Bank [1975]
- RGDP - The average annual growth rate of GDP from 1960 to 1970, World Bank [1978]
- DSIN - The percentage share of industry in GDP in 1976 minus the percentage share of industry in GDP in 1960, both from World Bank [1978]
- DMEX - The percentage share of manufactures in total merchandise exports in 1975 minus the percentage share of manufactures in 1960, both from World Bank [1978]
- DSCH - The percentage of the age group population enrolled in the primary school in 1975 minus the one in 1960, both from World Bank [1978]
- DLTR - The percentage rate of adult literacy in 1974 minus the one in 1960, both from World Bank [1978]
- DLIF - The life expectancy at birth in years in 1975 minus the one in 1960, both from World Bank [1978]
- DINF - The infant mortality rate per 1000 births in 1975 minus the one in 1960, both from World Bank [1978]
- DBTH - The crude birth rate per 1000 persons in 1975 minus the one in 1960, both from World Bank [1978]
- DDTH - The crude death rate per 100 persons in 1975 minus the one in 1960, both from World Bank [1978]



Table 2 ( Continued )

Definitions, Derivations, and Sources :

- DSUP - The percentage share of urban population in 1975 minus the one in 1960, World Bank [1978]
- GRUP - The average annual growth rate of urban population in percentage from 1960 to 1970, World Bank [1978]
- RGUP - The average annual growth rate of urban population in percentage from 1960 to 1970 minus the average annual growth rate of population in percentage from 1960 to 1970, World Bank [1978]
- DPRI - The percentage population share of the largest city in the total country population in 1970 minus the same share in 1960, where the population of the largest city in 1960 and 1970 is computed from available data between the period of 1956 to 1976 in U.N. [annual], nearest one to 1960 and another between 1970 and 1976 selected whenever possible and the country population in 1960 and 1970 is computed from its average annual growth rates from 1960 to 1970 and from 1970 to 1975 both from World Bank [1978] and the 1973 population in World Bank [1975]
- DPR3 - The same as DPRI but for the three largest cities in place of the largest city
- DPRM - The same as DPRI but for the total of the cities each of which had population of 100,000 or more in 1960 in place of the largest city
- DLRG - The same as DPRI but for the total of the cities each of which had population of one million or more in 1960 in place of the largest city
- DMED - The same as DPRI but for the total of the cities each of which had population of 100,000 or more but below one million in 1960 in place of the largest city
- DSML - The percentage share in 1970 of the urban population excluding the parts in the cities with population of 100,000 or more measured for 1960 minus the same percentage share in 1960, where the city sizes are computed as described for DPRI and the urban population in 1970 is computed from the country population in 1973 in World Bank [1975], the average annual growth rate of population from 1970 to 1975, the percentage share of urban population in 1975 and the average annual growth rate of urban population from 1970 and 1975 in World Bank [1978]



Table 2 ( Continued )

YPC - GNP per capita in 1960 in 1973 US dollars computed from GNP per capita in 1973 and its average annual growth rate from 1960 to 1973, both from World Bank [1975]

POP - Population in 1960 computed from 1973 population and the average annual growth rate from 1960 to 1973, both from World Bank [1975]

SUP - Percentage share of urban population in 1960, World Bank [1978]

Appendix Table 3 Significance of Correlation between Socio-economic Development Indices and Urbanization Indices:  
 Low Income Countries ( GNP per capita in 1960 of \$300 or less in 1976 US dollars )

	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	+	.	.	+	.	.	.	.	-	.	14 - 46
GRUP	.	.	.	.	.	.	.	.	.	.	14 - 46
RGUP	.	.	.	.	.	.	.	.	.	.	14 - 46
DPR1	.	.	.	+	.	.	.	.	.	.	11 - 28
DPR3	+	+	.	+	.	.	.	.	-	.	5 - 6
DPRM	.	+	.	+	.	+	.	.	-	.	5 - 6
DLRG	.	.	.	+	.	+	.	.	-	.	5 - 6
DMED	.	.	.	.	+	.	.	.	.	-	11 - 28
DSML	.	.	.	.	.	.	.	.	.	.	11 - 28
Range of Sample Sizes	6-46	6-41	6-33	6-30	6-44	5-20	6-46	5-14	6-46	6-46	

Notes : + refers to positive correlation at 5 % level of significance.  
 - refers to negative correlation at 5 % level of significance  
 .. refers to correlation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level

Source : Appendix Table 1 and 2

Appendix Table 4 Significance of Corelation between Socio-economic Development Indices and Urbanization Indices  
Medium Income Countries (GNP per capita in 1960 greater than \$300 in 1976 US dollars )

