MEASURING AND PREDICTING ACCESS TO SELECTED RESOURCES AND SERVICE: A COMPARATIVE EVALUATION

By

Gabriel C. Alvarez and Leda L. Layo*

Introduction

Development as a national and sectoral concern continues to pose serious questions requiring urgent solutions. The venues taken or proposed to arrive at these solutions oftentimes prove ineffective. Policies and action programs for this purpose fall short of effectuating improvements on critical sectors and reaching the less privileged segments of society. Yet, all these misapprehensions might have been avoided if approaches, objectives and supportive strategies concerning development had a common orientation. The term "development" has been defined differently in the preceding decades. Hobhouse (1924), reflective of the thinking of the 1920s, referred to it as an advance in scale, efficiency, freedom and mutuality of service. The development vocabulary includes concepts like community development, urbanization, modernization, and rural development. More recent pronouncements stress changes in economic, social and cultural patterns. Porter (1973) defines the interlinkages by specifying activities prescribing the establishment of increased wealth and income as a perceived attainable goal for the broad masses of society, the creation and/or selection of adequate means to attain this goal, and the restructuring of society to ensure persistent economic growth. The rhetoric continues and the concept

*Associate Professors, College of Business Administration and College of Nursing, respectively, University of the Philippines. This paper is an expanded version of two earlier papers. The first paper, "An Empirical Analysis of Selected Access Indicators," was presented at the Seminar on Evaluation Research coordinated by the Philippine Sociological Society and held at the Faculty Center University of the Philippines on February 11, 1978 and published in the *PSSC Social Sciences Information* Vol. 4, (February-March, 1978), pp. 8-13. The second paper entitled "Rural-urban Differentials in Access to Selected Resources," was presented at the U.P. Research Conference: Rural Agenda II in the Bicol Region on 17-19 April, 1978. The authors would like to acknowledge the assistance of Gloria P. David, Ma. Linda Josette V. Ruiz and Evelyn Co in the data preparation and Lourdes G. San Pedro and Umbelina A. Cinco in typing the manuscript.

accommodates philosophical undertones as evidenced by the following characterization.

> . . . . . Development is concerned with changing a whole way of values, outlook and orientations, and behavior. It is concerned with changing existing institutions and/or creating new ones — social, economic, political and the family so that they generate the desired contribution toward the ends of society, and in turn, their members could make good use of the output — the whole system. Since the aims and goals cover the brand spectrum of desire, development is therefore a broad concept that embraces not only material growth but also everything that is subsumed under national as well as individual development (de Guzman and Pondevilla 1973, p. 3).

Being a dynamic concept, development has been translated into numerous strategies like increased productivity in the industrial and cultural sectors by improving the productive capacity of the material and human resources, rural and urban development, employment creation through small and medium-scale industries, poverty, equity-oriented approaches and a host of others.

One relevant approach to development, now gaining acceptance is the proper allocation and equitable sharing of resources and benefits among the various segments of the population. Basic social and economic amenities should be available to the different sectors of society, particularly the less privileged groups. The Basic Needs Approach to development proposes a strategy which carries out the said objectives. This objective is broadly defined as:

> . . . . . providing the opportunities for the full physical, mental, and social development of the human personality . . . It focuses on the end of channeling particular resources to particular groups defined as deficient in these resources ... It concentrates on the nature of what is provided rather than on income . . . . it does not replace the more aggregate and abstract concepts, which remain essential to measurement and analysis; it gives them content. Nor does it replace concepts that are means to broader ends, like productivity, production and growth, but it derives from the end of meeting basic human needs like the need for changing the composition of output, the rate of growth of the different components, and the distribution of purchasing power (Streeten 1977, p. 9).

As a development approach, it opens up new horizons and possibilities in policy and research. This paper aims to adopt this approach for assessing development on the national, rural and urban levels.

Merriam (1968) argues that the measurement of welfare rests on two basic axes: 1) quantity and quality of all the elements that compose the level of living and 2) distribution of welfare among the population. Earlier, Sheldon and Moore (1965) suggested that distributive features be one of the five major areas for monitoring social change. These are operationalized in the U.S. Department of Health and Welfare indicators (Cowhig and Beale, 1965) as availability of facilities like dwelling units, water, telephone and automobile. The Agency for International Development (AID) similarly suggested that the implications for the distribution or redistribution of wealth, power and status should be considered in the preparation and assessment of sector loans. Also proposed as a criterion for assessing social costs and benefits is access to resources and opportunities and the ways and extent by which such access is broadened or narrowed. (Cohn 1971)

Access refers to the relationship between the administrative allocation of resources vis-avis the people who need them. Access here is conceived as an intervening variable between input and impact indicators. If so, the phenomenon of access needs closer analysis.

The stress on "balanced growth and development" in the recently formulated five-year development plan connotes drawbacks encountered by completed and ongoing development projects (NEDA:1077). The term "access" acquired particular significance as a criterion for successful programmatic impact.

The concern has been to set up a network for the distribution of goods and services to the affected sectors of the population. In short, the answer to development needs has been the proliferation of assistance programs — financial, technological, institutional, or a combination of these. Minimal concern has been given to the setting up of appropriate channels so that the target sectors can benefit most from these programs. The ability to provide is handicapped by the absence of venues to facilitate and guarantee access to assistance in the form of benefits or improvements. Our proposed analytical framework endorses the significance of the "access" dimension in development strategy.

Almost two decades of research reveals that social indicators are: 1) a kind of social statistics, 2) instruments for detecting changes in the quality of life of individuals, groups and societies, 3) instruments to monitor progress towards societal goals and 4) social sta-

tistics measuring changes that are components in a social system model (Brooks 1971). Alternatively, social indicators studies have been classified by Land (1975) as having one or a combination of the following rationale: 1) social policy, 2) social change, and 3) social reporting.

The evaluation of the uses of social indicators — from the descriptive, the monitoring, to the explanatory functions — reflects the complexity of social phenomena, the increasing sophistication of social scientists in viewing their objects of study and the growing demand from policy makers for a more comprehensive picture of the relationships between policy instruments and goal states.

Focusing on the dimensions of welfare or quality of life, the indicators measuring these dimensions, Mangahas and his associates (1977) identified nine dimensions and suggested 30 indicators which are output or impact variables. The social indicators work of the Social Research Associates (1976) chose 8 domains of social concern and listed 75 indicators per domain. Aside from measuring the relevant components of national welfare, these social indicators are variables of a social accounting framework specifying interrelationships at the macro and micro levels. What impact would a given set of sectoral projects and programs have on national goal and on individual well-being? What are the mechanisms or processes involved? This list provides a compendium of input, access and impact indicators.

Pertinent statistics have been provided for selected social indicators. The National Census and Statistics Office (NCSO) published two volumes containing statistical data for provinces and regions, reflecting eight dimensions of social indicators (NCSO: 1973, 1976). Territorial indicators of social well-being have been evaluated on the national and regional levels. The results are useful for development planning (Cant 1975, 1976).

Seven areas of development concern were included in this study as allowed by the data available. These are reflected in policy materials, more specifically the 1978-82 NEDA development plan. Twenty-one indicators measured these seven areas of concern on dimension. The distribution of the indicators to the dimensions are as follows: 1) 5 indicators for education, 2) 5 indicators for housing, 3) two indicators for agriculture, 4) two indicators for infrastructure, 5) three indicators for women-in-development, 6) two indica-

tors for health and 7) two indicators for welfare (see Table 1). In our analysis, an access indicator should show a quantified allocation of resources or services to a specified number from a target group. A more acceptable measure used is the proportion of the target group directly benefited by the resources or source of assistance. A limiting factor in selecting and constructing access indicators is the availability of secondary data. Sixty-six provinces are considered in the study.[1] Data on these provinces were obtained from secondary sources published within the 1970-75 period. Thus, secondary sources are also specified in Table 1.

Two major questions are raised by this study: (1) Do rural provinces significantly differ from urban provinces in access to selected resources and services? 2) Will this rural-urban dimension improve the predictability of access levels by assessing such predictors as income level, poverty level, and urbanization level?

The analysis consists of three phases. The first phase is concerned with significant rural-urban differences in access to selected resources using the difference-between-means test. The second phase involves discerning patterns of relationships among the 21 access indicators through the factor analysis procedure. The principal factoring with iteration method and the orthogenal rotation option were applied to extract the factors (Nye *et al* 1975). The factor analysis results are to be used in generating access indices. (The indexing procedure is part of the computed output of factor analysis in the SPSS sub-program). The indices will allow ranking of the urban and rural provinces in terms of access to resources and services. Access levels for the two groups of provinces is compared in this section of our analysis.

The third phase will examine the multiple regression results showing the capability of three variables — poverty level, income level and urbanization level — in explaning and predicting access level in the national, as well as the rural and urban scenes. A test of difference in the regressions results for the latter will be applied.

The estimated means, standard deviations and coefficients of variations of the 21 access indicators for all provinces and for rural and urban provinces are presented in Table 2.

---

[1] Manila was excluded in the analysis because it is more appropriately categorized as a city and is subsumed under the province of Rizal.

The 66 provinces will be disaggregated into urban and rural provinces. The criterion used to classify the provinces as rural or urban is the commonly used level of urbanization measure which takes the percentage of the population classified as "urban". Those provinces whose urban population constitute 24 per cent or more of its total population are characterized as "urban" while those falling below the specified standard are considered "rural". The arbitrary cutoff point is based on recent international estimates (1970) of urbanization level for developing countries drawn from a United Nations report (1974, 33, see Table 16) showing that the urban population in developing countries constitutes about 24 per cent of the total estimated population. Using this arbitrary norm, the 66 provinces were subdivided into 46 rural and 20 urban provinces.

Significant rural-urban differences were found in access to all the seven sectors included in the study (see Table 3). The differences were mostly in favor of the urban provinces, indicating greater access to resources and services.

In the education sector, while the rural provinces had higher ratios of primary schools to children aged 5 to 9 years than the urban provinces, the per cent of persons 6 to 14 years attending secondary school was higher in the urban areas. This significant difference could be partly due to higher attendance rates in the secondary level in the urban provinces — a difference not due to more secondary schools per target population in these areas, as indicated by a non-significant t-value.

