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Staff Papers Series

Staff Paper P86-42

September 1986

COUNTRY SIZE, LEVEL OF DEVELOPMENT, RELATIVE IMPORTANCE OF AGRICULTURE AND AGRICULTURAL RESEARCH IN LDCs

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Staff Papers are published without formal review within the Department of Agricultural and Applied Economics.

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Table of Contents

- I. Introduction
- II. Country Size and Economic Development
- III. Definition of Country Size
- IV. Country Size and Agricultural Research
- V. Country Size, Level of Development, Relative Importance of Agriculture and Agricultural Research in LDCs
- VI. Summary of Results and Implications for Further Research
- VII. Appendix
- VIII. Bibliography

I. Introduction

Aside from differences in opinion concerning the role of technical change in agriculture, the process by which new agricultural technologies are generated is unanimously perceived as one of enormous importance for sustaining the world's growing population.

In recent years efforts on the part of national governments and multilateral assistance agencies have been made to build strong and effective national agricultural research systems into significant factors for the transformation and modernization of LDC agricultures. Yet these attempts, in a number of developing countries, have appeared to be hindered by factors such as insufficient research expenditures and lack of scientific personnel.

It has been persistently argued that most LDCs are either economically too small and/or economically too poor to develop and support the national research capacity required to greatly improve both their levels of agricultural production and productivity. In addition, the importance of agriculture within the country has been seen as yet another determinant of the level of support that agricultural research can expect to receive. However, no comprehensive empirical evidence for either of the above arguments has been forthcoming.

Within this context, this paper is aimed at (1) proposing a more plausible definition of country size than the ones currently available in the literature; (2) relating this concept to agricultural research policy in LDCs: and (3) describing an eventual empirical relationship between financial and human resources allocated to agricultural research and measures of size, level of development, and relative importance of agriculture. The analysis will utilize a sample of 56 developing countries using 1980 data.

The paper is composed of six main sections. Section I is introductory and provides a brief overview of the problem, objectives and hypotheses.

In Section II a general review of literature on size as related to economic development is presented in order to identify the most important arguments for and against smallness in LDCs.

Section III suggests a more plausible definition of country size than the ones currently available in the literature.

Section IV is an attempt to determine whether there can be found an empirical relationship between either (a) research expenditures as a percent of Agricultural Gross Domestic Product; (b) research expenditures per scientist; (c) research expenditures per million of agricultural population; or (d) the number of scientists per million of agricultural population and size as measured by either population, agricultural land corrected for quality and gross national product independently or derived from these variables.

Section V makes use of a sample of 56 LDCs to analyze the same policy issues, though only one measure of size (agricultural land corrected for quality) is employed, and three new variables (per capita income, agricultural population as a percent of total population, and agricultural GDP as a percent of total GDP), which are utilized as a measure of both the level of development and relative importance of agriculture, are introduced in the analysis.

Section VI summarizes the general findings of the paper and its implications for further research.

II. Country Size and Economic Development

During the last three decades there has been a general belief that small countries face special disadvantages or problems in their development. This view appears to be at least partially supported by the fact that there is an impressive number of small nations among the so-called developing countries. Using population as a quick measure of size, for example, it is found that of 141 developing countries for which data are available, 88 countries have populations of less than seven million, and as many as 48 of these have populations of less than two million, and 22 of these 88 countries are considered by the United Nations to be part of the 31 least developed countries.

Given these facts, it is not surprising that interest has been expressed in the particular problems of these countries. The paragraphs below are an attempt to briefly review the literature on size as related to economic development. To begin with, Kuznets (1959) in his search for a reasonable answer to the question of whether a variant of a theory of economic growth for the many small national units differs from that for the few large ones initiated a debate which later resulted in Demas (1965) demanding a more precise distinction between large and small developing countries, and Robinson (1960) questioning how some of the emerging independent small nations of the sixties could escape the penalties of their smallness.

Following the Overseas Development Council (1983), developing countries will be hereafter defined as those with per capita GNP of US \$ 3,500 or less and Physical Quality of Life Index (a composite index which includes life expectancy, infant mortality and literacy) of 90 or below.

 $^{^2}$ All these numbers correspond to mid-1984 and were obtained from Todaro (1985).

Following these pioneering observations, in 1972 a collection of papers was prepared for a conference on Problems of Small Developing Countries which was organized by the Institute of Development Studies of the University of Sussex and presented at the University of the West Indies in Barbados³. While the main focus of the conference was on the dependent relationships of small Caribbean States with the former metropolitan powers, it generated much discussion on how far smallness could impose constraints on the future growth prospects of these countries.

Similarly, another conference held in 1979 by the Development Studies Centre of the Australian National University explored problems of economic development in the small island states and territories of the Pacific and Indian Oceans. The wider range of this conference permitted it to deal with such broad issues as isolation; population and migration; trade, transport and tourism; finance and economic stability; health and education; and administration, law and politics. The papers concluded that, for the most part, the development situations of small island states differ in significant ways and that policy options open to different island categories will have to vary accordingly⁵.

 $^{^{3}}$ For the collection of papers presented at this conference, see Selwyn (1975).

The papers presented at this conference appeared in Shand (1980).

In another paper Selwyn (1980) argues, however, that small islands as distinct from small countries, are not a useful category in analytical, predictive or policy terms, mainly because the problems that face island states could be parallelled in small, remote mainland countries, or indeed in peripheral regions of many larger countries.

More recently, in 1981, the Commonwealth Secretariat organized the last conference on problems and policies in small economies, held at Malborough House in England⁶. The studies presented at this conference included conceptual and theoretical issues as well as issues of practical interest and application. These issues can be analyzed either in terms of disadvantages or in terms of compensating advantages of being small.

In the view of the conference, the most important disadvantages were

- (1) smallness tends to reduce the scope for exploitation of scale economies particularly in manufacturing (Bhaduri, et al, 1982).
- (2) small countries face special handicaps in the provision of public services (such as infrastructure and research) especially for agriculture (Persaud, 1982) so that these services probably will not receive the necessary support from policy-makers⁷.
- (3) there is a tendency for small economies to concentrate production in a few commodities and a few industries (i.e. the concentration phenomenom), thereby increasing their vulnerability to fluctuations in commodity trade and capital inflows, and reducing their ability to adjust to shocks (Lloyd and Sundrum, 1982).

Regarding the compensating advantages of smallness, the conference found that

(1) small economies are likely to be more open, which appears to foster competitive and efficient economic behavior in the face of a chang-

For the complete collection of papers presented at this conference, see

⁷Following a similar reasoning, human resources and skills in small economies are also likely to be scarce (Jalan, 1982a).

- ing external environment (Jalan, 1982a).
- (2) they are also likely to have greater social homogeneity and cohesion, and a more equitable distribution of income which can ease resistance to the social ajustments that are an inherent feature of economic change (Jalan, 1982a).

Despite all these efforts, no plausible or consistent theory of size as an independent factor in development is available to date, and the view that there is no discernible association between country size and economic development appears, at least empirically, undisputed.

One objective of this paper is to analyze the second purported disadvantage of smallness by describing an eventual empirical relationship between financial and human resources allocated to agricultural research and several measures of size for a sample of 56 developing countries using 1980 data.

⁸Based on a sample of 30 developing countries during the period 1954-67, Khalaf (1979) found that the coefficients obtained from a regression between economic development (as measured by average per capita income for the years 1951-57, adjusted for price changes) and country size (as measured by population and GNP size), and between economic growth (measured in terms of average annual rates of growth of GNP for each country) and country size are positive but neither coefficient is statistically significant.

III. Definition of Country Size

The fact that there are many small nations in the world has forced most writers on small economies to use arbitrary cut-off points either in terms of population or usable land area to distinguish small from large countries.

This section is aimed at proposing a composite country size index 10 which includes population (as a proxy for labor force), total national income (as a proxy for capital stock and/or market size) and agricultural land 11 corrected for quality, which may be taken as representing different dimensions of a country's development potential. Thus, it is hypothesized that differences in economic performance caused by size will be explained by the size of its capital, human and natural resources.

Because size is a relative concept, the relative size of a country based on the three above criteria should be measured in relation to the highest values of these criteria for all the developing countries taken together. Assuming equal weights, a composite country size index can be constructed for all LDCs where the largest country for each criterion is taken

⁹Kuznets (1960) used a cut-off point of 10 million population, Demas (1965) defined small countries as those with a population of 5 million or less and with usable land area of 10 to 20 thousand square miles or less, and Chenery and Syrquin (1975) used a cut-off point of 15 million population.

Bhaduri, Mukherji and Sengupta (1982) criticize this approach on the following grounds. First, "a statistically satisfactory composite index of smallness will not be found because the various relevant variables are not, in general, positively correlated in any significant sense". Second, "the ordering of countries in terms of their relevant indices of smallness will not remain invariant over time".

Agricultural land is here defined as the sum of arable land under temporary crops and land under permanent pasture, plus land devoted to permanent pasture.

as 100. More specifically, the size index for 110 developing countries was calculated according to the following formula:

 $MCSI_i = 100/3 (POPUL_i/POPUL_{max} + AGLCQ_i/AGLCQ_{max} + TGNP_i/TGNP_{max})$ where

 $\mathtt{MCSI}_{\mathbf{i}}$ is the country size index for country i;

 ${
m POPUL}_{f i}$, ${
m AGLCQ}_{f i}$ and ${
m TGNP}_{f i}$ are population , agricultural land corrected for quality and gross national product of each country respectively; and ${
m POPUL}_{
m max}$, ${
m AGLCQ}_{
m max}$ and ${
m TGNP}_{
m max}$ are the highest values of population, agricultural land corrected for quality and gross national product for all developing countries taken together

This index differs from the one originally proposed by Jalan (1982b) in two respects. First, it includes agricultural land in lieu of arable land. Second, it utilizes the international land quality index developed by Peterson (1984) to correct agricultural land for quality. It is argued that agricultural, rather than arable land (i.e. area under temporary crops) more accurately reflects a country's long term endowment of natural (i.e. agricultural) resources. The international land quality index is derived from land quality weights obtained from a regression run on data in the US. It estimates the quality of an acre of (agricultural) land for 115 les developed and developed countries. Unavailability of data prevented Peterson from using information on nitrogen content as a proxy for organic matter or soil fertility. Instead two variables were used to measure the combined effects of topography and irrigated land. These are (1) nonirrigated cropland as a percent of all crop land (i.e. arable land under temporary crops and land under permanent crops) plus land under permanent pasture in farms, and (2) irrigated cropland as a percent of all cropland in farms. Long-run average rainfall was used to measure the relative productivity of the soil 12 . Peterson proceeds to argue that these land quality weights when applied to international data should result in "an international land quality index that is still far superior to a simple area measure". His approach appears to have some practical appeal for it would not be possible to estimate those weights directly from international information either because, for many countries, such data do not exist, particularly the centrally planned economies, or because if land prices were available for the world, exchange rate distortions would make the former somewhat unreliable. Peterson also mentions that since the land market in the US is open and competitive, those weights "should reflect true quality differences after accounting for population density". Finally, because many countries have precipitation figures which typically exceed 100 inches per year, whereas the wettest state in the US (i.e. Alabama) averaged only 57 inches per year, a truncating procedure was employed which assumed that precipitation in excess of 60 inches has no effect on land prices and quality.

Since the indices computed by Peterson do not provide a complete picture of land quality in the world, especially due to the exclusion of many developing countries, most of them also small, it was necessary to extend them.

where

LPV represents the predicted value of land PNICL is nonirrigated land as a percent of all cropland plus $\,$

permanent pasture PIL constitutes the percent of irrigated land of all cropland LP is annual average precipitation

After taking anti-logs of LPV, dividing each value by the sample average and multiplying by 100, the final land quality indices were obtained.

 $^{^{12}}$ Indeed, the predicting equation used by Peterson was the following:

log LPV = .0077 PNICL + .0133 PIL + log .4161 LP

The results of such an attempt are shown in TABLE 1. They more or less correspond to the same ordering of countries but in general the actual magnitudes are relatively lower than the results reported by Peterson (see TABLE2 in the Appendix). These differences can be partially explained as follows. First, all data on land area correspond to 1983 instead of 1977 13. During this period, some countries experienced both significant improvements in irrigation facilities and tended to reduce their pasture land as a percent of agricultural land thereby improving their overall land quality, whereas other countries did not. Given the limited comparability of the results, the very few updated indices which showed similar magnitudes to or greater magnitudes than those presented by Peterson, for example, do not necessarily reflect the real improvements in land quality experienced by those countries. Second, data on rainfall were obtained from different sources of information 14. Although in both cases long-run average rainfall data were used, they exhibitted some variation for certain countries. Third, the sample of countries was different. The inclusion of more countries in the sample led to a different ranking because now new countries lie inbetween Peterson's countries. Similarly, the larger number of countries yielded a different sample average which in turn resulted in different country indices from those obtained by Peterson 15.

¹³Information on cropland, pasture land and irrigation were obtained from FAO Production Yearbook (1984) and FAO Production Yearbook (1982) respectively.

Peterson's precipitation figures are from the British Air Ministry Meteorological Office (1958), whereas the updated indices used data on rainfall from Rudloff (1981).

Because the differences still appeared considerable, Peterson's data were double-checked. Apart from some other minor errors, it was found that the correct sample average of the hand predicted values (LPVs) was 7.42 and not

TABLE 1

			LAND	QUALITY INDI	CES			
Rank	Country	LQI	Rank	Country	LQI	Rank	Country	LQI
(81)	Afghanistan	60	(30)	Guadeloupe	123	(24)	P. New Guinea	132
(6)	Albania	172	(34)	Guatemala	117	(65)	Paraguay	78
(92)	Algeria	40	(50)	Guinea	95	(52)	Peru	93
(80)	Angola	61	(61)	Guinea-Bissa	ս 83	(13)	Philippines	157
(79)	Argentina	62	(33)	Guyana	120		Poland	93
(78)	Australia	63	(34)	Haiti	117	(34)	Portugal	117
(60)	Austria	84	(47)	Honduras	99	(28)	Puerto Rico	125
(30)	Bahamas	123	(4)	Hong Kong	182	(18)	Reunion	147
(89)	Bahrain	46	(51)	Hungary	94	(48)	Romania	98
(9)	Bangladesh	168	(7)	India	171	(42)	Rwanda	104
(23)	Barbados	133	(18)	Indonesia	147	(77)	St. Helena	65
(62)	Belgium	82	(77)	Iran	65	(19)	St. Lucia	144
(37)	Belize	114	(77)	Iraq	65	(16)	St. Vincent	149
(32)	Benin	121	(54)	Israel	91	(39)	Salomon Islands	112
(70)	Bolivia	73	(36)	Italy	115	(15)	Samoa	155
(91)	Botswana	43	(38)	Ivory Coast	113	(32)	Sao Tome and P.	121
(50)	Brazil	95	(49)	Jamaica	96	(97)	Saudi Arabia	32
(41)	Bulgaria	105	(1)	Japan	220	(65)	Senegal	78
(12)	Burma	161	(86)	Jordan	51	(40)	Seychelles	110
(45)	Burundi	101	(72)	Kenya	71	(44)	Sierra Leone	102
(43)	Cameroon	103	(7)	Korea Dpr	171	(14)	Singapore	156
(63)	Canada	81	(3)	Korea, Rep. of	196	(90)	Somalia	45
(87)	Cape Verde	48	(88)	Kuwait	47	(82)	South Africa	58
(49)	C.A.R.	96	(33)	Laos	120	(58)	Spain	86
(84)	Chad	56	(29)	Lebanon	124	(11)	Sri Lanka	162
(50)	Chile	95		Lesotho	56	(85)	Sudan	53
(31)	China	122	(35)	Liberia	116	(2)	Suriname	211
(57)	Colombia	87	(96)	Libya	33	(47)	Swaziland	99
(20)	Comoros	140	(51)	Madagascar	94	(55)	Sweden	90
(67)	Congo	76	(50)	Malawi	95	(70)	Switzerland	73
(14)	Cook Islands	156	(11)	Malaysia	162	(86)	Syria	51
(55)	Costa Rica	90	(82)	Mali	58	(74)	Tanzania	69
(27)	Cuba	126	(38)	Malta	113	(8)	Thailand	170
(59)	Cyprus	85		Martinique	126	(25)	Togo	128
(55)	Czechoslovakia		(96)	Mauritania	33	(17)	Tonga	148
(31)	Denmark	122	(10)	Mauritius	164	(12)	Trinidad and Tobas	30161
(98)	Djibouti	26	(56)	Mexico	89	(78)	Tunisia	63
(39)	Dominican Rep.	112	(96)	Mongolia	33	(51)	Turkey	94
(45)	Ecuador	101	(83)	Morocco	57	(44)	Uganda	102
(79)	Egypt	62	(76)	Mozambique	66	(78)	USSR	63
(27)	El Salvador	126	(94)	Namibia	36	(64)	United Kingdom	79
(30)	Eq. Guinea	123		Nepal	115	(57)		87
(69)	Ethiopia	74		Netherlands	135	(73)	Upper Volta	70
(22)	Fiji	134	(78)	New Caledonia		(73)	Uruguay	70
(46)	Finland	100	(24)	New Zealand	132	(68)	Venezuela	75
(55)	France	90		Nicaragua	91	(5)	Vietnam	173
(24)	F. Polynesia	132	(85)	Niger	53	(95)	Yemen Arab	35
(66)	Gabon	77		Nigeria	113		Yemen Democratic	39
(26)	Gambia	127			69	(55)	Yugoslavia	90
	Germany Dr.	100		Norway	121		Zaire	96
	Germany Fr.	92	(69)		74		Zambia	68
(55)	Ghana	90		Pakistan	126	(71)	Zimbabwe	72
(54)	Greece	91	(48)	Panama	98		·	

The indices reported in TABLE 1 were then applied to the equal-weight country size index by first dividing each country's index by the world's highest land quality index (i.e. Japan's), and second, multiplying the resulting weights by the corresponding cropland plus permanent pasture (i.e. agricultural land) values.