	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	+	.	.	.	.	.	.	.	.	.	34 - 53
GRUP	.	.	.	.	+	.	.	.	.	-	34 - 53
RGUP	.	.	.	.	+	.	.	-	.	-	34 - 53
DPR1	.	.	.	.	.	+	+	-	.	-	27 - 43
DPR3	.	.	.	.	.	.	.	.	.	.	13 - 24
DPRM	.	.	.	.	.	.	.	.	.	.	13 - 24
DLRG	.	.	.	.	+	+	+	.	.	-	8 - 15
DMED	.	.	.	.	.	.	.	.	+	.	27 - 43
DSML	.	.	.	.	.	-	-	.	-	.	27 - 43
Range of Sample Sizes	14-51	15-52	10-40	15-46	15-52	12-37	15-53	8-34	15-53	15-53	

Notes : + refers to positive corelation at 5 % level of significance.  
 - refers to negative corelation at 5 % level of significance  
 .. refers to corelation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level

Source : Appendix Table 1 and 2

Appendix Table 5 Significance of Correlation between Socio-economic Development Indices and Urbanization Indices  
Small Countries ( Population of 10 million in 1960 )

	RCNC	RGDP	DSIN	DSEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	.	.	.	.	.	.	.	.	.	.	31 - 69
GRUP	.	.	.	-	.	.	.	.	+	-	31 - 69
RGUP	.	.	.	.	.	.	.	-	+	-	31 - 69
DPR1	.	.	.	.	.	.	.	-	+	-	25 - 48
DPR3	.	.	.	.	-	.	.	.	.	.	7 - 10
DPRM	.	.	.	.	-	.	.	.	.	.	6 - 10
DLRG	.	.	.	.	.	.	.	.	.	.	4 - 4
DMED	.	.	.	.	.	.	.	-	+	.	25 - 48
DSML	.	.	+	.	.	-	-	.	-	+	25 - 48
Range of Sample Sizes	4-67	4-62	4-49	4-48	4-69	4-36	4-69	4-31	4-69	4-69	

Notes : + refers to positive correlation at 5 % level of significance.  
 - refers to negative correlation at 5 % level of significance  
 ..refers to correlation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level

Source : Appendix Table 1 and 2

Appendix Table 6 Significance of Correlation between Socio-economic Development Indices and Urbanization Indices  
Large Countries ( Population greater than 10 million )

	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	+	+	.	+	.	+	.	.	-	+	17 - 34
GRUP	.	.	.	.	+	+	+	.	.	-	17 - 34
RGUP	.	.	.	.	.	+	.	.	.	.	17 - 34
DPR1	+	+	.	+	+	+	.	.	-	.	13 - 25
DPR3	.	+	.	+	+	.	.	.	.	.	11 - 21
DPRM	+	.	.	.	.	.	.	+	.	.	11 - 21
DLRG	.	.	.	+	+	.	.	.	.	.	9 - 18
DMED	.	.	.	.	.	.	.	.	.	.	13 - 25
DSML	.	.	.	.	.	-	.	-	.	.	13 - 25
Range of Sample Sizes	17-33	17-33	12-24	17-29	17-30	14-22	18-34	9-17	18-34	18-34	

Notes : + refers to positive correlation at 5 % level of significance  
 - refers to negative correlation at 5 % level of significance  
 .. refers to correlation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level

