DIFFERENTIAL POPULATION PRESSURE IN THE PHILIPPINES

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While it is generally acknowledged that the Philippines is not an over-populated nation, the existence of maldistribution of the national population is commonly accepted. Reference is frequently made to high and low pressure areas and government resettlement programs are devised in an attempt to reduce the pressure where it is greatest. The task of this paper is to examine the meaning of population pressure as applied to the Philippines and to identify areas of differential pressure.

As with most widely used terms population pressure, and its counterpart, over-population, lacks precise definition. There is uncertainty, for example, as to whether the "pressure" bears on a particular natural resource, on all natural resources, on market factor in the economy. Nor is it always clear which quantity in the implied equation is assumed to be variable, though the usual assumption seems to be that population alone is subject to change and that the relation, whatever it may be, is fixed. Thus in order to make the term population pressure intelligible both of these sources of confusion must be avoided. Perhaps the best procedure is to critically examine a series of measures of pressure.

The simplest measure of population pressure is the density ratio, or the ratio of population per square kilometer of land. As may be observed in column 1 of Table I, the average density in the Philippines, in 1939,[1] was 54 persons per square kilometer. Provinces whose densities exceeded that figure would appear to be areas of high population pressure, while those with lower densities seem to be low pressure areas. High pressure areas, according to this measure, were to be found in Cebu, Rizal, Pampanga, Cavite, Lagusa, and elsewhere and the lowest pressure occurred mainly in Mindanao.

A simple density ratio is admittedly crude, however. Much of the land that enters into the ratio is mountainous, swampy, occupied by urban uses, and is in other respects agriculturally unproductive. A considerable degree of refinement may be achieved by relating population to land in cultivation. On this basis, according to Col. 2 of Table I, the greatest densities existed in Rizal, Mountain Province, Cebu, Batanes and Ilocos Norte. The most sparsely populated provinces were Nueva Ecija, Quezon, Marinduque, Davao, and Sorsogon. But this refined measure of density is also less than satisfactory. Included in the populations are many people who have no direct connection with the land. The residents of cities and even the non-agricultural workers in rural areas are somewhat less subject to the limitations of agricultural resources than are farmers.

[1] The 1939 census data are used in this paper in preference to 1948 and later data both because of the superior quality of the former and because the 1939 census publications included many relevant tabulations that were not repeated in the later census. Furthermore, the overall conditions of 1954 are probably not significantly different from those that prevailed in 1939.

Table I. Measures of the Relation of Population to the land, by Province, Philippines, 1939

Province	*Population per sq. Km.* All land	Cultivated land	Agricultural Workers per sq. Km. Cultivated land
Total	54	470	87
Abra	23	563	144
Agusan	9	273	70
Albay	108	419	80
Antique	75	437	96
Bataan	65	532	76
Batanes	46	716	272
Batangas	134	416	80
Bohol	121	513	112
Bukidnon	7	270	72
Bulacan	127	462	72
Cagayan	33	376	101
Camarines Norte	46	300	28
Camarines Sur	73	296	56
Capiz	93	458	105
Cavite	187	456	65
Cebu	219	768	190
Cotabato	13	396	115
Davao	15	198	59
Ilocos Norte	70	666	170
Ilocos Sur	101	806	170
Iloilo	142	460	102
Isabela	21	280	86
La Union	151	625	149
Laguna	155	294	60
Lanao	35	347	72
Leyte	116	459	104
Marinduque	90	195	61
Masbate	46	313	62
Mindoro	132	239	54
Misamis Occidental	104	391	82
Misamis Oriental	56	323	56
Mountain Province	21	898	304
Negros Occidental	108	423	97
Negros Oriental	75	191	122
Nueva Ecija	77	191	46
Nueva Vizcaya	12	424	118
Palawan	6	480	125
Pampanga	177	427	72
Pangasinan	142	491	104
Quezon	30	194	41
Rizal	194	1885	102
Romblon	76	276	63
Samar	40	355	86
Sorsogon	122	226	46
Sulu	89	518	93
Surigao	29	286	68
Tarlac	88	306	72
Zambales	30	519	100
Zamboanga	22	323	79

A further step in the refinement of the measure of the population-food resources ratio is accomplished by relating only agricultural workers, exclusive of their dependents, to a unit of cultivated land, as in Col. 3 of Table I. Thus the provinces that had more than 87 agricultural workers per square kilometer of cultivated land were, by that measure, over-populated. Extreme instances of excess numbers of workers existed in Mountain Province, Batanes, Cebu, Ilocos Sur, and Ilocos Norte. Pressure was lightest, on the other hand, in Camarines Norte, Quezon, Nueva Ecija, Sorsogon, and Mindoro.

