COSA

Committee On
Sustainability Assessment

Testing the "Progress out of Poverty Index"

Update to 2013-14 Report

FORDFOUNDATION

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"Progress out of Poverty Index"

Synthesis Report for

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Executive Summary

As we seek to improve and refine the ways in which poverty can be assessed, the Committee on Sustainability Assessment (COSA) evaluated different existing poverty measurement tools such as the Progress out of Poverty Index® (PPI®) that could be integrated into the COSA Producer Surveys. The goal was to trial these approaches to determine both their validity and whether we could establish direct correlations between the actual farmer incomes as determined by such globally recognized poverty metrics and our existing COSA indicators measured with the COSA Producer Surveys. After a review of several of the leading poverty assessment tools, COSA decided to pilot the Grameen Foundation's PPI, and also the Multidimensional Poverty Index (MPI) designed by the Oxford Poverty & Human Initiative (OPHI) in a smaller test.

COSA successfully used the PPI in four implementations: Guatemala (coffee), Peru (coffee), Mexico (coffee) and Colombia (cocoa). The initial results from these implementations utilizing the PPI tools suggest that the PPI could be a useful addition to the COSA Producer Survey. Our use of other indicators for poverty (total income, net income from crops, household assets, etc.) are valuable for targeted action but do not provide a complete benchmark for reporting the contextual reality of the farm family especially in relation to overall poverty levels in the country. Using net income as a proxy for poverty provides one valuable but incomplete piece of understanding about the socioeconomic status of the beneficiaries. Since other non-crop factors also affect their poverty, a broader tool like the PPI is particularly useful. Incorporating and using the PPI is therefore allowing COSA to better contextualize the reporting and interpretation of the poverty data it presents while also tempering the PPI with more localized findings.

Reviewing the data from two of the implementations (Mexico and Colombia), there was a correlation between COSA's income indicators and the PPI scores. For example, the poverty rate calculated using the PPI was related to food security and had a negative relationship with environmental practices. However, there is some uncertainty about the accuracy of using the PPI (created using national consumption data) while using populations that, by their nature – agricultural producers – may not be nationally representative.

For COSA clients (firms, development agencies and NGOs), using the PPI provides added value in two ways. First, the PPI can help identify the extent to which the project is targeting the poor. Second, the PPI can be used over time

to track the status of beneficiaries and help discern the change in their poverty level.

COSA has reviewed a number of discrete tool kits, such as the Women's Empowerment in Agriculture Index developed by IFPRI, and will continue to adopt and develop other promising indices for the broader COSA toolkit.

I. Purpose and Background

The Committee on Sustainability Assessment (COSA) is a global organization facilitating the measurement of social, environmental, and economic impacts in agriculture. COSA measures impact with its Research Partners in each country using an evolving set of indicators for each of these themes. COSA is continuously looking to improve how it measures impact and sought to add a poverty assessment tool to complement the current suite of survey tools. The goal was to establish more direct linkages from its detailed field work to more globally recognized poverty lines and metrics (such as USAID's Extreme Poverty Line, or the World Bank's global poverty line of $1.25 at 2005 PPP). By using clear and well-accepted poverty measures that reflect best practices and that use global standards, results can be quickly and easily compared across regions and projects, contributing to the improved understanding of poverty and the economic dimensions of sustainability.

The purpose of this report is to briefly discuss the recent advent of several poverty measurement tools and look at how each of these might work with the COSA system. We describe the results of four COSA pilots utilizing the Grameen Foundation's PPI, selected because of its transparency and wide acceptance. We compare the results of the PPI with our own income indicators, and then we use the PPI data to provide greater context for each of the pilots. Finally, we discuss how COSA can better integrate this tool and other established indices to improve the information COSA reports and how the PPI serves as a model index.

Background on poverty measurement

There is a need to accurately determine the socioeconomic status of groups of individuals or households. Governments, development institutions, NGOs, and others require this information to identify potential participants in projects, track the progress and evolution of poverty over time, and to identify the impact of policies or interventions that are intended to alleviate poverty. The United Nations 2015 Millennium Development Goals identify the eradication of poverty as the most important of all the goals. This poverty MDG is explicitly described in the following way: Halve, between 1990 and 2015, the proportion of people whose income is less than $1.25 a day.[1] A recent World Bank report[2]

1 http://www.un.org/millenniumgoals/poverty.shtml

2 Olinto, P, et al. 2013. The State of the Poor: Where Are The Poor, Where Is Extreme Poverty Harder to End, and What Is the Current Profile of the World's Poor? Economic Premise. October 2013 Number 125. Washington, D.C.: The World Bank.

on the state of the global poor estimates that while the number of extremely poor people is declining, there are still 1.2 billion people who are destitute – defined as having $1.25 per day or less (in 2005 Purchasing Power Parity). It is of paramount importance to be able to measure poverty rates especially related to sustainability initiatives in order to know if advances are truly being realized.

The PPI 2013-14

In an effort to reduce the costs, sample sizes, and the time needed to gather complete socioeconomic data, a number of newer and less detailed poverty assessment tools have been created (see Box). All of these tools make use of indicators that are correlated to poverty and some can present results in relation to globally referenced poverty lines.

Box 1: Five Major Poverty Assessment Tools

1. **IRIS/USAID's Poverty Assessment Tools (PAT)**
   The PAT are used to derive a short survey based on LSMS and previously collected data and are available for 27 countries.

2. **CGAP's Microfinance Poverty Assessment Tool**
   Designed for use by microfinance organizations, this tool uses a relative comparison of poverty between clients and the general population.

3. **IFAD's Multidimensional Poverty Assessment Tool**
   A more comprehensive survey, this tool moves beyond a consumption-based definition of poverty and looks, in some detail, at 10 different dimensions of rural livelihood.

4. **The Multidimensional Poverty Index (MPI) designed by the Oxford Poverty & Human Initiative (OPHI)**
   A holistic look at poverty which goes beyond measures of consumption and assets to include indicators on social justice and access to opportunity.

5. **The Progress out of Poverty Index® (PPI®)**
   This survey developed by Microfinance Risk Management LLC and supported by the Grameen Foundation is available for 58 countries and offers simple ten-question surveys to ascertain the probability that a household is poor in relation to national levels.

There are advantages to using any of these tools as a proxy measurement of poverty rates. Compared to an LSMS survey, most require fewer resources to gather data and can still provide a reasonable estimate of the poverty level of a beneficiary or a group. In the time it takes to fill one LSMS survey, a surveyor could conduct about 10 PPI surveys, for instance. In the following sections, each of these tools is briefly reviewed.

Conventional measurements of poverty are executed at the household level, where surveys and researchers ask detailed questions about household income and about recent consumption patterns. The best-known examples of this approach are the Living Standards Measurement Surveys (LSMS),[3] which were established by the World Bank in 1980, in an attempt to improve the methods used for monitoring progress in investments and projects that aimed to raise the socioeconomic status of beneficiaries. In addition, LSMS were designed to make local and national policy decision more evidence-based – here was the data to identify priorities and determine what was working and what needed to be changed. LSMS surveys, while highly credible, are also an enormous undertaking with multi-hour surveys and sample sizes in the thousands (1,600 to 5,000)[4]. Their practicality is therefore limited.

1. IRIS/USAID's Poverty Assessment Tools

USAID worked with and funded the IRIS (Institutional Reform and the Informal Sector) Center at the University of Maryland to develop, test, and disseminate poverty assessment tools that could calculate the percent of a population living below one or more national or international poverty lines and that also meet US Congressional requirements for accuracy and practicality.[5] Each tool consists of two components and is designed to be administered in twenty minutes or less, and produces data that can be easily used by partner organizations to determine the percentage of clients or beneficiaries that fall into different poverty categories.