In TABLE 4, the four indicators of size for 110 developing countries are presented. For the purposes of this paper, a total of 20 so-called developing countries for which reliable data are available were deliberately excluded. They can be roughly grouped into the following categories:

(a) countries highly dependent on oil and other mineral exports such as Saudi Arabia, Iran, Venezuela, Algeria, Iraq, Kuwait, Libya, Qatar, United Arab Emirates, Brunei, Ecuador, South Africa and Trinidad and Tobago; (b) highly specialized small countries such as Hong Kong, Singapore and Puerto Rico: and (c) high-income small European countries such as Yugoslavia, Portugal and Romania.

It is apparent that the MCSI¹⁶ for most countries is quite small and the mean and the median are 4.22 and .98 (on a scale from 0 to 100). There is also a considerable discontinuity at the beginning fo the series which clearly separates four countries (China, India, Brazil and Mexico) from the rest. Due to this skewed distribution, using the median as a cut-off point might be a convenient way to distinguish between small and large countries (Jalan, 1982b).

^{6.98} which was the number used by Peterson to compute the final land quality indices. For purposes of comparison, the results of this exercise are presented in TABLE 3 of the Appendix.

The first methodological problem of using a composite index of size suggested by Bhaduri et al (1982) (in footnote 10) is successfully addressed by the MCSI because the three variables (POPUL, AGLCQ and TGNP) in the sample of 110 countries are found to be highly positively correlated with each other (see TABLE 5).

-13-TABLE 4

INDICATORS OF SIZE IN SELECTED COUNTRIES

=======================================	======		ELEBEREE SIZE IN 5		
	obs		ill.) AGLCQ (000)	TGNP (US\$mi	•
CHINA	1	1019,100	212621.2	305730.0	100,0000
INDIA	2	733,2000	140634.0	190632.0	66.81396
BRAZIL	3	129,7000	102641.0	243836.0	46.91879
MEXICO	4	75.00000	39239,60	168000.0	26.92168
INDONESIA	5	155,7000	21580.70	87192,00	17.98243
ARGENTINA	6	29.60000	50008.00	61272.00	15.48850
NIGERIA	7	93,60000	26201.25	72072.00	15.02710
SOUTH KOREA		40.00000	1990.040	80400.00	10.38623
TURKEY	9	47,30000	15303.70	58652.00	10.34108
PAKISTAN	10	89.70000	14529,30	34983.00	9.025918
THAILAND	11	49,20000	15152.06	40344.00	8.383354
COLOMBIA	12	27,50000	14276.00	39325.00	7,425135
PHILIPPINES		52,10000	8782,700	39596.00	7.398110
BANGLADESH	14	95,50000	7399.360	12415.00	5.637284
EGYPT	15	45.20000	691.8800	31540.00	
		40.90000	20121,20	4908,000	5,036564
ETHIOPIA PERU	16 17	17,90000			5.027362
			12867.54	18616.00	4.632449
SUDAN	18	20.80000	16427,52	8320.000	4.162854
VIETNAM	19	58,30000		11077.00	4.087719
MALAYSIA	20	14.70000	3231.580	27714.00	4.015604
CHILE	21	11.70000	7494.040	21879.00	3.942994
NORTH KOREA		19.20000	1825.200	21696.00	3.279634
MOROCCO	23	20,80000	5432,440	15808.00	3,255526
TANZANIA	24	20.80000	12458.90	4992.000	3.177833
MONGOLIA	25	1,900000	18746.40	1482,000	3.162662
MADAGASCAR	26	9.500000	15914.73	2945,000	3.126826
BURMA	27	35,50000	7619,740	6390.000	3.052420
MOZAMBIQUE	28	13,40000		3216,000	3.003198
SYRIA	29	9,600000	3217,930	16896.00	2.660636
ZAIRE	30	29,70000	6899.640	5049,000	2.603611
ZAMBIA	31	4,300000	12448.98	3654.000	2.556123
ANGOLA	32	7.800000		6162.000	2.353599
AFGHANISTAN		14.40000		2448,000	2.348686
CAMEROON	34	9.400000	7172,200	7872.000	2.296686
BOLIVIA	35	6,000000	10007.25	3060,000	2.098749
CHAD	36	5.000000	12037.50	400.0000	2.094313
URUGUAY	37	3.000000	4824.960	7470.000	1.668995
MALI	38	7.200000	8333.780	1152.000	1.667617
KENYA	39	18.90000		6426,000	1.622826
IV. COAST	40	9.500000	3562.350	6745,000	1.604612
UGANDA	41	13,90000	5198.000	3058,000	1.602967
PARAGUAY	42	3.200000	6121,500	4512.000	1,556293
BOTSWANA	43	1.000000		900.0000	1.553082
NAMIBIA	44	1.100000	8570.880	1551,000	1.548768
TUNISIA	45	6.900000		8901,000	1,546274
GUATEMALA	46	7.900000		8848,000	1.484734
DOM. REP.	47	6.000000		8220.000	1.376465
SRI LANKA	48	15.40000		5082.000	1,362328

-14TABLE 4 (Cont...)

INDICATORS OF SIZE IN SELECTED COUNTRIES

COUNTRY POPUL (mill.) AGLCQ (000) obs TGNP (US\$mill)MCSI ZIMBABWE 49 7,900000 2487,540 5846,000 1,285759 GHANA 50 12,80000 2546,100 3968,000 1,250456 SOMALIA 51 5,100000 5983,200 1275,000 1.243832 52 NEPAL 15,70000 2141,360 2512,000 1.123113 SENEGAL 53 4,200000 3823,750 2728,000 1,099686 54 MAURITANIA 1,400000 5914.750 768,0000 1.063656 **UPPER VOLTA 55** 6.700000 4042,560 1407,000 1,006317 YEMEN ARAB 56 7,400000 1566,400 4180,000 0.949895 CONGO 57 3735,550 1.800000 2214.000 0.885899 NIGER 58 6,100000 3067,200 1464,000 0.839996 HONDURAS 59 4.100000 2324,500 2747,000 0.798340 NICARAGUA 60 3,000000 2589,970 2640,000 0.792000 GABON 61 1,000000 * 1803,200 4000.000 0.751517 JORDAN 62 3,200000 118.6800 5248,000 0.695456 EL SALVADOR 63 5,200000 760,9500 0.691915 3692.000 GUINEA 64 5.800000 1967,250 1740.000 0.687832 **PANAMA** 65 2,000000 785.2500 4240.000 0.650805 MALAWI 66 6.600000 1799.120 1386,000 0.649045 LEBANON 67 2.600000 * 172,4800 4914,000 0,647850 SIERRA LEONE 68 3.400000 1828,500 1188.000 0.533937 COSTA RICA 69 2,400000 1148.820 2448,000 0.525507 C.A.R. 70 2.500000 2186,800 700,0000 0.500924 71 HAITI 5.300000 742,5300 1590,000 0,463120 **RWANDA** 72 5,700000 681,5000 1539,000 0.461075 P.NEW GUINEA73 3,400000 * 284.4000 2788,000 0.459767 YEMEN DEM 74 2,000000 1669,860 1040,000 0.440596 BENIN 75 3.800000 1236,400 1102,000 0.438277 **JAMAICA** 76 2,300000 2990,000 0.433577 206.3600 BURUNDI 77 4.500000 1019,360 1080,000 0.424748 BAHRAIN 78 0.400000 * 1,260000 3712,000 0.417995 79 **CYPRUS** 0.700000 204.7500 2688.000 0.348064 TOGO 80 2,800000 943.6600 784.0000 0.325003 LAOS 81 3,700000 * 929,5000 407.0000 0.311117 REUNION 82 0.500000 42,88000 2005.000 0.241679 **GUYANA** 83 0.800000 * 948.7500 0.233345 534,0000 LIBERIA 84 2,100000 323,8300 1008,000 0.229357 LESOTHO 85 1,500000 574,5000 690,0000 0.214359 FIJI 86 0.700000 * 180,5600 1365,000 0.200027F. POLYNESIA 87 0.200000 57.00000 1596,000 0,189488 MAURITIUS 88 1.000000 85,50000 1240.000 0.181308 MALTA 89 0.400000 7.140000 1520.000 0.179926 SWAZILAND 90 0.400000 578.7000 564,0000 0.171842 MARTINIQUE 91 0.300000 * 29,07000 1404,000 0.167446 SURINAME 92 0.400000 * 77.76000 1180.000 0.153928 GUADELOUPE 93 0.300000 34,16000 1260,000 0.152544 GUINEA-BISSAU94 0.800000 * 595,4600 134,0000 0,134347 95 BARBADOS 0.300000 * 22,20000 1050,000 0.127773 N.CALEDONIA 96 0.100000 * 75,40000 700,0000 0.091412

TABLE 4 (Cont...)

INDICATORS OF SIZE IN SELECTED COUNTRIES

	:======:				
COUNTRY	obs	POPUL (mill.) AGLCG (000)	TGNP(US\$mil	.1) MCSI
=======================================	:======:			=======================================	=======================================
BAHAMAS	97	0.200000 *	6.160000	766,0000	0.091023
GAMBIA	98	0.700000 *	145,0000	252,0000	0.073103
COMOROS	99	0.500000 *	68.48000	170.0000	0.045625
EQ. GUINEA	100	0.300000 *	187.0400	52.50000	0.044859
SALOMON IS.	.101	0.300000 *	46.92000	198,0000	0.038756
SAMOA	102	0.200000 *	86.10000	170.0000	0.038575
BELIZE	103	0.200000 *	50.44000	216,0000	0,038000
DJIBOUTI	104	0.300000 *	24.00000	142.8000	0.029144
SEYCHELLES	105	0.100000 *	5.500000	179.7000	0.023726
CAPE VERDE	106	0.300000 *	14.30000	105.0000	0.023502
TONGA	107	0.100000 *	38,86000	62,00000	0.016123
ST. VINCENT	108	0.100000 *	12,92000	72,00000	0.013146
ST. LUCIA	109	0.100000 *	13,00000	48,00000	0.010542
SAO TOME &F	2110	0.100000 *	20.35000	37.00000	0.010495
**********		:=========			:========

SOURCES: World Bank (1985), FAO (1984) and Todaro (1985). All figures are for 1983 unless otherwise indicated.

* Figures correspond to mid-1984 and were obtained from Todaro (1985).

Note.- See text for the formula to compute the MCSI.

According to the data in TABLE 4, Upper Volta and Yemen Arab represent the median countries. The median values for the three criteria can be obtained by taking the average between the values that correspond to these two countries.

Since there is no logical basis for assigning equal weights to different factors, the validity of combining separate indices of size can be subject to question. To overcome this problem, Jalan (1982b) suggests considering the three variables as three independent measures of size where the highest values of these in the sample of countries with a MCSI below .98 (i.e. the median aggregate country size index for the sample) are taken as the corresponding cut-off points for the classification of small economies. That is, all countries which have populations of less than 6.6 million (which can be rounded to 7 million), agricultural land corrected for quality of less than 3,735 thousand hectares (which can be rounded to 4,000 thousand hectares) and GNPs of less than

SMPL 1 -	110	TABLE 5			
110 Observations	CORRELATION	BETWEEN MEASURES C	F SIZE		
	=======================================		=======================================	=======================================	
Series	Mean	S.D.	Maximum	Minimum	
MCSI	4.2243914	12,498028	100.00000	A A4A4050	
POPUL	30,109091	120,17511			
AGLCQ	9136,6149		1019,1000	0.1000000	
TGNP	·	26365.879	212621,20	1.2600000	
IGNE	16575.345	45395,121	305730,00	37,000000	
		=======================================		=======================================	
		Covariance	Corr	elation	
	=========	=======================================	========	=========	
MCSI,MCSI		154.78069	1.00	000000	
MCSI,POPL		1406.7661		452182	
MCSI,AGLO	:Q	321247.18		938339	
MCSI,TGNF	ı	535678.86			
POPUL, POP	UL	14310.765	0.9528401 1.000000		
POPUL, AGL		2925690.6			
POPUL, TGN		4402611.2			
AGLCQ, AGL				144282	
AGLCQ,TGN		688839934		000000	
		1.078D+09	0,90	91477	
TGNP, TGNP		2,0420+09	1.00	000000	
	=======================================		=======================================	==========	

SOURCE: TABLE 4

US\$ 5.248 billion (which can be rounded to US\$ 5.5 billion) may be classified as small.

Due to a high correlation between agricultural land corrected for quality and the other two variables (See TABLE 6), when the smallest LDCs are selected according to the MCSI, it is observed that, by and large, they are also countries with less than 4,000 thousand hectares of high-quality agricultural land ¹⁷. Thus it may be statistically sufficient to classify countries by quality adjusted agricultural land alone ¹⁸.

For a similar point, using population as the only indicator of size, see Lloyd and Sundrum (1982).

This last criterion also seems to respond quite effectively to an early observation advanced by Bhaduri, et al (1982) in footnote 10. In particular, agricultural land corrected for quality appears to be less time-variant than both population and GNP as a measure of size, and thus will be used as the only size indicator in Section V of this paper.

TABLE 6

CORRELATION OF MEASURES OF SIZE

	Number of countri Land Corrected fo (000 hect	or Quality of: ares)	
	Less than 4,000	4,000 and over	TOTAL
a) Population (in millions)			
Less than 7	58	10	68
7 and over	13	29	42
,	71	39	110
b) GNP (US \$ billion)			
Less than 5.5	59	18	77
5.5 and over	11	22	33
	70	40	110

SOURCE: TABLE 4. Based on similar table presented by Lloyd and Sundrum (1982).

IV. Country Size and Agricultural Research

In general, there are two central policy issues in agricultural research, namely, a country's research needs and the amount of financial (i.e. research expenditures) and human (i.e. scientific personnel) resources available to meet those needs. On the one hand, "some research capacity is essential in support of agricultural development, no matter how small the country may be" 19 (Gamble and Trigo, 1985). On the other hand, as the same authors indicate, "the amount of resources a nation can devote to agricultural research is determined by its size and the importance of agricultural production within its economy". In this section, an attempt is made to determine whether there exists an empirical association between (1) research expenditures as a percent of Agricultural GDP (EPAGDP), (2) research expenditures per scientist (RPS), (3) research expenditures per million of Agricultural Population (RPAP), and (4) number of scientists per million of Agricultural Population (SPAP), and size 20 (as measured by either one of the four criteria developed in the previous section) for a sample of 56 (large and small) developing countries using 1980 data 21 .

In order to do this, a simple regression analysis is used in which EPAGDP, RPS, RPAP and SPAP are treated as the dependent variables and the size measures are taken as explanatory variables. The results are shown in TABLE 7 and can be summarized as follows:

¹⁹Yet these needs vary from one country to another and this kind of analysis seems to be directed towards a level of specificity that this paper will not address.

The eventual empirical relationship between the same policy issues and both the relative importance of agriculture and the level of development of countries will be analyzed in Section V of this paper.

 $^{^{21}}$ For the complete data used, see TABLES 11, 12, 13, 14 and 15.

