

DEVELOPMENT IN THE EGYPTIAN GOVERNORATES : A MODIFIED PHYSICAL QUALITY OF LIFE INDEX

by

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This paper⁽³⁾ addresses two questions about development in Egypt that are often asked about low income countries generally. One question has to do with the relationship between economic growth and popular wellbeing. To what extent do aggregate economic measures — the value of goods produced, per capita income, even urbanization — convey a sense of how well ordinary people are living ? At issue is the association between conventional indicators of economic performance and the dissemination of benefits in society. The second question concerns which pattern, aggregate development, is more closely linked to population dynamics. If fertility reduction is a goal of public policy, is it best achieved by a development strategy emphasizing growth or by a strategy emphasizing distribution ? And if the latter, the distribution of what ?

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(3) This is one of several papers analyzing the dynamics of health and population growth in Egypt based on governorate-level data, a crude but instructive level of analysis. Our collection of papers, appropriately integrated, will soon appear as a monograph in a new series of studies undertaken by the M.I.T. — Cairo University Health Care Delivery Systems Project, which is one of several within the framework of the Cairo University — M.I.T. Technological Planning Program. We are grateful to our colleagues at Cairo University and the Ministry of Health, A.R.E., for their support. This paper has benefitted from comments made on an earlier draft by Amr Mohie-Eldine, Professor of Economics at Cairo University. Our research funding comes from the United States Agency for International Development, but we alone are responsible for the analysis reported here.

Both sets of question are germane to Egypt. Our analysis of a very limited body of data comparing the Egyptian govern- orates is suggestive of the work that needs to be done if the many trade-offs involved in development planning are to be properly understood.

Our point of departure is the Physical Quality of Life Index (PQLI) put together by Morris David Morris and his colleagues at the Overseas Development Council in Washington, D.C. (U.S.A.). The PQLI takes the infant mortality rate, life expectancy at age one, and the literacy rate for different countries, ranks each country's three figures separately on a 1 to 100 scale in relation to every other country's figure on the same measure, and then averages the scores produced for a final tally.⁽⁴⁾ Applying the PQLI to 150 countries based on data collected, like ours, in the early-mid 1970's, Morris et al. found Sweden to be highest on the Physical Quality of Life Index with a composite score of 98 and Guinea-Bissau in Africa to be lowest with a score of 12.

Egypt's PQLI of 43 puts it close to the bottom third of the international ranking. More telling, however, is the fact that Egypt's performance in promoting popular wellbeing, as measured by the PQLI, is quite creditable given its resource base. As Table 1 reveals, Egypt has the same PQLI as Iran but less than a fifth of Iran's per capita income. Only India among the four countries with a PQLI of 43 has a per capita income lower than Egypt's. Moreover, as shown in Table 2, Egypt's PQLI compares quite favorably with those of other Arab states even though Egypt is among the poorest countries in the region. Algeria has triple the per capita income of Egypt but a lower PQLI. Libya's PQLI is only two points higher than Egypt's, but Libya's income is almost 20 times greater. Perhaps the most glaring contrast is with Saudi Arabia. Saudi Arabia has 14 times the per capita income of Egypt but a PQLI that is 14 points lower !

(4) The most complete exposition of the PQLI may be found in Morris David Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index* (Elmsford, New York : Pergamon, 1979 — forthcoming). See also John W. Sewell, *The United States and World Development : Agenda, 1977* (New York : Praeger, 1977), pp. 147 - 154 and 160 - 171.

Obviously, oil wealth does not trickle down automatically. Not so obviously, Egypt has done quite well with the little it has.

Table 1 : Egypt and the Three Other Countries with PQLI Compared in Terms of Per Capita Income.

Country	PQLI	Average Per Capita Income (U.S. \$)
Iran	43	1,260
Bolivia	43	332
Egypt	43	245
India	43	133

Source : Morris David Morris, *Measuring the Condition of the World's Poor : The Physical Quality of Life Index*, manuscript dated August 31, 1978, to be published by Pergamon, 1979.

