

**A NEW METHODOLOGY FOR COMPARATIVE  
ANALYSIS OF POVERTY IN THE  
MEDITERRANEAN: A MODEL FOR DIFFERENTIAL  
ANALYSIS OF POVERTY AT A REGIONAL LEVEL**

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### **Abstract**

Over the last few decades, several studies have pointed out the multidimensional nature of poverty. Poverty suggests a hardship that is not solely confined to lack of the monetary resources necessary to maintain adequate living standards. The paper aims to propose a model for the differential analysis of poverty in the MENA countries through the Principal Components Analysis (PCA), in order to provide a correct definition of the different profiles of the phenomenon within different regional contexts. In the presence of complex phenomena, the peculiarity of PCA is to identify the main dimensions of the latent sense model, which determines the relationships between variables and indicators.

## 1. Development Policies and Strategies against Poverty

After a long period of protectionism, the transition of the economies of the Middle East and North Africa (MENA) towards “open” economic structures and towards a new market economy, has generally been accompanied by a sudden reduction in growth of per capita GDP, rising levels of unemployment and widespread conditions of poverty.

In particular, the structural adjustment programs which guided the reforms of the 80s in the MENA region, while giving important results with regard to macroeconomic stability, have also had a considerable number of negative effects on employment and poverty (Hamdouch, 1998; Handoussa and Kheir-El-Din, 1998; Holland, 1998). This in turn, generated “new poor” in various social groups as “direct victims” of the structural adjustment measures (Golbert and Kessler, 1996; Samad, 1996).

At the moment, the process of economic convergence and social cohesion in the Mediterranean region, set on track by the free exchange project launched under the Euro-Mediterranean Partnership, is still subject to opposing forces and the basin is the scene of developments which are by no means all in one direction.

Once beyond the threshold of development, in fact, the MENA countries are distinguished by a strongly ambivalent situation:

- firstly, there has been a significant reduction in income poverty over a period of years, demonstrated by an incidence ratio of less than 4 percent of the total population of the Arab States, and indices of economic poverty which have progressively fallen to levels below those characteristic of the developing areas of the world;
- secondly, distribution inequality is relatively limited in comparison with that of other countries at a similar stage of development (Page, 1998; Van Eeghen, 1998);
- thirdly, MENA countries have not seen an analogous rate of success in the reduction of human poverty and the improvement of social indicators (Shafik, 1994; UNDP, 1997; Van Eeghen, 1998).

The historic series of the main socio-economic indicators shows that the economic growth which has taken place in the countries of North Africa and the Middle East over the last thirty years - and in a vigorous fashion up to the middle -80s - has undoubtedly resulted in an increase in material wealth. This has taken the form of an increase in per capita income and has had a strong impact on the conditions of poverty of the peoples of the region, although: (a) the expansion cycle was followed by a

period in which the economy stagnated, or in some cases contracted significantly; (b) there are still considerable imbalances in economic and social terms between the various countries belonging to the MENA region; and (c) the current incidence of poverty in the area is by no means homogeneous<sup>1</sup>.

Some progress has been achieved throughout the MENA region, with the partial exception of Jordan, even if it has often taken the form of rapid growth followed by sudden setbacks, widely varying constrictions and opportunities. Yet, the number of individuals in conditions of human poverty is greater than that of the economically poor<sup>2</sup>.

The area of the Arab states is the part of the world in which this paradoxical contrast is clearest. Economic growth and the success it achieved, generally speaking, in reducing the incidence of income poverty, has not been balanced by similar results in translating economic prosperity into a higher standard of living for the population as a whole, and into the reduction of human poverty - which still afflicts approximately one-third of the overall population<sup>3</sup>.

This is because development is a wider and more complex concept than that of economic growth. Not only does it comprise the concept of growth, but also

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<sup>1</sup> Between 1990 and 1997, the total GDP of the MENA countries grew at an average rate of 2.6 percent per year. Nevertheless, there were clear geographical variations in the average wealth produced, both as an absolute value and in terms of trend. In certain countries, there was a significant increase in per capita GDP in the '90s, as in Turkey, where it grew from 1,735 dollars (1987 US\$) in 1990 to 1,940 in 1997, Tunisia (from 1,310 to 1,670 dollars), Egypt (from 900 to 1,015 dollars) and Morocco (from 916 to 927 dollars). In Algeria, on the other hand, there was a fall in average per capita income, from 2,624 to 2,352 dollars between 1990 and 1997. Lastly, in Jordan per capita income showed a variable trend: after rising significantly up to the mid-80s, it fell sharply and then, between 1990 and 1997, rose again (from 1,771 to 2,006 dollars in the seven-year period). In the most recent period, between 1996 and 1997, the greatest growth was seen in Tunisia (+9.7 percent increase in per capita GNP) and Turkey (+6.4 percent), but also in Egypt (+3 percent), Spain and Greece (+3.1 percent), as compared with the more industrialized European countries (France: +1.9 percent; Italy +1.2 percent). Morocco, on the other hand, went through a bad period, with a fluctuation of -4.4 percent in per capita GNP between 1996 and 1997, although the country's overall GDP registered an increase of 4.2 percent during the '80s and an average increase of 2 percent in the '90s (WB and UNDP figures).

<sup>2</sup> In Egypt, in particular, the incidence ratio of income poverty is 7.6 percent, but 33 percent of the population is afflicted by human poverty: a figure not far from that of Sudan (36.8 percent), Nigeria (38.2 percent) and southern Asia (38.6 percent), and one of the highest in the developing countries. In Morocco the figure is even higher, over 39 percent, as compared with only 1.1 percent of the population below the international poverty line of 1 dollar per head per day (UNDP figures).