TABLE 7

COUNTRY SIZE AND AGRICULTURAL RESEARCH

RECRESSION RESULTS

DEPENDENT VARIABLE	POP	EXPLANATORY VARIABLES ALCQ GNP	IABLES GNP	CSI	CONSTANT	R ²	1	# of obs.
1. EPAGDP	3.467D-05				.4469677	.000428	.0206960	56
		6.277D-07			.4389350	.006542	.0808828	56
		(torono)	2.271D-07		.4419558	.002475	.0497515	56
			(cocoooc.)	.0008661	.4422890	.002794	.0528629	56
2. RPS	-3.484D-06			(.3830049)	.0450871	.000478	0218593	99
		5.0710-08			.0440925	.004718	.0686842	56
		(19160001)	2.263D-08		.0442058	.002717	.0521276	99
			(26) Cror :)	5.6330-05	.0444671	.001306	.0361431	99
3. RPAP	0014105			(060/607.)	1.9918740	.007527	0867608	99
		5.785D-06			1.8226744	.005901	.0768162	56
,		Catalogical	4.090D-06		1.7896445	.008529	.0923519	95
			(occitor)	.0053768	1.8733983	.001144	.0338180	99
4. SPAP	0457976			~ ⁻ '	53.598095	622900.	0823325	56
•		-3.528D-05		•	51.637615	.000187	0136925	99
		. `	-6.279D-06		51.270232	1.720-05	0041434	99
				1767410 : (2388760)	52.422885	.001056	0324897	99

Note. - t-ratios are in parentheses,

SOURCE: TABLES 11, 12, 13, 14 and 15.

- 1. There appears to be no significant relationship between EPAGDP (Research Expenditures as a percent of Agricultural GDP) and any measure of country size for the sample of 56 countries utilized in the analysis. All regression coefficients denote positive signs which imply a positive, albeit non-significant, association between research expenditures and size. In other words, there was, in 1980, a weak tendency for large developing countries to allocate a relatively higher percentage of their agricultural GDP to agricultural research than their smaller counterparts 22. However, it is quite intriguing that the countries with the highest EPAGDP in 1980 do not seem to be quite large (see TABLE 12 in the Appendix). In fact, most of them are rather small African countries (i.e. Mali, Burundi, Senegal, Zambia and Zimbabwe) in which the success of their agricultural sectors does not seem to be strongly related to their level or growth-rate of agricultural research outlay (Lipton, 1985).
- 2. No significant statistical linkage was found between RPS (Research Expenditure per Scientist) and any of the country size measures for the same sample of countries. All regressions but that of RPS on population showed positive (non-significant) relationships between research costs per scientist and size. The negative (insignificant) effect of population

In an interesting analysis of the agricultural sector in small economies Persaud (1982) points out that because agriculture is very demanding of public services, the bigger agricultural sector of large countries often provides scope for external economies. He goes on to argue that, in the case of agricultural research, "returns tend to be higher the wider the area over which resulting innovations are adopted". Ruttan (1985) also makes a similar point when he states that "the cost of developing a new variety that will be grown on a million acres is unlikely to substantially greater than one that will be grown on half a million acres". Following this reasoning (and assuming government rationality), small developing countries would be expected to spend relatively more on research than larger ones. However, there is evidence to indicate that investment policy in LDCs is far from optimal (see Boyce and Evenson, 1975). Thus it also seems reasonable to think that larger countries will be willing to spend more on research than smaller ones. It is just more profitable for them to do so.

on research expenditures per scientist suggests that, in 1980, some countries with small populations paid relatively more money per scientist year than countries with large populations. Lipton observes that the cost of doing a comparable piece of research was at least three times as high in Sub-Saharan African countries such as Mali, Burundi, Zimbabwe, etc., as in South Asian countries such as India, Pakistan, Bangladesh, Sri Lanka and Nepal²³, but that they also appear to have obtained much less national research output than did the South Asian countries (see also TABLE 13 in the Appendix).

- Population) on population gave a negative coefficient indicating an inverse relationship between these two variables. This association was not statistically significant. A weak tendency for small countries as measured by population to spend relatively more money per million of agricultural population on agricultural research than larger ones was observed. The regressions of RPAP on ALCQ, GNP and CSI, however, yielded exactly the opposite results, but again it was not possible to obtain a significant outcome.
- 4. Finally, the results of similar regressions of SPAP (Scientists per million of Agricultural Population) on POP (Population), ALCQ (Agricultural Land corrected for quality), GNP (Gross National Product) and CSI (the Country Size Index) all showed negative coefficients. While they some-

It is important to mention, however, that salaries in Sub-Saharan countries are likely to be higher than in South Asian countries (Lipton, 1985) and that the inclusion of dummy variables for continents in the regressions would have probably provided more precise information on this regard (Evenson, 1986).

what contradict the general view that small countries face constraints in terms of availability of scientific personnel for agricultural research, they also appear to suggest the presence of economies of scale in agricultural research²⁴. Nonetheless, these results are not statistically conclusive either.

In brief, the above results are not consistent with the argument that the size of a country has a strong impact upon the amount of resources it devotes to agricultural research. They also show, however, that there are some "weak effects" that deserve some attention 25.

That is, small countries would require relatively more scientists per million of agricultural population than large countries in order to achieve a comparable research output. But this could also result in diseconomies to the system in the form of a rapid expansion of research stations and dispersion of knowledge and personnel (Boyce and Evenson, 1975; Lipton, 1985).

Other things being equal, two reasonable hypotheses -both favoring large as against small countries- for these "weak effects" can be advanced. On the one hand, a positive association between level level of financial resources allocated to agricultural research and size implies that large developing countries may have more incentives to invest in agricultural research than small countries simply because if they spend more then their gains are larger. On the other hand, a negative relationship between level of resources and country size suggests that large countries do not have to spend as much on research to obtain similar results to those of small countries (see also footnote 22). It can be argued that these two factors probably offset each other (Ruttan, 1986) which obscures the real effect of scale in agricultural research.

V. Country Size, Level of Development, Relative Importance of Agriculture and Agricultural Research

In this section the same sample of 56 countries is used to analyze the same policy issues, though only one measure of size (agricultural land corrected for quality) is employed, and three new variables (per capita income, agricultural population as a percent of total population and agricultural GDP as a percent of total GDP) are utilized to measure both the level of development and the relative importance of agriculture ²⁶.

In order to determine whether per capita income (PCI), agricultural population as a percent of total population (PAGP) and agricultural GDP as a percent of total GDP (PAGDP) had any impact upon availability of research resources in 1980, a multiple regression analysis is employed in which ALCQ, PCI, PAGP and PAGDP are explanatory (independent) variables of EPAGDP (Research Expenditures as a percent of Agricultural GDP), RPS (Research Expenditures per Scientist), RPAP (Research Expenditures per million of Agricultural Population) and SPAP (number of Scientists per million of Agricultural Population). The results are shown in TABLE 8 and can be summarized as follows:

1. All regressions of EPAGDP on different combinations of independent variables designated to describe an eventual empirical relationship between research expenditures and measures of size, level of development and relative importance of agriculture presented either non-significant results or high levels of multicollinearity among explanatory variables 27, and the signs of their coefficients varied, accordingly, from one regression to another. The six regressions reported in TABLE 8, however, show that

 $^{^{26}}$ For the complete data used, see TABLES 16,17, 18 and 19.

²⁷See TABLE 9.

TABLE 8

COUNTRY SIZE, LEVEL OF DEVELOPMENT, RELATIVE IMPORTANCE OF AGRICULTURE AND AGRICULTURAL RESEARCH

RESULTS	
REGRESSION	

1. EPAGDP (.394369) (.1795636)0002334 (.4301849 .007146 56 (.51732-07) (.1795636) (.17956621) (.1795662	DEPENDENT VARIABLE	ALCQ	INDEPENDENT VARIABLES PCI PAGP	VARIABLES PAGP	PAGDP	CONSTANT	R-2	f of obs.
6.5640-07 (.513009) (.1317663) (-1317663) (-1317663) (-15370787) (.1689966) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-1764407) (-17646093) (-1766621) (-168967 (-176466621) (-1764669) (-1766621)	1. EPAGDP	6.314D-07 (.5943469)	1.039D-05 (.1795636)			.4301849	.007146	56
5.087D-08 5.087D-08 5.087D-08 6.1587677 6.1587687 6.11689966) 0003097 0035040 0037212 004838 0465720 004838 0465720 004838 0465720 004838 0465720 004838 0465720 004838 0465720 0048388 0048388 0048388		6.1/30-07 (.5794298)		0002334		.4522822	.006867	99
5.087D-08		6.564D-07 (.6313009)			0035300	.5376363	.048938	. 95
00030970003504000350400035040 (-1.5345577)0035040 (-1.5345577)00350400035040 (-1.5345577)0035040 (-1.5345577)0035040 (-1.5345577)0035040 (-1.5345577)004838 (-1.5027094) (-1.168580)001862 (-1.168580)001862 (-1.168580)001862 (-1.168580)001862 (-1.168580)001862 (-1.168580)001862 (-1.168580)001580 (-1.168580)001780 (-1.168580)001580 (-1.168580)0017			9.715D-06 (.1689966)			.4407459	.000529	99
5.087b-08 4.407b-07 (-1.5345577)				0003097		.4663684	.000576	56
5.087b-08 4.407b-07 (.5027094) (.0799854) 5.904b-08 (.5887466) (1.1168580) 4.997b-08 (.4946093) (.4946093) 3.865b-07 (1.0826155) (.4066621) (.0445720 9.25b-05 (.0706659) (.0001789 (.4185490)) (.4185490)				•	0035040 (-1.5345577)	.5472993	.041786	26
5.087b-08 4.407b-07 (.5027094) (.0799854) (.0799854) (.0001862 (.5887466) (1.1168580) (1.4066621) (.4066621) (.4066621) (.0706659) (.0001789 (.0706659) (1.0826155) (.4185490) (.4185490) (.4185490)								
.0001862 (1.1168580) 3.865D-07 (.0706659) .0001789 (1.0826155) 9.273D-05 (.4185490) .003234	2. RPS	5.087D-08 (.5027094)	4.407D-07 (.0799854)			.0437212	.004838	56
9.075D-05 3.865D-07 (.0706659) .0001789 (1.0826155) .0273D-05 9.273D-05 .0422907 .003234 (.4185490)		5.904D-08 (.5887466)		.0001862		.0334426	.027603	99
.0445720 9.25D-05 .0347899 .021244 9.273D-05 .0422907 .003234 (.4185490)		4.997D-08 (.4946093)			9.0750-05	.0415550	.007813	56
0347899 .021244 9.273D-05 .0422907 .003234 (.4185490)			3.865D-07 (.0706659)	.0001789		.0445720	9.25D-05	56
.0422907 .003234			, C	1.0826155)		.0347899	.021244	. 95
					9.2/3D-05 (.4185490)	.0422907	.003234	56

TABLE 8 (Cont...)

				•			
DEPENDENT VARIABLE	ALCQ	INDEPENDENT VARIABLES PCI PAGP	VARIABLES PAGP	PAGDP	CONSTANT	\overline{R}^2	of obs.
3. RPAP	6.741D-06 (.8609413)((.2736D-06 (.2794660) (.6659589)	6.741D-06 .0026626 (.8609413)(6.2459960)*** 2.236D-06 6.316D-06 (.6659589) (6.245344)***	5.9628898)*07960460796046	** 0652706 (-3.1158999)** ** 0650201 (-3.1205623)**	4204641 6.3594930 3.6476763 3077195 6.4105237 3.7406534	.427390 .405041 .159811 .419382 .404164	56 58 58 58 56 58 58 58
4. SPAP	-6.386D-06 .0805104 (0220293) (5.1007134)*** 0001476 (5123678) (1.983D-05 (0594258) .0805172 (5.1500028)***	.0805104 (5.1007134)*** (-) (-) (-) (-) (-) (5.1500028)***	2.5099030 5.2413096)* 2.4916525 5.2536502)*	1.9009322 2.5794532)* 1.9017186 2.6050845)*	-16.189943 195.18046 104.78870 -16.296761 191.81277 104.49682	.329386 .341504 .111704 .329380 .338242	56 56 56 56 56 56
SOURCE: TABLES 16, 17,18 and 19 Note t-ratios are within parentheses	and 19 n parentheses	co	*** Coeffic: ** "	*** Coefficient is significant at the 1% level ** " " 5% " 5% "	icant at the	1% level 5% " 10% "	

SMPL	1	-	56	TABLE 9			
56 Ob	servati	ons					
=====	======	====		=======================================		=========	
	Series		Mean	S.D.	Maximum	Minimum	
=====		====	=======================================			=======================================	
	EPAGDP		0.4488749	0.2765362	1.2655820	0.0766635	
	ALCQ		15835.565	35633,765	212621.20	118,68000	
	PCI		836.78571		2490,0000	80,000000	
	PAGP		56,482143		92,100000	11.000000	
	PAGDP		28,089286	16.132719	82,000000	7.0000000	
=====		====	=======================================			=======================================	
				Covariance	Corre	lation	
			ACDO				
		DP,EP		0.0751067		00000	
	EPAGDP,ALCQ EPAGDP,PCI			782.78864		08828	
EPAGDP,PGP				4.0868443		29914	
• • • • • • • • • • • • • • • • • • •				-0.1397221	-0.02		
EFAGDP, PAGDP				-0.8956777	-0.20		
ALCQ,ALCQ				1.2470+09		00000	
ALCG,PCI				-447592.29	-0.01		
	ALCQ,PAGP			-55792.331	-0.0743834		
	ALCR,FAGDP PCI,PCI			10139,246	0.0179582 1.0000000		
	•			420693,24			
	PCI,F			-11235.397	-0.81		
				-7532,2130 451,12647	-0,72		
	PAGP,			249.22124		00000 00070	
	PAGDE			255.61703		39070 00000	
=====	740M7 ======	.CMG و	レr = = = = = = = = = = = = = = = = = = =	200+01/03	T+000	JOOOU 	

SOURCE: TABLE 16

the level of development of countries influences positively, although non-significantly, the percentage of agricultural GDP devoted to agricultural research in $LDCs^{28}$ and that the importance of agriculture appears to be negatively related to $EPAGDP^{29}$.

This is consistent with the view that as development occurs, countries tend to have a better understanding of how investments in science are linked to economic and social growth. Thus they can be expected to spend more on research (Gamble and Trigo, 1985).

That is, the larger the relative economic and social size of agriculture, the less attention it received from policymakers in 1980.

SMPL 1 - 56 Observations	56	TABLE 10		
Series	Mean	s.D.	Maximum	Minimum
RPS ALCQ PCI PAGP PAGDP	0.0448955 15835.565	35633.765 654.47858 21.431957		0.0116549 118.68000 80.000000 11.000000 7.0000000
		Covariance	Corre	ation
RPS,RPS RPS,ALCQ RPS,PCI RPS,PAGP RPS,PAGDF ALCQ,ALCG ALCQ,PAGI ALCQ,PAGI PCI,PCI PCI,PAGP PCI,FAGDP PAGP,PAGI PAGDP,PAGI) ; ; ; ; ;	0.0006798 63.239651 0.1626146 0.0807138 0.0237042 1.247D+09 -447592.29 -55792.331 10139.246 420693.24 -11235.397 -7532.2130 451.12647 249.22124 255.61703	0.06 0.00 0.14 0.05 1.00 -0.01 -0.07 0.01 1.00 -0.81 -0.72	000000 86842 96160 57520 68651 00000 95412 43834 79582 00000 55611 63483 00000 39070
=======================================	=========	===,===================================		

SOURCE: TABLE 17

- 2. Regressing RPS on similar combinations of independent variables also gave highly variable results due to the same kind of collinearity problems (See TABLE 10). Nevertheless, a relatively strong positive relationship between research expenditures per scientist and PAGP was observed, both including ALCQ and without ALCQ as an independent variable. This finding supports the view that in 1980, the relative importance of agriculture affected positively the research costs per scientist in LDCs. But this result does not appear to have an intuitive explanation.
- 3. Regressing RPAP on PCI provided significant t-ratios for the coefficient of PCI with and without $ALCQ^{30}$. This finding implies that relatively

³⁰ Note (in TABLE 8) that including ALCQ in the regression results in a higher, although still insignificant, t-ratio for the coefficient of this variable than that previously shown in TABLE 7.

richer countries were able to invest more in agricultural research per million of agricultural population than their poorer counterparts³¹. On the other hand, the results of regressing RPAP on the two measures of the relative importance of agriculture yielded negative significant t-ratios which endorse the view that in many countries agricultural research lacked the necessary support, despite agriculture being the principal sector of these countries, in both economic and social terms (ISNAR, 1984).