The first of the two components is a country-specific household survey that collects data on indicators that are pre-identified as the best predictors of whether a given set of households is very poor, according to the official definition of extreme poverty applicable to the country in question. The second is a data entry template into which survey data is entered. The

3 Grosh, Margaret E.; Glewwe, Paul. 1995. A guide to living standards measurement study surveys and their data sets. Living standards measurement study (LSMS) working paper; no. LSM 120. Washington, D.C.: The World Bank.
4 Ibid.
5 The IRIS Center at the University of Maryland has since closed

templates are connected to a software package that calculates and estimates the share of households living below the applicable poverty line. Results can be disaggregated by any number of variables and other relevant statistics from the data can also be calculated.

There are currently IRIS Poverty Assessment Tools (PATs) available for 37 countries, but as of 2012 with the end of USAID funding, no more new PATs are currently being developed by the IRIS Center, nor are the older PATs being updated. With no further development and updating, this tool may have a modest shelf-life and therefore was not actively tested in the field.

2. Consultative Group to Assist the Poor's Microfinance Poverty Assessment Tool

The poverty assessment tool developed by CGAP (Consultative Group to Assist the Poor) is distinct from the other tools discussed here. Rather than establishing and measuring the absolute poverty level of a beneficiary, this poverty assessment tool looks at the relative level of poverty. The tool compares the poverty levels of clients compared to non-clients in the same community. The tool was developed specifically for the use of microfinance organizations to target and identify new clients and to simply assess the effect of current microfinance services or projects on existing clients.

The tool involves surveys of 200 randomly selected client households of the target microfinance institution (MFI) and 300 non-client households in the same operational area as the target MFI. The survey is an indicator-based questionnaire which does not have pre-defined or coded responses. The survey collects information on the demographic structure and activities of households such as their footwear and clothing expenditure, food security and vulnerability, housing indicators, land ownership and assets. CGAP's extensive manual provides guidelines on how to adapt the recommended questionnaire to country conditions, including the possibility of adding local indicators to account for context specificity.

While the manual gives all the steps to create a survey for any given country and steps on how to analyze the data, the lack of information regarding the use, adaptation, or interpretation of this tool suggests that there may be relatively modest levels of uptake outside of the MFI community. For COSA, the difficulty it presents for having comparable data means it will be less relevant for its needs.

3. International Fund for Agricultural Development's Multidimensional Poverty Assessment Tool

IFAD's Multidimensional Poverty Assessment Tool (MPAT) is a multi-purpose tool that attempts to be more broadly inclusive in the definition of poverty. MPAT builds on traditional poverty assessment methods that are focused on economic and consumption-oriented indicators and has added other indicators to provide an overview of fundamental and relatively universal dimensions of rural livelihoods and rural life, and therefore of rural poverty. The MPAT is a survey-based (household and village level) tool with thematic indicators primarily designed to support monitoring and evaluation, targeting, and prioritization efforts at the local level.

The MPAT focuses on assessing 10 dimensions of rural livelihood: Food, Nutrition and Security; Domestic Water Supply; Health and Healthcare; Sanitation and Hygiene; Housing, Clothing and Energy; Education; Farm Assets; Non-farm Assets; Exposure and Resilience to Shocks; Gender and Social Equality.

This tool was designed to be universal enough to be relevant to most rural contexts around the world, yet it can be made specific enough to provide project managers and others with detail on key dimensions relevant to their rural poverty reduction efforts. The survey takes somewhat longer to administer than the other tools profiled here; in China, the surveys ran from 15 minutes to 105 minutes per household, with an average of 33 minutes.[6]

4. Multidimensional Poverty Index (MPI) of Oxford Poverty and Human Initiative (OPHI)

This poverty assessment tool expands on the approach that IFAD took. Basically, it assumes that measuring consumption or income of the household only provides us with a small and limited viewpoint of what poverty is and how it affects a household. In a nod to the work of Amartya Sen, this index attempts to measure and include the lack of opportunities and deprivations that the poor experience. In other words, poverty is not simply low income or low expenditures on household goods, but occurs in a context where the poor lack basic rights, services and opportunities. Chief among these are education, health, housing, empowerment, humiliation, employment, personal security and others. By including all of these, OPHI argues that levels of income are not always correlated with other trends, such as child mortality, access to

[6] Cohen, Alasdair (2009). *The Multidimensional Poverty Assessment Tool: Design, development and application of a new framework for measuring rural poverty.* International Fund for Agricultural Development: Rome.

education and undernourishment. This index was meant to complement and not replace income-based types of poverty assessment measurements.

OPHI created an equally weighted index for measuring poverty through identification of the number of deprivations that the poor suffer from. The resulting measures aggregate information to reflect societal poverty in a way that can be broken down by regions, groups and, importantly, can be broken down by dimension and indicator to show how people are poor and how they lack access to basic rights and services. OPHI has proposed using the Alkire-Foster[7] method to create a Multidimensional Poverty Index 2.0 for the post-2015 MDGs, as a headline indicator of multidimensional poverty that can reflect participatory inputs and still be easily disaggregated.

5. The Grameen Foundation's Progress out of Poverty Index (PPI)

The Progress out of Poverty Index is a poverty measurement tool comprised of a country specific survey with 10 simple, easy-to-answer multiple-choice questions. Each question has a point value associated with the potential answers. The point values are added up and this value is used to obtain a poverty score. An accompanying look-up table is then used to convert the poverty score to a probability that the given beneficiary is below a reference poverty line. Averaging these likelihoods for a group and considering the sample size, a likely poverty rate can be estimated for the group in question.

The PPI is constructed by identifying the 10 questions that will constitute the survey on the basis of a logit regression analysis of a country's national household income or expenditure survey to identify the indicators that are most predictive of poverty. These indicators are then converted into a question format for the survey. The regressions estimate the power of each question/indicator to predict the financial poverty level of a respondent.

Among the criteria for the indicators that are chosen is that they are easy to verify by a surveyor and simple to answer. Importantly, they are also subject to measurable change over time. Asking about education level of the head of the household will often result in a useful indicator for poverty (provided that educational levels are correlated to poverty in that country) but is not always included since this indicator will likely not show much change over time, even if the beneficiaries are improving their socioeconomic status. Likewise, the PPI

[7] Alkire and Foster developed the method to usefully aggregate other types of deprivations that the poor suffer from. More here: http://www.ophi.org.uk/research/multidimensional-poverty/alkire-foster-method/

surveys do not ask the values of expenditures, rather the questions often ask about the presence of household goods or the availability of certain services.

The chosen indicators are then verified for their ability to predict the poverty level by testing them using national survey data that was not used in the construction of the PPI survey. The results of the tests and scorecard creation are available for each country.[8] For every country where other Poverty Assessment Tools are available, PPI documentation shows the tests of these other Poverty Assessment Tools compared to the PPI. Most of the other tools do not document the exact methods of their comparison.

Mark Schreiner of Microfinance Risk Management, developer of this tool, has emphasized that a significant intention is to ensure its ease of adoption and simple usability for broad uptake. In particular he highlights the use of categorical indicators (presence of items) rather than numerical indicators (cost and values), and the scoring is calculated using whole number increments. The PPI score is then used to find the appropriate poverty rate – often multiple rates are available for comparison. The PPI score is a range from 0 to 100, and the poverty rates are given as the probability that the individual is below the chosen poverty line. When using the score for a group, the probabilities of each individual are averaged for the group's poverty rate.

Empirical Reviews of Poverty Assessment Tests

There are few examples in referenced, published journals that attempt to compare the different tools. A direct comparison of each is a difficult proposition, as they have been created from distinct sources and methods and cannot be easily compared directly. However the Poverty Assessment Tools that use the same source data (LSMS or other type of national surveys) can be more readily compared. Recently in El Salvador a study by the University of California took a sampling of the beneficiaries of a Catholic Relief Services project and applied three different Poverty Assessment Tools: the Progress out of Poverty Index, the USAID/IRIS Poverty Assessment Tool, and the OPHI Multidimensional Poverty Index and compared accuracy[9] against the national poverty levels.

[8] See www.microfinance.com

[9] Janet, Brendan Scott (2008). The Accuracy, Precision, and Implementation Challenges of Three Different Poverty Measurement Tools in El Salvador and Guatemala. Agricultural Economics Masters Thesis, University of California, Davis.

