

The Mahbub Ul Haq Memorial Lecture

Global Multidimensional Poverty Index

SABINA ALKIRE

Ladies and gentlemen, and friends, Asslam o alaekum! It is really a joy and an honour to be here at the PIDE Conference and also to be able to speak in the lecture that carries the name of Mahbub Ul Haq. I was honoured to do the doctoral fieldwork affiliated with the Human Development Centre (HDC) in Islamabad. I did my D.Phil fieldwork in 1996 and 1997 and of course then participated in the activities of the HDC at that time. It was really the vision of Mahbub Ul Haq, his eloquence, passion and commitment to the work, which gives one a sense of gravity and a sense of potential importance of gathering communities of people to debate issues about which we perhaps do not agree but which are so important to the society. I hold that memory very much in the mind.

What I would to do today is to speak a little bit about multidimensional poverty not as an end in itself but, as we have heard in all of the presentations in this Conference, as the reason to address poverty, inequality, or inclusive growth to use the tools of our trade as agents of change. I begin with the quote from John Dreze and Amartya Sen that positive change have often occurred and yielded some liberation when the remedy of ailments has been sought actively and with vigour. I think one of the distinguishing features of the academic conferences it that we get space and time to really try to crystallise some of the issues that lies at the heart of these topics.

First of all, I would set forth very briefly the methodology that we have developed and explain it using the example of a global multidimensional poverty index (MPI), which we compute this year for 108 countries. Then I will go down to the level of national context and address the nine reasons for which national governments are trying to build official national multidimensional poverty measures, which like national income poverty index are adapted to the their context, to the survey instruments, and to the policy priorities, so that they carry more of the texture of the debate and the values of those societies. I will also share briefly about a network of countries that are exploring, or are developing, or have developed such measures. I will also give in particular the case study of Colombia, which released its national MPI in 2011. At the end, I will share a little bit of draft MPI, which has been cooperatively developed by many and is under discussion in Pakistan.

Sabina Alkire <sabina.alkire@qeh.ox.ac.uk> is Director, Oxford Poverty and Human Development Initiative (OPHI), Oxford University, UK.

If you begin by thinking simply about income poverty, the word poverty can either mean income poverty or different deprivations that batter poor people's lives at the same time. It is a matter of terminology and preference how you define the particular word poverty. Some people use disadvantage or deprivation for a multidimensional concept. Let us begin by thinking about income or consumption poverty. As you will know, there are at least two main types of such poverty measures. One is internationally comparable, which is \$ 1.25 a day poverty measure, which is used to compare 112 developing countries at the moment, using data from 2000 to 2010 and the figures are released by the World Bank. The advantage is that it can affect comparisons, so it is meant to catalyse healthy competition, cross-learning and also some evaluations of comparative contexts.

In a similar way, there can be a global MPI, or a multidimensional poverty index, which can be compared across different countries. The MPI published by UNDP is one example of this, which we have produced over time for 115 countries. However, clearly the policy energy of any country is not aimed at reducing \$ 1.25 a day poverty and measures that are produced in Washington, D.C. Rather, at present they are focused on national measures of poverty, whether these are income or consumption measures. Nearly every country has their own national income poverty measures, which are also reported by the World Development Indices. They are also now one of the proposed targets of the sustainable development goals. In a similar way, it is also possible to develop national multidimensional poverty measures, where the specifications reflect the national definitions, policy priorities, priorities of the communities and other voices, as well as the data limitations and possibilities. As we will see, perhaps these can complement the monetary measures of poverty and used for policy.