A virtue of the PQLI is that it measures the extent to which ordinary citizens share some of the benefits of modernization : a reduced incidence of infant mortality, greater overall life expectancy, and the acquisition of literacy. These are not the only benefits of modernization, of course, but they are basic in defining the human condition at its mass base in a country, and they offer a clue to the general thrust of development pursued by many governments.

Our data permit us to replicate two-thirds of the PQLI for the Egyptian governorates : the rates of literacy and of infant mortality. We do not have a measure of life expectancy at age one and have, therefore, substituted for it a measure on the availability of purified water in the buildings where people live. We assume that having access to pure water improves the quality of life, especially with regard to health. Water purification is also a responsibility of government in Egypt, where the need is considerable ; and hence the proportion of people for whom pure water is available in the different governorates is, in part at least, a reflection of official action. We identify our modified version of the PQLI with an asterisk (PQLI*).

Table 2 : The PQLI Scores of Arab Countries Ranked According to Per Capita Income.

Country	Average Per Capita Income (U.S. \$)	PQLI
1. United Arab Emirates	14,368	34
2. Kuwait	13,787	75
3. Qatar	11,779	31
4. Libya	4,402	45
5. Saudi Arabia	3,529	29
6. Bahrain	1,370	61
7. Iraq	999	45
8. Lebanon	822	79
9. Algeria	780	41
10. Syria	662	54
11. Tunisia	626	47
12. Jordan	452	47
13. Morocco	436	41
14. Yemen (People's Republic)	260	33
15. Egypt	245	43
16. Sudan	241	36
17. Yemen Arab Republic	180	27
18. Somalia	111	19

Source: Morris David Morris, *Measuring the Condition of the World's Poor: The Physical Quality of Life Index*, manuscript dated August 31, 1978, to be published by Pergamon, 1979.

We thought it of interest to begin by relating the governorates of Egypt to the PQLI scores established at the national level for the 150 countries studied by Morris. To do so we created an "external PQLI*", in effect treating the governorates as countries and locating them on the existing PQLI scale⁽⁵⁾. The results appear in Table 3.

(5) Because it was not in the original PQLI, the availability of purified water is simply a percentage figure reflecting population coverage. Our PQLI* averages it with the component scores, also based on a 1 to 100 scale, for infant mortality and literacy.

Table 3 : A Modified Physical Quality of Life Index for the Egyptian Governorates in International Comparison (Drawn to Scale).

External PQLI* by Governorates	Country Equivalents : PQLI	
		Sweden (98) ^(a) , Argentina (85), Cuba (84), Sri Lanka (82), Leba- non (79), Chile (77)
1. Port Said	76	Guadeloupe, Kuwait (75)
2. Alexandria	70	Colombia (71), Phillipines (71), China (69)
3. Suez	66	Malaysia
4. Cairo	64	El Salvador, Dominican Republic, Bahrain (61)
5. Damietta	56	Turkey, Syria (54)
6. Ismailia	50	
7. Dakahlia, Giza	47	Jordan, Tunisia
9. Gharbia	44	Iraq (45), Libya (45)
10. Kafr-el-Sheikh, Behera	42	Algeria (41), Morocco (41)
12. Sharkia, Kalyubia	39	Kenya, Pakistan (38)
14. Kena, Aswan	37	Papua New Guinea
16. Menufia, Assiut	36	Haiti, Sudan
18. Souhag	35	Bangladesh, Swaziland, Ghana, UAE (34)
19. Beni-Suef, Fayoum	33	Yemen (People's Republic)
21. Minya	32	Zaire, Qatar (31) Saudi Arabia (29), Yemen Arab Re- public (27), Somalia (19), Guinea- Bissau (12) ^(b)

Table 3 (continued)

Note : The "External PQLI*" for the Egyptian governorates summarizes the governorate scores for infant mortality, literacy, and the availability of purified water in residential buildings when each score is related to the comparable scores for 150 countries employing data collected in the early 1970's. In effect, governorates are treated as countries and located accordingly. Because it was not in the original PQL, availability of purified water is simply a percentage figure in terms of population coverage. The three scores are then averaged. Countries not matching the Egyptian governorates exactly have their PQLI scores indicated in parentheses. All Arab countries are included, as are all matching countries.

(a) The highest PQLI.

(b) The lowest PQLI.