The study found that single dimension poverty tools (PPI and PAT) are both reasonably accurate when applied to nationally representative samples, but their accuracy can vary greatly when applied to non-nationally representative samples (areas and sub-regions). Using different definitions of poverty (single dimension tools like PPI and PAT versus multidimensional MPI) will identify different households as poor. However, it is not yet clear under which scenarios each tool will provide the most accurate representation of poverty. The multidimensional poverty index certainly provides more context through the inclusion of other dimensions but its distinct and more complex approach would require substantially more in-depth work. The researcher thus focused comparison on the PPI and PAT. He concluded that both the PPI and PAT provided good estimates of poverty, but the author recommended the PPI over the PAT in terms of accuracy and ease of use.

When using a specific poverty cut-off score (for targeting beneficiaries), the PPI was more accurate than the PAT. In samples that were nationally representative, both tools provided similarly accurate estimates. The PPI however was found to be more "field ready" and easier to implement. Additionally, the amount of literature available for each country specific PPI (available at www.progressoutofpoverty.org and www.microfinance.com), makes the PPI much more transparent and open to use. For these reasons, and that the PAT is no longer being updated, the PPI is the superior single-dimension poverty measurement tool.

Choosing a PAT to complement the COSA tool

COSA wanted to complement its survey by adding a poverty assessment tool that would seamlessly blend in with the existing structure of its detailed farm-level surveys. COSA already had a number of different indicators for poverty: income (both farm and off-farm); education level of the household; household assets, farm assets, living standards such as smoke ventilation in cooking area and access to clean drinking water, and food security (see Appendix 1). While these can be constructed to give a good representation of poverty, they do not directly measure poverty on a consumption basis and are limited in their relation to national poverty levels or global poverty lines. COSA measures of poverty do not readily map to other indices so adding a PAT to the COSA indicators provides a link to the broader policy discussions and, in turn, COSA can offer those discussions a more granular level of detail that provides access to the specific areas of intervention that would be most likely to make a difference to a farming household.

A significant consideration in integrating a separate PAT was how it would fit into the existing system that COSA uses of indicators, the survey, electronic data collection application, and the system of queries to access that data consistently. Finding a tool that can be readily applied during a brief farm visit and that will be continuously available (supported) were strong priorities for the selection. Based on these criteria, COSA chose to focus on the Grameen Foundation's Progress out of Poverty Index tool to pilot with the COSA surveys and to also try the OPHI MPI.

The PPI surveys for each country are readily available with full documentation on construction and scoring. At present, the PPI is available in 58 countries. Within the COSA platform, it is a matter of adding separate new sections for each PPI within the survey builder platform. This gives the user the ability to select and add the PPI as needed to a survey. Within the platform, individual queries are written and then tested for each PPI survey that will automate the scoring of each survey and reduce user error. This means that for every new country in which the PPI will be added to existing COSA surveys it requires some time for the set up but after initial configuration, and the additional training of surveyors, the data collection and analysis become a seamless part of the existing COSA workflow.

COSA began testing the PPI with some limited trials in farmer surveys for a cocoa project in Nicaragua, in collaboration with IFC and Ecom Agroindustrial Company. The testing involved using the Nicaraguan PPI, loading the survey into the system and creating queries for the data. After initial learning about the PPI and the success of some small pilots, COSA began to incorporate the use of PPI into the larger scale implementations. Now, it is beginning to use the PPI to not only provide context for the regions where it is working but also to supplement and validate the results of its indicators such as net income.[10] To date, COSA has utilized the PPI in collaboration with Root Capital's evaluation of cooperatives and microfinance in Guatemala; in the impact assessment of a leading multinational firm in southern Mexico; in an assessment of cocoa growers in Colombia; and in the evaluation of a credit program in Peru (ongoing). Additionally, the OPHI MPI for Colombia was included in the survey in order to facilitate a comparison of the OPHI.

[10] This comprehensive indicator for economic sustainability takes into account yield, prices, and cost of production.

II. Comparing PPI to COSA economic indicators

In this section we present some of the tests and analyses of the findings, first looking at the relationship between the PPI and COSA's standard economic indicators. We then look in more detail at how the PPI can provide context in the reports. Integrating the PPI more completely with COSA indicators is in process, but the addition of the PPI has already facilitated communication of the poverty levels of various participants.

Integrating the PPI into COSA implementations is intended to complement the current economic indicators that COSA uses. COSA principally measures the farmer's economic situation through net income and total household revenue (other measures relevant to poverty are noted in Appendix 1). COSA's net income indicator is described as *total revenue from focus crop sales less total costs for focus crop production.* Household revenue is *combined revenue from focus crop sales, other crops, other earnings (off farm, services, business revenue, and land & equipment rental), and gifts & remittances*. Net income is calculated using amounts sold and prices from the target crop (currently coffee and cocoa) and the cost of production for this crop. Household revenue requires recall and estimations of income from non-farm sources and of other members of the household. Net Income provides an indicator to analyze the economic viability and sustainability of the cultivation of the focus crop, while household revenue allows COSA to understand the diversification of income for the beneficiaries and the risk of depending solely on the target crop. While neither strictly provides an indicator of poverty per se, they do suggest the socioeconomic status of the beneficiary.

Mark Schreiner, the developer of the PPI, has stated that comparisons of other poverty indicators against the PPI are necessarily imperfect as these different poverty tools are built from different data and approach poverty from different perspectives and definitions.[11] The PPI scorecard is constructed with and measures consumption expenditures and thus measures one definition or aspect of poverty, which differs from how COSA has measured and described the indicators of poverty from multiple dimensions. In an ideal scenario, the correlation between the PPI and COSA economic indicators point in the same direction, but an absence of a correlation does not necessarily invalidate either approach. Since it is designed to align with national census averages in most cases it will not always pick up the specific poverty aspects experienced in a

[11] Personal communication with Mark Schreiner, 18 November, 2013

smaller sample such as a sub-national region if these aspects vary from the national tendencies.

Therefore, we explore the correlation between COSA economic indicators and the poverty rates provided by the PPI as a heuristic exercise and seek to learn how the PPI can enrich our understanding of other key indicators. The overall goal is to improve the accuracy of COSA assessments and the contextual validity of those results.

For the purposes of this comparison, we primarily use data gathered from two[12] COSA smallholder implementations for two crops in Mexico and Colombia. For each country we present the comparisons with the economic indicators first, and then we use the poverty rates from the PPI to look at other relationships between poverty and indicators in other thematic areas.

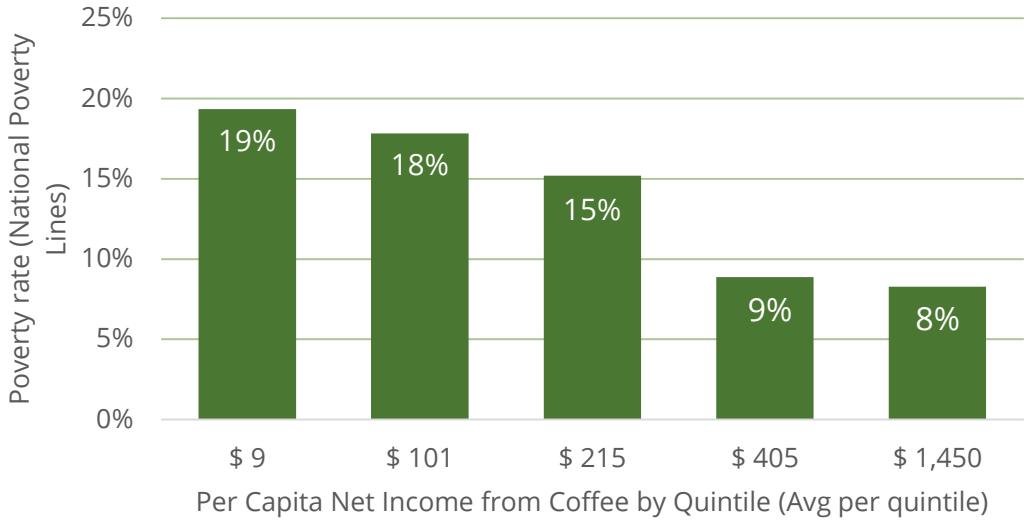
Mexico Implementation

The Mexico implementation was an evaluation of the certification project of a leading multinational firm conducted in a rural region in southeastern Mexico (Veracruz). The evaluation was funded by IFC, who asked COSA to take the baseline and midline data compiled by a COSA Research Partner organization and complete the impact assessment. The PPI for Mexico was incorporated into this final survey instrument and was implemented with 300 households, comprising both treatment and control groups.