But the assumption involved in a ratio of population or agricultural workers to cultivated land that all cultivated lands have uniform population carrying capacities is untenable. There are wide variations in land productivity and also in the market values of products. The latter, moreover, are subject to irregular seasonal and annual fluctuations. A combination of the two quantities, land productivity and market value of the product, constitutes a much better measure of sustenance opportunity or population carrying capacity than does amount of land in cultivation. Such a combination is represented in the gross peso value of the annual product. This measure has the added advantage of making comparable the population carrying capacities of different types of producing areas. It therefore provides a basis for the development of a reasonably accurate measure of population pressure, at least as of a given point in time.

By dividing the average national gross peso value of product per agricultural worker into the gross peso value of product of each province, we obtain an expected number of agricultural workers for each province, i.e. the number of workers that would have been present if the gross value of product had been produced at the national average per worker rate. The difference between the actual number and the expected number of agricultural workers in a province, as shown in Col. 4 of Table II, represents the extent to which rural population pressure is present or absent. In column 5 of Table II, such differences are expressed as percentages of the respective expected numbers of workers. In Abra, for example, the actual number of workers exceeded the number by 11.9 per cent. Thus Abra be regarded as having had, in 1939, an agricultural overpopulation of approximately 12 per cent. In Bataan, on the other hand, the actual number of workers was 44.6 per cent less than the expected number, or population pressure was 44.6 per cent less than average. The areas of greatest population pressure, by this measure, were concentrated mainly in the Visayan provinces, and Palawan, though there were areas of high pressure on Luzon and Mindanao. It is of interest to observe that several sections of Mindanao, commonly regarded as under-populated, are shown to have been high pressure areas. Cotabato, Surigao, and Zamboanga had excess numbers of workers ranging from 34 to 60 per cent.

The provinces of least population pressure were the rice-producing provinces of central Luzon: Pampanga, Nueva Ecija, Tarlac, Bulacan, and Laguna. Low pressure also characterized Bataan, a rice-producing province, Negros Occidental, the principal sugar producing province, Sulu, and Camarines Norte. None of the Mindanao provinces had ratios of agricultural workers to sustenance opportunities as far below average as had the provinces named.

Table II. Actual and Expected Numbers of Workers in Agriculture, and Differences between Actual and Expected Numbers, by Provinces, Philippines, 1939