Source for the PQLI country equivalents : Morris David Morris, **Measuring the Condition of the World's Poor : The Physical Quality of Life Index**, manuscript dated August 31, 1978, to be published by Pergamon, 1979.

Several observations may be made on the strength of this table. First, it is apparent that, even when compared in terms of international experience, there are marked differences among the Egyptian governorates. While the international spread is 98 to 12 on the PQLI, the Egyptian spread is from 76 to 32 on the PQLI*. In short, Egypt internally covers the entire middle range of international experience. The "physical quality of life" in Port Said (highest in Egypt) resembles what one finds in very much more affluent countries such as Kuwait and Chile. On the other hand, Minya, with a PQLI* of only 32 (lowest in Egypt, notwithstanding Minya's agricultural wealth) resembles Zaire, one of the world's poorest countries. Cairo's PQLI* of 64 puts it in league with countries like El Salvador and the Dominican Republic. Alexandria is on par with the People's Republic of China. No Egyptian governorate can match Sri Lanka's impressive PQLI of 82, which has been achieved on an average per capita GNP of only \$ 179. On the other hand, every Egyptian governorate comes out above Saudi Arabia, one of the world's richest countries, in terms of popular wellbeing.

Moreover, since Table 3 is drawn to scale, it is easily seen how the governorates cluster. The four urban governorates have the highest PQLI*'s by far, although the differences among them tend also to be ample. (Cairo fares least well among the urban governorates because of its very high incidence of infant mortality).⁽⁶⁾ The governorates of Lower Egypt come next, by and large, led by Damietta with a score of 56, with Menufia trailing at 36 — a large spread for a highly concentrated ecological zone. Except for Giza, a special case, the governorates of Upper Egypt have the lowest PQLI* scores, and the differences among them are small. In sum, the data indicate that popular wellbeing is greatest in Egypt's four urban centers, notwithstanding the migrant poor. Delta residents are, on average, next well off, although with significant spatial differences among them. Least advantaged in PQLI* terms are the people of Upper Egypt. These patterns are pretty much what one would expect, save possibly for the heterogeneity of the Delta and for the overall spread, which

(6) The infant mortality rate for Cairo was 128 per 1,000 live births in 1973, second highest in the country after Aswan's 180.

also testifies to the considerable diversity of the Egyptian governorates with regard to social wellbeing.

The interest value of our "external PQLI*" is that it treats the governorates as countries and ranks them as they would be ranked on an international scale. For comparison with other governorate-level data within Egypt, however, we have chosen to convert the "external PQLI*" into an "internal PQLI*," in effect taking the governorates as the universe and re-scoring them on a 1-100 scale limited to themselves. The principal reason for doing so is to permit a more matched set of comparisons with other relevant governorate-level data. The effect of converting to an "internal PQLI" is to spread the governorate scores upward and downward, thereby accentuating the differences among them and, in the process, breaking several tie scores. The new rankings differ only slightly from the old.

Table 4 presents the "internal PQLI*" for the Egyptian governorates along with the values and scores derived from them for each component measure.

As the distributions in Table 4 imply, the component variables of the PQLI* are not all that closely correlated.⁽⁷⁾ Governorates high in literacy are not necessarily low in their rates of infant mortality. The PQLI*, as it turns out, is comprised of largely independent changes in Egyptian society, suggesting that no single component is an adequate proxy for the whole concept.⁽⁸⁾ In effect, popular wellbeing in Egypt is empirically as well as conceptually diverse.

Of greater interest is how the PQLI* relates to other aspects of change. Inasmuch as the four urban governorates have

(7) In terms of simple Pearson correlation coefficients, only one of the three relationships — that between literacy and water availability — is statistically significant, and it crumbles when the influence of another measure of disseminated development, the electrification of homes, is partialled.

(8) Our research indicates that literacy and infant mortality are, in fact, significantly associated but in a rather curious way. The basic point stands that the PQLI* is not merely a cumbersome way of talking about one of its components.

Table 4. A Modified Physical Quality of Life Index for the Egyptian Governorates in Internal Comparison, Plus Components.