The first comparison we show for Mexico is between net income from the focus crop and the poverty rate as calculated by the PPI. The PPI is constructed using national databases and even though this was not a nationally representative sample, we see that there is a correlation between the net income from coffee and the expected poverty rate calculated by PPI of each group when using net income per capita and dividing the groups into quintiles.

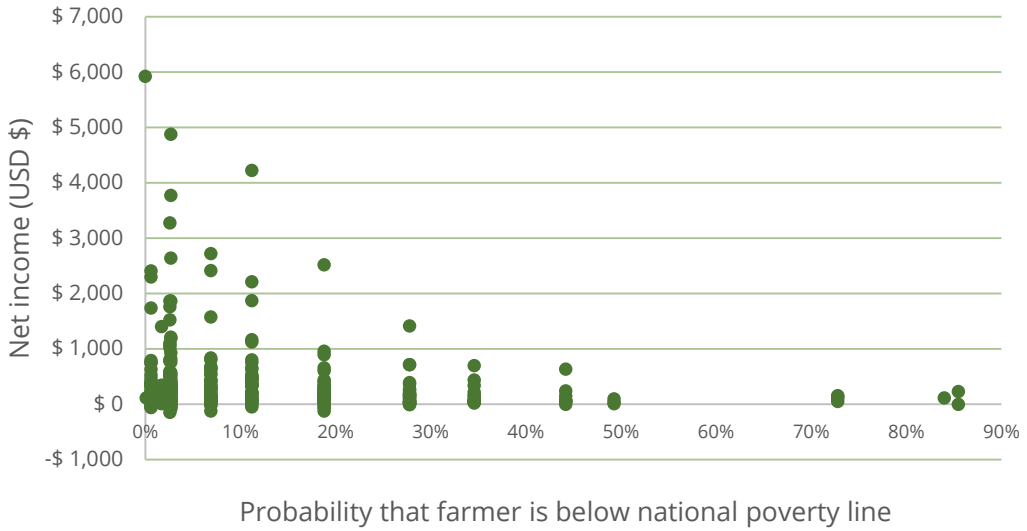
[12] Field work for the other pilots with the PPI wrapped up in December 2013 and the data was not yet available for this report

Figure 1: Mexico - National Poverty rate versus Per Capita Net Income from Coffee



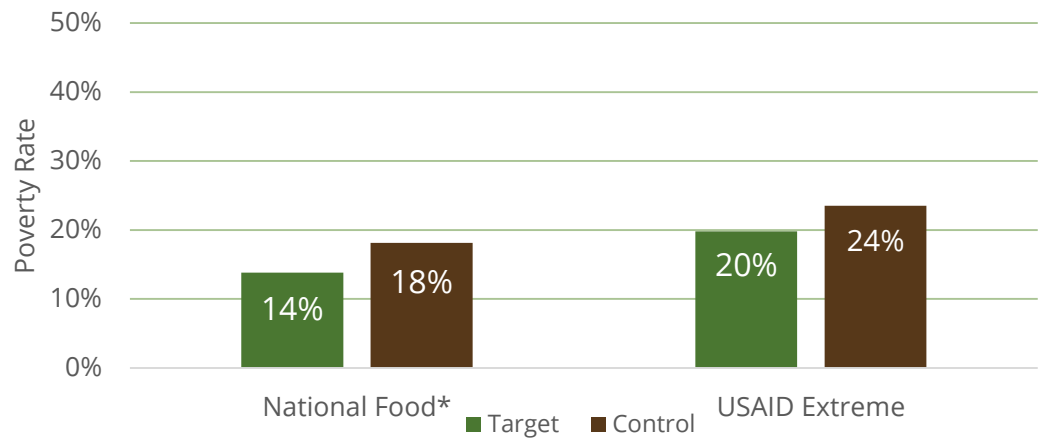
When viewed on an individual level (Figure 2), the correlation is clearer but also exposes interesting exceptions. Looking more closely at the data, there are a number of individuals who have relatively low per capita net incomes of less than US$1,000 and surprisingly also have low probabilities of being poor. The imperfect correlation to the expected PPI range could be caused by normal distributions of the data or factors such as that the household had other large sources of unreported income or that these are exceptions that occur naturally when a sample is not nationally representative.

Figure 2: Mexico - Individual per capita net coffee income and probability of being poor



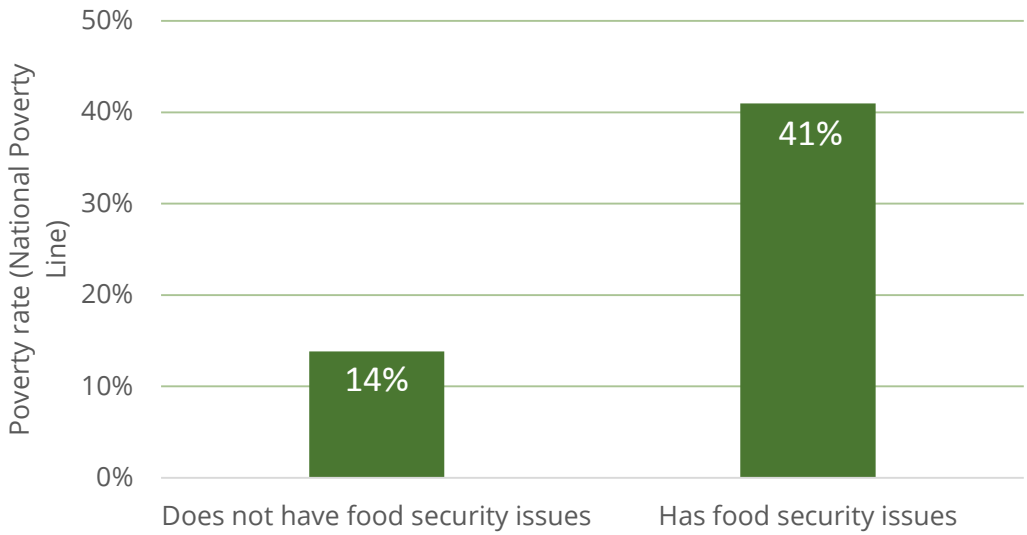
To further understand the context, the PPI was used to look at the differences of poverty rates between the target and control farmers and then to see how that matched food security findings. In the selection of control and treatment farmers, Propensity Score Matching techniques were used to ensure that the groups were well matched. Generally speaking, the target farmers in the sample are a bit less likely to be poor. Using the Mexican national food poverty line, target farmers had a 14% poverty rate compared to 18% of control farmers (this difference is significant at the 90% level). When the USAID's Extreme Poverty Line is used, there is a 4% difference in the poverty rates between the groups, but this difference is no longer significant. Since we only have the PPI data for the final evaluation, we cannot attribute the difference to participation in the project.

Figure 3: Mexico evaluation, coffee - Poverty rates of control and treatment group



One of the clearest relationships is that between poverty and food security. While there were not many respondents in Mexico who were identified as having long periods of food insecurity, those that did report food insecurity had a much higher poverty rate than those that did not have any periods of food insecurity. In other words – of the farmers (both control and treatment) that reported having periods of food insecurity, they collectively had a poverty rate of 41% (using the Mexican National Poverty Line), whereas the farmers who did not report any food insecurity have a poverty rate of 14%.