Access to better housing is significantly higher in the urban than in the rural provinces; an urban household is likely to have a radio, flush toilet, and electricity. The urban provinces showed higher access levels in agriculture, women-in-development and health.

In the sector of infrastructure and welfare, there were more kilometers of road per 1000 persons and more welfare cases served ($W1_1$) in the rural provinces than in the urban provinces.

In summary, access to education (secondary level), housing and health and participation in the development process is greater in the urban provinces. Access to agricultural services, primary level education, infrastructure and welfare is better among the rural provinces.

TABLE 1

Selected Access Indicators Reflecting Seven Dimensions and Their Data Sources

Variable No.	Access Indicator	Data Sources
	I Education	
Education (1)	Number of primary schools per 10,000 aged 5-9	FAPE. Philippine Atlas Vol. I, 1975
Education (2)	Number of secondary schools per 10,000 aged 10-14	FAPE. Philippine Atlas. Vol. I, 1975
Education (3)	Number of colleges and universities per 10,000 aged 15-24	FAPE. Philippine Atlas. Vol. I, 1975
Education (4)	Percentage of persons aged 6-14 attending school	1970 Census of Population and Housing.
Education (5)	Percentage of persons aged 15-24 attending school	1970 Census of Population and Housing.
	II Housing	
Housing (1)	Percentage of households in dwelling units with radios	NCSO. Social Indicators. 1976
Housing (2)	Ratio of households to occupied dwellings	NCSO. Social Indicators. 1976
Housing (3)	Percentage of households in occupied dwelling units with piped water	NCSO. Social Indicators. 1976
Housing (4)	Percentage of households with electricity	NCSO. Social Indicators. 1976
Housing (5)	Percentage of households with flush toilets	NCSO. Social Indicators. 1976

	III. Agriculture	
Agriculture (1)	Farms (in hectares) per person in the agricultural work force	1971 Census of Agriculture
Agriculture (2)	Number of rural banks per 10,000 farm operators	DAR documents
	IV Infrastructure	
Infrastructure (1)	Per capita consumption of electricity	FAPE, Philippine Atlas, Vol. I, 1975.
Infrastructure (2)	Km. of road per 1,000 persons	Philippine Almanac and Handbook of Facts, 1975.
	V. Women in Development	
W—I—D (1)	Percentage of female high school students to total no. of high school students	NCSO. Philippine Yearbook. 1977
W—I—D (2)	Percentage of female college students to total no. of college students	NCSO. Philippine Yearbook. 1977
W—I—D (3)	Percentage of females enrolled at secondary level	NCSO. Philippine Yearbook. 1972
	VI. Health	
Health (1)	Bed capacity per 1,000 persons	Philippine Health Statistics. 1974
Health (2)	Percentage births attended by MD, RN, Midw.	Philippine Health Statistics. 1974
	VII. Welfare	
Welfare (1)	Cases served per 1,000 persons	NCSO. Social Indicators. 1976
Welfare (2)	Cost of project/1,000 persons	NCSO. Social Indicators. 1976

TABLE 2

Means, Standard Deviations and Coefficient of Variation of Selected Access Indicators for All Provinces and Those Classified as Rural and Urban

Acess Indicators	All Provinces			Rural Province			Urban Province		
	Mean	Standard Deviation	Coefficient of Variation	Mean X	Standard Deviation SD	Coefficient of Variation CV	Mean X	Standard Deviation SD	Coefficient of Variation CV
1. Education (1)	83.69	36.96	.44	92.319	35.897	.389	65.385	30.628	.468
2. Education (2)	10.99	5.29	.53	11.534	6.538	.567	10.51	3.709	.353
3. Education (3)	.99	.75	.76	1.034	.827	.072	1.02	.491	.481
4. Education (4)	6.82	6.38	.10	61.107	6.464	.106	65.73	4.710	.072
5. Education (5)	27.85	5.77	.21	26.965	5.368	.199	28.64	5.173	.181
6. Housing (1)	43.52	15.04	.35	39.748	13.507	.340	50.836	14.576	.287
7. Housing (2)	102.32	2.27	.02	102.228	2.422	.024	102.255	1.286	.012
8. Housing (3)	21.71	20.89	.96	14.58	17.684	1.213	21.127	18.828	.891
9. Housing (4)	14.94	19.18	1.28	8.082	7.258	.898	26.193	23.618	.902
10. Housing (5)	17.75	14.83	.84	14.460	11.612	.803	21.825	15.112	.692
11. Agriculture (1)	.78	.38	.49	.785	.376	.479	0.845	.390	.462
12. Agriculture (2)	3.96	5.62	1.42	2.978	2.29	.769	7.244	9.145	1.262
13. Infrastructure (1)	93.13	468.68	5.03	35.308	108.838	3.082	45.232	54.597	1.207
14. Infrastructure (2)	2.63	1.92	.73	2.934	2.075	.707	2.051	1.264	.010
15. W-I-D (1)	36.53	4.24	.12	25.587	3.827	.108	38.05	4.273	.112
16. W-I-D (2)	56.52	5.89	.10	56.391	6.554	.116	57.05	3.762	.066
17. W-I-D (3)	50.14	6.84	.14	51.	2.688	.053	50.85	3.150	.064
18. Health (1)	12.45	14.59	1.17	1.122	1.306	1.454	1.454	1.289	.886
19. Health (2)	341.36	211.48	.62	31.977	15.756	.493	42.95	19.443	.453
20. Welfare (1)	584.39	338.02	.58	64.413	31.369	.487	47.75	33.140	.694
21. Welfare (2)	5.46	7.50	1.37	.623	.683	1.096	.627	.935	1.491

TABLE 3

Rural-Urban Differentials By Access Indicator

	Indicator	t — value	Number of Cases
1.	Education (1)	3.049**	66
2.	Education (2)	.791	66
3.	Education (3)	.082	64
4.	Education (4)	- 3.193**	66
5.	Education (5)	- 1.171	66
6.	Housing (1)	- 2.841**	66
7.	Housing (2)	.006	66
8.	Housing (3)	- 1.294	66
9.	Housing (4)	- 3.278**	66
10.	Housing (5)	- 1.901**	66
11.	Agriculture (1)	- .571	66
12.	Agriculture (2)	- 1.952*	61
13.	Infrastructure (1)	- .469	62
14.	Infrastructure (2)	2.083*	66
15.	Women in Development (1)	- 2.172*	66
16.	Women in Development (2)	- .505	66
17.	Women in Development (3)	.181	65
18.	Health (1)	- .933	64
19.	Health (2)	- 2.160*	66
20.	Welfare (1)	1.876*	66
21.	Welfare (2)	- .016	59

Note:

*Significant at 5 per cent.

**Significant at 1 per cent.

Analysis of Findings

The factor analysis results of the 21 access indicators will be examined and evaluated here.

The estimated zero-order correlation coefficients for these indicators are shown in Table 4. Even if the selected indicators reflect interrelated dimensions like education and women-in-development and, to some extent, housing and infrastructure, high in-

tercorrelative ($r \geq .5$) are evident only in 17.6 per cent of the total bivariate relationships. This observation seems to indicate that the selected indicators exhibit a considerable degree of independence.

It is clearly difficult to discern patterns or clusters of interrelationships from the simple correlation matrix presented earlier. The matrix exhibits varying magnitudes of bivariate relations as well as a complex profile of multidirectional symmetric relations. A clearer and a more concise picture of these interrelationships will be obtained through factor analysis.

The factor analysis results are shown in the three subsequent tables. Principal factoring with iteration was the factoring solution used to derive the main factors and the orthogenal (VARIMAX) rotation option was selected to adjust for independent variation of factors. The unrotated factor matrix in Table 5 reveals six principal factors, each with a distinct explanatory capacity to account for total and common variation. As observed, factors 1 and 2 have explanatory values of 27.3 per cent and 18.5 per cent, respectively, if a maximum number of 21 factors are derived. The adjusted explanatory values for the six factors, as shown in the same table, indicate the prominence of these first four factors since each accounts for more than ten per cent of common variation (i.e. if total variation is explained by only the six principal factors).

The next task is to identify the six factors by assessing the inclusion and combination of access indicators in each of the derived factors. The rotated factor matrix in Table 6 reveals the different clusters of indicators which can likewise serve as statistically meaningful patterns of relationships. The underscored factor loadings (coefficients) define the situational placement of each indicator in the rotated factor matrix. The listing of access indicators which loaded highly on one of the six factors is shown in Table 7. The naming of factors is based on the following criteria: (1) the frequency of occurrence of specific types of indicators and (2) the qualitative nature of indicators with the highest loadings. The first factor identified as access to services factor has the highest number of significant access indicators which are: two access to housing indicators, and one indicator for the following dimensions (1) access to educational resources, (2) access to agricultural resources, (3) access to infrastructure, (4) access to health and (5) access to welfare services. This factor can be regarded as a comprehensive factor because