4. The results of regressions of SPAP on ALCQ and PCI, and of SPAP on PCI alone clearly suggest that richer countries were able to capture relatively more scientists per million of agricultural population than poor countries, whereas regressing SPAP on the two measures of relative importance of agriculture, with and without ALCQ, provided similar results to those for RPAP.

³¹ Using a different dependent variable, Peterson (1979) also found a strong positive association between research and per capita income.

VI. Summary of Results and Implications for Further Research

Overall, the general findings of this paper, though limited as they are, support the view that (1) there is no direct relationship between a country's size and the relative amount of resources it devotes to agricultural research; (2) the level of development of countries influences positively both the amount of research expenditures and the number of scientists per million of agricultural population; and (3) the relative importance of agriculture as measured either by agricultural population as a percent of total population or by agricultural GDP as a percent of total GDP appears to be negatively related to the level of expenditures and the number of scientists per million of agricultural population in LDCs.

Finally, three implications for further research emerge from the paper.

First, it is quite apparent that the search for an appropriate statistical measure of size has not been exhausted. The discussion in Section III suggests that combining different factors into an overall composite index of size may still be particularly meaningful so long as the troublesome issue of assigning equal weights to different variables is successfully addressed.

A feasible approach along these lines appears to be redefining a country's potential for development (i.e. its size) in terms of its aggregate production function in which land, labor and capital are the corresponding factors of production. This would also avoid further problems of double-counting as noted by Peterson (1986b).

Unlike the approach developed by Jalan (1982b) and the one proposed in this paper, this approach implies using actual measures of the three primary production factors and not simple proxies. As before, land could be measured

in terms of quality adjusted agricultural land; labor may be measured as the number of people in the economically active population adjusted for differces in acquired skills by a human capital variable; and nonhuman, reproducible capital may be measured by summing gross domestic investment for each country for a reasonable life span (i.e. 30 years) of machines and tools, infrastructure and buildings (Peterson 1986a). Moreover, in view of the results of fitting a Cobb-Douglas production function (defined in terms of the above three inputs) to data of 98 countries obtained by Peterson, which clearly show that agricultural land corrected for quality, for example, has relatively less explanatory power than both capital and labor adjusted by the human capital variable in the regression, it would appear more reasonable to assign differential rather than equal weights to different factors into a new composite index of size. But there are two problems with this approach. One is that if a country's potential for development is solely defined in terms of its aggregate production function, then GNP alone should be a good measure of size(Peterson, 1986b), and constructing a differential-weight composite size index would become a worthless task. Another problem with this approach, which also applies to using GNP as the only size indicator, is that it considers only one dimension of size, that is the production side of size. This point is of utmost importance if one agrees that a country's development potential also depends on its domestic demand (i.e. its market size), that is the number of effective consumers it has. On the one hand, the variable labor corrected for differences in acquired skills does not appear to capture this relation. the other hand, GNP may not be an appropriate measure of the size of the market because two countries may have the same national income but their demands for a product will not necessarily be the same (Lloyd and Sundrum, 1982).

Second, much more effort on the part of agricultural economists and plan-

ers directed to understand the precise relationship between size (or scale) and effectiveness in agricultural research is warranted.

As Lipton (1985) points out, to certain extent, government willingness to spend more on agricultural research depends on the perceived efficiency (effectiveness?) of such spending. A prevailing argument in the literature is that "the research investment per acre or per hectare will have to be higher in a small system than in a larger system in order to achieve an equal level of effectiveness" (Ruttan, 1985). The results of this paper suggest, however, that a country's size has no strong effect upon the amount of resources it devotes to research. It does not follow that smaller countries have less incentives to invest in agricultural research than their larger counterparts. Evidence from small Sub-Saharan countries, for instance, suggests exactly the opposite. But Lipton also finds that such high levels of research outlay and scientist numbers have had less impact on output in Sub-Saharan Africa than in most other poor countries. Thus, at least empirically, other factors than size (per se) and levels of financial and human resources allocated to research (per se) appear to influence research effectiveness in LDCs.

Third, still following Lipton (1985), the efficiency (effectiveness) of research can be evaluated in terms of a three-stage process: (a) the stage between initiation and successful output of the research, (b) the stage between output and adoption by the farmer, and (c) the stage between adoption and achievement of higher levels of agricultural production and productivity. Within this context, while in a final sense the efficiency of research will depend on some elements of research policy (i.e. availability of financial and human resources), in an initial sense, it is an adequate agricultural policy that is required. This leaves out the puzzle of the kind of agricultural policy that is needed. Lipton argues that the most important single policy may be "to raise the propor-

tion of resources reaching the sector".

In Section V of this paper it was found that the larger the relative economic and social size of agriculture, the less attention that agricultural research received from policymakers in 1980. Granted this argument can be extended to the entire agricultural sector of many developing countries. One explanation for this kind of behavior is that a large agricultural sector in LDCs is often comprised of a large number of poor subsistence small farmers with little or no power to make their majority interests known (Rohrbach, 1984). However, this situation is further complicated by the fact that the level of development of countries also influences the amount of resources devoted to agricultural research in less developed economies. In fact, strong positive relationships between research expenditures and number of scientists per million of agricultural population and per capita income in a sample of 56 LDCs were found in 1980. It is not clear whether developing countries with large agricultural sectors do not provide the necessary support to agriculture and research due to the concentrated political power of urban-based industrial elites or wage labor force or whether they simply cannot afford it.

VII. APPENDIX

TABLE 2
PETERSON'S LAND QUALITY INDICES

	_						
Rank	Country	LQI	Rank	Country	LQI	Rank Country	LQI
(63)	Afghanistan	64	(38)	Ghana	102	(21) Norway	128
	Algeria	43	(42)	Greece	98	(10) Pakistan	170
	Angola	82	(17)	Guatemala	136	(34) Panama	106
	Argentina	62	(37)	Guinea	103	(13) P.New Guinea	143
	Australia	62	(18)	Guyana	134	(51) Paraguay	83
(51)	Austria	83	(20)	Haiti	130	(44) Peru	96
(4)	Bangladesh	179	(33)	Honduras	107	(9) Philippines	171
(47)	Belgium	91	(36)	Hungary	104	(35) Poland	105
(17)	Benin	136	(6)	India	176	(16) Portugal	137
(61)	Bolivia	69	(12)	Indonesia	160	(32) Romania	108
(71)	Botswana	49	(65)	Iran	61	(31) Rwanda	109
(39)	Brazil	101	(63)	Iraq	64	(52) Senegal	82
(29)	Bulgaria	111	(56)	Ireland	77	(30) Sierra Leone	110
(7)	Burma	175	(43)	Israel	97	(72) Somalia	44
	Burundi	100	(27)	Italy	115	(63) South Africa	64
	Cameroon	111	(25)	Ivory Coast	122	(46) Spain	92
(40)	Canada	100	(35)	Jamaica	105	(7) Sri Lanka	175
(34)	C.A.R.	106	(1)	Japan	240	(62) Sudan	68
(69)	Chad	55	(51)	Jordan	83	(36) Swaziland	104
(38)	Chile	102	(55)	Kenya	79	(41) Sweden	99
(19)	China	131	(2)	Korea Dpr	204	(54) Switzerland	80
(53)	Colombia	81	(2)	Korea Rep	204	(68) Syria	56
(52)	Congo	82	(14)	Lebanon	142	(57) Tanzania	75
(41)	Costa Rica	99	(67)	Lesotho	57	(3) Thailand	183
(15)	Cuba	141	(23)	Liberia	126	(13) Togo	143
(28)	Cyprus	113	(39)	Madagascar	101	(62) Tunisia	68
(42)	Czechoslovakia	98	(38)	Malawi	102	(39) Turkey	101
(19)	Denmark	131	(5)	Malaysia	177	(30) Uganda	110
(26)	Dominican Rep.	121	(67)	Mali	57	(61) USSR	69
(29)	Ecuador	111	(74)	Mauritania	30	(48) UK	89
(8)	Egypt	172	(11)	Mauritius	165	(47) USA	91
(22)	El Salvador	127	(46)	Mexico	92	(59) Upper Volta	72
(60)	Ethiopia	71	(66)	Morocco	60	(58) Uruguay	74
(29)	Finland	111		Nepal	128	(49) Venezuela	88
(44)	France	96 •		Netherlands	108	(45) Yugoslavia	94
(28)	Gabon	113	(25)	New Zealand	122	(34) Zaire	106
(20)	Gambia	130		Nicaragua	99	(50) Zambia	85
(29)	Germany Dr	111	, ,	Niger	54		
(43)	Germany Fr	97	(24)	Nigeria	124		

SOURCE: Peterson (1984)

TABLE 3

PETERSON'S LAND QUALITY INDICES (REVISED)

Rani	Country	LQI	Ranl	Countr	y LQI	Rank	Country	LQI
(63)) Afghanistan	63	(37)	Ghana	- 96	(21)	=	-
	Algeria	40		Greece	92		Norway	121
	Angola	77		Guatemala			Pakistan	160
(65)	Argentina	59		Guinea	97	(33)	Panama	100
	Australia	58		Guyana	126	(51)	P.New Guinea	134
(51)	Austria	78		Haiti	122		Paraguay Peru	78
(4)	Bangladesh	168		Honduras	101	(9)		90
(47)	Belgium	85	(35)		98	,	Philippines Poland	161
(17)	Benin	127	(6)	India	166		Portugal	99
(61)	Bolivia	65	(12)		151	(32)	Romania,	129
(71)	Botswana	46	(67)		57	(31)		101
(38)	Brazil	95		Iraq	60	(52)		102 77
(29)	*Bulgaria	104		Ireland	72		Sierra Leone	104
(7)	Burma	165		Israel	91	(72)	Somalia	41
(39)	Burundi	94		Italy	108		South Africa	60
	Cameroon	104		Ivory Coas		(45)		87
	Canada	94	(34)	Jamaica	99	(7)	Sri Lanka	165
	CAR	100	(1)	Japan	226		Sudan	64
	Chad	51	(52)	*Jordan	77		Swaziland	98
	Chile	96	(55)	Kenya	74		Sweden	93
	China	123	(2)	Korea Dpr	192		Switzerland	75
(53)		76	(2)	Korea Rep.	192		Syria	53
	Congo	77	(13)	Lebanon	134		Tanzania	71
	Costa Rica	93	(68)	Lesotho	53	(3)	Thailand	172
(14)		132	(23)	Liberia	119	1.7.	Togo	134
	Cyprus	107	(38)	Madagascar	95		Tunisia	64
	Czechoslovakia		(39)	Malawi	96		Turkey	95
	Denmark	123	(5)	Malaysia	167		Uganda	103
	Dominican Rep.		(68)	Mali	53	(61)		65
	Ecuador	104		Mauritania	28	(47)	UK	83
(8)	Egypt	162		Mauritius	155	(46)	USA	86
	El Salvador	119		Mexico	86	(59)	Upper Volta	68
	Ethiopia	66		Morocco	56	(58)	Uruguay	70
	Finland	104		Nepal	120		Venezuela	83
	France	90		Netherland:		(44)	Yugoslavia	88
	Gabon	79		New Zealand		(34)		99
	Gambia	122		Nicaragua	93	(49)	Zambia	80
	Germany Dr	104		Niger	50			
(42)	Germany Fr	91	(24)	Nigeria	117			

SOURCES: FAO (1982); British Air Ministry Meteorological Office (1958)

Note.- Except for rounding errors, indices which were not corrected should retain the ranking presented in TABLE 2.

^{*} indicates indices which were corrected.

TABLE 11

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CHILE 54 1765.600 11.31700 177.0000 2.077000 ARGENTINA 55 11782.80 59.75000 1065.000 0.345000				70.92900		24,99500
ARGENTINA 55 11782.80 59.75000 1065.000 3.660000				11.31900		2.099000
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	UKUGUNI	====	=========			: = = = = = = = = = = = = = = = = = = =

SOURCES: World Bank (1982); Evenson (1986); FAO (1984)

Note.- All figures are for 1980

TABLE 12

		******	********			_
	bs ===:	EPACDP	PDP ========= 5,000000	ALCQ	GNP.	CSI
CHAD	1	0.562105	5,000000			
BANGLADESH	2	0.459023	95.50000	********	400,0000	2,09431
ETHIOPIA	3	0.180669	40,90000	7399.360	12415.00	5.63728
NEPAL	4	0.248444		20121,20	4908,000	5.02736
MALI	5	1.036981	15.70000	2141,360	2512,000	1.12311
BURUNDI	6	0.830380	7 • 200000	8333.780	1152,000	1,66761
RWANDA	7		4.500000	1019.360	1080,000	0.42474
UPPER VOLTA	á	0.175781	5.700000	681,5000	1539.000	0.424/4
ZAIRE	9	0.281888	6.700000	4042,560	1407.000	0.46107
T		0.253906	29,70000	6899.640	5049,000	1.00631
·	10	0.228699	733,2000	140634.0	1007.000	2.60361
CTERRA TRANS	11	0.480338	15,40000	1942.500	190632.0	66.8137
SIERRA LEONE		0.208483	3.600000	1000 500	5082,000	1,36232
TANZANIA J	.3	0.318921	20.80000	1828,500	1188.000	0.53373
CHINA	4	0.695592	1019,100	12458.90	4992,000	3,17783
PAKISTAN 1	. 5	0.449433	1017,100	212621.2	305730.0	100.000
****	.6	0.076664	89.70000	14529.30	34983.00	9.025916
*** - * - * - * - * - * - * - * - * - *	7	0.415644	13,90000	5918.000	3058,000	1 71504
G110 1	Ġ		9.500000	15914.73	2945.000	1.71584
~····	9	0.497767	20.80000	16427.52.	8320.000	3,126826
		0.124589	12.80000	2546.100	3768,000	4.162854
* na	0	1.115192	18,90000	1939.200		1.250456
T145		0.468750	1.500000	574,5000	6426.000	1,622826
INDONESIA 2	2	0.182940	155.7000	21580.70		0.214359
MAURITANIA 2		0.222920	1.600000	501/ 750		17.78243
SENEGAL 2	4	1.265582	6.200000	5916.750	768.0000	1.063656
LIBERIA 2	5	0.105235	2.100000	3823,750 .	2728.000	1,099686
HONDURAS 2	6	0.151454	4 100000	323,8300.	1008.000	0.229357
ZAMBIA 2		0.915040	4.100000	2326.500	2747,000	0.798340
BOLIVIA 2			6.300000	12448.98	3654,000	
EGYPT 20		1.035883	6,000000	10007.25	3060,000	2.556123
ZIMBABWE 3		0,491677	45,20000	691.8800	31640,00	2.078749
EL SALVADOR 3	•	0.976151	7.900000	2487.540	5044 000	5,036564
		0.261226	5.200000	760.9500	5846,000	1,285759
AMEROON 3:		0.196963	7.600000	7172,200	3692,000	0.691915
HAILAND 33	3	0.258296	49.20000		7872,000	2,296686
HILIPPINES 3	ļ	0.116787	52,10000	15152.06	40344.00	8,383354
ICARAGUA 35	;	0.453445	2 000000	8782,700	39596.00	7.378110
OROCCO 36		0.248545	3,000000	2589.970	2640,000	0.792000
ERU 37		0.530341	20,80000	5432,440	15808.00	3.255526
IGERIA 38			17.90000	12867.54	18616.00	4 (2014)
ANAICA 39		0.668495	93,60000	26201.25	72072.00	4.632449
		0.439380	2,300000	206,3600	72972100	15,02710
VURY COAST 40		0.545559	9.500000	3562,350	2990.000	0.433577
MINICAN R. 41		0.210025	6,000000	1811.520	6745,000	1.604612
LOMBIA 42		0.389282	27,50000		8220,000	1.376465
RAGUAY 43		0.401273	3.200000	14276.00	39325.00	7 • 425135
INISIA 44		0.545044	6.900000	6121,500	4512,000	1,556293
RIA 45		0.192364	9.600000	2233,270	8701,000	1.546274
RDAN 46		0.484589	7 700000	3217,930	16896.00	2.660636
RKEY 47		0.213791	3.200000 47.500000	118,6800	5248.000	0.695456
UTH KOREA 48		0.311287	47.30000	15303,70	58652,00	10.34108
*******	===	**************************************	40.00000	1990.040	80400,00	10.38623
LAYSIA 49			40.00000 ===============================	========	==========	10.30023
		V	14,90000	3231.580	27714.00	
		0.262947	2.400000	1148.820	2440 000	4.015604
NAMA 51		0.711175	2,000000	785.2500	2448.000	0.525507
AZIL 52		0.635409	129,7000	107444	4240,000	0,650805
XICO 53		0.531861	75.00000	102641.0	243836.0	46.91879
ILE 54		0.575855	11 70000	39239+60	168000.0	26.92168
O-11-11		0.507095	11.70000	7494.040	21879.00	3,942994
GENTINA 55						
GENTINA 55 UGUAY 56		0.452242	29,60000 3,000000	50008.00 4824.960	61272.00	15.48850