Figure 4: Mexico evaluation - Food security and poverty rate

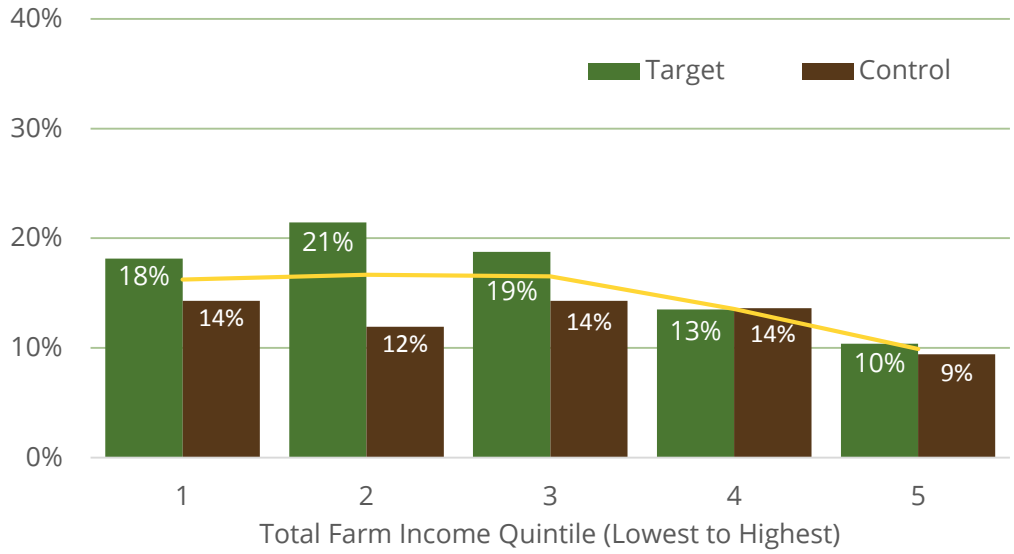


Cocoa in Colombia

As part of a donor evaluation for a training and technical assistance project for cocoa producer organizations in the south and northeast of Colombia, COSA deployed the PPI as a part of our Producer Survey with 960 producers (target and control). As depicted in Figure 5, there is a clear correlation between our measures of crop net income[13] and the PPI measures. It shows reduced likelihood of poverty among cocoa producers who have higher net cocoa incomes. When we estimate overall producer incomes and arrange them by quintiles, we can see that the PPI, using a different, broader indicator still returns a similar overall finding. The correlation is certainly not always clearly evident across the individual samples.

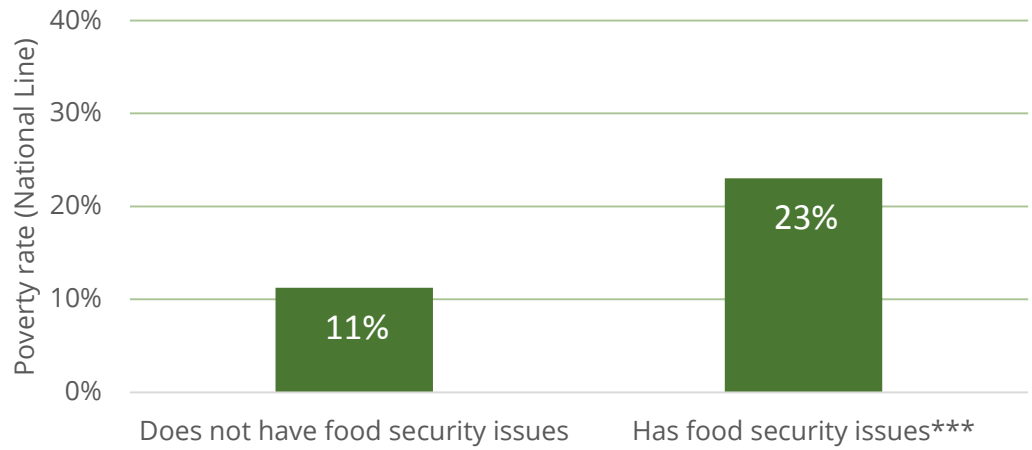
[13] Crop net income for small farmers tends to correlate to overall income when the crop is the primary focus of the farm, as it is in most of the evaluations noted in this report.

Figure 5: Colombia evaluation - Net income quintiles versus poverty rate (treatment, control and average) of participants in program



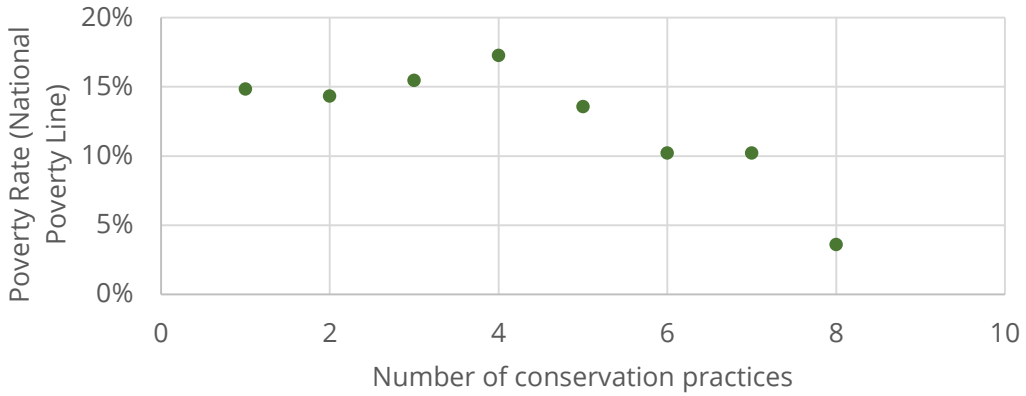
Similar to the results seen previously in Figure 4 for Mexico, there is a clear relationship between those identified as having food insecurity and the poverty rate calculated by the PPI. Those that are food insecure have a higher poverty rate (as defined by the national food poverty line) than those that are not for both targets and controls. For Colombia, the poverty rate for those that have identified as having food security issues is 23% versus 11% for those that had none (Figure 6).

Figure 6: Colombia evaluation - Food insecurity and poverty rate



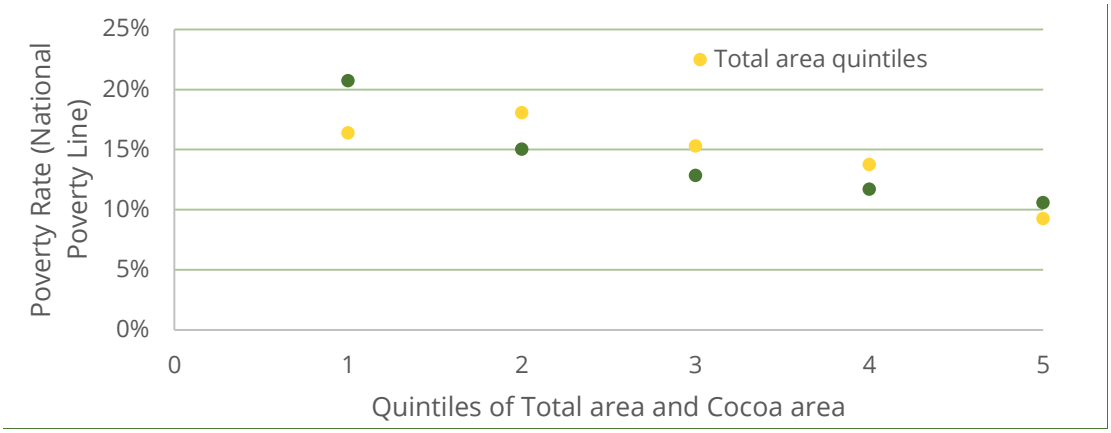
Environmental degredation and poverty are two rural issues that appear to be linked in the Colombia work, though not necessarily in a causal way. The data from Colombia (Figure 7) shows that farms that utilized a higher number of environmentally sound management practices were less likely to be poor than those that did not have as many environmental practices. While further information is required to determine if poor farmers have adequate information about the benefits of good environmental practices to make appropriate decisions, the correlation between the two issues is clear.