TABLE 4

Simple Correlation Matrix of Access Indicators

	E(1)	E(2)	E(3)	E(4)	E(5)	H(1)	H(2)	H(3)	H(4)	H(5)	A(1)	A(2)	I(1)	I(2)	W(1)	W(2)	W(3)				
Education (1)	1.00																				
Education (2)	.54	1.00																			
Education (3)	.25	.76	1.00																		
Education (4)	.003	.26	.18	1.00																	
Education (5)	−.04	.32	.31	.60	1.00																
Housing (1)	−.52	−.15	.05	.61	.35	1.00															
Housing (2)	−.19	.02	.19	−.13	.37	.14	1.00														
Housing (3)	.10	.29	.23	.39	.54	.13	.18	1.00													
Housing (4)	−.47	−.18	−.06	.55	.50	.69	.26	.46	1.00												
Housing (5)	−.25	−.0003	.08	.56	.52	.58	−.23	.45	.67	1.00											
Agriculture (1)	−.10	.001	.03	−.31	−.36	−.09	.07	−.18	−.18	−.33	1.00										
Agriculture (2)	−.33	−.13	−.10	.42	.25	.48	.11	.20	.64	.43	−.07	1.00									
Infrastructure (1)	−.20	−.17	−.18	.24	.44	.21	.32	.48	.53	.46	−.28	−.05	1.00								
Infrastructure (2)	.53	.80	.66	.04	.19	−.33	−.06	.22	−.30	−.14	.03	−.25	−.12	1.00							
W-I-D (1)	−.28	−.22	−.02	.23	.17	.27	−.004	.21	.20	−.41	−.23	−.13	.23	−.26	1.00						
W-I-D (2)	.17	−.02	−.21	.24	−.11	−.08	−.65	−.12	−.24	−.003	−.06	−.11	−.15	−.03	.36	1.00					
W-I-D (3)	−.001	−.09	−.03	−.27	−.13	−.25	−.01	−.37	−.07	−.09	−.02	−.03	.003	.0004	.04	.05	1.00				
Health (1)	.09	.53	.54	.41	.63	.13	.25	.73	.49	.50	−.22	.29	.45	.46	−.12	−.24	−.05	1.00			
Health (2)	−.19	.14	.13	.57	.58	.38	.12	.49	.67	.50	−.20	.44	.40	.06	.03	−.26	−.17	.60	1.00		
Welfare (1)	.19	.12	.02	.09	.18	−.09	.14	.24	.09	.03	.06	.25	.02	.15	−.23	−.17	−.39	.20	.22	1.00	
Welfare (2)	.31	.29	.10	.13	.14	−.14	−.18	.18	−.17	−.16	.14	−.04	−.08	.36	.17	−.03	−.44	.17	.11	.34	1.00

Factor Analysis Results for the Access Indicators
(Unrotated Factor Matrix)

	Indicator	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	h^2
1.	Education (1)	− .24	.65	.18	.02	− .19	.14	.57
2.	Education (2)	.17	.88	.09	.14	.22	− .04	.89
3.	Education (3)	.24	.70	− .11	.26	.41	− .30	.88
4.	Education (4)	.71	.05	.51	− .04	.16	.07	.80
5.	Education (5)	.75	.21	.01	.10	− .09	− .03	.63
6.	Housing (1)	.62	− .41	.13	− .09	.42	− .23	.82
7.	Housing (2)	.32	− .02	− .65	.05	− .03	− .23	.59
8.	Housing (3)	.66	.28	.03	− .07	− .33	− .05	.64
9.	Housing (4)	.85	− .38	− .09	− .02	.09	.19	.92
10.	Housing (5)	.76	− .19	.12	.17	− .02	− .08	.67
11.	Agriculture (1)	− .30	.04	− .13	− .22	.21	.01	.20
12.	Agriculture (2)	.52	− .27	.03	− .19	.34	.34	.61
13.	Infrastructure (1)	.55	− .17	− .17	.18	− .57	− .06	.73
14.	Infrastructure (2)	.01	.87	.01	.13	.04	.05	.78
15.	W-I-D (1)	.27	− .30	.32	.26	− .12	− .30	.44
16.	W-I-D (2)	.22	− .08	.87	.21	− .12	.03	.87
17.	W-I-D (3)	.25	− .16	− .21	.80	.10	.47	.99
18.	Health (1)	.75	.47	− .11	.19	− .11	.11	.85
19.	Health (2)	.75	.05	− .03	− .11	.01	.25	.64
20.	Welfare (1)	.19	.25	− .10	− .49	− .10	.20	.40
21.	Welfare (2)	.03	.44	.14	− .45	− .11	.07	.44
	Eigenvalue	5.46	3.63	1.77	1.51	1.14	.81	
	% of Total Variance	27.3	18.5	9.8	8.8	6.8	5.1	76.3
	% of Common Variance	38.1	25.3	12.4	10.6	8.0	5.7	100.0

TABLE 6

Orthogenal Related Factor Matrix of Access Indicators

Indicator	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
1. Education (1)	.02	.44	.28	− .41	.35	− .02
2. Education (2)	.07	.92	− .06	− .04	.18	.05
3. Education (3)	.003	.90	.21	.07	− .15	.06
4. Education (4)	.41	.23	− .36	.64	− .02	.20
5. Education (5)	.62	.30	.12	.36	.03	.10
6. Housing (1)	.10	− .09	.09	.77	− .37	.26
7. Housing (2)	.22	.03	.73	.05	− .09	.01
8. Housing (3)	.68	.22	.08	.77	.20	.24
9. Housing (4)	.48	− .19	.22	.78	− .01	− .05
10. Housing (5)	.57	.01	.03	.52	− .24	.06
11. Agriculture (1)	− .41	− .01	.10	− .07	.12	.05
12. Agriculture (2)	.05	− .12	.03	.75	.15	− .06
13. Infrastructure (1)	.79	− .22	.22	.02	− .05	− .01
14. Infrastructure (2)	.07	.80	− .05	− .23	.28	− .23
15. W−I−D (1)	.35	− .13	− .20	.12	− .48	− .12
16. W−I−D (2)	.04	− .05	− .89	− .11	− .23	.02
17. W−I−D (3)	− .05	− .01	− .004	− .10	− .23	.97
18. Health (1)	.66	.52	.19	.28	.19	.06
19. Health (2)	.47	.10	.12	.57	.25	.02
20. Welfare (1)	.07	.05	.10	.11	.55	.24
21. Welfare (2)	.003	.22	− .13	− .06	.49	.36

it reflects five out of the six dimensions of access considered in our analysis.

The other five factors, namely, the educational access factor, the female access to higher socioeconomic status factor, the access to housing factor, the welfare access factor, and the female educational access factor, have more specific indicator clusters. The third factor which is female access to higher socioeconomic status factor is, perhaps, an exception. Difficulty in labelling this factor is evidenced by the high loading of two indicators with no logical interconnection. The undetermined nature of this specific factor can be due to the absence of other pertinent indicators either related to housing or to women-in-development which can clarify the linkage between these two dimensions. The inadequate selection of women-in-development indicators has compounded the problem of interpreting the derived factor. There tends to be some overlap between the third and six factors. To conveniently label them as distinct factors, it was decided to regard the latter as an education access factor and the former as a socioeconomic status factor. The education aspect of women-in-development is over-represented, as reflected by the choice of indicators for this dimension. Our compilation was greatly determined and dictated by data availability. The inadequacy will be rectified in later studies.

The extent of interrelationship of these six access factors is expressed in the zero-order correlation matrix in Table 8. The derived factors are shown to be orthogenal from these results. Each reflects a particular facet of access to selected resources and services. The adjustment option of orthogenal rotation will enable us to derive independent factors which will be used as dependent variables in our regression analysis.

After identifying the access factors, index scores for all the provinces were computed based on these access factors. These results are found in Appendix A. With the access index scores the different provinces can be ranked and their individual placement within the access level scale be determined.[2] These tabulations yielded that: 1) 56 to 65 per cent of the provinces have low access levels (negative index scores); 2) 48 to 68 per cent of the rural

[2] The index scores are standardized scores. Positive scores depict better access while negative scores as interpreted mean poor access to resources and services.

TABLE 7

Derived Access Factors and their Corresponding Indicators

				Factor Loading
F_1	=		Access to Service Factor	
	1.	Education (5)	= % of persons aged 15-24 attending school	.62
	2.	Housing (3)	= % of households in occupied dwelling units with piped water	.68
	3.	Housing (5)	= % of households with flush toilets	.57
	4.	Agriculture (1)	= Farms (in hec.) per person in the agricultural work force	– .41
	5.	Infrastructure (1)	= Per capita consumption of electricity	.79
	6.	Health (1)	= Bed capacity per 1,000 population	.66
F_2	=		Educational Access Factor	
	1.	Education (1)	= # of primary schools per 1,000 persons aged 5-9	.44
	2.	Education (2)	= # of secondary schools per 10,000 persons aged 10-14	.92
	3.	Education (3)	= # of colleges & universities per 10,000 persons aged 15-24	.90
	4.	Infrastructure (2)	= # of roads per 1,000 persons	.80
F_3	=		Female household Involvement Factor	
	1.	Housing (2)	= Ratio of households to occupied dwelling units	.73
	2.	W-I-D (2)	= % of female college students to total college students	– .89
F_4	=		Access to Housing Factor	
	1.	Education (4)	= % of persons aged 6-14 attending school	.64
	2.	Housing (1)	= % of households in dwelling units with radios	.77
	3.	Housing (4)	= % of households with electricity	.78
	4.	Agriculture (2)	= # of rural banks per 10,000 farm operators	.75
	5.	Health (2)	= % of births attended by MD, RN, Midwife	.57
F_5	=		Welfare Access Factor	
	1.	W-I-D (1)	= % female high school students to total high school students	– .48
	2.	Welfare (1)	= Cases served per 1,000 population	.55
	3.	Welfare (3)	= Cost of projects per 1,000 population	.49
F_6	=		Female Education Access Factor	
	1.	W-I-D (3)	= % of females enrolled at the secondary level	.97

TABLE 8

Zero-Order Correlation Matrix of Access Factors
(All Provinces, N=66)

	F_1	F_2	F_3	F_4	F_5	F_6
F_1	1.00					
F_2	.01	1.00				
F_3	.0002	.003	1.00			
F_4	.08	− .02	.01	1.00		
F_5	.04	.005	.03	− .03	1.00	
F_6	.003	− .01	.003	− .01	.04	1.00

provinces have low access levels; and 3) 35 to 75 per cent of the urban provinces have low access levels. A more detailed comparison of the access levels of the rural and urban provinces along the six factors are presented in Table 9.

TABLE 9

Per cent of Rural and Urban Provinces with High and Low Access Levels by Type of Access

Type of Access		Access Level			
		High rural	Low rural	High urban	Low urban
1.	Services	37	63	40	60
2.	Education	37	63	45	55
3.	Household Resources	32	68	65	35
4.	Housing	32	68	45	55
5.	Welfare	52	48	25	75
6.	Female Education	32	68	40	60

The highest rural-urban differential was found in the welfare factor, with the rural provinces having better access. The rural-urban differentials in the access to services, education, female access to higher socioeconomic status, housing, welfare, and female education were all in favor of the urban provinces.