	Internal PQLI*		Infant Mortality ^a		Literacy ^b		Pure Water ^c	
	Value	Score	Value	Score	Value	Score	Value	Score
1. Port Said	95	100	48	60	88	87	96	
2. Suez	78	86	60	56	78	65	69	
3. Alexandria	77	35	103	63	95	90	100	
4. Cairo	65	6	128	65	100	81	89	
5. Damietta	57	56	85	51	65	50	50	
6. Ismailia	51	69	74	49	60	30	25	
7. Dakahlia	45	64	79	44	48	29	24	
8. Giza	40	28	109	47	55	40	38	
Kafr-el-Sheikh	38	92	55	30	13	17	9	
9. Gharbia	38	40	99	45	50	29	24	
11. Behera	36	73	71	34	23	20	13	

12. Sharkia	30	89	52	37	30	16	8
13. Kalyubia	28	118	18	46	53	20	13
14. Kena	27	75	68	29	10	12	3
15. Menufia	23	115	21	43	45	13	4
16. Assiut	22	98	41	31	15	17	9
Souhag	21	88	53	27	5	14	5
17. Aswan	21	132	1	44	48	22	15
19. Beni-Suef	18	106	32	32	18	12	3
20. Fayoum	15	97	42	26	1	12	3
21. Minya	15	103	35	29	10	11	1

Note: The "Internal PQLI*" is the average for each governorate of its scores on infant mortality, literacy, and the availability of purified water in residential buildings. Each score is derived from the relative position of the governorates on a 1-100 scale, thereby standardizing the three component measures.

(a) The number of infant deaths reported per 1,000 live births in 1973 (Ministry of Health). The higher the infant mortality, the lower the score.

(b) The percentage of the total population in each governorate that was recorded as literate in the CAPMAS household census of 1976. Higher literacy produces a higher score.

(c) The percentage of each governorate's population having access to pure water in the buildings where they reside, from the CAPMAS household census of 1976. The higher the percentage, the higher the score.

the highest PQLI* scores in Egypt, it comes as no surprise that, overall, urbanization is closely associated with wellbeing as measured by the PQLI*. If the four urban governorates are excluded from consideration, however, the association collapses. Urbanization elsewhere in Egypt does almost nothing to improve the "physical quality of life."⁽⁹⁾

When attention turns to explicit measures of productivity and the generation of wealth, the pattern is even more clear. One variable in our arsenal is the per capita value of agricultural production in the rural governorates. Were popular wellbeing related to aggregate productivity, at least on the farm, this variable would correlate significantly with the PQLI*. Governorates relatively high in the value of their agricultural produce would also be governorates relatively high in wellbeing, while those relatively low in production would also be relatively low on the PQLI*.

In fact, no such pattern emerges. Indeed, the relationship is actually negative.⁽¹⁰⁾ The same holds for a second variable, the average per capita income derived from agriculture in the governorates. Higher rural incomes not only do not dispose toward greater wellbeing, the relationship is again, on balance, slightly negative.⁽¹¹⁾

In short, when viewed in terms of conventional economic development indicators — productivity and income — the economic performance of Egypt's rural governorates says nothing about living standards as measured by the PQLI*. The reasons are not difficult to discern. Aggregate growth is one thing ; distribution is another. Similarly, incrementally greater productivity and income have no necessary spillover effects on infant mortality rates, literacy, and the availability of purified water. In Egypt,

(9) Including the urban governorates the Pearson coefficient is .86 (sig. at .001). Without them it is .35 (n.s.). The respective Spearman rank-order coefficients are .6 (sig. at .001) and .2 (n.s.).

(10) $r = -.22$ (n.s.).

(11) $r = -.02$ (n.s.). As might be expected, the productivity and income measures are significantly correlated (.76 ; sig. at .001).

as in other countries, wealth and wellbeing are substantially divorced in the sense that improvements in the former do not lead immediately or even automatically to improvements in the latter. As we are now painfully aware from much international experience, the "trickle down" benefits of growth often take a long time to reach the poor.⁽¹²⁾

This being the case, the relationship between the PQLI* and population growth in Egypt is a matter of considerable interest. If patterns observed elsewhere are any guide, greater popular wellbeing in PQLI* terms should be associated with lessened birth rates.⁽¹³⁾ That is, governorates with higher PQLI* scores might be expected to have lower birth rates than governorates whose PQLI* scores are not so high, whereas governorates with conspicuously low PQLI*'s (Minya, Fayoum, and Beni-Suef, for example) might be expected to show particularly high rates of population growth.