TABLE 13

		=======================================	:========	========	
00011111	RES	P0P	AI CO	Chim	
CHAD 1	0.038143	F 00000	*********	*******	****
BANGLADESH 2	0.020919	5,000000 95,50000	12037,50 7399,360	400,0000	2.094313
ETHIOPIA 3	0.021935	40,90000	20121.20	12415.00	5.637284
NEPAL 4	0.011655	15.70000	2141.360	4908,000 2512,000	5.027362
MALI 5	0.090309	7.200000	8333.780	1152,000	1,123113
BURUNDI 6	0.088000	4.500000	1019.360	1080.000	1,667617 0,424748
RWANDA 7	0.039375	5,700000	681.5000	1539.000	0.461075
UPPER VOLTA 8	0.092083	6.700000	4042,560	1407.000	1.006317
ZAIRE 9 INDIA 10	0.051598	29,70000	6899.640	5049,000	2.603611
INDIA 10 SRI LANKA 11	0.051244	733.2000	140634.0	190632.0	66.81376
SIERRA LEONE12	0.011983	15,40000	1942.500	5082,000	1.362328
TANZANIA 13	0.019943 0.034028	3,400000	1828.500	1188.000	0.533937
CHINA 14	0.037260	20,80000 1019,100	12458.90	4992,000	3,177833
PAKISTAN 15	0.024669	89.70000	212621.2	305730.0	100,0000
UGANDA 16	0.042583	13,90000	14529,30	34983.00	9.025918
MADAGASCAR 17	0.071735	9.500000	5918.000 15914.73	3058.000	1.715844
USUDAN 18	0.090667	20.80000	16427,52	2945.000	3,126826
GHANA 19	0.035952	12.80000	2546.100	8320.000 3968.000	4.162854
KENYA 20	0.056780	18.90000	1939.200	6426,000	1,250456
LESOTHO 21	0.033214	1.500000	574,5000	690.0000	1.622826
INDONESIA 22	0.022539	155.7000	21580.70	87192.00	0.214359 17.98243
MAURITANIA 23	0.035500	1.600000	5916.750	768.0000	1,063656
SENEGAL 24	0.056547	6.200000	3823.750	2728.000	1.099686
LIBERIA 25 HONDURAS 24	0.019700	2.100000	323,8300	1008,000	0,229357
	0.017450	4.100000	2326.500	2747.000	0.798340
ZAMBIA 27 BOLIVIA 28	. 0.054187	4.300000	12448.98	3654,000	2.556123
EGYPT 29	0.090992	6.000000	10007,25	3040.000	2.098749
ZIMBABWE 30	0,026265 0,05253 <i>7</i>	45,20000	691.8800	31640.00	5,036564
EL SALVADOR 31	0.030654	7,900000 5,200000	2487.540	5846,000	1,285759
CAMEROON 32	0.035736	9.6 00000	760,9500	3692,000	0.691915
EE DIALIAHT	0,017089	49,20000	7172,200 15152,06	7872.000	2,276686
PHILIPPINES 34	0.014895	52,10000	8782.700	40344.00	8.383354
NICARAGUA 35	0.038789	3.000000	2589.970	39596,00 2640,000	7.398110
MOROCCO 36	0.011700	20,80000	5432.440	15808.00	0,792000
PERU 37	0.028148	17,90000	12867.54	18616.00	3,255526
NIGERIA 38	0.112398	93,60000	26201.25	72072.00	4.632449 15.02710
JAMAICA 39	0.023375	2.300000	206.3600	2990,000	0.433577
IVORY COAST 40	0.110095	9.500000	3562.350	6745,000	1.604612
DOMINICAN R. 41	0.062850	6,000000	1811.520	8220,000	1.376465
COLOMBIA 42 PARAGUAY 43	0.034585	27,50000	14276.00	39325.00	7.425135
	0.085032	3,200000	6121.500	4512,000	1.556293
TUNISIA 44 SYRIA 45	0.023733	6.900000	2233.290	8901.000	1.546274
JORDAN 46	0.027726	9.600000	3217.930	16896.00	2.660636
TURKEY 47	0.024257	3,200000 47,20000	118.6800	5248.000	0.695456
SOUTH KOREA 4A	0.042477 0.030221	47,30000	15303.70	58652.00	10.34108
COUNTRY obs		40.00000	1990,040	80400,00	10.38623
COUNTRY obs	RPS	POP	ALCG		
MALAYSIA 49		*=========	, zz===================================	GNP	CSI
		A 7 1 10000	3231.580	27714.00	4.015604
COSTA RICA 50	0.028907	2.400000	1148.820	2448.000	0.525507
PANAMA 51	0.048667	2,000000	785.2500	4240,000	0.020507 0.650805
BRAZIL 52 MEXICO 53	0.057287	129.7000	102641,0	243836.0	46.71879
	0.065736	75.00000	39239.60	168000.0	26.92168
CHILE 54 ARGENTINA 55	0.063949	11.70000	7494.040	21879,00	3.942994
URUGUAY 56	0.056103	29,60000	50008,00	61272.00	15.48850
	0.017212	3.000000	4824,960		1.668995
				# = = = = = =	

TABLE 14

			TABLE	<u>'</u>		========
2222222222222	====		POP	ALCG	GNP	CSI
COUNTRY	bs	RPAP ==========	PUP =====	======================================	==========	========
			5.000000	12037.50	400.0000	2,094313
CHAD	1	0.427885 0.373512	95.50000	7399.360	12415.00	5.637284
BANGLADESH	2	0.134207	40.90000	20121.20	4908.000	5.027362
ETHIOPIA	3	0.193990	15.70000	2141.360	2512,000	1,123113
NEPAL	4	1.007547	7.200000	8333.780	1152,000	1,667617
MALI	5		4.500000	1019.360	1080,000	0.424748
BURUNDI	6	1,072533 0,205167	5.700000	681.5000	1539,000	0.461075
RWANDA	7		6.700000	4042.560	1407,000	1.006317
UPPER VOLTA	8	0.196549 0.236230	29.70000	6899.640	5049,000	2.603611
ZAIRE	9		733,2000	140634.0	190632.0	66.81396
INDIA	10	0.275780 0.641344	15,40000	1942.500	5082,000	1.362328
SRI LANKA	11	0.325408	3,600000	1828.500	1188.000	0.533937
SIERRA LEONE			20.80000	12458,90	4992,000	3.177833
TANZANIA	13	0.471873	1019.100	212621.2	305730.0	100.0000
CHINA	14	1.073710	89.70000	14529.30	34983,00	9,025918
PAKISTAN	15	0.641004	13.90000	5918,000	3058.000	1.715844
UGANDA	16	0.699062	9.500000	15914.73	2945.000	3.126826
MADAGASCAR	17	0.672920	20.80000	16427.52	B320.000	4,162854
SUDAN	18	0.947207		2546.100	3968.000	1.250456
GHANA	19	2.154409	12.80000	1939.200	6426,000	1,622826
KENYA	20	1.746271	18.70000	574,5000	690.0000	0.214359
LESOTHO	21	0.414808	1.500000	21580.70	87192,00	17,98243
INDONESIA	22	0.373676	155,7000	5916.750	768,0000	1.063656
MAURITANIA	23	0.210370	1,600000	3823,750	2728.000	1.099686
SENEGAL	24	2,290627	6,200000	323,8300	1008.000	0,229357
LIBERIA	25	0.302147	2,100000		2747,000	0.798340
HONDURAS	26	0.453247	4,100000	2326,500 12448,98	3654,000	2.556123
ZAMBIA	27	1.382408	6.300000	10007.25	3060.000	2.098749
BOLIVIA	28	4.085488	6.000000	691,8800	31640,00	5.036564
EGYPT	29	1.141008	45,20000		5846.000	1.285759
ZIMBABWE	30	2.446143	7,900000	2487,540	3692.000	0.691915
EL SALVADOR		0.969980	5,200000	760.9500 7172.200	7872.000	2.296686
CAMEROON	32	0.548667	9.600000	15152.04	40344.00	8.383354
THAILAND	33	0.617002	49,20000	8782.700	39596,00	7.398110
PHILIPPINES		0.431026	52,10000	2589.970	2640.000	0.792000
NICARAGUA	35	1.910977	3.000000	5432,440	15808.00	3.255526
MOROCCO	36	0.782566	20.80000	12867.54	18616.00	4.632449
PERU	37	1,192549	17.90000		72072,00	15.02710
NIGERIA	38	2.840226	93.60000	26201,25 206,3600	2990.000	0.433577
JAMAICA	39	2.082405	2.300000		6745,000	1.604612
IVORY COAST		1.951857	9.500000	3562.350	8220,000	1.376465
DOMINICAN R	- 41	0.806286	6,000000	1811.520	39325.00	7.425135
COLOMBIA	42	4.564004	27.50000	14276.00	4512,000	1.556293
PARAGUAY	43	3.458360	3.200000	6121,500	8701.000	1.546274
TUNISIA	44	2.607556	6,900000	2233.290 3217.930	16896.00	2.660636
SYRIA	45	1.187321	9,600000	118.6800	5248.000	0.695456
JORDAN	46	1.125995	3,200000	15303.70	58652.00	10.34108
TURKEY	47	1.092925	47.30000	1990.040	80400.00	10.38623
SOUTH KOREA	48	1,972532	40,00000	17701040		
			POP	ALCR	GNP	CSI
COUNTRY	obs	RPAP	FUF :=========	7200		
	49	4.677697	14,90000	3231,580	27714.00	4.015604
MALAYSIA		2,713392	2.400000	1148.820	2448,000	0.525507
COSTA RICA		2./13372 3.682493	2.000000	785,2500	4240,000	0.650805
PANAMA	51	3.756817	129,7000	102641.0	243836.0	46.91879
BRAZIL	52	2.837728	75,00000	39239.60	168000.0	26,92168
MEXICO	53		11,70000	7494,040	21879.00	3.942994
CHILE	54	5,392568	29,60000	50008.00	61272.00	15,48850
ARGENTINA	55	16.32514	3,000000	4824,960	7470.000	1.668995
URUGUAY	56	11.07536 		==========	=========	
222022202						

TABLE 15

		.============	<u> </u>			
	obs	SPAP	POP	ALCG	GNP	CSI
		;=====================================				
CHAD	1	11,21795	5.000000	12037.50	400,0000	2.094313
BANGLADESH	2	17.85521	95.50000	7399.360	12415.00	5.637284
ETHIOPIA	3	6.118260	40.90000	20121.20	4908,000	5.027362
NEPAL	4	16,64457	15.70000	2141.360	2512,000	1.123113
MALI	5	11,15669	7.200000	8333.780	1152,000	1.667617
BURUNDI	6	12.18787	4.500000	1019,360	1080,000	0.424748
RWANDA	7	5.210595	5.700000	681.5000	1539,000	0.461075
UPPER VOLTA		2.134472	6.700000	4042.560	1407,000	1.006317
ZAIRE	9	4.578279	29,70000	6899.640	5049,000	2,603611
INDIA	10	5.381712	733,2000	140634.0	190632.0	66.81376
SRI LANKA	11	53.51934	15.40000	1942.500	5082,000	1.362328
SIERRA LEON	E12	16.31702	3.600000	1828.500	1188.000	0.533937
TANZANIA	13	13,86709	20,80000	12458.90	4992,000	3,177833
CHINA	14	28.81668	1019,100	212621.2	305730.0	100,0000
PAKISTAN'	15	25.98405	89.70000	14529.30	34983.00	9.025918
UGANDA ·	16	16.41651	13,90000	5918,000	3058,000	1.715844
MADAGASCAR	17	9,380604	9.500000	15914.73	2945.000	3.126826
SUDAN	13	10.44714	20.80000	16427.52	8320,000	4.162854
GHANA	19	59.92510	12.80000	2546.100	3968,000	1.250456
KENYA	20	30.75504	18,90000	1939.200	6426.000	1.622826
LESOTHO	21	12.48885	1.500000	574,5000	690,0000	0.214359
INDONESIA	22	16.57906	155.7000	21580.70	87192,00	17.98243
MAURITANIA	23	5,925926	1,600000	5916,750	768,0000	1,063656
SENEGAL	24	40.50872	6.200000	3823,750	2728,000	1.077686
LIBERIA	25	15.33742	2.100000	923.8300	1008,000	0.229357
HONDURAS	26	25,97403	4.100000	2326.500	2747.000	0.798340
ZAMBIA	27	25.51156	6.300000	12448,98	3654,000	2.556123
BOLIVIA	28	44.89943	6.000000	10007.25	3040,000	2.098749
EGYPT	29	43,44270	45,20000	691.8800	31640.00	5,036564
ZIMBABWE	30	46.56011	7.900000	2487,540	5846,000	1.285759
EL SALVADOR		31.64300	5.200000	760,9500	3692,000	0.691915
CAMEROON	32	15.95942	9.600000	7172,200	7872,000	2,296686
THAILAND	33	36.10603	49.20000	15152.06	40344,00	8.383354
PHILIPPINES	34 35	28.93702 48.34534	52.10000	8782,700	39596.00	7.378110
NICARAGUA		49.26534	3,000000	2589,970	2640.000	0.792000
MOROCCO	36	66.88768	20.80000	5432,440	15808.00	3,255526
PERU	37	42.36669	17.90000	12867.54	18616,00	4,632449
NIGERIA JAMAICA	38 39	25.26924	73,60000	26201.25	72072.00	15.02710
		89,08686	2,300000	206.3600	2990,000	0.433577
IVORY COAST		17.72887	9.500000 6.000000	3562.350	6745,000	1.604612
DOMINICAN R COLOMBIA	42	12.82874 124.7522	27.50000	1811.520 14276.00	8220,000	1.376465
PARAGUAY	43	40.67140	3.200000	6121.500	39325.00 4512.000	7.425135 1.556293
TUNISIA	44	109.8689	6.900000	2233,290	8701.000	1.546274
SYRIA	45	42.82297	9.600000	3217,930	16896,00	2.660636
JORDAN	46	46.41910	3.200000	118.6800	5248,000	0.695456
TURKEY	47	25,72998	47.30000	15303.70	58652.00	10.34108
SOUTH KOREA		65,27060	40,00000	1990.040	80400.00	10.38623
	===			******	*********	
COUNTRY C	bs	SPAP	POP	ALCQ	GNP	CSI
		=======================================	========	**********		
MALAYSIA	49	59.41203	14.90000	3231.580	27714.00	4.015604
COSTA RICA	50	93.86733	2,400000	1148.820	2448,000	0.525507
PANAMA	51	75.66766	2,000000	785.2500	4240,000	0.650805
BRAZIL	52	63,36493	129.7000	102641.0	243836.0	46.91879
MEXICO	53	43.16863	75.00000	39239.60	168000.0	26.92168
CHILE	54	84.32587	11.70000	7494.040	21879.00	3,942994
ARGENTINA	55	290,9836	29,60000	50008.00	61272.00	15.48850
URUGUAY	56	643,4783	3,000000	4824,960	7470,000	1,668995
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TABLE 16