A composite access index was constructed based on the six access factors using the following estimating procedure:

$$CA_c = \sum c_i A_i \qquad (1)$$

where:

A_c : composite access index

c_i : proportion of common variation explained by a particular access factor (A_i)

The composite access index is a weighted average of the six standardized index scores obtained from the extracted factors. Table 10 presents all the provinces ranked according to the magnitude of these composite index scores.

First it was noted that there are positive and negative coefficients. Arbitrarily, all the provinces with negative coefficients were assigned to group 3, the low access provinces. Next, the provinces with positive coefficients were divided into two, with the upper half as Group 1, the high access provinces, and the lower half as Group 2, the moderate access provinces.

The three provinces with the highest access are Batanes, Leyte, and Rizal while the three with the lowest are Negros Oriental, Masbate and Zamboanga del Norte. The per cent of provinces, with high, moderate and low access levels was 26, 27 and 47 per cent respectively.

Comparing the urban and the rural provinces, 30 per cent of the former and 24 per cent of the latter belong to the high group. Thirty per cent of the urban provinces and 26 per cent of the rural provinces belong to the moderate access group. Finally, two-fifths of the urban provinces exhibited low access, compared to only one-half for the rural provinces.

TABLE 10

The High, Moderate, and Low Access Provinces and their Composite Factor Coefficients

Group 1 High Access	Composite Factor Coefficient	Group 2-Moderate Access	Composite Factor Coefficient
1. Batanes	2.360	1. Albay	.211
2. Leyte (U)*	2.102	2. Antique	.197
3. Rizal (U)*	.998	3. Cavite (U)*	.178
4. Benguet (U)*	.698	4. Agusan del Norte (U)*	.166
5. Camarines Sur	.574	5. Zambales (U)*	.143
6. Mountain Province	.486	6. Bulacan (U)*	.117
7. Kalinga-Apayao	.358	7. Aklan	.113
8. Iloilo (U)*	.336	8. Surigao del Norte	.105
9. Davao del Sur (U)*	.325	9. La Union	.104
10. Ilocos Norte (U)*	.302	10. Misamis Occidental	.092
11. Abra	.286	11. Eastern Samar (U)*	.086
12. Capiz	.284	12. Laguna (U)*	.068
13. Cagayan	.248	13. Misamis Oriental	.046
14. Northern Samar	.242	14. Bukidnon	.045
15. Ifugao	.240	15. Catanduanes	.043
16. Isabela	.236	16. Lanao del Norte	.027
17. Camarines Norte (U)*	.230	17. Bataan	.026
		18. Pangasinan	.019

(U)* Stands for urban province. The rest of the provinces are rural.

Group 3 — Low Access Provinces and their Composite Factor Coefficients

1. Pampanga (U)*	-.031	16. Sulu	-.240
2. Palawan	-.031	17. Southern Leyte	-.245
3. South Cotabato (U)*	-.050	18. Lanao del Sur	-.259
4. Surigao del Sur (U)*	-.061	19. Quezon (U)*	-.263
5. Davao del Norte	-.065	20. Sorsogon (U)*	-.271
6. Nueva Vizcaya	-.090	21. Bohol	-.280
7. Occidental Mindoro (U)*	-.093	22. Oriental Mindoro	-.286
8. Marinduque	-.123	23. Camiguin	-.307
9. Tarlac	-.129	24. Western Samar	-.336
10. Batangas	-.136	25. Agusan del Sur	-.338
11. Davao Oriental	-.168	26. Cotabato	-.348
12. Romblon	-.198	27. Zamboanga del Sur	-.370
13. Negros Occidental (U)*	-.195	28. Ilocos Sur	-.387
14. Nueva Ecija	-.205	29. Zamboanga del Norte	-.387
15. Cebu (U)*	-.231	30. Masbate	-.438
		31. Negros Oriental	-.450

These results further support the earlier finding that urban provinces are relatively in a better position than rural provinces in access to resource and services. This particular table helps quantify the level of access for each province.

After determining the relevant clusters of indicators characterizing patterns of access to selected resources, the fourth major concern is to evaluate three predictors of access, namely, income level, poverty level, and urbanization level. The measures chosen for the three predictors are: (1) income level = income per capita; (2) poverty level = per cent of families earning an annual income of ₱3,000 and below: and (3) urbanization level = per cent of total population classified as urban. Recent statistics were gathered for 66 provinces. The data cover the period 1970 to 1973.[3]

The analytical model to be tested is shown in the following diagram (see Figure 1)

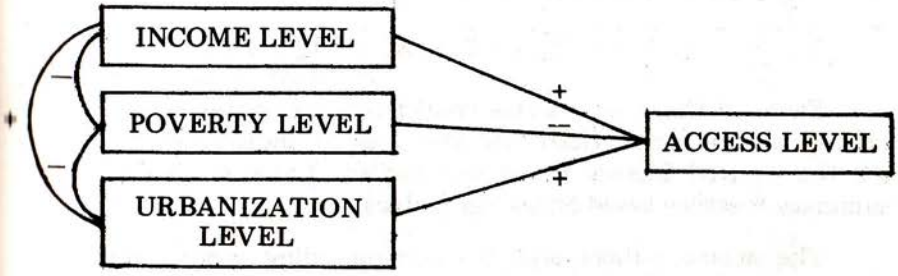


Figure 1. An Analytical Model of Access to Resources and Services

The model consists of three independent variables, namely, income level (X_1), poverty level (X_2), and urbanization level (X_3), and one principal dependent variable, access level (Y). Essentially, the regression model that will be tested is represented by the follow-

[3] The following statistical reference materials were used as data sources: E. Yambot (editor-in-chief), *Philippine Almanac and Handbook* of Facts, 1975 (Quezon City: Philippine Almanac Printers, Inc. 1975); Social Research Associates. *An Analytical Description of the Poor Majority.* Project Report I-B. Submitted to the US Agency for International Development (May 1977): and Tito A. Mijares, and Francisco Nazares. *The Growth of Urban Population in the Philippines and Perspective.* Technical Paper No. 5, Manila: Bureau of Census and Statistics 1974.

ing equation:

$$Y = a + b_1 X_1 + b_2 X_2 + b_3 X_3 \quad (2)$$

The adequacy of this model will be evaluated from three distinct perspectives — national, rural and urban. A comparative scheme is being applied when testing the regression model specified in equation (2). In effect, three models will be assessed, each containing the three independent variables and one dependent variable. The latter will reflect three different reference points: (1) access level for all provinces (Y_1): (2) access level for rural provinces (Y_2); and (3) access level for urban provinces (Y_3). Three comparable regression models are represented by the following equations:

$$Y_1 = a_1 + b_{1 \cdot 1} X_{1 \cdot 1} + b_{2 \cdot 1} X_{2 \cdot 1} + b_{3 \cdot 1} x_{3 \cdot 1} \quad (3)$$

$$Y_2 = a_2 + b_{1 \cdot 2} X_{1 \cdot 2} + b_{2 \cdot 2} + X_{2 \cdot 2} + b_{3 \cdot 2} X_{3 \cdot 2} \quad (4)$$

$$Y_3 = a_3 + b_{1 \cdot 3} X_{1 \cdot 3} + b_{2 \cdot 3} X_{2 \cdot 3} + b_{3 \cdot 3} X_{3 \cdot 3} \quad (5)$$

Each of the access levels considered (i.e. national, rural and urban) is sub-characterized into seven access indices, six of which are the derived factors mentioned earlier. The seventh index is a summary measure based on the six factors.

The access indices and the corresponding symbol notations are presented in Table 11. The regression equations for the first set of access level indices will take the following forms:

$$Y_{11} = a_{1.1} + b_{1.11} X_{1.11} + b_{2.11} X_{2.11} + b_{3.11} X_{3.11} \quad (6)$$

$$Y_{12} = a_{1.2} + b_{1.12} X_{1.12} + b_{2.12} X_{2.12} + b_{3.12} X_{3.12} \quad (7)$$

$$Y_{13} = a_{1.3} + b_{1.13} X_{1.13} + b_{2.13} X_{1.13} + b_{3.13} X_{1.13} \quad (8)$$

$$Y_{14} = a_{1.4} + b_{1.14} X_{1.14} + b_{2.14} X_{2.14} + b_{3.14} X_{1.13} \quad (9)$$

$$Y_{15} = a_{1.5} + b_{1.15} b_{2.15} + X_{2.16} X_{3.16} + b_{3.16} X_{3.16} \quad (10)$$

$$Y_{16} = a_{1.6} + b_{1.16} X_{2.16} + b_{1.16} \dagger b_{2.16} + b_{3.16} X_{3.16} \quad (11)$$

$$Y_{17} = a_{1.7} + b_{1.17} X_{1.17} + b_{2.17} X_{2.17} + b_{3.17} X_{3.17} \quad (12)$$

There will be several regression models expressing a similar equation for the second and third sets of access level indices representing rural and urban access. A total of 21 regression models will be tested for goodness of fit. Particular attention will be focused on the comparative predictability of the proposed analytical model for the urban and the rural settings. The Chow test will be applied to test the homogeneity of structures of the rural and urban access models (Chow 1960).

TABLE 11

Symbolic Representations of Access Level Indices for all Provinces, and Those Classified as Rural and Urban

	Access Level Index		
Type of Index	All Provinces	Rural Provinces	Urban Provinces
Composite Access Index	Y_{11}	Y_{21}	Y_{31}
Access Index 1	Y_{12}	Y_{22}	Y_{32}
Access Index 2	Y_{13}	Y_{23}	Y
Access Index 3	Y_{14}	Y_{24}	Y_{34}
Access Index 4	Y_{15}	Y_{25}	Y_{35}
Access Index 5	Y_{16}	Y_{26}	Y_{36}
Access Index 6	Y_{17}	Y_{27}	Y_{37}

Rural and urban mean access indices are compared in Table 12. In the same table are their standard deviations and the estimated "t" statistics to test significant differences. These results show greater spread or variability for urban access levels in terms of (1) the composite access index, (2) access to services, (3) educational access and (4) female educational access. More variability in rural access level is observed in: (1) female access to higher socioeconomic status, (2) access to housing, (3) health access, and (4) welfare access. A significant difference (0 = .05) exists between urban and rural access levels.