<sup>3</sup> Incidentally, it is interesting to note how the reverse situation is to be found elsewhere, for example in Latin America, where human poverty has been cut to approximately 14.5 percent of the population, while income poverty still afflicts about 24 percent of the inhabitants (UNDP figures).

incorporates significant institutional, structural and qualitative aspects relating to an increase in the well-being of the entire population.

The conviction that the pursuit of economic growth, espoused by certain countries after World War II, would naturally lead to the development of even the poorest regions, has turned out to be an illusion (Pasca di Magliano, 2000). It is now clear that the link between the economic prosperity of a country and the social development of its population - or between economic growth, the reduction of the incidence of poverty and the improvement of social indicators - is by no means automatic and assured. In other words, a country's advances may not be of benefit to the poor: in practice, they can leave unchanged-or even aggravate-the state of deprivation of the poorest segments of society.

A few simple linear correlations show very concisely how, in the MENA region, there has been no directly proportional relationship between economic growth and an increase in the wealth of a country, on the one hand, and the reduction of poverty and overall social development, on the other.

Figure 1 compares human poverty (measured according to the *Human Poverty Index* (HPI) drawn up by UNDP) and income poverty (measured as the percentage of the population which lives below the international poverty threshold for developing countries, set at 1 dollar per head per day). There appears to be no significant relationship between the two phenomena. Egypt is the only country where a high level of economic poverty is accompanied by a high rate of human poverty. For the other countries, there is an ambiguous relationship between the two aspects - material and "immaterial" - of deprivation, as in the case of Morocco, which has a low rate of economic poverty, but the highest rate of HPI. It follows, that there are countries, which have reduced the extent of economic deprivation, but nevertheless show a high incidence of human poverty and, vice versa, nations where the social conditions of the inhabitants have improved, but not the availability of economic resources. These two types of poverty are not necessarily found together in a correlated fashion.

Figure 2 illustrates the correlation between the wealth of a country, measured as per capita GDP, and income poverty, based on the international poverty threshold. It can be seen that the simultaneous fluctuation of the two variables is negligible, which amounts to saying that a country where the population is, on average, richer will not necessarily have a proportional reduction in income poverty. This conclusion shifts the focus onto the role of unequal distribution of wealth as the factor responsible for the persistence of poverty in the Arab countries of the Mediterranean.

The correlation between per capita GDP and HPI (Figure 3) seems less contradictory, at first sight: as the average available income grows, human poverty decreases accordingly. Nevertheless, the ratio is not strictly dependent ( $R^2 = 0,39$ ). Generally speaking, this means that in some nations the increased prosperity of the country as a whole has been effectively converted into a generalized improvement in social conditions, resulting in a decrease in human poverty, while other countries, though on average richer, still lag behind with regard to progress in the social sphere.

Without neglecting the objective of raising per capita income in order to increase the wealth of the poor, past experiences of countries of the world, together with the empirical evidence set out above, clearly demonstrates the need to link development policies to strategies for fighting poverty.

## 2. New Ways of Interpreting Poverty

In the course of the 1990s, these convictions came to full maturity within the framework of the socio-economic review and debate on development promoted by the international community. This in effect led to the introduction of radical changes in the ways poverty was interpreted, as a result of the elaboration of different conceptual definitions of the phenomenon and of the consequent adoption of new methodologies for measuring it.

The definitions of "absolute poverty" and "relative poverty", which makes reference to a poverty threshold, are based on a mono-dimensional approach that identifies the cause of the state of indigence as lack of income. This is considered insufficient in the first case for the fulfillment of basic survival needs and in the second case for an acceptable standard of living with regard to the average living standards of the society in question. These criteria are based on a traditional view, according to which the maximization of economic growth represents the fundamental objective of development, while an increase in individual resources - expressed as per capita GDP - is seen as the main indicator of prosperity.

Nevertheless, many authors have emphasized the multidimensional nature of poverty. It represents a state of hardship, which is not limited to the concept of economic indigence or destitution, that is to say the lack of the monetary resources necessary to maintain an acceptable standard of living. In fact, poverty-related hardship has a number of dimensions, some being of a strictly economic nature and some of a social and relational kind. If the concept is limited to the purely economic dimension, as in the definition of "absolute poverty" and "relative poverty", it is impossible to give due consideration to a series of factors which also play a decisive role in determining conditions of hardship and social exclusion.

It is therefore more accurate to look at poverty as a multidimensional phenomenon, and this definition means that its causes must not be sought solely among factors of an economic kind, which prevent individuals from reaching a minimum income determined by a poverty threshold.

This reveals the inadequacy, from both a conceptual and an operational point of view, of systems that measure poverty exclusively on the basis of data relating to spending or other variables of a monetary kind. In order to avoid giving a simplified picture, the search for the causes of poverty must be extended to a wider field of observation, which simultaneously considers subjective factors (age, level of education, state of health, congenital or acquired inabilities, and so on), and the organization of society as a whole (the existence or otherwise of certain citizens' rights, access to social services, job opportunities, and so on). As mentioned above, being poor means, among other things, being left out of the dynamic processes of society, being excluded from the mechanisms adopted for making collective decisions and being deprived of citizens' rights. The result being, that assets and economic, political and social power become concentrated solely in the hands of the "insiders".