Figure 7: Colombia evaluation - number of environmental practices vs. poverty rate



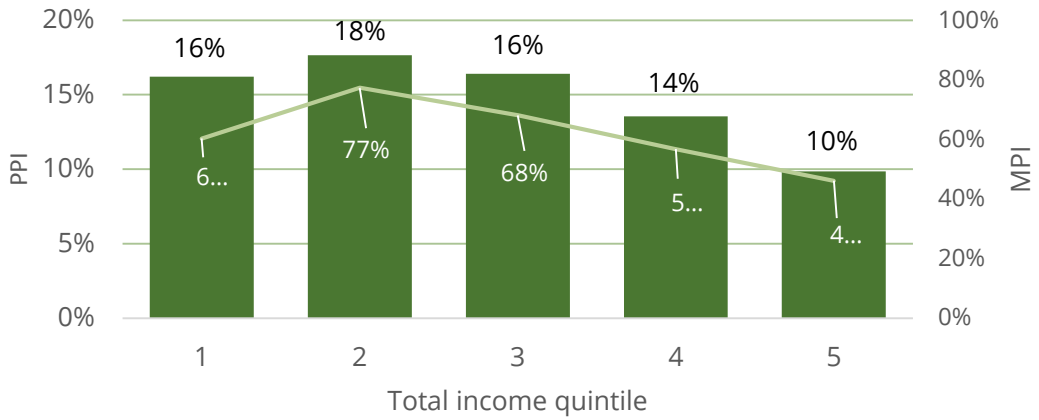
This piece of data shows a fairly intuitive comparison. In Colombia, the farmers that had greater amounts of land were less likely to be poor. This is especially true for land cultivated with cocoa, the dominant legal cash crop for the regions that were surveyed. Farmers that have smaller plots of land planted to the target crop are not diversifying into other crops and are more likely to be poor. These are the farmers that could be ideally targeted for productivity or efficiency improvements.

Figure 8: Colombia evaluation - land area vs. poverty rate



The final comparison presented in the work done in Colombia is the comparison of the OPHI MPI and the PPI across the total income quintiles. At first glance it may seem that the MPI and the PPI are at odds with the poverty rates for the farmers grouped by income quintile. However, there is a measure of correlation and it is important to note that each index has its own reference point. The PPI is referring to the National Food Poverty Line, while the MPI is its own sui generis reference point. The MPI is different from the PPI because it includes the following indicators: Education of family members, Childhood and youth conditions, Labor, Healthcare, Public services and house conditions. Each of these indicators carries an equal weight in calculating the overall MPI score.

Figure 9: Comparison of MPI to PPI across income quintiles in Colombia



Colombia has a national MPI score of 35%[14], and so these groups of farmers are significantly poorer by this index than the national average. The PPI for Colombia[15] only has partial overlap with 2 of these categories, or would comprise approximately 20% of the score. The difference that is observed is in how the poverty rates are interpreted. The PPI was used to calculate the national food poverty rate, which is only a small component in the more holistic measurement of poverty used by the MPI.

The PPI and MPI appear to be quite different but at one general level, the two indices are in agreement as both show a decreasing relationship between poverty rate and the income quintile groups, and both relate the second quintile as more likely to be poor than the first quintile. The first quintile, with the lowest total income has a lower poverty rate than the second quintile. Total income for the quintile classifications is calculated from both the income from the sale of the main crop (cocoa) plus the other household and off-farm income. The data shown here is compiled from three different Colombian departments. Focusing on the first and second quintiles, while the difference in the poverty rate calculated by the PPI is not significantly different (16% to 18%), the MPI is substantially so, from 77% to 60%. One potential interpretation is that the first quintile and second income quintiles may have similar levels of poverty as defined by income, yet there are public services or other opportunities available to this first group that are not available to those in the second quintile. The rest of the income comparison shows decreasing poverty with increasing income, which is the correlation that is expected.

The limited exposure that COSA has had with the PPI assessment tools has been positive to date. Incorporating the PPI country surveys into COSA impact assessment surveys has been successful. Within the COSA platform, queries have been coded to provide the PPI score and the probabilities of alignment to the national poverty lines in addition to the $1.25 and $2.50 lines. Initial feedback from clients has been limited but all positive, as using the PPI has provided a simple and quick way of classifying and even comparing the beneficiaries to the control population. For COSA, we continue to explore ways to better report and present this data, to identify how the poverty data provided by the PPI works with and improves the information presented by our indicators, and how we can use the PPI to track participants' status over time.

14 See http://www.ophi.org.uk/policy/national-policy/colombia-mpi/ for the Colombian government's use of the MPI.
15 http://www.microfinance.com/English/Papers/Scoring_Poverty_Colombia_2009_EN.pdf

Future questions

Given the transparency and the documentation of the PPI, there is little doubt that as a practical and easy to deploy Poverty Assessment tool there are few peers. However, in reviewing the applicability of the PPI for use in assessment of the poverty status of rural farmers in global supply chains, questions are raised about the necessary scale of sampling.

The PPI is created and verified using a national data set. In other words, for the PPI to be the most accurate, a nationally representative sample is needed. Many investigations of farmers and sustainability initiatives are limited to geographic regions and specific rural locations, whose populations are not nationally representative. In the PPI documentation, and in a recent conversation, Mark Schreiner suggests that the accuracy of the PPI would drop in cases where the PPI is applied to a subgroup. Using a power analysis to determine the minimum sample size for the 2005 PPI for Nicaragua, estimates for poverty rates with a .90 confidence level and a confidence interval of +/- 3%, requires sample size of 339 farmers. It also requires the assumption that these 339 farmers are representative of the national sample. While smaller samples are likely to reduce the statistical accuracy of the poverty rate for these groups, they can still be tracked over time utilizing the PPI.

Reviewing the COSA indicators on poverty (Appendix 1) there are a few indicators that do not overlap with the commonly used questions engaged for the construction of the PPI. Living standards (smoke ventilation in cooking area and access to clean drinking water) and Food Security are two of the most obvious. These two indicators are a standard part of any COSA implementation and could be used by the PPI implementers to provide some depth and a more granular understanding of poverty to the consumption-based poverty rates provided by the PPI. However, where considerable detail is preferred and where having easy comparability is not desired, then the OPHI MPI can be incorporated in situations where the project requires a holistic view of poverty.

III. Next steps

Advancing the work of COSA with the PPI

COSA endeavors to work with time series data and counterfactuals. Very simply, data is gathered at the baseline, before an intervention or investment is made, then captured again after sufficient time has passed to determine the results of such interventions and compare to a similar control group over the same period. The changes captured in the data over time provide the basis for an assessment of the impact of the intervention. As of this report, we did not have any time series data for the PPI in any of the implementations. Adding the ability to look at and track changes in poverty status over time, in parallel with changes for other COSA indicators, will reveal future ways in which COSA might incorporate the poverty data provided by the PPI and use it for learning, monitoring, and evaluation of results. Presently, we also have PPI data for 1000 households in Peru and will be tracking the PPI over the course of that implementation with our partners there, the InterAmerican Development Bank and the Sustainable Commodity Assistance Network. We will be gathering another series of this data in late 2015 and hope to determine the outcomes of the program on the poverty levels of the beneficiaries using a blended COSA-PPI approach that combines PPI national relevance with COSA local relevance. We will also share these lessons with the Grameen Foundation.

Other indices and tools

The COSA platform offers the opportunity to provide a testing ground for the integration of diverse tools and indices with the comprehensive farm household assessment that COSA and dozens of its partner institutions already employ. The experience with the PPI and the modular nature of the COSA platform allows us to provide valuable feedback. Developers of similar tools and indices can design and create discrete modules that can be repeatedly tested and improved utilizing established COSA indicators and tools. COSA supports such collaborations to provide an ever improving and common platform for enhancing our reporting and understanding of the key issues surrounding agricultural sustainability and rural poverty.