The intercorrelation of access factors for the urban and the rural scene is shown in Table 13. Generally low correlations are observed among the access factors — a pattern consistent with the

TABLE 12

Means and Standard Deviation of the Six Access Indices For Rural and Urban Provinces

	Mean	Standard Deviation	t
Access (C)			
Rural Provinces	-.0765	.2673	-1.410
Urban Provinces	.1760	.7612	
Access (1)			
Rural Provinces	-.0960	.5248	-.890
Urban Provinces	.2208	1.5145	
Access (2)			
Rural Provinces	-.0621	.5245	-.542
Urban Provinces	.1429	1.6131	
Access (3)			
Rural Provinces	-.0661	1.0337	-.944
Urban Provinces	.1521	.7513	
Access (4)			
Rural Provinces	-.1715	.9045	-2.165*
Urban Provinces	.3946	.9763	
Access (5)			
Rural Provinces	.1184	.9196	1.633
Urban Provinces	-.2723	.8544	
Access (6)			
Rural Provinces	-.1281	.5270	-1.093
Urban Provinces	.2947	1.6511	

*The "t" statistic is significant at the .05 level

intercorrelations for all provinces. The only notable exception is the moderately high inverse correlation (r = -.5) between access to services and female access to higher socioeconomic status in the rural setting. There is a relatively strong positive relationship for the same factors (r = .5) for the urban setting. The relationship observed for health access and female educational access tends to be higher in the urban setting. These findings definitely need further explanation.

TABLE 13

Intercorrelation of Access Factors of Rural and Urban Provinces

Rural Provinces (N = 46)	F_1	F_2	F_3	F_4	F_5	F_6
F_1	1.00					
F_2	.12	1.00				
F_3	- .47	- .22	1.00			
F_4	.24	- .04	- .05	1.00		
F_5	.18	- .18	.10	- .08	1.00	
F_6	- .17	.11	.05	.01	- .44	1.00

Urban Provinces (N = 20)	F_1	F_2	F_3	F_4	F_5	F_6
F_1	1.00					
F_2	- .03	1.00				
F_3	.49	.21	1.00			
F_4	- .11	- .06	.10	1.00		
F_5	.004	.20	- .09	.28	1.00	
F_6	.01	- .06	- .10	- .14	.55	1.00

Referring to our analytic model (Figure 1), the following directions in the interrelationship of the independent variables were hypothesized: (1) a negative relationship between income level and poverty level, and the latter with urbanization level; and (2) a positive relationship between income level and urbanization level. The theoretical basis of these interrelationships still needs empirical validation. The results presented in Table 14 do not confirm the hypothesized relationships specified above. The correlations appear to be low for rural, urban, and all provinces, with the exception of strong direct relations observed for poverty level and urbanization level (r = .5) for urban provinces. This finding seems to indicate that the urban setting has become a breeding ground for poverty, heightened possibly, by the lack of basic amenities to accommodate a

TABLE 14

Intercorrelation of Independent Variables

All Provinces (N = 66)	X_1	X_2	X_3
Income Level X_1	1.00		
Poverty X_2	-.06	1.00	
Urbanization Level X_3	-.02	.20	1.00
Rural Provinces (N=46)	X_1	X_2	X_3
Income Level X_1	1.00		
Poverty Level X_2	.06	1.00	
Urbanization Level X_3	.04	.03	1.00
Urban Provinces (N=20)	X_1	X_2	X_3
Income Level X_1	1.00		
Poverty Level X_2	-.16	1.00	
Urbanization Level X_3	-.09	.50	1.00

rapidly growing population. Only the hypothesized relationship on income level and poverty level in the national and urban scenes is confirmed by the results. In general, the weak intercorrelations among the independent variables indicate independent variation– a condition prescribed to minimize collinear problems.

Bivariate relations between the three independent variables and the seven dependent variables have been assessed. The estimated zero-order correlation coefficients depicting these relationships are presented in Table 15. In general, the coefficients are relatively low.

TABLE 15

Intercorrelation of Independent and Dependent Variables

	Income Level	Poverty Level	Urbanization Level
Access (c)			
All Provinces	.64	—.21	— .20
Rural Provinces	.42	— .03	.001
Urban Provinces	.73	— .32	— .16
Access (1)			
All Provinces	.19	— .27	— .22
Rural Provinces	.14	— .09	— .24
Urban Provinces	.20	— .41	— .23
Access (2)			
All Provinces	.75	— .04	— .05
Rural Provinces	.28	.10	.12
Urban Provinces	.90	— .11	— .09
Access (3)			
All Provinces	.12	.14	— .01
Rural Provinces	— .03	.11	.13
Urban Provinces	.35	.34	— .06
Access (4)			
All Provinces	.15	.01	— .13
Rural Provinces	.31	— .10	.12
Urban Provinces	.12	.39	.20
Access (5)			
All Provinces	.33	— .11	.18
Rural Provinces	.30	— .15	.04
Urban Provinces	.48	— .18	.12
Access (6)			
All Provinces	.04	— .09	— .10
Rural Provinces	— .10	.11	.04
Urban Provinces	.08	— .18	.26

As hypothesized, income level is shown to be positively related to access except female access to higher socioeconomic status and female educational access in the rural provinces — the access factors reflecting the women-in-development dimension. The inverse relationship observed between income level and two access factors mentioned, although weak, empirically support the contention that female educational participation is rather minimal despite increasing rural income levels.

A uniform pattern of negative relationships is observed between poverty level and the access to services factor the welfare access factor, and the composite access factor in the national, urban and rural settings. A less consistent pattern of relationships figures in the educational access and the W—I—D access factor, namely, female educational access, with poverty level. Among rural provinces, the relations between the latter and the specified access factors tend to be positive.

This finding may cast some doubt on the contention that education is a means for upward social mobility in the rural sector. Female access to higher socioeconomic status is shown to be positively related to poverty level. This relationship is strongest in the urban setting and hints on the possibilities of improving poverty levels if female household members actively seek out income-generating opportunities.

A curious finding is the strong positive association ($r = .39$) between access to housing and poverty level in urban areas. This paints a somewhat ambiguous portrait of poverty since it does not clearly demonstrate whether poverty is a determinant or a consequence of increased access to housing. Recent urban low-cost housing programs have been implemented to meet this need of low-income families.

Contrary to what has been hypothesized earlier, negative weak relations are observed between urbanization level and access level, more specifically, the composite access index, the access to services factor, the educational access factor, and the female access to higher socioeconomic status. These findings tend to indicate the imbalance between the rising demands of a fast urbanizing population and the inadequate resources to meet these demands. This in some way illustrates the "overurbanization" phenomenon commonly experienced by the developing countries (Hauser 1963, Breese 1966,

Hawley 1971).

After considering the bivariate relationships between the independent variables — income level, poverty level, and urbanization level — and the dependent variables — the six access factors and the composite access index — the three independent variables as predictors of access levels in the national, rural and urban settings will be assessed through multiple regression analysis. Twenty-one regression results were evaluated. Comparisons were made along the following aspects: (a) the combined explanatory capacity of the three predictors on access to selected resources and services for all provinces, for rural and for urban provinces, and the best situation where the proposed explanatory access model will be most operative; (b) the best predictor(s) of access in the specified circumstances; and (c) the predictor effect on rural and urban access to selected resources.

In evaluating the combined explanatory effects of the three predictors on national, rural and urban access levels, the coefficients of determination (R^2) of the 21 regression results will be compared as well as the F values for the regression and their level of significance. Table 16 presents these estimates and the standardized regres-

TABLE 16

Full Regression Results of Selected Determinants of Access Level

Ao = Composite Access Index	All Provinces (N=66)		Rural Provinces (N=46)		Urban Provinces (N=20)	
Determinant	F	F	b	F	b	F
Income	.63	45.45	.42	9.13	70	17.99
Poverty	—.15	2.42	—.06	.16	—.21	1.22
Urbanization	—.16	2.82	—.01	.01	.01	.01
R		.68		.42		.76
R^2		.46		.18		.58
F		17.95		3.06		7.25
a		.001		.05		.001

TABLE 16 (continued)

Full Regression Results of Selected Determinants of Access Level

:cess 1 = Access to Services Factor

	All Provinces (N=66)		Rural Provinces (N=66)		Urban Provinces (N=20)	
:terminants	b	F	b	F	b	F
come	.17	2.09	.16	1.13	.14	.37
verty	—.23	3.65	—.10	.42	—.37	2.04
banization	— .17	2.00	—.23	2.83	— .04	.02
R	.37		.30		.44	
R^2	.13		.09		.19	
F	3.17		1.41		1.25	
a	.05		n.s.		n.s.	

:cess 2 = Educational Access Factor

	All Provinces (N = 66)		Rural Provinces (N = 46)		Urban Provinces (N = 20)	
:terminants	b	F	b	F	b	F
come	.70	78.17	.27	3.51	.90	65.1
verty	.10	.01	.08	.31	.04	.1
banization	—.03	.16	.11	.58	—.03	.0
R	.75		.32		.90	
R^2	.56		.10		.81	
F	26.22		1.56		22.12	
a	.001		n.s.		.001	

TABLE 16 (continued)

Access 3 = access to higher socioeconomic status

	All Provinces (N = 66)		Rural Provinces (N = 46)		Urban Provinces (N = 20)	
Determinants	b	F	b	F	b	F
Income	.13	1.03	—.03	.05	.41	4.1
Poverty	.16	1.58	.11	.53	.56	5.7
Urbanization	—.04	.09	.13	.69	.30	1.6
R	.20		.17		.60	
R^2	.04		.03		.36	
F	.83		.43		2.94	
α	n.s.		n.s.		n.s.	

Access 4 = Access to housing factor

	All Provinces (N = 66)		Rural Provinces (N = 46)		Urban Provinces (N = 20)	
Determinants	b	F	b	F	b	F
Income	.15	1.42	.32	4.80	.08	.1
Poverty	.05	.14	.13	.76	.40	2.2
Urbanization	—.13	1.21	.11	.61	.01	.0
R	.20		.35		.40	
R^2	.04		.13		.16	
F	.86		2.02		1.02	
α	n.s.		n.s.		n.s.	