Therefore, there are two different measures—the global and the national. I will begin with illustrating the methodology of the global but spend most of the time speaking about the national measure. The first step, and in a sense a key step, in defining any measure is to select the relevant parameters. In the multidimensional sense, this means a number of dimensions, or organising concepts; it means a number of indicators, which are columns in a matrix that you are going to work with in identifying who is poor and creating the poverty measure. For each indicator, you also define a deprivation cutoff. Thus, in the case of global MPI, there are three dimensions, which are health, education and living standard, which are equally weighted. Also, there are 10 indicators. You are deprived in nutrition, if any member of your household is malnourished; in child mortality if a child has died; in years of schooling if no member of your family has completed 5 years of schooling; in school attendance if a child is not attending school at the age at which they would complete class 8; you are deprived if you cook with dung, wood, or charcoal; if you do not have improved sanitation by Millennium Development Goals (MDG) definition, or if it is shared; if you do not have safe drinking water by MDG definitions, or have to walk more than 30 minutes to obtain it; if you do not have electricity; if your floor is dirt, sand, or natural; and if you do not own more than one of a set of assets, which are radio, television, telephone, bicycle, motorcycle, and refrigerator. If you own a car or a truck, you are not deprived in assets.

This is, in a sense, the structure of the multidimensional poverty measures. These indicators can vary and, as we will see, they do vary in countries. What is distinctive about this methodology is that rather than beginning with the aggregate averages of these

10 indicators, we begin at the individual or at the household level. The global MPI uses the household level. For example, Natalie, a 20 year old woman in the northern Ares of Cameroon is deprived in both health indicators and in all six living standard indicators and her weighted deprivation score is 67 percent, or two-thirds. This enables us to see the situations that Duflo and Banerjee describe in their influential work. These are complicated, overlapping, rainstorm of deprivations that people experience together because responses to those very deprivations are interconnected and are also often need to see the different profile of deprivations.

However, we are also working with the very real data - data which are often messy and where preferences vary, the climactic conditions vary, and data accuracy varies. Therefore, in the case of global MPI, for example, we do not consider that any single deprivation constitutes poverty. If we would, more than 90 percent of the people would be poor in over 40 countries. Rather, we identify a person is poor if they are deprived in some proportion of these weighted indicators, which in this case is the third. Therefore, Nathalie is poor because she is deprived in one-third of the weighted indicators. On the other hand, if they are not, we do not consider them poor and we do not take into account their deprivations in the measure. Technically, we run this measure for every value of deprivations.

The MPI, then, is a very simple poverty-gap style measure, which is computed as the follows. It is the percentage of the people who are poor because they are deprived in one-third, or more, of the indicators at the same time. It is then multiplied by a new figure, which is called intensity. The intensity is the average proportion, or average percentage, of the deprivations that poor people experience in that country. The formula is given by $MPI = H * A$. It is adding this new term 'A' to the longstanding practice of the accounting tradition, which gives this measure some very desirable properties. This methodology I was happy to develop with James Foster and therefore, very naturally, it is an extension of Foster-Greer-Thorbecke (FGT) set of indices. Because we are adding a new factor of intensity, we are able to break the indicator down into a set of consistent partial indices for each of the 10 indicators. Just like the FGT is the mean of a censored vector, the MPI is the mean of a censored matrix. There are other consistent indices that can be computed if data are cardinal. However, when we are working on poverty usually many indicators contain ordinal or even binary data. Consequently, we stick with the M_0 (ordinal data) formulation. This naturally satisfies a number of desirable axiomatic properties, which we could speak about but the ones that I will show are subgroup decomposability and subgroup consistency and also dimensional break down disability after I identify the poor to break down the poverty measure into the consistent dimensional indices.