IV. Appendices

Appendix 1. COSA Indicators that are Typically Directly Relevant to Poverty

Indicator name	Description
Producer net income from focus crop	Total revenue from focus crop sales less total costs for focus crop production
Household revenue*	Combined revenue from focus crop sales, other crops, other earnings (off farm, services, business revenue, and land & equipment rental), and gifts & remittances
Production/labor efficiency	Kg crop produced per unit of input (fertilizer, herbicide, fungicide, pesticide, paid labor day, unpaid labor day)
Producer characteristics	Age of decision maker (producer) responsible for the focus crop, grades of school completed, gender, years of experience growing focus crop
Smoke ventilation in cooking area	Whether or not a vent or chimney is used to eliminate indoor smoke
Food Security	The ability of all members of a farm household to obtain adequate nutrition in a culturally appropriate and satisfying way each day.

Appendix 2. PAT for Nicaragua

Survey Number _____

Client Assessment Survey - Nicaragua

Interviewer: **Text in bold** should be read aloud. *Text in italics* are instructions and should not be read aloud.

You should use probing questions if necessary to elicit responses to all questions. If, however, a response is still not forthcoming, the following codes should be used: 99 - not applicable; 98 - no response given.

Fill out the information below before the survey begins. Do not ask the respondent for this information.

Date of Interview (dd-mm-yyyy)		Quality Control Checks
Interviewer (code)		Field Supervisor
Branch (code)		Date_____ Initials _____
Region	*1 □ Managua*	Headquarters
	2 □ Pacifico	Date_____ Initials _____
	3 □ Atlantico	Data Processor
	4 □ Central	Date_____ Initials _____
Client Location	*0 □ Urban*	
	1 □ Rural	
Months in Program		
Client or ID #		

Hello. My name is ___. I work for the organization ___. We are conducting a survey to learn a little bit more about the clients we work with. My records indicate that [name**] is the main point of contact between [**organization**] and your household. May I please speak to [**name**]?**

If person is desired respondent, read only the instructions marked 2.

If person is NOT desired respondent, read both 1 and 2 when desired respondent is located.

1. **Hello. My name is ___. I work for the organization ___. We are conducting a survey to learn a little bit more about the clients we work with. My records indicate that you are the point of contact between [**organization**] and your household.**

2. **The interview should only take about 20 minutes and your answers will be put together with answers from other households. All of your answers are completely confidential and your name will not be given with your answers. Are you willing to answer these questions today?**

After he/she agrees, proceed with the text below.

First, I would like to ask you about your household. Let me tell you what we mean by 'household.' For our purposes today, members of a household are those that usually live and eat together in this dwelling. It should include anyone who has lived in your house for 6 or more of the last 12 months, as well as the person you identify as the head of household if he or she has been absent for more than 6 of the last 12 months and infants under 6 months of age who normally live and eat here. Do you have any questions about that?

Answer any questions the respondent has before proceeding.

Now I would like you to identify each person in your household and answer some basic questions about each person. Let's start with the names of each person in your household. Shall I identify you as [name**]?**

If the respondent is reluctant to provide his or her name or those of others in the household, record relationships instead (ex: Respondent, Husband, etc).

Use row 1 for respondent.

Are you the head of the household or is someone else?

If not the respondent, record the Head of Household's name next, then continue filling in column A with each household member before asking questions in the remaining columns.

	A. **Household Member's Name**	B. **Is [NAME] female or male?**	C. **What is the relationship of [NAME] to [HOUSEHOLD HEAD]?**	D. **How old is [NAME]?**	*E. Ask only if age 7 or older* ***What is the highest diploma, certificate, or degree*** *[name]* ***has obtained?***
1.					

Survey Number _____

	Female .... 0 Male 1	Head ..... 1 Spouse/partner ..... 2 Son/Daughter ..... 3 Parents/parents-in-law ..... 4 Son/Daughter in law ..... 5 Grandchild/Great grandchild .. 6 Sister/Brother ..... 7 Other relatives of head ..... 8 Unrelated ..... 9 Domestic Worker ..... 10 Pensioner 11	(complete years) If less than one year old, write 0.	None ..... 0 Preschool ..... 1 Adult Education ..... 2 Primary School ..... 3 Secondary School..... 4 Basic Technical ..... 5 Intermediate Technical School ..... 6 Teacher Training ..... 7 Superior Technical ..... 8 University ..... 9 Masters ..... 10 Doctorate ..... 11 Special Education 12
1)				
2)				
3)				
4)				
5)				
6)				
7)				
8)				
9)				
10)				
11)				
12)				
13)				
14)				
15)				

Now, I would like to ask you a few questions about your home.

2. **How many rooms does the household have?**
   (Do not include bathrooms, corridors, garages and the kitchen.) ☐ *enter number*

3. **Where does this household obtain most of its water?**
   1 ☐Pipe inside the house
   2 ☐Piping outside house but on property
   3 ☐Public place
   4 ☐Public or private well
   5 ☐Water hole, spring
   6 ☐River, stream, creek
   7 ☐Tanker truck
   8 ☐Lake or pond
   9 ☐Another home, neighbor, business
   10 ☐Other

4. **What is the primary source of lighting used by this household?**
   1 ☐Electric power network
   2 ☐Plant, electric generator
   3 ☐Solar panel
   4 ☐Car battery
   5 ☐Kerosene gas
   6 ☐Candle
   7 ☐Pine (ocote)
   8 ☐Other
   9 ☐None

5. **What type of fuel is usually used for cooking?**
   1 ☐Firewood
   2 ☐Butane or propane gas
   3 ☐Coal or charcoal
   4 ☐Kerosene
   5 ☐Electricity
   6 ☐Other
   7 ☐No kitchen

Survey Number _____

6. **How is most of the garbage disposed of in this household?**	*1 □Garbage truck* *2 □Authorized container or dumpster* *3 □Burning* *4 □Burying* *5 □Dumped in field, vacant lot, river, street* *6 □In a field, vacant lot or waterway* *7 □Pay to throw away* *8 □Used as compost* *9 □Other*
7. **What type of toilet facility is used by your household?**	*1 □Untreated toilet or latrine* *2 □Treated toilet or latrine* *3 □Connected to sewage pipes* *4 □Connected to septic tank* *5 □River or creek* *6 □None*
8. **What is the primary material used in the exterior walls of the dwelling?**	*1 □Concrete blocks* *2 □Quarry stone* *3 □Reinforced concrete* *4 □Concrete Slab* *5 □Covintec panels* *6 □Gypsum* *7 □Laminated plycem, nicalit* *8 □Concrete and wood (minifalda style)* *9 □Concrete and other material* *10 □Clay brick or block* *11 □Adobe or Wattle & Daub* *12 □Wood* *13 □Zinc* *14 □Bamboo, barul, cane, or palm* *15 □Rubble or debris* *16 □Other*
9. **What is the main construction material used for the floor of your dwelling?**	*1 □Cement brick, mosaic, terrazzo, or ceramic* *2 □Pavement or concrete* *3 □Mud brick* *4 □Log* *5 □Earth* *6 □Other*

Next, I would like to ask you about farming and animal raising activities.

10a. **During the last 12 months, did any members of your household raise or tend any cattle?**	*0 □No* *1 □Yes*
10b. **How many cattle do you currently have?**	☐ *number or "0" if 11a response was "0"*
11a. **Does your household own any small tools used for agriculture or forestry?**	*0 □No* *1 □Yes*
11b. **How many small tools used for agriculture or forestry does your household own?**	☐ *number or "0" if 12a response was "0"*

Look over the survey to see if you have missed any questions, then end the interview.

Those are all the questions I need to ask you today. Thank you for your time and effort in completing this survey.