TABLE 16 (continued)

ccess 5 = health and welfare access factor

	All Provinces (N = 66)		Rural Provinces (N = 46)		Urban Provinces (N = 20)	
eterminants	b	F	b	F	b	F
come	.33	7.99	.31	4.58	.46	4.78
verty	— .14	1.33	— .17	1.36	— .25	1.08
rbanization	.22	3.32	.04	.07	.29	1.40
R	.40		.35		.55	
R^2	.16		.12		.30	
F	4.05		1.91		2.27	
a	.05		n.s.		n.s.	

ccess 6 = female educational access factor

	All Provinces (N = 66)		Rural Provinces (N = 46)		Urban Provinces (N = 20)	
eterminants	b	F	b	F	b	F
come	.04	.08	— .11	.46	.06	.01
verty	— .07	.31	.12	.59	— .40	2.34
rbanization	— .09	.44	.05	.09	.46	3.16
R	.13		.16		.44	
F	.02		.03		.19	
R^2	.35		.36		1.28	
a	n.s.		n.s.		n.s.	

sion coefficients (b) of each predictor and their corresponding F values. The predictors are observed to be better for national and urban access levels as measured by composite indices. The obtained R^2's are .46 and .58, respectively, indicating that our predictors account for 50 per cent of total explained variation. Also, the regression results for national and urban scene are highly significant (2 = .001).

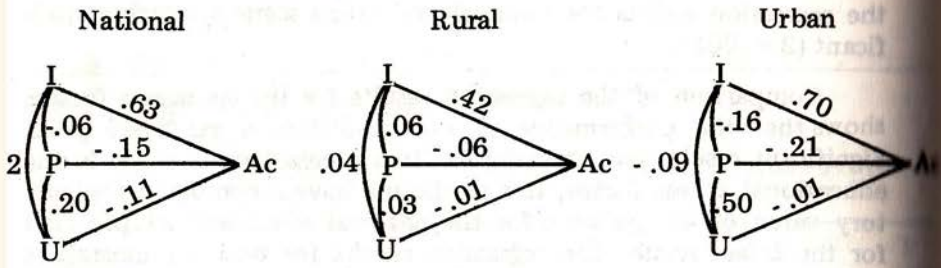
Comparison of the regression results for the six access factors shows that the performance of our predictors is relatively poor. Significant results are observed for two access factors only. In the educational access factor, our predictors have a combined explanatory value of 56 per cent for the national scene and 81 per cent for the urban scene. The regression results for both circumstances are shown to be highly significant (2 = .001). Significant results (2 = .05) are also observed for the access to services factor, particularly for the national scene. The estimated R^2 for our predictors is only .13. The coefficients of determination estimated for the four remaining access factors are low indicating that access to these dimension can be better explained by other unaccounted predictors.

The standardized regression coefficient (b) were used to determine the relative importance of predictors in affecting access levels. These are considered as path coefficients in path analysis. (Duncan 1966). These coefficients are regarded as comparable weights whose magnitude will indicate the relative importance of our predictors. The significant regression results, (as discussed earlier), yield the following patterns:

(a) The most important predictor for the national and urban access levels, is income level which likewise shows a positive impact. (The same pattern is discerned in the rural setting). This is clearly illustrated by the diagrams below (see Figure 2). The coefficients appearing beside the curved lines linking the predictors are zero-order correlation coefficients.

FIGURE 2

The Relative Importance of Selected Predictors on National, Rural and Urban Access Levels



Note: The complete designation of the variables in the diagrams are as follows: A_C — access level (as measured by the composite access index); I — income level; P — poverty level; and U — urbanization level.

(b) for educational access in the national setting, income level is the most important predictor manifesting a positive effect; and

(c) poverty level is the most important predictor of access to services and has a negative impact on these variables.

From the b's of the remaining regression results come the following findings:

(1) Poverty level is the best predictor of female access to higher socioeconomic status and of female educational access, showing a positive impact on the former and a negative impact on the latter;

(2) The most important predictor of access to housing, and welfare access is income level, which exhibits a positive effect on the national, rural, and urban scenes. It is interesting to note that the independent effects of income level and poverty level do not coincide in all cases. The latter is assessed to be an important predictor of three access factors, namely educational access, access to housing, and welfare access, while the former is shown to be

the best predictor of access to services, female access to higher socioeconomic status, and female educational access. These results show that income level can be easily considered as the best predictor of access level. The findings indicating the importance of poverty level as an important predictor simply reinforce the above conclusion. Its complementarity with income level can be asserted because the basis of our poverty measure is annual family income.

This will strongly complement the observation for access levels, measured by the composite index), indicating income level as the predictor.

This section examines more closely the regression results for and urban provinces and compares the two situations in terms e relative effects of the predictors on access level as determined even measures. A test used to assess the comparability of regres- results of the subgroups, in effect testing the homogeneity of tures, is the Chow test. These results are shown in Table 17.

TABLE 17

Results of the Chow Test as Applied to Regression Results on Rural and Urban Access Levels

Dependent	Sum of Squares	df	F	a
Access (C)	.8887	4	.906	n.s.
	14.22388	58	.362	
Access (1)	1.39909	4	.362	n.s.
	55.97465	58		
Access (2)	.58698	4	.138	n.s.
	61.82024	58		
Access (3)	.66399	4	.164	n.s.
	58.8079	58		
Access (4)	4.46705	4	1.178	n.s.
	54.999	58		
Access (5)	3.92833	4	1.136	n.s.
	50.12094	58		
Access (6)	2.503465	4	.565	n.s.
	64.29615			

The estimated F values are shown to be low and insignificant. These findings clearly support the null hypothesis of homogeneity. The importance of income level as a predictor of access is found to be consistent in the rural and urban settings. This observation corroborates our earlier findings.

SUMMARY AND CONCLUSIONS

The major findings of the study are as follows:

1. Urban provinces showed greater access to selected resources and services in five of the seven dimensions considered. Rural provinces exhibited greater access to welfare and infrastructure.

2. Six access factors were extracted (through factor analysis) from a compendium of 21 access indicators reflecting seven dimensions. These factors have been labelled as: (1) access to services factor, (2) educational access factor, (3) female access to higher socioeconomic status factor, (4) access to housing factor, (5) welfare access factor and (6) female educational access factor.

3. Although higher access levels were observed for urban provinces, variability was particularly noted for access to services, educational access in general and female education access in particular. On the whole, access levels (as measured by the composite index) showed greater variability among urban provinces. In the rural setting, disparities were observed in terms of female access to higher socioeconomic status, housing, and welfare. Moreover, a significant difference in access levels for urban and rural provinces was found only with respect to housing.

4. The hypothesized relationships specified by the analytic model of access to selected resources were not confirmed by the intercorrelations of independent and dependent variables. Bivariate positive relations with varying magnitudes are noted in the national, urban, and particularly in the rural scenes.

5. The three predictors of access to selected resources, namely, income level, poverty level, and urbanization level tend to show better predictability for national and urban access levels. The combined performance of these predictors are likewise highly significant for educational access and for access to services.

6. Income level is the best predictor of access level (composite index) for the national, urban and rural settings. It is also assessed as the best predictor for access to housing, health and welfare access. National educational access is best predicted by income level. Positive effects are exhibited by this predictor in all those situations. Poverty level is seen as the best predictor for access to services, female educational access and female access to higher socioeconomic status. It exhibits a negative effect on the first and second access factors and a positive effect on the third.

7. The performance of our predictive model of access in the rural and urban settings is shown to be comparable and the structural effects of our predictors are homogeneous. Under both situations, it can be said that income level is the best predictor of access levels.

The study is an attempt to determine the level of access to selected resources and services for sixty-six provinces categorized into two subgroups, namely rural and urban provinces. Twenty-one indicators of access were selected representing seven dimensions, namely, education, housing, agriculture, infrastructure, women-in-development, and welfare. From our findings, it can be safely concluded that access is a multi-dimensional concept, as revealed by the six extracted factors. Five of these factors reflect five of the original categorical dimensions considered, namely, education, housing, women-in-development health and welfare. Four of the mentioned dimensions above (housing education, health and welfare) are reflected in the most important factor, namely, access to services. This particular result corroborates the preceding assertion. It also lends support to the main thesis of the study viewing the phenomenon of access as multi-dimensional in scope and concern. The components characterizing this phenomenon reflect basic human needs whose fulfillment may enhance development efforts particularly in improving the quality of life of critical sectors of the population.

Higher access levels are observed in the urban than in the rural scene. This salient finding gives empirical support and a concrete basis to argue for a more balanced development thrust. The neglect of the rural areas in favor of the urban areas has been a disoriented feature of some existing policies and programs. The accomplishments in raising rural access levels are more pronounced in concerns like welfare, housing and female socioeconomic status. Improving access along other concerns will reduce the rural-urban imbalance. A problematic question still needs to be answered:

how do we raise levels of access to resources and services in rural areas? One strategy is by intensifying rather than increasing poverty amelioration programs. Efforts should include provisions in setting up means or channels to facilitate access to these programs. After all, the best measure of impact is still active utilization of resources, services and benefits.

The urban experience in achieving present access levels can be transplanted in the rural setting. Greater acess can be brought about by raising income levels through economically productive activities, coupled with better institutional facilities and communication and transportation systems. Our findings lend support to this strategy since income level is assessed to be the best predictor of rural as well as urban access levels. This strategy has also been mentioned in the section on national goals and policies of the Five-Year Philippine Development Plan, 1978-82 which states that;

> Increased production alongside better distribution of income and opportunities requires a strategy that provides for balance among sectors and among regions which are mutually reinforcing. Industrial development will be pursued to complement agricultural development. At the same time, the service sector will be oriented toward improved efficiency and competitiveness in supporting the rural sector and providing the necessary dynamic push to the economy.
>
> Support to rural and regional development will be limited to agricultural production but will include tenurial improvement, institution building and industrial dispersal. The integrated areas development scheme will be implemented. This approach which involves a comprehensive planning and development of complementary projects will lead to a more balanced rural and regional growth. (NEDA: 1977:8-9)

Knowledge as to the rank and identity of provinces with respect to access levels will be useful to planners and program facilitators. It can provide a guide as to which provinces need further attention in enhancing programatic action and providing better venues leading to greater access to programs.