A multidimensional approach to the phenomenon of poverty, such as that adopted by the UNDP in its *Human Development Report*, for example, does not contemplate an economic poverty threshold, but prefers to consider various indicators relating to the risk of exclusion,- living conditions, access to social services, level of education, degree of social security, participation in political life, limitations in what Sen (1985) defines as "functioning". This leads to a less simplified understanding of the complex characteristics of social hardship. It offers for analysis and interpretation a greater amount of information about the many factors involved, in different ways, in the creation and maintenance of conditions of poverty<sup>4</sup>.

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<sup>4</sup> With regard to the composite indices of "human development" and "human poverty" drawn up by UNDP, it must be emphasized that, by admission of the authors themselves, the HDI and HPI do not include certain variables which are important for measuring poverty - but hard to quantify - such as lack of political freedom, difficulty in taking part in decision-making processes, loss of personal security, exclusion from the life of the community and so on. In addition, these indices provide information solely at a national level, and therefore do not allow verification of the regional disparities and specific local realities within each country. Overall, the UNDP indices provide rather abstract profiles and images of poverty: a picture which cannot constitute an adequate, valid reference for drawing up programs aimed at social protection in order to reduce poverty. Nonetheless, these indices are at present the only ones which allow comparison on a world scale of the many dimensions of poverty and development and of the progress or recession of the various areas of the globe.

It should be underlined, however, that in spite of the availability of more detailed analyses and studies carried out with innovative methodologies so far the most obvious result of the changes introduced into models for interpreting poverty have been the heterogeneous nature of the criteria adopted for the various studies and the consequent difficulty in comparing the data and results obtained. More specifically, such an approach generates new problems linked to the availability of comparable data, the measurement of the indices and their comparison in different realities, as well as new difficulties related to the need to give the results obtained an unequivocal interpretation.

### **3. A New Methodology for Comparative Analysis of Poverty**

In view of this situation, it is evidently necessary to find a new methodology for poverty analysis, which is in a position to satisfy the current requirements to define the phenomenon, keeping in mind two essential aspects:

- the multidimensional perspective, that is to say the influence of the different factors involved in determining conditions of poverty;
- the regional factors, even more relevant within a geographical context, such as the Mediterranean, which is characterized by profound variances (first and foremost the fracture between the North and the South of the basin, but also the radical differences existing within the MENA regions, and within each country between urban, rural and coastal areas).

This study aims to define a methodology that makes it possible to correlate the complex phenomena discussed above: economic growth and poverty, on the one hand, and overall well-being and social development, on the other. As already mentioned, these are complex phenomena which, as such, cannot be observed directly, but which have many aspects that can be represented by a number of variables. As a result, some indications can be given as to the best type of methodology to be adopted:

- since the phenomenon to be studied is of a multidimensional nature, the interpretative model must also be of a multidimensional kind;
- the analytic approach must be in the form of an inspection, that is to say it must not stem from a pre-established definition of the relationship between the variables but must try to penetrate the latent structure of the ratios expressed by the data matrices;
- the results of experiments based on applying the model must constitute a frame of reference to be used to identify operational strategies for fighting the phenomenon of poverty, in accordance with a multi-criteria approach and in close connection with development policies;

- lastly, the proposed model must allow periodic intervention to monitor and verify the results of the activities planned and carried out within the framework of the management of social questions.

These conditions appear to be satisfied by a model of differential analysis of poverty at a regional level through the Principal Components Analysis (PCA), an effective way of elaborating a correct definition of the different profiles of the phenomenon within different regional contexts.

During the early 1980s, Ram (1982) had already used PCA in a study on poverty according to the approach theorized by Sen on “functioning” and “capabilities”, obtaining an index of development starting from a series of indicators relating to primary needs and quality of life. Furthermore, Maasoumi and Nickelsburg (1988) have used the same method on data taken from the Michigan Panel Survey of Income Dynamics.

The application of PCA to the study of poverty was adapted by CENSIS in a research on social hardship in Sardinia (CENSIS, 1998) It was later used in experimentation in various countries of the Mediterranean basin during a research project on poverty and development carried out in connection with the FEMISE international network (CENSIS, 2000).

In the specific case in question, this method of multivariate statistical analysis was used to identify the variables involved in defining a poverty profile corresponding as closely as possible to local reality. In other words, the objective of differential and comparative analysis is to focus accurately, not only on the dimensions and composition of poverty, but also on the interrelated factors responsible for the conditions of hardship existing in a given social and territorial context.

In this way, by using PCA it is possible: (a) to make a single evaluation of the influence of many aspects in determining a complex phenomenon; (b) to proceed to make an international comparison; and (c) to extract qualitative guidelines for interpretative hypotheses as to the components which, by their interaction, help bring about conditions of hardship and poverty.

The expected result is a regional (or town-by-town) map of poverty showing both the geographical distribution of the phenomenon, and the different components which help to determine marginality and social exclusion in a variable manner according to the different geographical contexts.

It is clear that this methodology can constitute an important point of reference for two reasons:

- initially, because it provides the data necessary to study and draw up programs for social protection and development, with the aim of fighting poverty by means of a strategy involving management of the projects at a local level, in a focused and more effective fashion;
- and at a later stage, because this methodology offers important advantages in monitoring and evaluating the effects of the policies and strategies adopted.

#### **4. Description of the Methodology**

In accordance with the conceptual hypotheses which underlies the proposed model for interpreting poverty, the approach adopted focuses, not only on variables of an economic and monetary kind, relating to the income and/or spending power of the population, but above all on aspects linked to deprivation and to the social and relational exclusion of the individuals in question; thus allowing the definition of indicators connected with the overall standard of living.

In the first place, it is necessary to identify the set of simple variables which best describes the basic socio-economic characteristics of the countries considered.