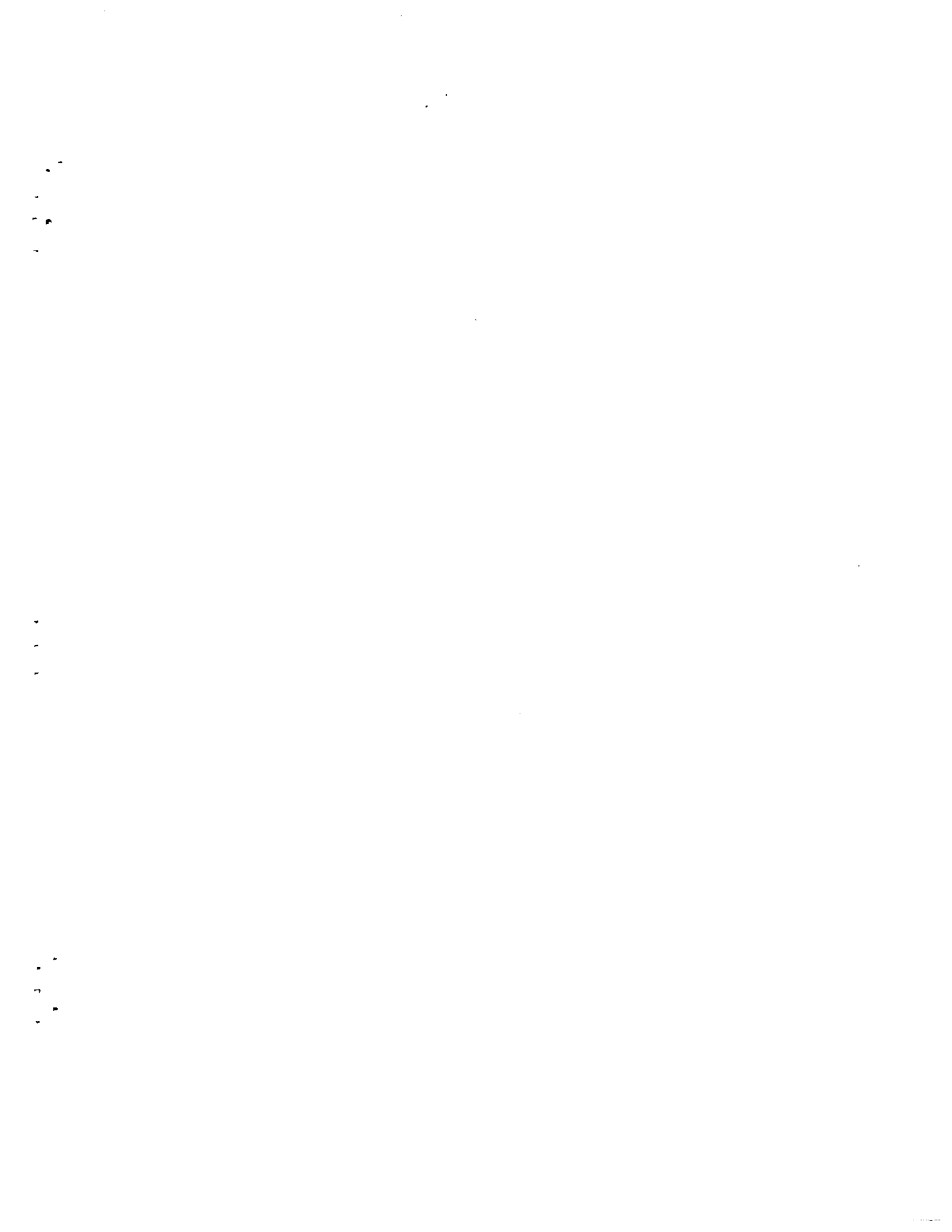
Source : Appendix Table 1 and 2

Appendix Table 7 Significance of Corelation between Socio-economic Development Indices and Urbanization Indices  
 Little Urbanized Countries ( Share of urban population of 10 % or less in 1960 )

	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	.	.	.	.	.	.	.	.	..	.	4 - 28
GRUP	.	.	.	.	-	.	.	-	.	.	4 - 28
RGUP	.	.	.	.	-	.	.	-	.	.	4 - 28
DPRI	+	+	+	.	.	.	+	.	-	-	5 - 28
DPR3	iss	iss	iss	iss	iss	iss	iss	iss	iss	iss	n.a.
DPRM	iss	iss	iss	iss	iss	iss	iss	iss	iss	iss	n.a.
DLRG	iss	iss	iss	iss	iss	iss	miss	iss	iss	iss	n.a.
DMED	+	+	.	.	.	.	+	iss	-	-	5 - 12
DSML	-	-	.	.	.	.	.	iss	.	.	5 - 12
Range of Sample Sizes	12-27	12-23	8-17	8-13	12-28	5-11	12-28	4-4	12-28	12-28	

Notes : + refers to positive corelation at 5 % level of significance  
 - refers to negative corelation at 5 % level of significance  
 ..refers to corelation not significant at 5 % level  
 iss refers to case where there is no sufficient sample size to test significance level

Source : Appendix Table 1 and 2



Appendix Table 8 Significance of Correlation between Socio-economic Development Indices and Urbanization Indices: Urbanized Countries ( Share of urban population greater than 10 % in 1960 )

	RGNC	RGDP	DSIN	DMEX	DSCH	DLTR	DLIF	DINF	DBTH	DDTH	Range of Sample Sizes
DSUP	+	+	.	+	+	.	.	.	.	.	44 - 75
GRUP	.	.	.	.	+	+	+	.	.	-	44 - 75
RGUP	.	.	.	.	+	.	.	-	.	-	44 - 75
DPRI	.	.	.	+	.	+	+	-	.	-	36 - 61
DPR3	.	.	.	+	.	.	.	.	.	.	18 - 31
DPRM	.	.	.	.	.	.	.	.	.	.	18 - 31
DLRG	+	+	.	+	+	+	.	.	.	.	13 - 22
DMED	.	.	-	.	.	.	.	-	+	.	36 - 61
DSML	.	.	.	.	.	-	-	.	.	.	36 - 61
Range of Sample Sizes	21-73	21-72	16-56	21-64	21-71	18-47	22-75	13-44	22-75	22-75	

Notes : + refers to positive correlation at 5 % level of significance.  
 - refers to negative correlation at 5 % level of significance  
 . refers to correlation not significant at 5 % level  
 .. refers to case where there is no sufficient sample size to test significance level

Source : Appendix Table 1 and 2