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COUNTRY	nhs	EPAGDP	ALCG	PC4	PAGP	PAGDP
	====	=======================================		.==========		=======================================
CHAD	1	0.562105	12037.50	BO,00000	81,00000	64.00000
BANGLADESH	2	0,459023	7399,360	130,0000	82,80000	47.00000
ETHIOPIA	3	0.180669	20121.20	120,0000	77.40000	48.00000
NEPAL	4	0.248444	2141.360	160.0000	92.10000	59,00000
MALI	5	1.036981	8333.780	160.0000	85.40000	46.00000
BURUNDI	6	0.830380	1019.360	240,0000	81.50000	58,00000
RWANDA	7	0.175781	681.5000	270,0000	88.10000	46.00000
UPPER VOLTA		0.281888	4042.560	210,0000	80,00000	41,00000
ZAIRE	9	0.253906	6899,640	170.0000	72.60000	36,00000
INDIA	10	0.228699	140634.0	260,0000	60,90000	36,00000
SRI LANKA	11	0.480338	1942.500	330.0000	52,40000	27,00000
SIERRA LEON		0.208483	1828,500	330.0000	63,00000	32,00000
TANZANIA	13	0.318921	12458.90	240,0000	79.30000	52,00000
CHINA	14	0.695592	212621.2	300.0000	57.20000	37,00000
PAKISTAN	15	0.449433	14529.30	390,0000	51.90000	27,00000
UGANDA	16	0.076664	5918.000	220,0000	79.10000	82,00000
MADAGASCAR	17	0.415644	15914.73	310,0000	80,90000	41.00000
SUDAN	18	0.497767	16427.52	400,0000	75,10000	34.00000
GHANA	19	0.124589	2546.100	310,0000	48,90000	53,00000
KENYA	20	1.115192	1939,200	340,0000	76.00000	33,00000
LESOTHO		0.468750	574,5000	460,0000	81,40000	23,00000
INDONESIA	21	0.182940	21580.70	560.0000	56.50000	26,00000
MAURITANIA	22 23	0.182740	5916.750	480,0000	81,10000	34,00000
SENEGAL		1.265582	3823.750	440.0000	72,60000	21,00000
LIBERIA	24	0.105235	323.8300	480,0000	67,70000	34,00000
HONDURAS	25	0.103233	2326.500	670,0000	61,40000	27,00000
ZAMBIA	26		12448.98	580.0000	64,60000	14,00000
BOLIVIA	27	0.915040 1.035883	10007,25	510,0000	48.30000	23,00000
EGYPT	28 29	0.491677	691.8800	700,0000	49,20000	20,00000
ZIMBABWE		0.976151	2487.540	740.0000	57,00000	11,00000
EL SALVADOR	30	0.976131	760,9500	710.0000	48,70000	20,00000
CAMEROON		0.196963	7172,200	817.7777	79,40000	24,00000
THAILAND	32		15152.06	820,0000	73,90000	23,00000
	33	0.258296	8782,700	760,0000	43.90000	22,00000
PHILIPPINES		0.116787	2589.970	880.0000	40.20000	22,00000
NICARAGUA	35	0.453445		760,0000	49.40000	17.00000
MOROCCO	36	0.248545	5432,440	1040,000	35,20000	8,000000
PERU	37	0.530341	12867.54	770.0000	50.50000	26.00000
NIGERIA	38	0.668495	26201.25		18,50000	7.000000
JAMAICA	39	0.439380	206,3600	1300,000	77.50000	27.00000
IVORY COAST		0.545559	3562.350	710,0000	54.50000	17.00000
DOMINICAN R		0.210025	1811,520	1370,000	24,80000	20.00000
COLOMBIA	42	0.389282	14276.00	1430.000	47.80000	26,00000
PARAGUAY	43	0.401273	6121,500	1410.000		14,00000
TUNISIA	44	0.545044	2233,290	1290,000	37.90000 46.40000	19,00000
SYRIA	45	0.192364	3217,930	1760,000 1640,000	23,60000	B,000000
JORDAN	46	0.484589	118.6800	1240.000	50,10000	19.00000
TURKEY	47	0.213791	15303.70		35,00000	14,00000
SOUTH KOREA		0.311287	1990.040	2010.000		
=======================================			ALCO		PAGP	PAGDP
COUNTRY	obs	EPAGDP	ALCQ	PCI		
	_	0.524544		1860.000	45.40000	21.00000
MALAYSIA	49	0.536564	3231.580	1020.000	33,00000	23.00000
COSTA RICA		0.262947	1148,820		32.50000	8.000000
PANAMA	51	0.711175	785,2500	2120,000		12,00000
BRAZIL	52	0.635409	102641.0	1880.000	35.80000 33.50000	8,000000
MEXICO	53	0.531861	39239,60	2240,000		10.00000
CHILE	54	0.575855	7494,040	1870,000	17,00000	12,00000
ARGENTINA	55	0.507095	50008.00	2070,000	12,10000 11,00000	12.00000
URUGUAY	56	0.453262	4824.960	2490.000		
*======================================	====					

SOURCE: TABLES 4 and 11; World Bank (1984,1985); FAO (1984)

Note.- All figures but those of EPAGDP correspond to 1983. Figures for EPAGDP are for 1980

TABLE 17

*********	======		=========	2422222222		
COUNTRY	obs	RPS	ALCG	PCI	PACE	PACTIO
	======		========	========	, ,,,,,, ==============================	
CHAD	1	0.038143	12037.50	80,00000	81.00000	64.00000
BANGLADESH	2	0.020919	7399.360	130,0000	82.80000	47.00000
ETHIOPIA	3	0.021935	20121.20	120,0000	77,40000	48.00000
NEPAL	4	0.011655	2141.360	160.0000	92,10000	59,00000
MALI	5	0.090309	8333,780	160,0000	85,40000	46,00000
BURUNDI	6	0.088000	1019,360	240,0000	81.50000	58,00000
RWANDA	7	0.039375	681,5000	270.0000	88.10000	46,00000
UPPER VOLTA	_	0.092083	4042,560	210,0000	80.00000	41,00000
ZAIRE	9	0.051598	6899.640	170.0000	72,60000	36.00000
INDIA	10	0.051244	140634.0	260,0000	60.90000	34.00000
SRI LANKA	11	0.011983	1942.500	330.0000	52,40000	27,00000
SIERRA LEON		0.019943	1828.500	330,0000	63,00000	32,00000
TANZANIA	13	0.034028	12458.90	240.0000	79,30000	52,00000
CHINA	14	0.037260	212621.2	300.0000	57.20000	37,00000
PAKISTAN	15	0.024669	14529.30	390,0000	51,90000	27,00000
UGANDA	16	0.042583	5918.000	220.0000	79.10000	82,00000
MADAGASCAR	17	0,071735	15914.73	310,0000	80.90000	41,00000
SUDAN	18	0.090667	16427,52	400,0000	75,10000	34.00000
GHANA ,	19	0.035952	2546.100	310,0000	48,90000	53.00000
KENYA	20	0.056780	1939,200	340.0000	76.00000	33.00000
LESOTHO	21	0.033214	574,5000	460.0000	81,40000	23.00000
INDONESIA	22	0.022539	21580.70	560.Q000	56.50000	26.00000
MAURITANIA	23	0.035500	5916.750	480,0000	81.10000	34.00000
SENEGAL	24	0.056547	3823,750	440.0000	72,60000	21.00000
LIBERIA	25	0.019700	323.8300	480,0000	67.70000	36.00000
HONDURAS	26	0.017450	2326.500	670.0000	61,40000	27,00000
ZAMBIA	27	0.054187	12448.98	580,0000	64,60000	14,00000
BOLIVIA	28	0.090992	10007.25	510.0000	48.30000	23.00000
EGYPT	29	0.026265	691.8800	700.0000	49,20000	20,00000
ZIMBABWE	30	0.052537	2487.540	740,0000	57,00000	11.00000
EL SALVADOR		0.030654	760,9500	710,0000	48,7000Q	20,00000
CAMEROON	32	D.035736	7172,200	817,9999	79.40000	24,00000
THAILAND	33	0.017089	15152,06	820,0000	73,90000	23,00000
PHILIPPINES	34	0.014895	8782.700	760.0000	43.90000	22,00000
NICARAGUA	35	0,038789	2589.970	880,0000	40.20000	22,00000
MOROCCO	36	0.011700	5432.440	760.0000	49,40000	17.00000
PERU	37	0.028148	12867,54	1040.000	35,20000	8,000000
NIGERIA	36	0.112378	26201.25	770.0000	50,50000	26,00000
JAMAICA	39	0.023375	206,3600	1300.000	18.50000	7.000000
IVORY COAST	40	0.110095	3562,350	710.0000	77.50000	27.00000
DOMINICAN R.	41	0.062850	1811.520	1370,000	54.50000	17.00000
COLOMBIA	42	0.036585	14276.00	1430.000	24.80000	20.00000
PARAGUAY	43	0.085032	6121,500	1410,000	47.80000	26.00000
TUNISIA	44	0.023733	2233,290	1290.000	37.90000	14,00000
SYRIA	45	0.027726	3217.930	1760,000	46.40000	19.00000
JORDAN	46	0.024257	118.6800	1640,000	23.60000	8.000000
TURKEY	47	0.042477	15303.70	1240,000	50.10000	19.00000
SOUTH KOREA		0.030221	1990.040	2010.000	35.00000	14,00000
======================================	======	=======================================		=========		
COUNTRY	obs	RPS	ALCR	PCI	PAGP	PACTIP
	49	0.078733				
MALAYSIA	50	0.028907	3231.580	1860.000	45,40000	21.00000
COSTA RICA	51		1148.820	1020.000	33.00000	23.00000
PANAMA		0.048667	785.2500	2120.000	32,50000	8.000000
BRAZIL	52 53	0.059289 0.065736	102641.0	1880.000	35.80000	12.00000
MEXICO			39239,60	2240,000	33.50000	8.000000
CHILE	54 55	0.063949	7494.040	1870.000	17,00000	10.00000
ARGENTINA	55 56	0.056103	50008,00	2070,000	12,10000	12.00000
URUGUAY		0.017212 ========	4824,960	2490.000	11.00000	12.00000
						=========

SOURCE: TABLES 4 and 11; World Bank (1984, 1985); FAO (1984)

Note.- All figures but those for RPS correspond to 1983. Figures for RPS are for 1980

TABLE 18

=======================================				 		:=======
	obs	RPAP	ALCG	PCI	PAGP	PAGDP
=======================================	======					=======
CHAD	1	0.427885	12037.50	80.00000	81,00000	64.00000
BANGLADESH	2	0.373512	7399.360	130,0000	82.80000	47,00000
ETHIOPIA	3	0,134207	20121.20	120,0000	77,40000	48.00000
NEPAL	4	0.193990	2141.360	160,0000	92.10000	59.00000
MALI	5	1.007547	8333,780	160.0000	85,40000	46.00000
BURUNDI	6	1.072533	1019,360	240.0000	81,50000	58.00000
RWANDA	7	0.205167	681,5000	270,0000	88,10000	46.00000
UPPER VOLTA	8	0.196549	4042,560	210,0000	80.00000	41,00000
ZAIRE	9	0.236230	6899,640	170.0000	72,60000	36.00000
INDIA	10	0.275780	140634.0	260,0000	60.90000	36,00000
SRI LANKA	11	0.641344	1942.500	330,0000	52,40000	27,00000
SIERRA LEON	E12	0.325408	1828,500	330.0000	63,00000	32.00000
TANZANIA	13	0.471873	12458.90	240,0000	79.30000	52,00000
CHINA	14	1.073710	212621.2	300.0000	57.20000	37,00000
PAKISTAN	15	0.641004	14529.30	370.0000	51.90000	27.00000
UGANDA	16	0,699062	5918.000	220.0000	79.10000	82,00000
MADAGASCAR	17	0.672920	15914.73	310,0000	80,90000	41.00000
SUDAN	18	0.947207	16427.52	400,0000	75.10000	34.00000
GHANA	19	2,154409	2546.100	310,0000	48.90000	53,00000
KENYA	20	1.746271	1939,200	340,0000	76.00000	33.00000
LESOTHO	21	0.414808	574,5000	460.0000	81,40000	23,00000
INDONESIA	22	0.373676	21580.70	560,0000	56,50000	26.00000
MAURITANIA	23	0.210370	5916.750	480.0000	81.10000	34,00000
SENEGAL	24	2,290627	3823,750	440.0000	72,60000	21,00000
LIBERIA	25	0.302147	323,8300	480,0000	67.70000	34,00000
HONDURAS	26	0.45324 <i>7</i>	2326.500	670.0000	61,40000	27.00000
ZAMBIA	27	1.382408	12448.98	580,0000	64.60000	14.00000
BOLIVIA	28	4.085488	10007.25	510.0000	48.30000	23,00000
EGYPT	29	1,141008	691.8800	700.0000	49.20000	20.00000
ZIMBABWE	30	2,446143	2487,540	740,0000	57.00000	11.00000
EL SALVADOR	31	0.969980	760.9500	710.0000	48,70000	20.00000
CAMEROON	32	0.548667	7172,200	819.9999	79,40000	24,00000
THAILAND	33	0.617002	15152.06	820,0000	73.90000	23,00000
PHILIPPINES	34	0.431026	8782,700	740.0000	43,90000	22.00000
NICARAGUA	35	1.910977	2589,970	880.0000	40.20000	22,00000
MOROCCO	36	0.782566	5432,440	760,0000	49,40000	17.00000
PERU	3 <i>7</i>	1.192549	12867.54	1040,000	35,20000	8.000000
NIGERIA	38	2.840226	26201.25	770.0000	50.50000	26.00000
JAMAICA	39	2.082405	206,3600	1300.000	18.50000	7,000000
IVORY COAST	40	1,951857	3542,350	710.0000	77.50000	27,00000
DOMINICAN R.	41	0.805286	1811.520	1370,000	54,50000	17.00000
COLOMBIA	42	4,564004	14276.00	1430,000	24.80000	20,00000
PARAGUAY	43		6121.500	1410-000	47,80000	26,00000
TUNISIA	44	2.407554	2233,290	1290,000	37.90000	14.00000
SYRIA	45	1.187321	3217.930	1760,000	46,40000	19,00000
JORDAN	46	1,125995	118.6800	1640,000	23,60000	81000000
TURKEY	47	1.092925	15303.70	1240,000	50.10000	19,00000
SOUTH KOREA	48	1.972532	1990.040	2010,000	35.00000	14,00000
9===========					222222222	
	bs	RPAP	ALCÜ	PCI	PAGP	PAGEP
		4 477/07				
MALAYSIA	49	4.677697	3231.580	1860.000	45,40000	21,00000
COSTA RICA	50	2.713392	1148,820	1020.000	33,00000	23.00000
PANAMA	51	3,682493	785.2500	2120,000	32.50000	8,000000
BRAZIL	52	3.756817	102641.0	1880,000	35,80000	12,00000
MEXICO	53	2.837728	39239.60	2240,000	33.50000	8,000000
CHILE	54	5.392568	7494.040	1870,000	17.00000	10.00000
ARGENTINA	55	16.32514	50008,00	2070,000	12.10000	12,00000
URUGUAY	56	11.07536	4824,960	2490.000	11.00000	12,00000
			= = = = = = = = =			

SOURCE: TABLES 4 and 11; World Bank (1984,1985); FAO (1984)

Note.- All figures but those for RPAP correspond to 1983. Figures for RPAP are for 1980