Naturally, in the case of developing areas of the world, the choice of the variables to be considered is at present strongly conditioned by the effective availability of reliable and comparable data from official international sources, so as to guarantee the transnational homogeneity of the criteria adopted for the studies and measurements. Besides the problem of the lack of information, it must also be remembered that the data available does not always allow accurate international comparisons, because of distortions due either to the collection phase or to the different conceptual definitions adopted.

More complex, multidimensional indicators are then constructed by combining the simple indicators using factorial analysis with the method of Principle Components Analysis. This achieves two objectives. On the one hand, that of concentrating the information available in a synthetic indicator, and on the other hand, that of identifying the various dimensions which help to determine the level of poverty/wellbeing in the countries in question, while simultaneously highlighting existing regional disparities.

In effect, PCA is a multivariate analysis technique that is generally used to reduce the number of variables considered by extracting new variables (the factors), which express in a synthetic form the information contained in the original battery of data. The factors extracted show a linear relationship with the original variables and account for ever-smaller quotas of overall variability. Essentially, they constitute completely new variables, independent of one another, each of them summing up a

particular aspect of the phenomenon being investigated - and therefore of the original set of simple indicators - and adding an autonomous, original piece of information. It is possible to identify these aspects by considering the relevance of each of the original variables in determining a given factor (factor score), so as to reproduce the implicit structure of the weights of the ratios of the basic indicators. The specific contribution which makes this technique different derives from an analysis of the correlation between the factor extracted and the original variables, which determine the possibility of making a satisfactory qualitative interpretation. PCA does not allow a definition of the relationships existing between the variables in terms of cause-and-effect, but gives a clearer - and therefore easier to interpret - snapshot of the relationships between the variables characteristic of the macro-phenomenon in question.

Subsequently, the results of PCA can be subjected to Cluster Analysis This is a specific methodology used in multivariate statistics by which it is possible, on the basis of a number of initial simple indicators, to divide into homogeneous groups the statistical units considered - in this case nations. However, if the data is broken down further, sub-national territorial segmentation can be achieved - in accordance with criteria relating to similarity, and on the basis of an approach which tends to minimize variability within each individual group and maximize that between different groups. The peculiarity of Cluster Analysis is therefore its ability to aggregate different countries - or portions of countries - which, with regard to the phenomenon under examination, are most similar, distinguishing them from the other areas considered. Since clustering is, essentially, a classification technique, it is not subsequently possible to draw up a rating of the groups identified. It is only possible to identify clusters and define their specific characteristics.

In the presence of complex phenomena, the specific contribution of PCA is the opportunity to identify the main dimensions of the latent sense model, which determines the relationships between variables not directly observable. Already, in the case examined, a preliminary analysis of the available data and indicators (first of all by WB, IMF, and UNDP) revealed the structure of such a model in the strong polarisation existing between developing countries (Sub-Saharan Africa, Southeast Asia, Latin America and the Caribbean, MENA region, and so forth) and developed countries (OCSE). The complexity of the analysis carried out is due to the attempt to allow the emergence of appreciable results other than this obvious empirical evidence.

### **5. Synthesis of Principal Results**

An empirical analysis carried out on the basis of the proposed methodology allowed the verification of certain aspects relating to the intertwined relationships existing

between the phenomenon of poverty and social exclusion and structural, social, economic and political factors in 22 countries belonging to the poor regions of the world.

The countries to be studied were selected on the basis of the availability of data from official international sources (WB, UNDP and UN). and also in accordance with a discretionary approach in the choice of countries characteristic not only of the MENA region but also of Sub-Saharan Africa, Latin America and the continent of Asia.

The operational application of the multidimensional concept of poverty was effected on the basis of a matrix of 13 simple variables (Table 1). Care was taken to select indices, which were significant of the concepts of growth and social development without using the indicators normally used to measure poverty. That is to say, the incidence ratio of income poverty based on the threshold of one dollar per-head-per-day, and the HDI and HPI indices elaborated by UNDP. These indicators would have affected the calculations, reproducing essentially the same scenarios as those already depicted in other analyses - as in the rating of the *UNDP's Human Development Report*, mentioned above - and would in practice have nullified the chance of investigating other components, neither strictly economic nor directly observable, which also help to determine poverty profiles.

Using the PCA technique, three factors were extracted from the original set of variables. These factors have been taken as the axes of the graphs below (Figures 4 and 5). Together they account for a variance in the phenomenon of approximately 71 percent.

The first factor extracted (which accounts for 37.5 percent of the original variance) is a synthetic indicator of basic social conditions and standard of living. It reproduces a polarization between variables indicating: (a) on the positive semi-axis, high life expectancy at birth, a higher degree of literacy in the adult population and greater levels of per capita income; (b) on the negative semi-axis, seriously disadvantaged living conditions (higher incidence of infant mortality and of malnourished children).

As can be seen from the graph, the group of countries in Sub-Saharan Africa (Sudan, Senegal, Côte d'Ivoire and Nigeria, with the partial exception of Ghana) are those which show the most critical conditions on this axis. On the other hand, a heterogeneous group of countries (Lebanon, Venezuela, Thailand, Brazil, Turkey, Jordan, El Salvador) is situated near the opposite pole, on the positive semi-axis. In the middle there are the Central American countries (Nicaragua and Honduras) and most of the MENA countries (Tunisia, Libya, Syria and, in still worse conditions, Algeria, Egypt and Morocco).

The second factor extracted (which accounts for 20.2 percent of the overall variance) can be defined as the axis that represents the social structure and policies for security and social promotion. This factor is particularly affected by demographic pressure (annual rate of population growth), by the presence of women in the labor market (as a percentage of the labor force), and by public spending on education and health (as a percentage value of the wealth produced by the country).