Province	Gross value of product: 1000 pesos (1)	Actual No. workers in agriculture (2)	Expected No. workers in agriculture* (3)	Difference bet. actual and expected (4)	Per cent excess or deficit of actual relative to expected** (5)
Abra	1,525	22,443	20,062	2,381	11.9
Agusan	1,685	26,077	22,164	3,913	17.6
Albay	4,314	91,946	56,770	35,176	62.0
Antique	1,964	44,328	25,836	18,492	71.6
Bataan	1,708	12,455	22,475	—10,020	—44.6
Batanes	189	3,646	2,482	1,164	46.9
Batangas	5,361	85,034	70,538	14,496	20.6
Bohol	3,964	107,870	52,157	55,713	106.8
Bukidnon	1,060	15,711	13,949	1,762	12.6
Bulacan	7,450	52,319	98,021	—45,702	—46.6
Cagayan	5,209	79,881	68,542	11,339	16.5
Camarines Norte	1,304	10,661	17,160	— 6,499	—37.9
Camarines Sur	4,379	91,337	57,621	33,716	58.5
Capiz	6,073	94,266	79,905	14,361	18.0
Cavite	2,798	34,438	36,814	— 2,376	— 6.4
Cebu	6,911	265,222	90,935	174,287	191.7
Cotabato	4,183	88,080	55,038	33,042	60.0
Davao	9,591	88,732	126,194	—37,462	—29.7
Ilocos Norte	4,197	60,590	55,221	5,369	9.7
Ilocos Sur	2,612	57,436	34,363	23,073	67.1
Iloilo	10,787	167,251	141,938	25,313	17.8
Isabela	5,446	68,735	71,663	— 2,928	— 4.1
La Union	2,588	49,503	34,048	15,455	45.4
Laguna	6,857	50,811	90,218	—39,407	—43.7
Lanao	4,457	51,575	58,648	— 7,073	—12.1
Leyte	8,539	210,832	112,360	98,472	87.6
Marinduque	855	19,965	11,253	8,712	77.4
Masbate	1,788	36,818	23,529	13,289	56.5
Mindoro	2,506	30,511	32,969	— 2,458	— 7.4
Misamis Occ.	2,938	45,286	38,659	6,627	17.1
Misamis Or.	3,186	42,567	41,919	648	1.5
Mt. Province	6,779	101,947	89,199	12,748	14.3
Negros Occ.	25,202	192,245	331,601	—139,356	—42.0
Negros Or.	3,696	92,336	48,626	43,710	89.8
Nueva Ecija	19,866	101,347	261,399	—160,052	—61.2
Nueva Vizcaya	2,118	22,293	27,872	— 5,579	—20.0
Palawan	710	24,676	9,348	15,328	164.0
Pampanga	14,926	64,005	196,389	—132,384	—67.4
Pangasinan	15,338	158,620	201,819	— 43,199	—21.4
Quezon	7,400	77,332	97,366	— 20,034	—20.6
Rizal	2,107	24,547	27,728	— 3,181	—11.5
Romblon	1,118	23,112	14,716	8,396	57.0
Samar	6,132	133,793	80,684	53,109	65.8
Sorsogon	4,110	50,432	54,076	— 3,644	— 6.7
Sulu	6,499	44,844	85,518	— 40,674	—47.6
Surigao	3,012	55,052	39,634	15,418	—52.9
Tarlac	9,948	62,760	130,896	— 68,136	—52.0
Zamboanga	4,980	88,364	65,524	22,840	34.8
Zambales	1,475	20,928	19,405	1,523	7.8

* Col. 1 divided by 75.97, the average per agricultural worker gross peso value of annual agricultural product.

** Col. 4 divided by col. 3.

A rank ordering of the four measures of population pressure, by provinces, such as shown in Table III. reveals that there is hardly any agreement among them. No province occupied the same position in all series; in fact, no province held an identical rank in more than two series. The greatest consistency occurred in Cebu which had the highest population pressure on the basis of two measures and occupied third position on the other two measures of pressure. The position of second highest population pressure was held by Rizal on one measure, by Mountain Province on another, by Batanes on a third, and by Palawan on the fourth. On the other hand, the lowest position, indicating the least pressure, was occupied by Palawan, Nueva Ecija, Camarines Norte, and Pampanga on successive measures.

It has been stated that the percentage ratio of the actual to the expected number of agricultural workers is the most refined and therefore the superior measure of population pressure. An empirical test of that hypothesis is needed, however. It should be possible to show, in other words, that in provinces where the measure of pressure is high the actual level of living is low, and, conversely, where the measured pressure is low the level of living is relatively high. A demonstration of this requires some sort of measure of level of living.

In the absence of direct evidence of level of living, such, for example, as a measure of purchasing power or of the rate of consumption of farmers, it is necessary to resort to indirect evidence in the form of an index of level of living. Doubtlessly such an index must be a composite of several indicators, for it seems unlikely that any one factor would be sufficiently representative of the degree of well being. From the data available in the 1939 census four factors or indicators have been selected. These are: number of kilometers of first-class roads per 1000 population, per cent of the population literate, per cent of families who obtain their water supply from artesian wells, and the number of non-agricultural workers per 100 agricultural workers. To the objection that the data for these indicators are inaccurate, it may be answered that they are the only data available. Furthermore, there is no evidence of the degree of error, not to mention how the error is distributed among the provinces.