APPENDIX A

Table A-1

Provincial Factor Scores for Access to Services (F_1)

High Access			Low Access		
	Province	Score		Province	Score
1.	Leyte	6.18	1.	Northern Samar	-.03
2.	Mountain Province	1.56	4.	Pangasinan	-.03
3.	Rizal (U)	1.36	3.	Laguna (U)	-.03
4.	Batanes	1.33	4.	Cavite (U)	-.04
5.	Benguet (U)	1.23	5.	Camarines Norte (U)	-.06
6.	Kalinga Apayao	.62	6.	Bohol	-.10
7.	Surigao del Norte	.60	7.	Isabela	-.10
8.	Ilocos Norte (U)	.58	8.	Catanduanes	-.11
9.	Camarines Sur	.48	9.	La Union	-.12
10.	Davao Oriental	.36	10.	Sorsogon (U)	-.14
11.	Capiz	.31	11.	Nueva Vizcaya	-.15
12.	Abra	.28	12.	Batangas	-.16
13.	Southern Leyte	.27	13.	Zamboanga del Norte	-.21
14.	Agusan del Norte (U)	.20	14.	Bukidnon	-.24
15.	Eastern Samar (U)	.17	15.	Surigao del Sur (U)	-.25
16.	Antique	.17	16.	Negros Oriental	-.28
17.	Lanao del Sur	.17	17.	Quezon (U)	-.28
18.	Zambales (U)	.15	18.	Tarlac	-.29
19.	Romblon	.10	19.	Ilocos Sur	-.33
20.	Negros Occidental (U)	.09	20.	Occidental Mindoro	-.35
21.	Bulacan (U)	.08	21.	Aklan	-.36
22.	Albay	.07	22.	Masbate	-.36
23.	Ifugao	.05	23.	Camiguin	-.37
24.	Misamis Occidental	.03	24.	Marinduque	-.42
25.	Western Samar	.03	25.	South Cotabato (U)	-.46
			26.	Misamis Oriental	-.47
			27.	Pampanga (U)	-.50
			28.	Davao del Norte	-.55
			29.	Oriental Mindoro	-.56
			30.	Palawan	-.56
			31.	Cebu (U)	-.57
			32.	Agusan del Sur	-.62
			33.	Sulu	-.64
			34.	Nueva Ecija	-.66
			35.	Cagayan	-.68
			36.	Cotabato	-.73
			37.	Zamboanga del Sur	-.84
			38.	Bataan	-.87
			39.	Iloilo (U)	-.99
			41.	Lanao del Norte	-1.02

Table A-2

Provincial Factor Score for Access to Education (F_2)

	Province	Score		Province	Score
1.	Batanes	6.58	1.	Cagayan	-.01
2.	Ifugao	1.50	2.	Eastern Samar (U)	-.01
3.	Abra	1.12	3.	Laguna (U)	-.03
4.	Benguet (U)	.82	4.	Bataan	-.06
5.	Capiz	.70	5.	Nueva Ecija	-.06
6.	Misamis Occ.	.60	6.	Ilocos Sur	-.09
7.	Misamis Occ.	.68	7.	Batangas	-.10
8.	Isabela	.46	8.	Cebu (U)	-.11
9.	South Cotabato (U)	.46	9.	Camiguin	-.14
10.	Misamis Oriental	.45	10.	Lanao del Norte	-.16
11.	Surigao del Sur (U)	.45	11.	Bohol	-.20
12.	Marinduque	.36	12.	Cotabato	-.22
13.	Davao del Norte	.34	13.	Camarines Sur	-.23
14.	Ilocos Norte (U)	.34	14.	Antique	-.24
15.	Surigao del Norte	.32	15.	Pampanga (U)	-.26
16.	Davao del Sur (U)	.30	16.	Sorsogon (U)	-.26
17.	Kalinga-Apayao	.30	17.	La Union	-.28
88	Agusan del Norte (U)	18. .23	18.	Davao Oriental	-.29
19.	Pangasinan	.22	19.	Lanao del Sur	-.30
20.	Occ. Mindoro (U)	.19	20.	Zambales (U)	-.30
21.	Bulacan (U)	.17	21.	Southern Leyte	-.32
22.	Or. Mindoro	.14	22.	Agusan del Sur	-.37
23.	Nueva Vizcaya	.09	23.	Quezon (U)	-.42
24.	Palawan	.08	24.	Zamboanga del Sur	-.47
25.	Mountain Province	.06	25.	Cavite (U)	-.53
26.	Iloilo (U)	.02	26.	Catanduanes	-.53
			27.	Tarlac	-.54
			28.	Albay	-.56
			29.	Camarines Norte (U)	-.56
			30.	Negros Occ (U)	-.56
			31.	Negros Or	-.57
			32.	Rizal (U)	-.57
			33.	Western Samar	-.69
			34.	Bukidnon	-.70
			35.	Zamboanga del Norte	-.71
			36.	Masbate	-.76
			37.	Northern Samar	-.78
			38.	Romblon	-1.00
			39.	Sulu	-1.14
			40.	Leyte	-1.75

TABLE A-3

Provincial Factor Scores for Female Access to Higher Socioeconomic Status (F_4)

	Province	Score		Province	Score
1.	Lanao del Norte	4.81	1.	Kalinga-Apayao	-.02
2.	Sulu	2.43	2.	Negros Oriental	-.03
3.	Leyte	1.90	3.	Tarlac	-.03
4.	Misamis Oriental	1.26	4.	Negros Occidental	-.03
5.	Zamboanga del Sur	1.20	5.	Misamis Occidental	-.13
6.	Batanes	1.12	6.	Masbate	-.24
7.	Davao del Norte	1.05	7.	Benguet (U)	-.24
8.	Palawan	.86	8.	Zamboanga del Norte	-.27
9.	Cebu (U)	.78	9.	Or. Mindoro	-.29
10.	Rizal (U)	.69	10.	Camarines Norte (U)	-.34
11.	Laguna (U)	.61	11.	Nueva Vizacya	-.32
12.	Iloilo (U)	.60	12.	Quezon (U)	-.34
13.	South Cotabato (U)	.57	13.	Camarines Sur	-.36
14.	Pampanga (U)	.56	14.	Northern Samar	-.36
15.	Eastern Samar (U)	.52	15.	Occ. Mindoro (U)	-.37
16.	Bataan	.45	16.	Marinduque	-.39
17.	Bulacan (U)	.44	17.	Pangasinan	-.44
18.	Isabela	.37	18.	Bohol	-.48
19.	Agusan del Sur	.34	19.	Camiguin	-.50
20.	Surigao del Sur	.19	20.	Romblon	-.51
21.	Cavite (U)	.15	21.	Catanduanes	-.56
22.	Agusan del Norte (U)	.14	22.	Batangas	-.64
23.	Nueva Ecija	.12	23.	Sorsogon	-.66
24.	Davao del Sur (U)	.08	24.	Aklan (U)	-.67
25.	Zambales (U)	.08	25.	Western Samar	-.68
26.	Cotabato	.08	26.	Albay	-.70
27.	La Union	.07	27.	Cagayan	-.77
28.	Bukidnon	.04	28.	Capiz	-.78
			29.	Ilocos Sur	-.78
			30.	Mountain Province	-.80
			31.	Ifugao	-.90
			32.	Lanao del Sur	-.96
			33.	Southern Leyte	-.99
			34.	Abra	-1.07
			35.	Surigao del Norte	-1.12
			36.	Ilocos Norte (U)	-1.13
			37.	Antique	-1.15
			38.	Davao Or.	-1.52

TABLE A-4

Provincial Factor Score for Access to Housing (F_3)

	Province	Score		Province	Score
1.	Rizal (U)	4.07	1.	Misamis Occ.	-.00
2.	Bukidnon	2.31	2.	Aklan	-.01
3.	Catanduanes	2.24	3.	Batanes	-.03
4.	La Union	1.91	4.	Cotabato	-.04
5.	Bataan	1.89	5.	Nueva Vizcaya	-.05
6.	Pampanga (U)	1.66	6.	Occ. Mindoro (U)	-.14
7.	Zambales (U)	1.48	7.	Ilocos Sur	-.15
8.	Tarlac	.93	8.	Marinduque	-.16
9.	Benguet (U)	.87	9.	Iloilo (U)	-.18
10.	Nueva Ecija	.75	10.	Camiguin	-.21
11.	Batangas	.56	11.	Camarines Norte (U)	-.23
12.	Ifugao	.51	12.	Laguna (U)	-.27
13.	Davao del Norte	.45	13.	South Cotabato (U)	-.28
14.	Pangasinan	.44	14.	Abra	-.29
15.	Agusan del Norte (U)	.36	15.	Oriental Mindoro	-.33
16.	Kalinga-Apayao	.35	16.	Capiz	-.35
17.	Cagayan	.31	17.	Surigao del Norte	-.39
18.	Leyte	.17	18.	Sorsogon (U)	-.43
19.	Quezon (U)	.14	19.	Romblon	-.44
20.	Negros Occ.(U)	.09	20.	Lanao del Sur	-.47
21.	Misamis Or.	.09	21.	Bulacan (U)	-.47
22.	Albay	.06	22.	Surigao del Sur (U)	-.48
23.	Cavite (U)	.03	23.	Camarines Sur	-.50
24.	Ilocos Norte (U)	.03	24.	Southern Leyte	-.54
			25	Zamboanga del Sur	-.54
			26.	Davao del Sur (U)	-.54
			27.	Agusan del Sur	-.55
			28.	Davao Or.	-.59
			29.	Palawan	-.63
			30.	Antique	-.66
			31.	Bohol	-.66
			32.	Isabela	-.67
			33.	Cebu (U)	-.81
			34.	Zamboanga del Norte	-.84
			35.	Northern Samar	-.89
			36.	Sulu	-.95
			37.	Lanao del Norte	-.97
			38.	Masbate	-1.02
			39.	Negros Or.	-1.04
			40.	Eastern Samar (U)	-1.04
			41.	Western Samar	-1.08
			42.	Mountain Province	-1.77