The second factor appears to discriminate strongly between the group of MENA countries (except Lebanon and Turkey) and, to varying degrees, all the other countries considered, particularly Nigeria and the Asian countries (Indonesia and Thailand).

Lastly, the third factor accounts for 13.0 percent of the variance. It can be defined as the axis representing the level of progress and is chiefly influenced by the economic situation (rate of change in GNP 1997-1998), on the one hand, and by the diffusion among the population of radios and television sets, on the other: a sign of the attainment of higher thresholds of prosperity - not only material, because radio and TV provide easier access to information and are instrumental in raising the general cultural level.

The distribution of the countries examined around this factor shows clustering, on the positive semi-axis, of those which have seen an acceleration in the level of progress (chiefly Lebanon and El Salvador, with 892 and 461 radios per thousand inhabitants respectively), while the negative semi-axis shows the influence of unfavorable economic situation in aggravating the conditions of poverty (here the most eloquent example is that of Indonesia: - 16.2 percent variation of GNP between 1997 and 1998).

The application of Cluster Analysis makes it possible to divide the countries examined into three groups, internally homogeneous but with marked differences between them. The three groups have particular factors determining poverty, which makes it possible to develop three different hardship profiles, only partially corresponding to the geographical distribution of the countries (Table 2).

The first group consists of the countries of the MENA region (Algeria, Syria, Morocco, Tunisia, Egypt, Libya and Jordan, with the exception of Lebanon and Turkey). With regard to the above-mentioned factors, the group occupies a central position on the first axis (synthetically representing a medium standard of living) and, on the second, lies on the semi-axis representing high institutional commitment to education (on average 5.3 percent of GNP) and health (on average 2.8 percent of GDP). The positive effects of this are at least partially offset, by demographic growth, however, that is still intense (on average 2.9 percent per annum, with a figure of four

percent for Jordan and 3.5 percent for Libya). It can moreover be seen that, within the group, the presence of women in the labor market is still extremely marginal (29.3 percent of the labor force, on average, falling to 26 percent in the case of Algeria, Libya and Syria).

The second group consists of the countries of Asia (Indonesia, Thailand, Philippines) and Latin America (Brazil, Venezuela, El Salvador), which have characteristics similar to those of Lebanon and Turkey. These countries have better living conditions (average life expectancy of 68.7 years, 86.9 percent adult literacy, and per capita income markedly higher than that of the other countries under consideration), but also have a more highly developed, relatively stable social structure (with small gender-related differences in the degree of literacy and the lowest rate of population growth). This segment also has the lowest infant mortality rate. Other signs of relative progress are to be found in the higher number of radios and TV sets per inhabitant.

The third group consists of the countries of Sub-Saharan Africa, which stand out from all the others because of the extremely critical conditions of poverty. as a result of the enormous deficits in basic living conditions (the rate of infant mortality is on average 82 per thousand infants born alive, that of under-weight children touches 12.6 percent, life expectancy is on average less than 53 years), on the scarcity of economic resources in a strict sense (these countries have the lowest per capita income), and lastly, on the weaker indices of progress (for example, on average only 232 TV sets per thousand inhabitants).

## 6. Conclusions

It should once more be emphasized that optimum conditions for making a more detailed analysis than the current experimentation, in order to obtain reliable results and to identify clear policy guidelines for the eradication of poverty, depend on the quality and completeness of the mass of data available to be utilized for each country considered. More precisely, the successful outcome of the analysis depends on:

- level of regional break-down of the units under examination;
- how up-to-date the data ;
- whether all the indicators used to measure the phenomenon point in one direction;
- the reliability, homogeneity and comparability of the data utilized for the different geographical areas.

In order to achieve an effective system for monitoring the conditions of poverty and the development trends in the countries in transition, it is therefore essential to have complete data on the economic and social structures: an information base which is at present not entirely satisfactory.



To sum up, the following is required:

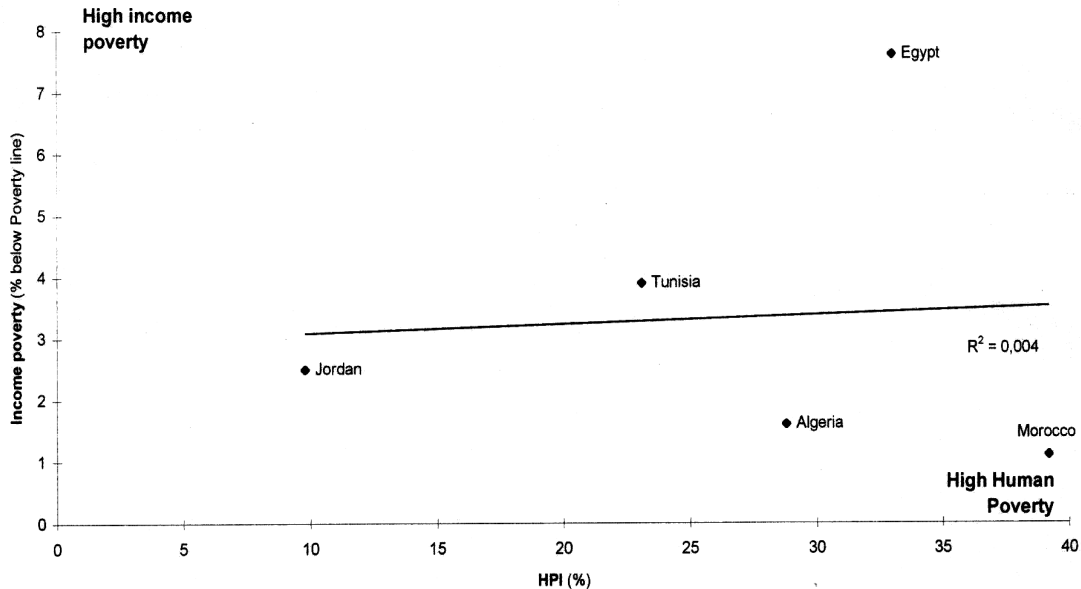
- first, a wider set of indicators than that used. Of necessity, for the present analysis, this must fulfill the conditions of transnational comparability, making it possible to study the various aspects which, singly or in combination, help to determine situations of imbalance in social development;
- second, an articulated database at a sub-national level, allowing regional segmentation so as to permit a comparison of the situations that exist on a local scale in the different geographical and socio-economic configurations, and to allow transversal extension of the comparison throughout the regions of the various countries studied.