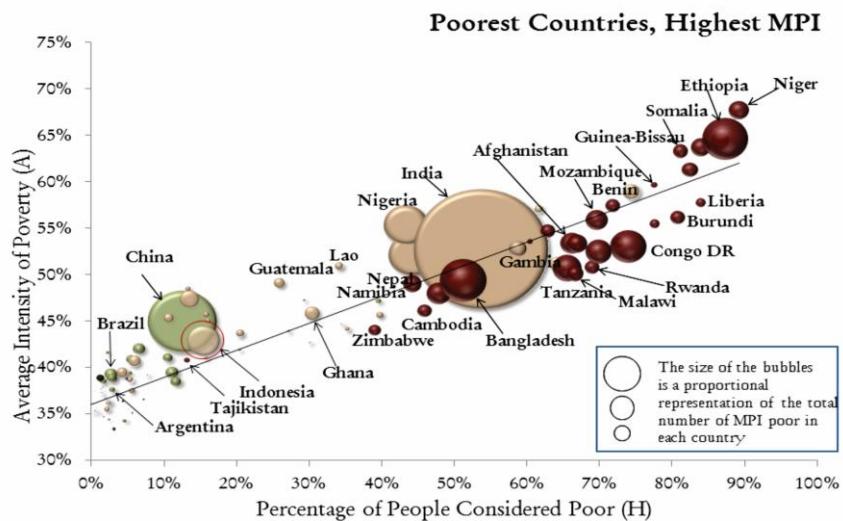
That was a very simple overview of a global MPI. By that global MPI of the 5.4 billion people who are citizens of those 108 countries, 1.6 billion, or 30 percent, are poor. However, the headcount varies from 0 percent to 89 percent in the poorest country of Niger. In the 43 sub-national regions, the headcount is above 90 percent. Of those 1.6 billion people who are poor, 52 percent of them live in South Asia and 71 percent of them live in middle-income countries. Therefore, these kinds of very crude comparisons can be made with the global measure and this does have at the moment some play; it is proposed as one of the Sustainable Development Goals (SDGs). For textured policies, however, we

have to do much better than that and really go in to create measures that reflect the values of each society.

Given that, I would like to present rather a hodgepodge of reasons why it can be useful to have a national multidimensional poverty index alongside, not replacing but complementing, a monetary poverty measure. One is to give a bird's eye view of the overlapping non-monetary dimensions of poverty. The Stiglitz-Sen-Fitoussi Commission in 2009 report, speaking about the quality of life acknowledged that while assessing the quality of life requires a consideration of plurality of indicators, there are strong policy demands for having a one number that journalists understand whether the poverty changed over time, how, and where. The second reason, as I mentioned before, is that we need a measure now that shows the overlapping deprivations, or the joint-distribution of disadvantages, that people experience. That, I think, is recognised by many as being the signal value-addition of this particular approach to multidimensional poverty measurement.

The third reason for the economists is that it is quite familiar. You will know the Foster-Greer-Thorbecke class of measures and this is very much like the poverty-gap measure, i.e. $H * I$ was the headcount times the gap, mentioned both in Sen (1976) and Foster, Greer, and Thorbecke (1984). This is a straightforward extension in a three-dimensional space of this gap to look at the dimensional shortfall, or breadth of deprivations. The fourth reason is the one that starts to come near to policy and that, in a way, derives from the additive linear formulation of the index. We can speak about why, and I am sure we will, we have not curved it. It has to do with very policy relevant priorities of how it can be broken down.

First of all, as I said, the MPI gives one number that can be used to make comparisons over time between regions or districts. Second, clearly it is made up of the headcount and the intensity and so we can report the headcount and the intensity for each country. The headcount is, of course, for the journalists' understanding. In Figure 1 below, we have 108 countries lined up with Niger, the poorest on the right hand side. The countries are lined up by the headcount ratio and the height is the average intensity.



A lot can be learned from the fact that the poorest countries also have the highest intensity, which implies that each poor person is poor in a larger percentage of deprivations at the same time, which is a sad finding. Different regions, countries, and different levels of income can also be compared using this measure. These are shaded according to income status of the countries. Going further, we can disaggregate a national measure sub-nationally. This is shown as for global MPI but it can be done nationally. The MPI can also be broken down by 10 indicators to see the national profile of poverty, which kinds of indicators have contributed the most, and where there have been statistically significant changes over time in each of the component indicators as they have affected the poor populations. Finally, these different analyses can be combined and look sub-nationally at the composition of poverty, how it is evolving over time. This enables the measure to be used as a tool for policy coordination and use. For example, Mexico was the first government to release a national MPI in 2009. It has from 2009 released figures at the state level. Now it is the state governors who are really trying to understand the poverty profiles and work to reduce them most proactively.