Both expectations are sustained by the data. Minya, Fayoum, and Beni-Suef do have notably high birth rates, while the correlation coefficient linking the PQLI* with fertility for all 21 governorates of the Nile system is a strong $-.82$ (sig. at $.001$).⁽¹⁴⁾ In short, the higher the PQLI*, the lower the birthrate in Egypt. This is a pattern, moreover, which withstands controls for agricultural productivity, rural income, and urbanization. The PQLI* is not simply a blind for other kinds of change. On the contrary, it represents one kind of change (dispersed benefits) that really counts in fertility reduction.⁽¹⁵⁾ We might add that neither our measure of agricultural productivity nor our measure of income derived from agriculture relates sig-

(12) James P. Grant, "Development: The End of Trickle Down?," *Foreign Policy*, 12 (Fall 1973), 43-65.

(13) See William Rich, *Smaller Families Through Social and Economic Progress*, Overseas Development Council, monograph No. 7 (January 1973). More recent research also supports this argument.

(14) The fact that the urban governorates have relatively high PQLI* scores and relatively low birth rates is not the sole reason for this association. The coefficient is also significant when the four urban governorates are removed from the calculations ($r = -.52$, sig. at $.02$).

(15) For a very different set of reasons, urbanization is also a factor in bringing birth rates down. We shall discuss this in another paper.

nificantly to the birth rate at all.⁽¹⁶⁾ it would appear that, in and of itself, general economic growth in Egypt will have little bearing on fertility, much as it has little bearing on popular wellbeing. What it is going to take for the birth rate to come down significantly and fast are improvements in the human condition, notably access to purified water, a dramatically reduced incidence of infant mortality, and expanded literacy : the ingredients of the PQLI*.

To conclude, our adaptation of the PQLI to Egypt, while intriguing, is hardly definitive. What we have done is — at best — an initial probe suggesting that not all which comes under the heading of “development” enhances popular wellbeing or contributes to lowered birth rates. Both of these findings, along with that showing a strong connection between disseminated development and reduced fertility, have profound implications for policy. Accordingly, there is a need for others to pursue this line of inquiry in order to develop a richer perspective on the dynamics involved.

Two recommendations follow from our own effort. First, the time has come to create an index that is empirically grounded. Both the original PQLI and our PQLI* are conceptual constructs that, whatever their abstract validity, may not be most suited to Egyptian conditions. Other parameters may be equally important or more so. One task, therefore, is to explore a wide range of variables, including measures of income distribution, employment, and land ownership, and to establish a much richer index of popular wellbeing whose components have more than a logical relationship to one another. The promise of more complete data empirically tied together is that it should become possible to predict the effects of specified kinds of change quite precisely.

(16) Although not significant, the association between agricultural productivity and income, on the one hand, and the birth rate, on the other, tends to be positive (the more, the higher), even when appropriate partials are introduced. While this pattern runs counter to expectations, there are others in our data consistent with it, suggesting that incremental change, as inferred from cross-sectional analysis, may pose more problems than it solves, at least in the short run.

Second, the governorate level of analysis places so many constraints on what can be done with data that it is clearly preferable to disaggregate to, say, the district level if at all possible. Not only are there too few governorates, and hence data points, for meaningful statistical manipulation ; the governorates themselves are probably too heterogeneous internally to be substantively appropriate for sensitive analysis. Both those who collect demographic and economic data in Egypt and those who examine these data should insist on finer, more numerous, and more useful units of analysis. The payoffs to knowledge and to policy could be considerable.

In any event, our findings offer reason to believe that, in Egypt as in other low income countries experiencing serious population pressures, the "basic human needs" approach to development is more than a fad, that it represents an important dimension of development which governments cannot afford to neglect. Promoting the "physical quality of life" (whatever it really is) and curbing population growth are dual challenges facing the Egyptian government as the prospects for a genuine peace brighten.

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