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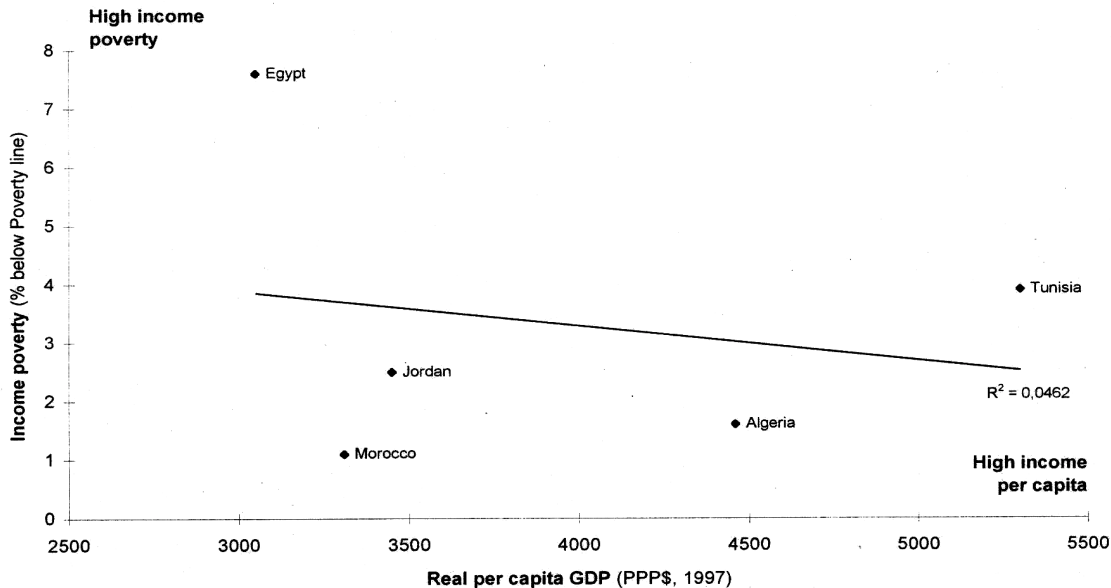
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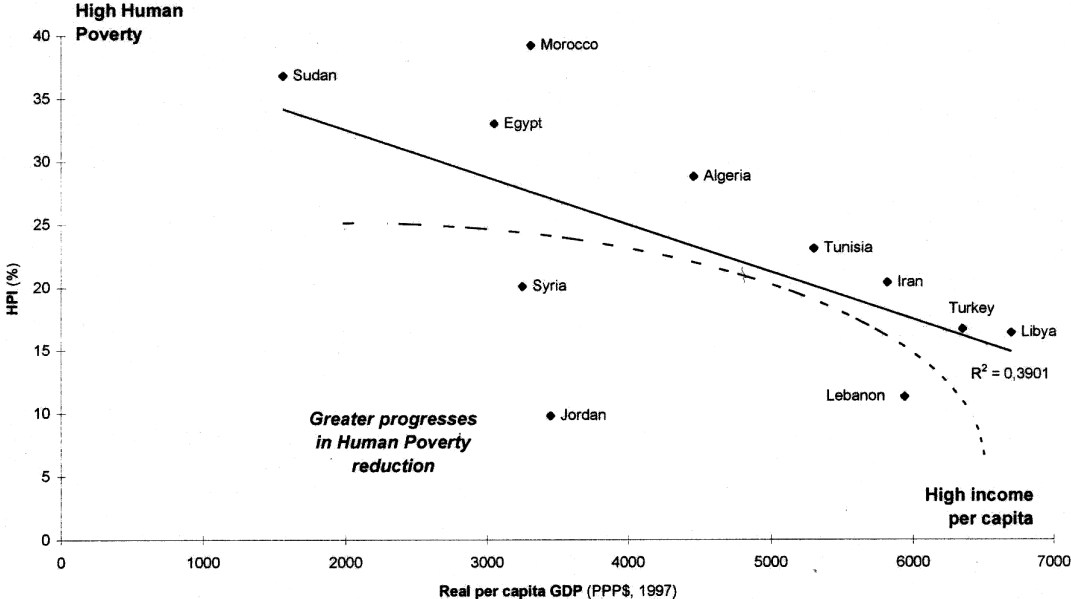
**Figure 1: Correlation between Human Poverty and Income Poverty in the MENA Region**