TABLE A-5

Provincial Factor Scores for Access to Welfare (F_5)

	Province	Score		Province	Score
1.	Isabela	2.71	1.	Tarlac	-.01
2.	Mountain Province	2.05	2.	Zambales (U)	-.01
3.	Eastern Samar (U)	2.01	3.	Western Samar	-.02
4.	Camarines Sur	1.74	4.	Zamboanga del Sur	-.06
5.	Rizal (U)	1.71	5.	Surigao del Sur (U)	-.10
6.	Romblon	1.64	6.	Benguet (U)	-.10
7.	Palawan	1.54	7.	Cotabato	-.13
8.	Sulu	1.21	8.	Quezon (U)	-.18
9.	Cagayan	1.12	9.	Cebu (U)	-.19
10.	Bataan	.92	10.	Bulacan (U)	-.27
11.	Batanes	.64	11.	Misamis Occ.	-.38
12.	Catanduanes	.62	12.	Kalinga Apayao	-.43
13.	Abra	.61	13.	Pampanga (U)	-.49
14.	Northern Samar	.60	14.	Bohol	-.50
15.	Davao Or.	.59	15.	Lanao del Norte	-.52
16.	Occ. Mindoro (U)	.56	16.	Camarines Norte (U)	-.54
17.	Agusan del Sur	.42	17.	Batangas	-.57
18.	Davao del Sur (U)	.35	18.	Misamis Or.	-.58
19.	Surigao del Norte	.31	19.	Cavite (U)	-.60
20.	Zamboanga del Norte	.25	20.	Agusan del Norte (U)	-.65
21.	Antique	.21	21.	Oriental Mindoro	-.66
22.	La Union	.22	22.	Southern Leyte	-.67
23.	Capiz	.22	23.	Aklan	-.67
24.	Albay	.21	24.	Nueva Ecija	-.69
25.	Nueva Vizcaya	.19	25.	Sorsogon (U)	-.72
26.	Bukidnon	.15	26.	Leyte	-.73
27.	Masbate	.10	27.	Pangasinan	-.79
28.	Iloilo (U)	.07	28.	Camiguin	-.84
29.	Marinduque	.01	29.	South Cotabato (U)	-.84
			30.	Negros Occ. (U)	-.94
			31.	Lanao del Sur	-.100
			32.	Negros Oriental	-1.15
			33.	Laguna (U)	-1.20
			34.	Ifugao	-1.28
			35.	Davao del Norte	-1.41
			36.	Ilocos Sur	-1.48
			37.	Ilocos Norte (U) 1	-1.60

TABLE A-6

Provincial Factor Scores for Female Education Access (F_6)

	Province	Score		Province	Score
1.	Camarines Sur	7.18	1.	Cataduanes	-.00
2.	Pangasinan	.82	2.	Palawan	-.00
3.	Kalinga-Apayao	.78	3.	Ifugao	-.01
4.	South Cotabato (U)	.62	4.	Leyte	-.05
5.	Sorsogon (U)	.58	5.	Laguna (U)	-.05
6.	Ilocos Norte (U)	.56	6.	Zambales (U)	-.06
7.	Masbate	.52	7.	Batanes	-.06
8.	Western Samar	.49	8.	Sulu	-.07
9.	Bataan	.46	9.	Davao del Norte	-.08
10.	Tarlac	.44	10.	Romblon	-.08
11.	Nueva Ecija	.38	11.	Cavite (U)	-.08
12.	Pampanga (U)	.37	12.	Ilocos Sur	-.11
13.	Camarines Norte (U)	.34	13.	Antique	-.14
14.	Cebu (U)	.33	14.	Misamis Or.	-.14
15.	Or. Mindoro	.26	15.	Davao del Sur (U)	-.15
16.	Capiz	.25	16.	Quezon (U)	-.16
17.	Batangas	.24	17.	La Union	-.16
18.	Bulacan (U)	.20	18.	Aklan	-.18
19.	Abra	.19	19.	Cotabato	-.19
20.	Marinduque	.18	20.	Nueva Vizcaya	-.22
21.	Occ. Mindoro (U)	.14	21.	Cagayan	-.23
22.	Lanao del Norte	.13	22.	Camiguin	-.25
23.	Negros Oriental	.08	23.	Negros Occidental (U)	-.26
			24.	Iloilo (U)	-.33
			25.	Bohol	-.34
			26.	Zamboanga del Sur	-.35
			27.	Agusan del Sur	-.41
			28.	Misamis Occidental	-.41
			29.	Zamboanga del Norte	-.45
			30.	Mountain Province	-.50
			31.	Rizal (U)	-.54
			32.	Agusan del Norte (U)	-.54
			33.	Albay	-.54
			34.	Benguet (U)	-.56
			35.	Southern Tagalog	-.58
			36.	Northern Samar	-.60
			37.	Bukidnon	-.64
			38.	Isabela	-.64
			39.	Lanao del Sur	-.70
			40.	Surigao del Sur (U)	-.76
			41.	Surigao del Norte	-.88
			42.	Davao Oriental	-1.57
			43.	Eastern Samar (U)	-1.62

REFERENCES

Alvarez, G. C. and L. L. Layo. "An Empirical Analysis of Selected Access
1978 Indicators," *P.S.S.C. Social Science Information,* IV (January — March), pp. 8-13.

————————, "Rural-Urban Differentials of Access to Selected Resources,"
1978 A Paper presented at the 1978 U.P. Research Conference: Rural Agenda V in the Bicol Region (April 17-20); Mimeo.

Breese, G. *Urbanization in Newly Developing Countries* (Englewood Cliffs,
1966 New Jersey: Prentice-Hall, Inc.).

Brooks, R. *et al,* "Toward the Measurement of Social Indicators," Proceedings of the Social Statistics Section, American Statistical Association in L. Wilcox, *et al* (Eds.), *Social Indicators and Societal Monitoring* (New York: Elsevier Scientific Publishing Co.) pp. 91-92.

Bureau of the Census and Statistics
1973

Cant, R. G. Planning for Development in the Philippines: Case Studies to Exa-
1972 mine the Applicability of Territorial Indicators at National and Regional Levels. *Philippine Economic Journal,* XIV: 4, pp. 463-512.

————————, "Territorial Indicators and National Planning: A Report on
1975 Country Studies in Thailand and the Philippines," *Economic Bulletin for Asia and the Pacific,* XXVII: 2 (December), pp. 26-53.

Chow, G. "Tests of Equality Between Sets of Coefficient in Two Linear Re-
1960 gressions," *Econometrica* 28 (3) (July), pp. 581-605.

Cohn, E. Social Criteria for Project and Sector Lending: Revised draft, "AID,
1971 June 28, 1971, in L. Wilcox, *et al* (eds.) *Social Indicators and Societal Monitoring,* (New York: Elsevier) 1972, p. 59.

Cowhig, J. and C. Beale. "Levels of living among Whites and Non-whites,"
1965 U.S. Department of Health, Education and Welfare Indicators, Washington, D.C. in L. Wilcox *et al* (Eds.). *Social Indicators and Societal Monitoring.* (New York: Elsevier, 1972), p. 60.

de Guzman, L. and R. L. Pondevilla. Development Studies: Social Work and
1973 Development (Manila: Philippine Association of Social Workers).

Diseases Intelligence Center, Ministry of Health, Philippine Health Statistics,
1974 Manila.

Duncan, O.D. "Path Analysis: Sociological Examples," *American Journal of*
1966 *Sociology 72, / (July), pp. 1-16.*

Fund for Assistance to Private Education. *The Philippine Atlas: A Historical*
1975 *Economic and Educational Profile of the Philippines.* I Manila.

Hauser, P.M. "The Social, Economic and Technological Problems of Rapid Urbanization," in B.F. Hoselitz and W. E. Moore, eds. *Industrialization and Society.* (Geneva: Mouton). pp. 199-216.

Hawley, A. H. *Urban Society: An Ecological Approach.* (New York: The Ronald Press Company).

Hobhouse, L. T. *Social Development: Its Nature and Conditions.* London: George Allen and Unwin, Ltd. (Rev. Ed., 1966).

Land, K. "Social Indicator Models: An Overview," in K. Land and S. Spilerman
1975 (Eds.). *Social Indicators Models.* New York: Russell Sage Foundation, pp. 5-36.

Mangahas, M. *Measuring Philippine Development.* Development Academy of
1976 the Philippines.

Merriam, I. "Concepts and Measures of Welfare," Proceedings of the Social
1967 Statistics Section of the American Statistical Association in L. Wilcox, et. al (Eds.) *Social Indicators and Societal Monitoring.* (New York: Elsevier), pp. 73-74.

Mijares, T. A. and F. Nazaret. Growth of Urban Population in the Philippines
1974 and its Perspectives. Technical Paper No. 5 (Manila: Bureau of the Census and Statistics).

National Census and Statistics Office, *Philippine Yearbook.* Manila.
1977.

———— Census of Agriculture (National Summary, Manila).
1971

———— Census of Population and Housing, Vol. II. (National Summary,
1970 Manila).

———— Indicators of Social Development. (Manila).
1973

———— *Social Indicators,* Vols. I and II (Manila).
1970

National Economic and Development Authority. *Five-Year Philippine Development Plan,* (178-82) Manila (September).

Nie, N. H. *Statistical Package for the Social Sciences.* 2nd ed., (New York: McGraw-Hill Book Co.).

Social Research Associates, *An Analytic Description of the Poor Majority.* 1977 Project Report I-B. Submitted to the U.S. Agency for International Development (May), unpublished.

Streeten, P. "The distinctive features of Basic Needs Approach to Development," 1977 *International Development Review.* No. 3, pp. 8-16.

United Nations, *The World Population Situation on 1970-75.* (New York). 1974

Yambot, E. (Editor-in-chief) *Philippine Almanac and Handbook of Facts.* (Que- 1975 zon City: Philippine Almanac Printers, Inc.).