TABLE 19

COUNTRY obs SPAP ALCG PCI PACP PAGEP CHAD 1 11.21775 12037.50 80.00000 81.00000 64.00000 BANGLADESH 2 17.85521 7399.360 130.0000 82.80000 44.00000 REPAL 3 6.18260 20121.20 120.0000 77.40000 77.00000 NEPAL 4 16.64457 2141.360 160.0000 85.40000 46.00000 NEPAL 5 11.15659 8333.780 160.0000 85.40000 46.00000 BURINDI 6 12.18787 1019.360 240.0000 81.50000 54.00000 BURINDI 6 12.18787 1019.360 240.0000 81.50000 46.00000 BURINDI 6 12.18747 4042.550 210.0000 72.60000 46.00000 LUPER VOLTA 8 2.134472 4042.550 210.0000 80.00000 41.00000 LUPER VOLTA 8 2.134472 4042.550 210.0000 80.00000 41.00000 RINDIA 10 5.381712 140634.0 260.0000 60.90000 32.00000 RINDIA 10 5.381712 140634.0 260.0000 67.40000 27.00000 SIELRAMA 11 53.51934 1942.500 330.0000 67.40000 27.00000 RINDIA 10 6.31679 12458.70 240.0000 77.90000 72.00000 RINDIA 10 5.381712 150.000 77.00000 67.00000 77.00000 RINDIA 10 5.381712 150.000 77.00000 67.00000 77.00000 RINDIA 10 5.381712 150.0000 77.00000 77.00000 77.00000 RINDIA 10 5.381712 150.000 77.00000 77.00000 77.00000 RINDIA 10 6.31702 1628.500 330.0000 67.40000 77.00000 RINDIA 10 6.31702 1628.500 330.0000 67.40000 77.00000 RINDIA 10 7.0000 77.00000 77.00000 77.00000 77.00000 RINDIA 10 7.0000 77.00000 77.00000 77.00000 77.00000 RINDIA 10 7.00000 77.00000 77.00000 77.00000 77.00000 77.00000 RINDIA 10 7.00000 77.00000 77.00000 77.00000 77.00000 RINDIA 10 7.00000 77.00000 77.00000 77.00000 77.00000 RINDIA 10 7.00000 77.00000 77.00000 77.00000 77.00000 REPAL 10 7.00000 77.00000 77.00000 77.00000 77.00000 REPAL 10 7.00000 7							
CRAD					PCI	PAGP	PAGDP
CHAID 1	COUNTRY	105 		.==========		=========	========
BANGLADESH 2					80,00000	81,00000	64,00000
NETHIOPIA 3 6.118260 20121.20 120.0000 77,40000 48.00000 MEPAL 4 16.64457 2141.360 160.0000 71.0000 57,00000 PALTI 5 11.15669 8333.780 160.0000 85,40000 46.00000 MALTI 5 11.15669 8333.780 160.0000 81.50000 58.00000 MALTI 5 12.18787 1019.360 240.0000 81.50000 46.00000 MALTI 5 12.18787 1019.360 240.0000 81.50000 46.00000 MALTI 8 2.134472 4042.560 210.0000 80.0000 41.00000 MALTI 8 2.134472 4042.560 210.0000 80.0000 41.00000 MALTI 8 2.134472 4042.560 210.0000 60.0000 40.00000 MALTI 8 2.134472 140.634.0 260.0000 60.0000 40.00000 MALTI 8 2.134472 140.634.0 260.0000 60.0000 27.00000 SIL LANKA 11 53.51734 1942.500 330.0000 52.40000 27.00000 SIL LANKA 13 13.86707 12458.90 300.0000 67.930000 52.00000 MALTI 13 13.86707 12458.90 300.0000 67.930000 52.00000 MALTI 13 13.86707 12458.90 240.0000 79.30000 52.00000 MADAGASCA 15 94055 158.000 200.0000 51.700000 27.00000 MADAGASCA 17 9.386604 15914.73 310.0000 80.90000 41.00000 MADAGASCA 17 9.2510 2546.100 310.0000 80.90000 41.00000 MADAGASCA 17 9.386604 15914.73 310.0000 80.90000 41.00000 MADAGASCA 17 9.2510 2546.100 310.0000 80.90000 41.00000 80.90000 80					130,0000	82.80000	47.00000
NEPAL 4		3				77.40000	48.00000
MALT S					160,0000	92.10000	59.00000
BUNUNDI 6 12.18787 1019.360 240.0000 81.50000 58.000000 1019ER VANDA 7 5.210595 681.5000 270.0000 81.00000 41.00000 1019ER VALDA 8 2.134472 4042.560 210.0000 72.60000 36.00000 41.00000 241.00000 101014 10 5.381712 4042.560 210.0000 60.90000 36.00000 36.00000 101014 10 5.381712 140634.0 260.0000 60.90000 36.00000 27.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 37.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.00000 36.00000 36.000000 36.00000 36.00000 36.00000 36.00000 36.000000 36.000000 36.000000 36.000000 36.000000 36.000000 36.000000 36.000000 36.0000000000					160,0000	85.40000	46,00000
NAMINDA						81,50000	58.00000
UPPER VOLTA						88,10000	46.00000
ZAIRE 9 4.57a279 6899.640 170.0000 72.60000 36.00000 1NDL 5 381712 140634.0 260.0000 60.90000 27.00000					210,0000	80.00000	41,00000
TNDIA					170,0000	72,60000	36.00000
SRT LANKA 11					260,0000	60.90000	36.00000
STERRA LEONEL 2 16.31702 1828.500 330.0000 63.00000 32.00000 7ARZANIA 13 13.86709 12458.90 240.0000 79.30000 52.00000 70.000000 70.00000 70.00000 70.00000 70.00000 70.00000 70.00000 70.000000 70.00000 70.00000 70.00000 70.00000 70.00000 70.00000 70.000000 70.00000 70.00000 70.00000 70.00000 70.00000 70.00000 70.000000 70.00000 70.00000 70.00000 70.00000 70.00000 70.00000 70.000000 70.00000 70.00000 70.00000 70.00000 70.00000 70.00000 70.000000 70.00000 70.00000 70.00000 70.000000 70.000000 70.00000 70.000000 70.000000 70.000000 70.00000 70.000000 70.00000 70.00000					330,0000	52,40000	27,00000
TANZANIA 13 13.86709 245.9.000 77, 30000 52,00000 CHINA 14 28.81668 212621.2 300.0000 77, 20000 37,00000 37,00000 PAKISTAN 15 25,98405 14529.30 390.0000 57,20000 37,00000 82,00000 UGANDA 16 16.41651 5918.000 220,0000 77,10000 82,00000 MDADAGASCAR 17 7,380604 15914.73 310.0000 80,9000 41,00000 SUDAN 18 10.44714 16427.52 400.0000 75,10000 34,00000 KENYA 20 30,75504 1939,200 340,0000 76,00000 33,00000 KENYA 20 30,75504 1939,200 340,0000 76,00000 33,00000 LESOTHO 21 12,48885 574,5000 460,0000 81,40000 23,00000 MAURITANIA 23 5,925926 5916,750 480,0000 56,50000 34,00000 MAURITANIA 23 5,925926 5916,750 480,0000 72,60000 31,00000 SENEGAL 24 40,50872 3823,750 440,0000 67,70000 31,00000 AURITANIA 23 5,925926 5916,750 480,0000 67,70000 21,00000 AURITANIA 23 5,9342 3823,750 440,0000 67,70000 21,00000 AURITANIA 23 15,33742 323,8300 480,0000 67,70000 27,00000 AURITANIA 23 15,33742 323,8300 480,0000 67,70000 27,00000 AURITANIA 27 25,51156 12448.98 580,0000 61,40000 12,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,30000 12,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,00000 12,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,00000 12,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,00000 14,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,00000 14,00000 AURITANIA 23 44,89943 10007.25 510,0000 48,00000 14,00000 AURITANIA 23 54,54649 12487.540 740,0000 73,90000 14,00000 AURITANIA 23 54,54649 12487.540 740,0000 73,90000 14,00000 AURITANIA 23 54,54649 12487.540 140,0000 73,90000 23,00000 AURITANIA 23 54,54649 12487.540 140,0000 73,90000 23,00000 AURITANIA 23 54,54649 1247.520 819,9999 77,40000 23,00000 AURITANIA 23 54,54649 12867.54 1040,0000 73,90000 23,00000 AURITANIA 33 36,1063 45,540 40,0000 49,40000 77,00000 AURITANIA 33 54,2634 440 760,0000 49,40000 77,00000 AURITANIA 34 40,67140 412,552 440 760,0000 49,40000 77,00000 AURITANIA 34 40,67140 412,550 4140,0000 35,00000 49,40000 77,00000 AURITANIA 44 107,8689 233,290 1290,000 37,90000 14,00000 AURITANIA 44 107,8689 233,290 1290,000 37,90000 14,00000 AURITANIA 44 107,8689 2						63.00000	32.00000
CHIMA 14 28.816468 212621.2 300.0000 57.20000 37.00000 PAKISTAN 15 25.98405 145279.30 390.0000 57.90000 27.00000 UGANDA 16 16.41651 5718.000 220.0000 77.10000 82.00000 MADAGASCAR 17 9.880604 15914.73 310.0000 80.90000 41.00000 SUDAN 18 10.44714 16427.52 400.0000 75.10000 34.00000 CHARLES 19 57.92510 2546.100 310.0000 48.90000 33.00000 LESOTHO 21 12.48885 574.5000 440.0000 67.60000 33.00000 LESOTHO 21 12.48885 574.5000 440.0000 67.60000 26.00000 MADRITANIA 23 5.925926 5916.750 480.0000 67.70000 26.00000 MARITANIA 23 5.925926 5916.750 480.0000 81.40000 27.00000 LEBERIA 25 15.33742 323.8300 480.0000 67.70000 31.00000 LEBERIA 25 15.33742 323.8300 480.0000 67.70000 32.00000 MONDINESS 26 25.97403 3236.500 670.0000 61.40000 27.00000 BOLIVIA 28 44.89943 10007.25 510.0000 48.30000 27.00000 BOLIVIA 28 44.89943 10007.25 510.0000 48.30000 20.00000 ZIMBABWE 30 46.56011 2487.540 740.0000 57.00000 11.00000 EL SALVADDR 31 31.64300 760.9500 710.0000 48.70000 20.00000 PRILLIPPINES 34 28.93702 8782.700 760.0000 48.70000 23.00000 PRILLIPPINES 34 28.93702 8782.700 760.0000 49.20000 23.00000 PERU 37 42.34669 12367.54 1040.000 37.90000 23.00000 PERU 37 42.34669 12367.54 1040.000 37.90000 23.00000 PERU 37 42.34669 12367.54 1040.000 37.50000 23.00000 PERU 37 42.34669 12367.54 1040.000 37.50000 22.00000 PERU 37 42.34669 12367.54 1040.000 37.90000 23.00000 PERU 37 42.34669 12367.54 1040.000 35.20000 8.000000 PERU 37 42.34669 12367.54 1040.000 35.20000 8.000000 PERU 37 42.34669 12367.54 1040.000 35.20000 8.000000 PERU 37 42.34669 12367.54 1040.000 35.00000 77.00000 PERU 37 42.36678 5432.40 760.000 35.00000 77.00000 PERU 37 42.36678 5432.40 760.0000 35.00000 77.00000 PERU 37				• • • • • • • •		79.30000	52,00000
PARTISTAN 15 25.98405 14529.30 390.0000 51.90000 27.00000 UGANDA 16 16.41651 5918.000 220.00000 79.10000 82.00000 MADAGASCAR 17 9.380604 15914.73 310.0000 80.90000 41.00000 SUDAN 18 10.44714 16477.52 400.0000 75.10000 34.00000 KENYA 20 30.75504 1939.200 340.0000 48.90000 33.00000 KENYA 20 30.75504 1939.200 340.0000 76.00000 33.00000 KENYA 21 12.48885 574.5000 460.0000 81.40000 23.00000 INDONESIA 22 16.57906 21580.70 560.0000 56.50000 26.00000 MAURITANIA 23 5.925926 5916.750 480.0000 67.70000 340.00000 MAURITANIA 23 5.925926 5916.750 480.0000 67.70000 340.00000 MAURITANIA 23 5.925926 5916.750 480.0000 67.70000 340.00000 MAURITANIA 23 5.925926 5916.750 480.0000 67.70000 21.00000 MAURITANIA 25 15.33742 323.8300 480.0000 67.70000 340.00000 MONDURAS 26 25.97403 3236.500 670.0000 61.40000 27.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 140.00000 MONDURAS 26 45.97403 2326.500 670.0000 64.60000 27.00000 MONDURAS 26 45.97403 2326.500 670.0000 64.60000 170.00000 MONDURAS 26 45.97403 2326.500 670.0000 64.60000 170.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 27.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 170.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 27.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 27.00000 MONDURAS 26 25.97403 2326.500 670.0000 49.20000 23.00000 MONDURAS 26 25.97403 200.00000 49.20000 23.00000 23.00000 MONDURAS 26 25.9540 26.00000 49.20000 23.00000 23.00000 MONDURAS 26 25.9540 26.00000 49.20000 23.00000 23.00000 MONDURAS 26 26.00000 20.00000 MONDURAS 26 26.00000 27.00000 2						57.20000	37,00000
MANAGASCAR 17 9,380604 15914.73 310,0000 82,00000 41,00000 82,00000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 41,00000 80,90000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,90000 31,00000 80,900000 80,90000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000 80,900000000000000000000000000000000000						51.90000	27,00000
MADAGASCAR 17 7,380604 15914.73 310.0000 80.90000 41.00000 SUDAN 18 10.44714 16427.52 400.0000 75.10000 34.00000 GRANA 19 59.92510 2546.100 310.0000 76.00000 33.000000 ENTAL 20 30.75504 1939.200 340.0000 76.00000 23.00000 LESOTHO 21 12.48885 574.5000 460.0000 81.40000 23.00000 ENTAL 22 16.57906 21580.70 560.0000 56.50000 24.00000 MAURITANIA 23 5.925926 5916.750 480.0000 81.10000 34.00000 MAURITANIA 23 5.925926 5916.750 480.0000 61.10000 34.00000 ENTAL 25 15.33742 323.8300 480.0000 67.70000 36.00000 ENTAL 25 15.33742 323.8300 480.0000 67.70000 36.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.0000						79.10000	82,00000
SUDAN 18 10.44714 16427.52 400.0000 75.10000 34.00000 GARANA 19 59.92510 2546.100 310.0000 48.90000 53.00000 LESOTHO 21 12.46885 574.5000 460.0000 81.40000 23.00000 INDONESIA 22 16.57906 21580.70 560.0000 56.50000 24.00000 MAURITANIA 23 5.925926 5916.750 480.0000 81.10000 24.00000 SINEGRAL 24 40.50872 3823.750 440.0000 72.60000 21.00000 SINEGRAL 25 15.33742 323.8300 480.0000 67.70000 36.00000 HONDURAS 26 25.97403 2326.500 670.0000 64.40000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.000000 27.00000 27.00000 27.00000 27.00000 27.00000 27.00000 27.0000						80.90000	41.00000
GRANA 19 59,92510 2546.100 310.0000 48.90000 53.00000 KENTA 20 30.75504 1939,200 340.0000 76.00000 33.00000 LESOTHO 21 12.48885 574.5000 460.0000 81.40000 23.00000 1NDONESIA 22 16.57906 21580.70 560.0000 81.40000 24.00000 MAURITANIA 23 5.925926 5916.750 480.0000 81.10000 24.00000 MAURITANIA 23 5.925926 5916.750 480.0000 67.70000 36.00000 LIBERIA 25 15.33742 323.8300 480.0000 67.70000 36.00000 MONDURAS 26 25.97403 2326.500 670.0000 64.60000 27.000000 27.00000						75.10000	34,00000
NENTA 20 30.75504 1939.200 340.0000 76.00000 33.00000 21.12.48885 574.5000 460.0000 81.40000 23.00000 24.00000 34.0						48.90000	53,00000
LESOTHO					340,0000	76.00000	33,00000
INDONESIA 22					460.0000	81.40000	23,00000
MAURITANIA 23 5.925926 5916.750 480.0000 81.10000 34.00000 SENEGAL 24 40.50872 3823.750 440.0000 72.60000 21.00000 LIBERIA 25 15.33742 323.8300 480.0000 67.76000 36.00000 HONDURAS 26 25.97403 2326.500 670.0000 61.40000 27.00000 27.00000 BOLIVIA 28 44.89743 10007.25 510.0000 48.30000 23.00000 ECYPT 29 43.44270 691.8800 700.0000 49.20000 20.00000 ECYPT 29 43.44270 691.8800 700.0000 49.20000 20.00000 EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 21.00000 CAMERON 32 15.35342 7172.200 819.9797 79.40000 24.00000 THAILAND 33 36.10603 15152.06 820.0000 43.90000 22.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 PERU 37 42.36669 12867.54 1040.0000 35.20000 8.000000 IVORY COAST 40 17.72887 3562.350 710.0000 35.20000 8.000000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 PRAGUAY 43 40.67140 6121.500 1410.000 47.80000 26.00000 JURISIA 44 12.82874 1811.520 1370.000 47.80000 26.00000 JURISIA 44 109.8689 2233.270 1290.000 37.00000 24.00000 JURISIA 44 109.8689 2233.270 1290.000 37.00000 14.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 26.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 26.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 27.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 26.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 14.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 27.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 27.00000 JURISIA 45 42.82279 3217.793 1760.000 47.80000 27.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 14.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 14.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 37.00000 37.00000 JURISIA 45 42.82279 3217.793 1760.000 37.90000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37.00000 37					560,0000	56.50000	26.00000
SENEGAL 24 40,50872 3823,750 440,0000 72,60000 21,00000 LIBERIA 25 15,33742 323,8300 480,0000 67,70000 36,00000 HONDURAS 26 25,97403 2326,500 670,0000 61,40000 27,00000 24,00000 BOLIVIA 28 44,89743 10007,25 510,0000 48,30000 23,00000 ECYPT 29 43,44270 691,8800 700,0000 48,70000 20,00000 EL SALVADOR 31 31,64300 760,9500 710,0000 48,70000 20,00000 EL SALVADOR 31 31,64300 760,9500 710,0000 48,70000 24,00000 EL SALVADOR 31 31,64300 760,9500 710,0000 48,70000 23,00000 PHILIPPINES 34 28,93702 8782,700 760,0000 43,90000 22,00000 NICARAGUA 35 49,26534 2589,970 880,0000 40,20000 22,00000 PERU 37 42,36669 12867,54 1040,000 35,20000 22,00000 NICARAGUA 35 49,26534 2589,970 880,0000 40,20000 22,00000 NICARAGUA 37 42,36669 12867,54 1040,000 35,20000 8.000000 NICARAGUA 37 42,36669 1386,00000 18,50000 7,000000 NICARAGUA 38 25,26924 26201,25 770,0000 50,50000 26,00000 NICARAGUA 43 40,67140 6121,500 1410,000 44,80000 7,000000 DIARAGUAY 43 40,67140 6121,500 1410,000 47,80000 27,000000 DIARAGUAY 43 40,67140 6121,500 1410,000 47,80000 17,00000 NICARAGUAY 43 40,67140 6121,500 1410,000 47,80000 20,00000 NICARAGUAY 43 40,67140 6121,500 1410,000 47,80000 19,00000 DIARAGUAY 43 40,67140 6121,500 1410,000 37,90000 14,00000 DIARAGUAY 43 40,67140 6121,500 1410,000 47,80000 19,00000 DIARAGUAY 43 40,67140 6121,500 1410,000 47,80000 20,00000 DIARAGUAY 43 40,67140 6121,500 1410,000 37,90000 17,00000 DIARAGUAY 43 40,67140 6121,500 1410,000 37,90000 14,00000 DIARAGUAY 43 40,67140 6121,500 1400,000 37,90000 14,00000 DIARAGUAY 43 40,671						81,10000	34,00000