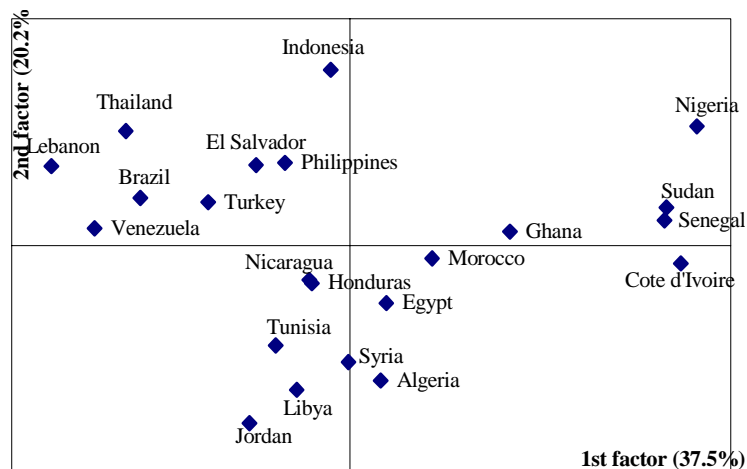
**Figure 2: Correlation between Income Per Capita and Income Poverty in the MENA Region**



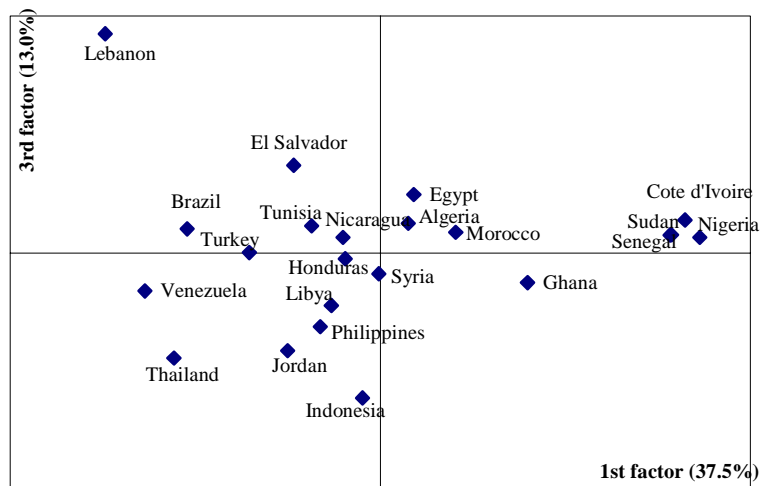
**Figure 3: Correlation between Income Per Capita and Human Poverty in the MENA Region**



**Figure 4: Distribution of Countries around 1st and 2nd Factors**



**Figure 5: Distribution of Countries around 1st and 3rd Factors**



**Table 1: Variables Considered in PCA**

Variable	Year	Source
Life expectancy at birth (years)	1997	UNDP
Adult literacy rate (%)	1997	UNDP
Real GDP per capita (PPP\$)	1997	UNDP
Public expenditure on education (% of GNP)	1996	WB
Public expenditure on health (% of GDP)	1990-97	WB
Low-birth-weight infants (%)	1990-97	UNDP
Infant mortality rate (per 1,000 live births)	1997	UN
Women's presence in the labor market (% of labor force)	1997	WB
Diff. % of gender-related literacy rate	1997	Processed by CENSIS
Avg. annual growth rate of GNP (%)	1997-98	WB
Avg. annual growth rate of population (%)	1975-97	UN
Television sets per 1,000 people	1997	WB
Radios per 1,000 people	1997	WB

**Table 2: Values of the Variables Used in PCA by Country and Average Values for the Three Clusters**

Country	A	B	C	D	E	F	G	H	I	J	K	L	M
Algeria	68.9	60.3	4.5	5.1	9	26	25.0	5.0	2.8	55.0	3.3	67	239
Egypt	66.3	52.7	3.1	4.8	10	29	24.2	3.3	2.3	36.3	1.7	127	316
Jordan	70.1	87.2	3.5	7.3	7	23	10.4	-2.5	4.0	36.0	3.7	43	287
Honduras	69.4	70.7	2.2	3.6	9	31	0.9	1.0	3.2	43.0	2.8	90	409
Libya	70.0	76.5	6.7	7.1	7	26	25.8	-0.5	3.5	68.3	2.3	140	265
Morocco	66.6	45.9	3.3	5.3	9	35	26.6	-1.0	2.0	62.0	1.2	160	241
Nicaragua	67.9	63.4	2.0	3.7	9	37	0.0	0.8	2.9	52.3	5.3	190	283
Syria	68.9	71.6	3.3	4.2	7	26	30.0	1.8	3.2	39.4	2.3	68	274
Tunisia	69.5	67.0	5.3	6.7	8	31	22.3	3.9	2.2	43.0	3.0	182	218
<b>Cluster 1</b>	<b>68.6</b>	<b>66.1</b>	<b>3.7</b>	<b>5.3</b>	<b>8</b>	<b>29</b>	<b>18.4</b>	<b>1.3</b>	<b>2.9</b>	<b>48.4</b>	<b>2.8</b>	<b>119</b>	<b>281</b>
Brazil	66.8	84.0	6.5	5.5	8	35	0.2	-1.4	1.9	47.3	1.9	316	435
El Salvador	69.1	77.0	2.9	2.2	11	35	5.9	1.4	1.7	44.1	2.4	250	461
Philippines	68.3	94.6	3.5	2.2	9	37	0.5	-2.1	2.3	40.0	1.3	109	159
Indonesia	65.1	85.0	3.5	1.4	8	40	11.1	-16.2	1.9	58.1	0.7	134	155
Lebanon	69.9	84.4	5.9	2.5	10	29	12.9	2.7	0.6	34.0	3.0	354	892
Thailand	68.8	94.7	6.7	4.1	6	46	3.9	-8.5	1.7	31.7	2.0	234	204
Turkey	69.0	83.2	6.4	2.2	8	36	18.5	-0.5	2.1	39.9	2.7	286	178
Venezuela	72.4	92.0	8.9	5.2	9	34	0.9	-2.4	2.7	21.4	1.0	172	471
<b>Cluster 2</b>	<b>68.7</b>	<b>86.9</b>	<b>5.5</b>	<b>3.2</b>	<b>8</b>	<b>36</b>	<b>6.7</b>	<b>-3.4</b>	<b>1.9</b>	<b>39.6</b>	<b>1.9</b>	<b>232</b>	<b>369</b>
Côte d'Ivoire	46.7	42.6	1.8	5.0	12	33	17.3	3.6	2.7	91.0	1.4	61	157
Ghana	60.0	66.4	1.6	3.8	8	51	20.0	1.9	3.0	81.1	2.9	109	238
Sudan	55.0	53.3	1.6	4.3	15	42	24.1	-0.4	2.5	85.5	1.7	44	172
Nigeria	50.1	59.5	0.9	0.9	16	36	17.7	-1.7	2.8	84.2	0.2	61	197
Senegal	52.3	34.6	1.7	3.5	12	43	19.7	3.1	2.7	68.0	1.2	41	141
<b>Cluster 3</b>	<b>52.8</b>	<b>51.3</b>	<b>1.5</b>	<b>3.5</b>	<b>12</b>	<b>41</b>	<b>19.8</b>	<b>1.3</b>	<b>2.7</b>	<b>82.0</b>	<b>1.5</b>	<b>63</b>	<b>181</b>