The number of kilometers of first-class roads per 1000 population is regarded as an evidence of intra-provincial as well as inter-provincial accessibility for marketing produce and for all other kinds of communicaions. This variable does not include water routes, which are extensively used in many provinces. But transportation by water is frequently disrupted during the typhoon season, whereas the first-class or hard-surfaced road provides an all-season route of travel. The per cent of the population that was literate is an approximate indication of the level of educational opportunities available. It may also reflect the extent to which members of the population were freed from primary employment by virtue of a sufficient net productivity for the support of an unremunerated activity such as school attendance. An artesian well represents a substantial capital outlay, in contrast to an open well or a surface water source. Furthermore, an artesian well assures a sanitary water supply and somewhat better health than would otherwise be possible. The proportion of non-agricultural workers also has a two-fold significance. It indicates not only the frequency of alternative job opportunities, but also something of the level of services available to the residents of any given province.

Table III. Rank Orders of Measures of Population Pressure, by Province, Philippines, 1939

Province	*Population per sq. Km.*		Agricultural workers per sq. Km. cultivated land	Per cent excess or deficit of actual to expected number of agricultural workers
	All land	Cultivated land		
Abra	40	8	6	27
Agusan	47	41	27	22
Albay	16	25	20	10
Antique	26	20	18	7
Bataan	29	9	25	44
Batanes	31	4	2	15
Batangas	9	26	23	19
Bohol	13	13	11	3
Bukidnon	48	42	26	26
Bulacan	11	16	16	45
Cagayan	36	29	15	25
Camarines Norte	32	35	39	42
Camarines Sur	27	36	35	12
Capiz	19	19	12	20
Cavite	3	21	29	32
Cebu	1	3	3	1
Cotabato	45	27	10	11
Davao	44	45	34	40
Ilocos Norte	28	5	4	28
Ilocos Sur	18	6	4	8
Iloilo	8	17	14	21
Isabela	42	39	21	31
La Union	6	7	5	16
Laguna	5	37	33	43
Lanao	35	31	26	36
Leyte	14	18	13	5
Marinduque	20	46	32	6
Masbate	33	33	31	14
Mindoro	10	43	36	24
Misamis Occ.	17	28	22	23
Misamis Or.	30	32	35	30
Mt. Province	43	2	1	25
Negros Occ.	15	24	17	41
Negros Or.	25	10	8	4
Nueva Ecija	23	48	37	48
Nueva Vizcaya	46	23	9	37
Palawan	49	15	7	2
Pampanga	4	22	26	49
Pangasinan	7	14	13	38
Quezon	37	47	38	39
Rizal	2	1	14	35
Romblon	24	40	30	13
Samar	34	30	21	9
Sorsogon	12	44	37	33
Sulu	21	12	19	46
Surigao	39	38	28	17
Tarlac	22	34	26	47
Zambales	38	11	16	29
Zamboanga	41	32	24	18

The relative importance of each of the four factors in the determination of level of living is unknown. Hence it will be assumed that they are of equal importance. Accordingly, each of the series is reduced to relative values, i.e., the actual value for each province is expressed as a per cent of the national average value, and the arithmetic mean of the four relative values for each province constitutes the level of living index for that province. The indexes together with the data employed are shown in Table IV. It should be noted that the index as here constructed is an approximation. Further explorations and improved data will permit the development of a much better measure. But the objective of the moment is not that of measuring level of living accurately, rather it is to locate as accurately as possible the relative positions of the 49 provinces in the level of living range that obtained in the Philippines in 1939. If this has been accomplished, the index should correlate inversely with the measure of population pressure.

Correlation coefficients of each of the measures of population pressure with the level of living index are:

Population per square kilometer of all land:	.2041
Population per square kilometer of cultivated land:	.5058
Agricultural workers per square kilometer of cultivated land:	—.1441
Percentage ratio of actual to expected number of agricultural workers:	—.4690

The correlation of the index with the number of people per square kilometer of all land, while not close, is positive, indicating that the greater the density the higher the level of living. But that is unreasonable. Obviously a simple density ratio is not a useful measure of population pressure. The coefficient for the index and population per square kilometer of cultivated land (.5058) indicates a similar inconsistency. A negligible degree of covariance is found between the number of agricultural workers per square kilometer of cultivated land and the level of living index. The closest relationship exists between the percentage ratio of actual to expected number of agricultural workers and the index. This conforms to the hypothesis set forth earlier. Moreover, also in accordance with the hypothesis, the relationship is inverse (negative): as the ratio increases the index declines.