Therefore, this tool can be a communication device between the different layers of the institutions. Finally, for people who are interested in this, there is an academic literature around this, which is developed. There is also a book, which we are very honoured to be able to produce and it will be published in June 2014. It is a very systematic treatment of multidimensional poverty comparisons, which also includes methodology, systematic both in theoretic and axiomatic properties. It also discusses empirical working, treatment of the data, standard errors of regression analysis, and changes over time in inequality among the poor. It also reviews other methodologies that have been implemented. It tries to give all of us, working in the area of multidimensional poverty, a bag of tools so that we understand which techniques to use when. However, it does not try to say that one technique can do everything because it cannot.

A sixth reason, which is certainly developing as the empirical literature comes forward is how the MPI differs from the income poverty measure in terms of policy change. Philippines released its official MPI in 2013 but they used data are from its release and they calculated back to 1988. From the year 2000 to 2009, Philippines have been growing strongly but the income poverty was static, which is partly because they had allocated considerable fiscal expenditure to the social sectors. Therefore, MPI in the case of Philippines was able to show the effect of growth on the other eye of poverty. If the income is the one eye and the other dimensions of the poverty are the other, then you have a 3-D perspective to show different kinds of policy changes and their effect on poverty.

There are a suite of robustness tests that look for the poverty cut-off and standard errors, then you can do a kind of a dominance test for changes over time and changes across regions for all values of the poverty cut-off. The comparisons between Colombia and Philippines, for example, enable us to understand how sensitive different rankings of regions, for example, are to changes and specifications of the measure. Similar tests are done for the weights, for the choice of indicators and for the associations—the redundancy or similarity—among the indicators within each measure.

The eighth reason is perhaps the first time that I was surprised. The reason is an empirical one and it is that what we have found through the empirical work is that the

measure does complement income poverty in a surprising way in that it does not identify the same people as poor. For example, Bhutan's national MPI for 2013, which was first released in 2010, shows that the incidence of poverty was 12.7 percent in Bhutan. Bhutan's national income poverty measure identified 12 percent of the population as being consumption poor. However, in the case of Bhutan, both of these variables came from the same dataset, so we could cross to see who is poor in both the measures. Therefore, both the measures give roughly the same results. But what we found was that only 3.2 percent of the population was poor by both measures, and three-quarters of the income poor were not multidimensionally poor and vice versa. This is a call for anthropologists and sociologists, to please explain this phenomenon to us whether it is the seven day recall, lumpiness of consumption, addiction, or is it people having good or bad shopping patterns. We need to understand much more but at least this is bringing new information into the problem. We have done this now on 15 or 16 datasets for different countries and we always get surprising magnitudes.

This draws on larger European literature, which predates us. For example, in Table 1 below, these are chronic poverty numbers and chronic material deprivation numbers for nine European countries. The table shows that on average 20 percent of the people were income poor, 20 percent of the people were materially deprived, but only half were both, even though both deprivations were economic.

Table 1
Distribution Across Combined Income Poverty and Deprivation Persistence Variable by Country

	Neither Persistently Income Poor nor Deprived	Persistently Income Poor Only	Persistently Deprived Only	Persistently Income Poor and Deprived
Denmark	82.8	6.9	8.9	1.4
The Netherlands	78.8	7.1	7.3	6.8
Belgium	73.0	9.3	8.8	8.9
France	70.8	11.6	8.5	9.0
Ireland	64.8	11.4	9.7	14.0
Italy	68.8	9.2	11.3	10.7
Greece	68.8	11.2	9.9	10.1
Spain	72.7	9.2	8.7	9.4
Portugal	64.5	12.0	11.3	12.2
All	70.7	10.4	9.2	9.7

This overlap motivated Europe's move in 2010 to multidimensional poverty measure. All the countries look sub-nationally at the income and multidimensional poverty ranks. It is quite interesting in the case of Bhutan that the poorest district, Gasa, by multidimensional poverty, was the least poor by income poverty, which is quite a stark contrast. It was because they had these caterpillars, which gives them great income. However, it is a 15-day walk from a road and they do not have electricity, health, or education facilities.