Notes: A. Life expectancy. at birth (years); B. Adult literacy rate (%); C. Real GDP per capita (PPP\$); D. Public expenditures. on education (% of GNP); E. Low-birth-weight infants (%); F. Women's presence in the labor market (% of labor force); G. Diff. % of gender-related literacy rate; H. Avg. annual growth rate of GNP (%); I. Avg. annual growth rate of population (%); J. Infant mortality rate (per 1,000 live births); K. Public expenditure on health (% of GDP); L. Television sets (per 1,000 people); M. Radios (per 1,000 people)

## Appendix: Description of Factorial Axes and Clusters

**Table A.1a: Description of Factor 1 with Continuous Active Variables**

Coord.	Weight	Denomination of the Variable	Avr.	Standard Deviation	No.
-0.89	22.00	Life expectancy at birth (years)	65.05	7.13	1
-0.82	22.00	Adult literacy rate(%)	70.30	16.95	2
-0.80	22.00	Real GDP per capita (PPPS)	3.89	2.10	3
<b>Central Zone</b>					
0.49	22.00	Diff. % of gender related literacy	14.45	9.91	11
0.71	22.00	Low-birth-weight infants (%)	9.41	2.44	12
0.87	22.00	Infant mortality rate (per 1,000 live births)	52.80	19.13	13

**Table A.1.b: Description of Factor 2 with Continuous Active Variables**

Coord.	Weight	Denomination of the Variable	Avr.	Standard Deviation	No.
-0.79	22.00	Public expenditure on education (% of GNP)	4.12	1.72	1
-0.66	22.00	Avg. annual growth rate of population (%)	2.49	0.71	2
-0.52	22.00	Public expenditure on health (% of GDP)	2.18	1.11	3
<b>Central Zone</b>					
0.36	22.00	Television sets per 1,000 people	147.18	90.36	11
0.55	22.00	Avg. annual growth rate of GNP (%)	0.25	0.21	12
0.67	22.00	Women's presence in the labor market (% of labor force)	34.59	6.80	13

**Table A.1c: Description of Factor 3 with the Continuous Active Variables**

Coord.	Weight	Denomination of the variable	Avr.	Standard Deviation	No.
-0.68	22.00	Avg. annual growth rate of GNP (%)	0.25	0.21	1
-0.49	22.00	Avg. annual growth rate of population (%)	2.49	0.71	2
-0.34	22.00	Adult literacy rate (%)	70.30	16.95	3
<b>Central Zone</b>					
0.39	22.00		147.18	90.36	11
0.41	22.00	Low-birth-weight infants (%)	9.41	2.44	12
0.65	22.00	Radios per 1,000 people	290.55	164.02	13

**Table A.2a: Custer 1/3**

RG	Distance	Ident.	RG	Distance	Ident.
1.0	1.88348	Algeria	2.0	3.25897	Tunisia
3.0	3.30543	Syria	4.0	4.04537	Egypt
5.0	5.69375	Honduras	6.0	6.66443	Libya
7.0	7.52078	Morocco	8.0	9.06540	Jordan
9.0	11.70324	Nicaragua	-	-	-

**Table A.2b: Cluster 2/3**

RG	Distance	Ident.	RG	Distance	Ident.
1.0	3.96082	Brazil	2.0	4.51675	Turkey
3.0	4.73270	El Salvador	4.0	5.39295	Philippines
5.0	6.38070	Thailand	6.0	8.26944	Venezuela
7.0	15.74771	Indonesia	8.0	19.98158	Lebanon

**Table A.2c: Cluster 3/3**

RG	Distance	Ident.	RG	Distance	Ident.
1.0	1.71404	Senegal	2.0	1.74375	Sudan
3.0	3.59228	Côte d'Ivoire	4.0	6.96803	Nigeria
5.0	9.62910	Ghana	-	-	-