The correlation coefficient of the percentage ratio of actual to expected number of agricultural workers and the level of living index is, however, lower than was anticipated. That probably is at least partially a fault of the index. A revised index from which the kilometer of first-class roads per 1000 population is omitted and to which are added the median size of farm and the peso value of farm implement per worker yields the following correlation coefficients:

Population per square kilometer of all land:	.4520
Population per square kilometer of cultivated land:	.3781
Agricultural workers per square kilometer of cultivated land:	—.2340
Percentage ratio of actual to expected agricultural workers:	—.5806

Although the pattern of difference among the coefficients is of the same order, the relationships are more pronounced that those obtained

with the first index. Further improvement doubtlessly is possible. But the perfection of a level of living index is not the task of this paper.

Table IV. Percentage Ratios of Values of Selected Variables to Their Respective National Averages and Arithmetic Mean of Ratios, by Province, Philippines, 1939

Province	Km. of 1st class roads per 1000 population (1)	Per cent literate (2)	Per cent of families with artesian water supply (3)	Per cent of all workers in non-agricultural employment (4)	Level of living index: arithmetic mean of ecols. 1, 2, 3, and 4 (5)
Abra	1.64	.93	.01	.35	.74
Agusan	1.06	1.02	1.13	.38	.90
Albay	.80	1.05	.25	.75	.71
Antique	1.45	.91	.09	.53	.74
Bataan	1.20	1.21	4.88	2.25	2.38
Batanes	2.97	1.25	.00	.20	1.10
Batangas	.86	.96	1.65	1.52	1.25
Bohol	.88	.91	.66	.82	.82
Bukidnon	3.13	.74	.05	.42	1.08
Bulacan	.85	1.39	3.74	2.46	2.11
Cagayan	1.90	.98	.23	.50	.90
Camarines Norte	1.30	1.49	.20	4.08	1.77
Camarines Sur	1.18	1.08	.36	.62	.81
Capiz	1.31	.77	.31	.70	.77
Cavite	.79	1.27	3.26	1.55	1.72
Cebu	1.00	.75	1.50	.73	1.00
Cotabato	.59	.41	.01	.20	.30
Davao	.08	.78	.08	.45	.35
Ilocos Norte	1.05	1.02	.68	.52	.82
Ilocos Sur	1.06	1.03	1.31	1.08	1.12
Iloilo	.92	1.08	.96	1.47	1.11
Isabela	1.88	1.08	.43	.23	.89
La Union	1.01	1.12	.25	.63	.75
Laguna	1.18	1.34	1.81	1.56	1.47
Lanao	.29	.82	.28	.92	.59
Leyte	.44	.86	.22	.53	.51
Marinduque	.85	1.22	.70	.50	.82
Masbate	1.12	.88	.06	.75	.70
Mindoro	1.14	1.02	1.07	.78	1.00
Misamis Occ.	1.00	.89	.63	.52	.76
Misamis Or.	1.11	1.07	.39	.75	.83
Mt. Province	.68	.60	.03	.52	.46
Negros Occ.	.83	.92	1.27	.80	.96
Negros Or.	1.05	.63	.28	.52	.62
Nueva Ecija	1.49	1.18	2.61	.50	1.44
Nueva Vizcaya	2.22	.97	2.43	.30	1.48
Palawan	.23	.81	.01	.65	.42
Pampanga	.90	1.22	4.66	1.60	2.10
Pangasinan	1.12	1.08	2.99	.67	1.46
Quezon	1.23	1.38	.13	.87	.90
Rizal	.70	1.38	2.84	9.02	3.48
Romblon	1.19	.82	.02	.52	.64
Samar	.83	.76	.03	.47	.52
Sorsogon	.90	1.08	.12	.78	.72
Sulu	1.05	.38	.12	1.02	.64
Surigao	.65	.92	.03	.57	1.30
Tarlac	1.29	1.14	2.22	.88	.32
Zambales	2.02	1.24	.63	.58	
Zamboanga	.01	.68	.03		