When these changes happen over time, it does animate the discussion quite a bit. In the case of Mexico, for example, when they updated their measure in 2008 after the financial crisis, being neighbour of the U.S. subject to exogenous shock, both in terms of

the income poverty and food prices, they saw a rise in their income poverty and a rise in their food security. Nevertheless, they were able to show that, using their multidimensional poverty measure, which includes income, in 5 out of 6 social dimensions, social policy had effected a reduction in poverty, despite the exogenous shock. Therefore, it gives us a more nuanced picture.

The final, and the ninth reason, is that although it can be a bit concerning that it might confuse the press to have two poverty measures, or to have income and other dimensions of poverty together. These countries that already have official poverty measures have found some kinds of efficiency in their communication with the press. These are some of the reasons for using multidimensional poverty measure. I share them because not they are necessarily definitive but just because they have come out from the partners that we work with as we are learning more and more about how to use measures effectively and to, of course, address poverty and not just for the sake of measurement, and publication.

At the moment, four governments have official national MPIs and more will be launched soon. The Ho Chi Minh, Vietnam, will be the first city to have city measure of MPI. I would like to share just one example of Colombia. Colombia has two measures, the income measure, as Latin America uses income measure, and the multidimensional poverty measure. They describe income poverty measure as the indirect channel of poverty reduction through growth. On the other hand, they describe social protection and the MPI as reflecting the direct channel of fiscal allocation, proactive social policies, conditional cash transfers and geographical targeting. They have established both the MPI and income poverty as the official measures and they combine them. The MPI is used for two primary purposes, which are monitoring and measuring. Measuring is done by their planning commission, which is called Departamento Nacional de Planeación (DNP). The monitoring, on the other hand, is done by the President of Colombia, which is the same situation as in Mexico. In Mexico, the president has advisors and they use MPI to coordinate and monitor progress. In the case of Colombia, they have 15 indicators that reflect their national plan, which means that they have a national plan with political will behind it. They simply took the national plans, used the deprivation targets to set the deprivation cut-offs. They use the measures as tool towards realising their national policy. They had problem in their income series and around that time, they moved towards multidimensional poverty measure. They are able to compare the trends, both in income and multidimensional poverty. Because the statistics office of Colombia had a problem with income series, there was some concern about the poverty numbers and it helped to restore the confidence.

Colombia uses the MPI for policy in four ways. One is to look at the objectives from the social policy, the other is monitoring, and the third is for coordination. The last one is interesting and which is to provide alerts on annual basis as they have an annual survey to update it and it affects allocation in the next year. Therefore, they use MPI for targeting, for deciding what to put in their targeted programmes, and for setting the parameters of graduation from conditional cash transfer programmes. They also have public-private sector partnership where they make the results of the MPI available online on a social map. The private sector has been very proactive in investing in different regions where they have factories, manufactories or services to do their bit for common social good.

The case of Colombia shows how they use the alerts. For example, in 2010 there were problems with school achievements, income generation and early childhood care, so they had some responding policies in terms of tuition fees and a strategy for childhood care. In 2011, there was a housing problem, so they looked at the subsidised housing solution. In 2012, there was urban-rural gap, so in 2013 they had higher investment in CCTs in rural areas. This gives the idea that how Colombia is using MPI for policy intervention.

These four countries are part of the network that was launched in 2013 in Oxford, to which Pakistan pertains. The launch was marked by participation by President Santos of Colombia and the lecture by Amartya Sen. In the last meeting in Berlin, the participation doubled to about 32 countries. This also includes China, which has targeted 90 million people using MPI. The network also includes institutions, including Islamic Development Bank, OECD, the SDG actors, and a number of other countries. These groups are creating peer network with ministers, or vice ministers, participating from each country as well as statistics offices, which is very useful in helping to translate the numbers into policy.