LIBERIA 25					440,0000	72,60000	21.00000
HONDURAS 26 25.97403 2326.500 670.0000 61.40000 27.00000 2AMBIA 27 25.51156 12448.78 580.0000 64.60000 14.00000 23.00000 E0LIVIA 28 44.89743 10007.25 510.0000 48.30000 23.00000 ECYPT 27 43.44270 691.8800 700.0000 49.20000 20.00000 ECYPT 29 43.44270 691.8800 700.0000 49.20000 20.00000 EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 20.00000 EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 24.00000 EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 24.00000 EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 23.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 MOROCCO 36 66.88768 5432.440 760.0000 47.40000 17.00000 PERU 37 42.36649 12867.54 1040.000 35.20000 8.000000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 26.00000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 17.00000 IVORY COAST 40 17.72887 3562.350 710.0000 37.90000 17.00000 IVORY A00000 17.00000 IVORY A00000						67,70000	36,00000
Name						61.40000	27.00000
BOLIVIA 28 44.89743 10007.25 510.0000 48.30000 23.00000 ECYPT 27 43.44270 471.8800 700.0000 47.20000 20.000000 ZIMBABWE 30 46.56011 2487.540 740.0000 57.00000 11.00000 EL SALVADOR 31 31.64300 760.7500 710.0000 48.70000 20.00000 CAMEROON 32 15.35342 7172.200 817.77977 77.40000 24.00000 THAILAND 33 36.10603 15152.06 820.0000 73.70000 23.00000 PHILIPPINES 34 28.73702 8782.700 760.0000 43.70000 22.00000 NICARAGUA 35 47.26534 2587.770 880.0000 40.20000 22.00000 NICARAGUA 35 47.26534 2587.770 880.0000 47.40000 17.00000 NICERIA 38 25.26724 26201.25 770.0000 35.20000 8.000000 NICERIA 38 25.26724 26201.25 770.0000 50.50000 26.00000 NIVORY COAST 40 17.72887 3562.350 710.0000 77.50000 7.000000 DOMINICAN R.41 12.82874 1811.520 1370.0000 77.50000 27.000000 TUNISIA 44 107.8687 2233.270 1430.0000 74.80000 20.00000 TUNISIA 44 107.8687 2233.270 1270.0000 77.700000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 14.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 14.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 14.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 17.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 17.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 17.00000 TUNISIA 44 107.8687 2233.270 1270.000 37.70000 14.00000 TUNISIA 45 42.82277 3217.730 1760.000 37.70000 14.00000 TUNISIA 45 42.82277 3217.730 1760.000 37.70000 17.00000 TUNISIA 45 42.82277 3217.730 1760.000 37.00000 23.00000 37.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 COUNTISTY ODS SPAP ALCG PCI PAGP PAGDP PAGDP PAGENTINA 55 43.16863 37239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 74.94.040 1870.000 17.00000 12.00000 CHILE					580,0000		14.00000
ECYPT 27 43,44270 691,8800 700,0000 49,20000 20,00000 21,						48.30000	23,00000
ZIMBABWE 30 46.56011 2487,540 740.0000 57.00000 11.000000					700,0000	49.20000	
EL SALVADOR 31 31.64300 760.9500 710.0000 48.70000 20.00000 CAMEROON 32 15.35342 7172.200 819.9797 79.40000 24.00000 THAILAND 33 36.10603 15152.06 820.0000 73.90000 22.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 49.40000 17.00000 PERU 37 42.36669 12867.54 1040.000 35.20000 8.000000 NIGERIA 38 25.26924 26201.25 770.0000 50.50000 26.00000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 TUNISIA 44 109.8689 2233.290 1270.000 37.90000 26.00000 JORDAN 46 46.41710 118.6800 1640.000 47.80000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 COUNTRY OBS SPAP ALCG PCI PAGP PAGDP ALCG A8.8000 20.00000 PARAZSIA 49 59.41203 3231.580 1860.000 35.00000 19.00000 PARAZSIA 49 59.41203 3231.580 1860.000 35.00000 23.00000 PARAZSIA 52 63.36473 1148.820 1020.000 35.00000 23.00000 PARAZSIA 52 63.36473 1148.820 1020.000 35.00000 23.00000 PARAZSIA 52 63.36473 102641.0 1880.000 35.800000 23.00000 PARAZSIA 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 843.4783 4824.9760 2240.000 17.00000 12.00000 12.00000 CHILE 54 843.4783 4824.9760 2240.000 11.00000 12.00000 12.00000 12.00000 12.00000 12.00000 12.00000 12.00000 12.00000 12.00000 12.000000 12.00000 12.00000 12.000000 12.000000 12.00000 12.000000 12.000000 12.000000 12.00000						57.00000	
CAMEROON 32 15.35342 7172.200 819.9797 79.40000 24.00000 THAILAND 33 36.10603 15152.06 820.0000 73.90000 22.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 MOROCCO 36 66.88768 5432.440 760.0000 49.40000 17.00000 PERU 37 42.36669 12867.54 1040.000 35.20000 8.000000 NIGERIA 38 25.26924 26201.25 770.0000 50.50000 26.00000 JAMAICA 39 89.08686 206.3600 1300.000 18.50000 7.000000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.000000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 TUNISIA 44 109.8689 2233.290 1270.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 47.80000 19.00000 TURKEY 47 25.72998 15303.70 1240.000 33.60000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY COAST 40 17.00000 18.80000 20.00000 TURKEY 47 25.72998 15303.70 1240.000 37.90000 14.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY COAST A0 18.8000 16.40000 37.00000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 14.00000 PARAZIL 52 63.36493 102641.0 1880.000 35.80000 20.00000 MEXICO 53 43.16863 39239.60 2240.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 35.80000 12.00000 CHILE 54 84.32587 7494.040 1870.000 35.80000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 1					710.0000	48.70000	20.00000
THAILAND 33 36.10603 15152.06 820.0000 73.90000 23.00000 PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 MOROCCO 36 66.88768 5432.440 760.0000 49.40000 17.00000 PERU 37 42.36669 12867.54 1040.000 35.20000 8.000000 JAMAICA 38 25.26924 26201.25 770.0000 50.50000 26.00000 JAMAICA 39 89.08686 206.3600 1300.000 18.50000 7.000000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 27.000000 PARAGUAY 43 40.67140 6121.500 1410.000 47.80000 20.00000 TUNISIA 44 109.8689 2233.270 1270.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 TURKEY 47 25.72998 15303.70 1240.000 33.00000 19.00000 TURKEY 47 25.72998 15303.70 1240.000 35.00000 14.00000 TURKEY 47 25.72998 15303.70 1240.000 35.00000 14.00000 MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 12.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000		_			819.9999	79.40000	
PHILIPPINES 34 28.93702 8782.700 760.0000 43.90000 22.00000 NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 MOROCCO 36 66.88768 5432.440 760.0000 49.40000 17.00000 PERU 37 42.36669 12867.54 1040.000 35.20000 8.000000 NIGERIA 38 25.26724 26201.25 770.0000 50.50000 26.00000 JAMAICA 39 89.08686 206.3600 1300.000 18.50000 7.000000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 TUNISIA 44 109.8689 2233.270 1270.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 47.80000 26.00000 TURKEY 47 25.7298 15303.70 1240.000 23.60000 19.00000 SOUTH KOREA 48 65.27060 1970.040 2010.000 35.00000 14.00000 TURKEY 47 25.7298 15303.70 1240.000 35.00000 19.00000 SOUTH KOREA 48 65.27060 1970.040 2010.000 35.00000 14.00000 PARADIX 49 59.41203 3231.580 1860.000 45.40000 21.00000 PARADIX 49 59.41203 3231.580 1860.000 45.40000 21.00000 PARADIX 49 59.41203 3231.580 1860.000 35.00000 19.00000 PARADIX 49 59.41203 3231.580 1860.000 35.00000 19.00000 PARADIX 49 59.41203 3231.580 1860.000 35.00000 20.00000 PARADIX 55 646764 785.2500 2120.000 33.00000 23.00000 PARADIX 55 63.36473 102641.0 1880.000 35.80000 12.00000 PARADIX 55 43.36463 39239.60 2240.000 35.80000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 17.00000 17.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000 CHILE 54 84.32587 7494.040 1870.000 17.00000 12.00000					820,0000	73,90000	
NICARAGUA 35 49.26534 2589.970 880.0000 40.20000 22.00000 MOROCCO 36 66.88768 5432.440 760.0000 49.40000 17.00000 PERU 37 42.36669 12867.54 1040.000 35.20000 8.000000 NIGERIA 38 25.26924 26201.25 770.0000 50.50000 26.00000 JAMAICA 39 89.08686 206.3600 1300.000 18.50000 7.000000 IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.000000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 TUNISIA 44 109.8689 2233.270 1270.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 JORDAN 46 46.41910 118.6800 1640.000 23.60000 8.000000 TURKEY 47 25.72998 15303.70 1240.000 35.00000 19.00000 SOUTH KOREA 48 65.27060 1790.040 2010.000 35.00000 14.00000 COUNTRY 0bs SPAP ALCQ PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 21.00000 BRAZIL 52 63.36473 1148.820 1020.000 33.00000 23.00000 BRAZIL 52 63.36473 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7474.040 1870.000 17.00000 10.00000 DIRIGIDAY 56 643.4783 4824.960 2470.000 11.00000 12.00000						43.90000	
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JAMAICA 39 89.08686 206.3600 1300.000 18.50000 7.000000 1VORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.000000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.000000 DAMINICAN R.41 109.8689 2233.290 1270.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 47.80000 19.00000 DAMINICAN 46 46.41910 118.6800 1640.000 23.60000 8.000000 DAMINICAN 46 46.41910 118.6800 1640.000 23.60000 8.000000 DAMINICAN 48 65.27060 1990.040 2010.000 35.00000 14.00000 DAMINICAN 49 59.41203 3231.580 1860.000 35.00000 14.00000 DAMINICAN 49 59.41203 3231.580 1860.000 45.40000 23.00000 DAMINICAN 55 43.86733 1148.820 1020.000 32.50000 8.000000 DAMINICAN 55 290.9836 50008.00 2070.000 17.00000 17.00000 DAMINICAN 56 643.4783 4824.960 2490.000 12.00000 12.00000 DAMINICAN 55 290.9836 50008.00 2070.000 12.00000 12.00000 DAMINICAN 56 643.4783 4824.960 2490.000 11.00000 12.000000 DAMINICAN 56 643.4783 4824.960 2490.000 11.000000 DAMINICAN 56 643.4783 4824.960 2490.000					770.0000	50.50000	26,00000
IVORY COAST 40 17.72887 3562.350 710.0000 77.50000 27.00000 DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 PARAGUAY 43 40.67140 6121.500 1410.000 47.80000 26.00000 TUNISIA 44 109.8689 2233.270 1270.000 37.70000 14.00000 SYRIA 45 42.82297 3217.730 1760.000 46.40000 17.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 TURKEY 47 25.72978 15303.70 1240.000 50.10000 19.00000 SUTH KOREA 48 65.27060 1790.040 2010.000 35.00000 14.00000 COUTH KOREA 48 65.27060 1790.040 2010.000 35.00000 14.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36473 1148.820 1020.000 32.50000 8.000000 BRAZIL 52 63.36473 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.00000 URICIDAY 56 643.4783 4824.960 2470.000 11.00000 12.00000 URICIDAY 56 643.4783 4824.960 2470.000 11.00000 12.000000 URICIDAY 56 643.4783 4824.960 2470.000 11.00000 12.000000					1300,000	18.50000	7,000000
DOMINICAN R.41 12.82874 1811.520 1370.000 54.50000 17.00000 COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 PARAGUAY 43 40.67140 6121.500 1410.000 47.80000 26.00000 TUNISIA 44 109.8689 2233.270 1270.000 37.70000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 TURKEY 47 25.72978 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1970.040 2010.000 35.00000 14.00000 COUNTRY 0bs SPAP ALCQ PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 23.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.0				3542,350	710,0000	77.5 0000	
COLOMBIA 42 124.7522 14276.00 1430.000 24.80000 20.00000 PARAGUAY 43 40.67140 6121.500 1410.000 47.80000 26.00000 TUNISIA 44 109.8689 2233.290 1290.000 37.90000 14.00000 SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.000000 TURKEY 47 25.72998 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY ODS SPAP ALCG PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36493 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.00000 URIGINAY 56 643.4783 4824.960 2490.000 11.00000 12.000000 URIGINAY 56 643.4783 4824.960 2490.000 11.00000 12.000000 URIGINAY 56 643.4783 4824.960 2490.000 11.00000 12.000000					1370,000	54,50000	17.00000
PARAGUAY 43 40.67140 6121.500 1410.000 47.80000 26.00000 TUNISIA 44 109.8689 2233.290 1270.000 37.90000 14.000000 SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.0000000 TURKEY 47 25.72998 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.000000 COUNTRY 0bs SPAP ALCQ PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 21.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36493 102641.0 1880.000 35.80000 12.000000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.0000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 URUGUAY 56 643.4783 4824.960 2490.000 11.00000 12.000000					1430.000	24.80000	
TUNISIA 44 109.8689 2233.270 1270.000 37.70000 14.00000 SYRIA 45 42.82297 3217.730 1760.000 46.40000 19.000000 JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.0000000 TURKEY 47 25.72798 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1970.040 2010.000 35.00000 14.000000 COUNTRY 0bs SPAP ALCG PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36473 102641.0 1880.000 35.80000 12.000000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 URICOTAY 56 643.4783 4824.960 2470.000 11.00000 12.000000 URICOTAY 56 643.4783 4824.960 2470.000 11.00000 12.000000				6121,500	1410,000	47.80000	
SYRIA 45 42.82297 3217.930 1760.000 46.40000 19.00000 JORDAN 46 46.41910 118.6800 1640.000 23.60000 8.000000 TURKEY 47 25.72998 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY 0bs SPAP ALCG PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 21.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36493 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.0			-	2233,270	1290,000	37,90000	
JORDAN 46 46.41710 118.6800 1640.000 23.60000 8.0000000 TURKEY 47 25.72978 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY ODS SPAP ALCQ PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 21.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36493 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 RIGHIGHAY 56 643.4783 4824.960 2490.000 11.00000 12.000000 12.000000 RIGHIGHAY 56 643.4783 4824.960 2490.000 11.00000 12.000000					1760,000		
TURKEY 47 25.72998 15303.70 1240.000 50.10000 19.00000 SOUTH KOREA 48 65.27060 1990.040 2010.000 35.00000 14.00000 COUNTRY ODS SPAP ALCQ PCI PAGP PAGDP MALAYSIA 49 59.41203 3231.580 1860.000 45.40000 21.00000 COSTA RICA 50 93.86733 1148.820 1020.000 33.00000 23.00000 PANAMA 51 75.66766 785.2500 2120.000 32.50000 8.000000 BRAZIL 52 63.36493 102641.0 1880.000 35.80000 12.00000 MEXICO 53 43.16863 39239.60 2240.000 33.50000 8.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 CHILE 54 84.32587 7494.040 1870.000 17.00000 10.000000 URIGIDAY 56 643.4783 4824.960 2490.000 11.00000 12.000000					1640.000	23,60000	8.000000
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SOURCE: TABLES 4 and 11; World Bank (1984, 1985); FAO (1984)

Note.- All figures but those for SPAP correspond to 1983. Figures for SPAP are for 1980

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