Having observed differences in the extent of population pressure, the question that normally follows is: What do such observations mean? Do the high pressure areas, e.g. the Visayan provinces, Palawan, and scattered provinces on Luzon and Mindanao, have too many people, such that the only feasible solution of poverty is the removal of large numbers of people to low pressure areas? An affirmative answer to that question may not be given unless it can be demonstrated that no further improvements in the efficiency of the economy in the high pressure areas are possible. Poverty in agricultural areas may arise from exhorbitant land rents, a defective credit system, inadequate marketing and storage facilities, and other factors that prevent the population from deriving an adequate living from the product of its efforts.[2] An inefficient or primitive economy, in fact, may result in wide spread poverty even in low pressure areas.

In short, population is seldom the only factor that lends itself to change, and it is seldom the most manageable factor. As the experience with resettlement programs has abundantly shown, the transplantation of substantial numbers of people is a slow and costly process. And if it is pursued without at the same time making basic changes in the economy, the relief achieved can be no more than temporary. The original problems reappear in the same form and in the same degree of intensity.

Terms such as population pressure and over-population should be used advisedly. At best they are relative terms, that is, relative to the existing organization of the economy there may be too many people. Often such terms reflect a policy position that has been arbitrarily adopted in order to preserve a convenient status quo. But the problem, as this paper has attempted to show, is usually more complicated than a simple condition of excess numbers of people.

[2] Farm tenancy is not necessarily a cause of rural poverty. In general, the frequency of farm tenancy varies directly with the productivity of the land, and in this respect the Philippines is not exceptional. It is rather the abuse of farm tenancy that produces poverty and the discontent so often associated with poverty.

LANDLORDISM A WORLD ISSUE

CORNELIO M. FERRER

Social scientists, educators, men in the armed forces, religious leaders, and officials alike deplore the effects of landlessness upon the Philippines rural population. This social problem is universal. As a political issue in the Philippines, the slogan "land for the landless" was interchangeably used by all political parties and the present Magsaysay Administration is committed to a promise to tackle this national and world issue.

If the Philippines is bound to remain as a republic, it should be its policy to multiply her landholders as it is the policy of a totalitarian state to multiply its tenants.

Drastic but democratic land reform must be democracy's answer to Hukism. The Huk is "the product of a feudal system that has long outlived its usefulness." In the province of Pampanga, the birth place of Hukism, now commonly called Huklandia, 2 per cent of the people own 98% of the land. North of Pampanga is the province of Nueva Ecija, the rice bowl of the Philippines. The greater portion of the land under cultivation in Nueva Ecija is divided into 69 haciendas operated by farm managers of absentee landlords, each hacienda ranging from 100 to 3,000 hectares.

The majority of the almost one-million combined population of Pampanga and Nueva Ecija have been tenants all their lives and their parents and grandparents before them. They have not experienced the feeling of solidness and the joy which comes from the possession of a piece of land, however small, on which their home stands.

Tenancy is the natural outcome of concentrated landholding. Today tenancy and landlordism are two social forces which constitute a negative quantity in the social equation of a dynamic but restless rural population in Huklandia. Politically, landlordism in the Philippines is strong well-organized, and powerful in every administration since the Philippines became independent in 1946. The landless peasants, on the other hand, are voiceless and leaderless and Hukism wants to take up the leadership. Several laws were enacted by the Philippine government aimed to improve landlord-tenant relations but all are ineffective.

Associated with landlordism is usury. Interest paid by tenants on borrowed money is grossly onerous. Rates of 200% and even higher are common. The tenants are perpetually indebted with their landlord.

Basic Social Theories for Democratic Land Reform

In advocating for democratic land reforms, it might be well for us to state here certain fundamental observations to help us understand the relationship of landownership and democracy.

(1) Perpetual tenantry under oppressive landlordism annihilates the love of country and weakens individual freedom. The landless tenant is artificially planted on the land. His status as a tenant kills his initiative to make permanent improvements on the land. He exploits the land but does not improve it. Being landless, he does not have social prestige in the community where he lives and it is but natural that he does not