Finally, on behalf of a much larger group, I will share a little bit of early ideas on MPI in Pakistan. Regarding the process, we did a two-week training in March 2015 in Islamabad in which a number of participants from different institutions and provinces, and both academic and government agencies participated. The participants were of very high calibre and highly motivated and it was impressive what they managed to learn and accomplish within a very short time period. Both before and after the training, there was a development of candidate measures using the district waves of the Pakistan Social and Living Measurement (PSLM) dataset. The selection of indicators was first done on 47 indicators that could be had from the dataset and shortlisted those that seemed to be coherent with the emerging Vision 2025. Early results were presented in April at a national conference, with UNDP and the Planning Commission co-organising it. The trial measure was refined from input in that conference. There have also been consultations in Karachi, Lahore, and Peshawar and there will be others. I believe that the plan is to have a national conference to conclude the MPI design, which is very much the work of the Planning Commission and the UNDP but it has certainly been a privilege for me to be a part of this process.

In terms of this trial measures, there are three dimensions, namely health, education and living standard. There are 15 indicators for the case of Pakistan, four for health, four for education, and seven for living standard. The weights are equal across dimensions and variable across the education and health indicators, with the living standards being equally weighted. In the case of education if no male over 10 years has completed 5 years of schooling, the household is deprived; if no female over 10 years of age has completed 5 years of schooling, the household is deprived; if the school aged child from 6 to 11 is not attending school, or if the child is not attending school because of the quality issues, or if is attending but dissatisfied with the service, then the household is deprived. Thus, we have a preliminary variable on education quality, with a lighter weight because of the self-reporting nature. In terms of health, household is deprived if it does not use the health facility or use only once in a while and that is due to access constraints, it is too far, it is too costly, lack

amenities or staff, or does not have enough services. There are also three, light-weighted indicators that refer to sub-sections of the population, which are immunisation, antenatal care, and safe delivery.

If the walls of the house are made up of mud, *katcha* bricks, wood, or bamboo then the household is deprived in housing; if there more than 4 persons per room, they are deprived in housing; if the water does not meet MDG standards, or is away more than 30 minute round trip, the household is deprived. Similarly, for sanitation, for lack of electricity, and lack of clean energy indicators are developed. The asset index incorporates land and livestock, as well as small and large assets in order to make this relevant in rural areas.

That is the structure of the index. Very briefly, the trends show that the MPI decreased each year for all poverty cut-offs. The decrease in headcount ratio is statistically significant, not from 2004 to 2006, but from 2006 to 2008 and 2008 to 2010-11. The MPI changes are not statistically significant in the intervening years though across the periods, there is a significant decrease, which is for all values of k , choosing a k of 33 percent, which means that a person is deprived in one indicator. It should be noted that we have computed for the range of all of the relevant k 's. We can see that in many indicators, there has been a reduction in the indicator-specific deprivations but not perhaps in the health indicators to the same extent.

Comparing rural and urban areas, unsurprisingly, rural poverty is far greater than the urban poverty, in 2010-11. Regarding composition of poverty, the educational deprivations, access to health facility, and cooking fuel have the largest contribution to overall poverty at this moment, given the structure. Without any surprise, although Baluchistan is home to only 5 percent of the total population of Pakistan, it is by far the poorest of the provinces, not only in 2010-11 but also in each of the other periods. Nevertheless, thankfully, Baluchistan did reduce poverty in the 7 year period covered. Finally, as I talked about the distribution of countries across very different MPIs, but it was interesting given the conversation on inequality, when I decomposed PSLM by districts, we also see a great variation between districts from 4.8 percent headcount in Islamabad to 96.6 percent in Dera.

This is an indicator for discussion, for criticism, and for exchange. It is by no means perfect and it is limited by the datasets, and we need to have comparability across time, but it may at least introduce some of what this methodology could contribute. That has been really what I wanted to share, including a little bit of methodology, how an MPI is constructed, and using the global MPI that can be compared across countries. But what I really wanted to focus was on national MPIs and how these add value to an income poverty measure. If you get something in your eye and have to put a patch on your eye, then you only see without depth. It may be that if we only look at income or only non-income dimensions, we do not really get the full 3-D insights into poverty. Therefore, perhaps it is by using both monetary measures, be it income of consumption, and looking at the other dimensions that we get a bit of a more balanced view of both of the levels and of the changes and comparisons across time. I would like to offer MPI, perhaps as a small step in a long journey and little by little, step by step, we can make incremental progress.

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