Appendix 3: PPI for Colombia

PPI® Scorecard for Colombia

Entity	Name	ID	Date (DD/MM/YY)
Member:			Joined:
Field agent:			Today:
Service point:			Household size:

Indicator	Value	Points	Score
1. How many household members are 18-years-old or younger?	A. Four or more	0	
	B. Three	5	
	C. Two	11	
	D. One	17	
	E. None	23	
2. What is the highest educational level reached by the female head/spouse?	A. None, or pre-school	0	
	B. Primary or middle school	3	
	C. High school	6	
	D. No female head/spouse	8	
	E. Post-secondary or college (1 to 4 years)	9	
	F. Post-secondary or college (5 years or more)	17	
3. How many household members spent most of the past week working?	A. None	0	
	B. One	9	
	C. Two or more	14	
4. In their main line of work, how many household members work as wage or salary employees for a private firm or the government?	A. None	0	
	B. One	4	
	C. Two or more	11	
5. What is the residence's rate class for electricity?	A. No class or zero (no connection, pirated connection, or generator), one, or two	0	
	B. Three	4	
	C. Four, five, or six	9	
6. What fuel or energy source does the household usually cook with?	A. Firewood, wood, charcoal, coal, electricity, gasoline, petroleum, kerosene, alcohol, or waste material	0	
	B. LPG from a cylinder or tank	2	
	C. Natural gas from a public network	3	
	D. Does not cook	6	
7. Does the household have a working clothes washing machine?	A. No	0	
	B. Yes	4	
8. Does the household have a working refrigerator or freezer?	A. No	0	
	B. Yes	3	
9. Does the household have a working DVD?	A. No	0	
	B. Yes	4	
10. Does the household have a motorcycle and/or a car for its own use?	A. None	0	
	B. Motorcycle only	3	
	C. Car (regardless of motorcycle)	9	

By Mark Schreiner of Microfinance Rish Management L.L.C., developer of the PPI. Score:

This PPI was updated in November 2012 based on data from 2009. For more information about the PPI, please visit www.progressoutofpoverty.org

The following lookup tables convert PPI scores to the poverty likelihoods below each of the poverty lines.

PPI Score	USAID Extreme (%)	$1.25 2005 PPP (%)	$2.50 2005 PPP (%)	$3.75 2005 PPP (%)	$5.00 2005 PPP (%)
0-4	88.8	62.8	90.7	96.2	96.2
5-9	83.0	49.8	84.7	97.6	99.9
10-14	78.8	46.1	84.5	94.8	97.3
15-19	63.9	28.4	67.8	90.5	97.3
20-24	51.8	19.6	56.5	81.6	91.7
25-29	40.2	12.8	43.2	68.4	83.6
30-34	27.6	7.4	29.3	56.3	73.7
35-39	16.3	3.8	17.9	39.8	59.2
40-44	9.9	2.3	10.4	25.3	42.3
45-49	4.9	1.3	5.1	14.4	28.6
50-54	2.2	0.6	2.5	6.7	16.0
55-59	1.2	0.4	1.1	3.3	8.2
60-64	0.7	0.3	0.6	1.3	3.9
65-69	0.2	0.0	0.2	0.8	1.8
70-74	0.0	0.0	0.3	0.2	0.6
75-79	0.0	0.0	0.1	0.2	0.3
80-84	0.1	0.1	0.1	0.1	0.1
85-89	0.0	0.0	0.0	0.0	0.0
90-94	0.0	0.0	0.0	0.0	0.0
95-100	0.0	0.0	0.0	0.0	0.0

Source: Microfinance Risk Management, L.L.C. Based on Colombia's 2009 Encuesta Integrada de Hogares.

Appendix 4: Global OPHI MPI

Oxford Poverty and Human Development Initiative (OPHI)

www.ophi.org.uk
Oxford Dept of International Development,
Queen Elizabeth House, University of Oxford

Country Briefing: Nicaragua

Multidimensional Poverty Index (MPI) *At a Glance*

For an explanation of the MPI and details of the resources available in the MPI Data Bank, please see the last page of the briefing.

This Country Briefing presents the results of the Multidimensional Poverty Index (MPI) and explains key findings graphically. More information, international comparisons and MPI resources are available at www.ophi.org.uk/multidimensional-poverty-index/.

The MPI was constructed by OPHI for UNDP's 2013 Human Development Report (http://hdr.undp.org/en/).

Please cite this document as: Oxford Poverty and Human Development Initiative (2013). "Nicaragua Country Briefing", Multidimensional Poverty Index Data Bank. OPHI, University of Oxford. Available at: www.ophi.org.uk/multidimensional-poverty-index/mpi-country-briefings/.

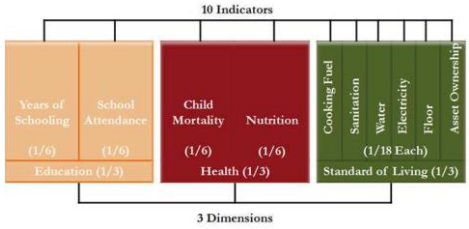
For information on the original MPI methodology, see the revised paper, Alkire, S. and Santos, M.E. (2013), "Measuring Acute Poverty in the Developing World: Robustness and Scope of the Multidimensional Poverty Index", OPHI Working Paper 59. Available at www.ophi.org.uk/wp-content/uploads/ophi-wp-59.pdf.

For information on updates that took place in 2011, see Alkire, S., Roche, J.M., Santos, M.E. and Seth, S. (2011), "Multidimensional Poverty Index 2011: Brief Methodological Note". Available at: www.ophi.org.uk/wp-content/uploads/MPI_2011_Methodology_Note_4-11-2011_1500.pdf.

For information on updates that took place in 2013, see Alkire, S., Conconi, A. and Roche, J.M. (2013), "Multidimensional Poverty Index 2013 : Brief Methodological Note and Results". Available at: www.ophi.org.uk/multidimensional-poverty-index/.

Inside the MPI

The MPI has three dimensions and 10 indicators, which are shown in the box below. Each dimension is equally weighted, each indicator within a dimension is also equally weighted, and these weights are shown in brackets within the diagram.



Country Profile — Nicaragua-DHS-2006

Country: Nicaragua **Year:** 2006 **Survey:** DHS

Region: Latin America and Caribbean

Multidimensional Poverty Index (MPI)

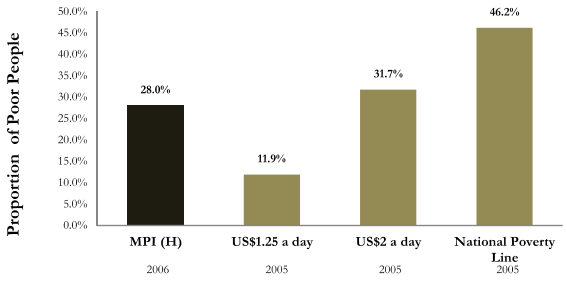
The MPI reflects both the **incidence** or headcount ratio (H) of poverty – the proportion of the population that is multidimensionally poor – and the average **intensity** (A) of their poverty – the average proportion of indicators in which poor people are deprived. The MPI is calculated by multiplying the incidence of poverty by the average intensity across the poor (H×A). A person is identified as poor if he or she is deprived in at least one third of the weighted indicators. The following table shows the multidimensional poverty rate (MPI) and its two components: incidence of poverty (H) and average intensity of deprivation faced by the poor (A). The first and second columns of the table report the survey and year used to generate the MPI results. Those identified as "Vulnerable to Poverty" are deprived in 20% - 33% of weighted indicators and those identified as in "Severe Poverty" are deprived in 50% or more.

Survey	Year	Multidimensional Poverty Index (MPI = H×A)	Percentage of Poor People (H)	Average Intensity Across the Poor (A)	Percentage of Population Vulnerable to Poverty	Percentage of Population in Severe Poverty
DHS	2006	0.128	28.0%	45.7%	17.4%	11.2%

Comparing the MPI with Other Poverty Measures

Chart A compares the poverty rate using the MPI with three other commonly used poverty measures. The height of the first column denotes the percentage of people who are MPI poor (also called the incidence or headcount ratio). The second and third columns denote the percentages of people who are poor according to the $1.25 a day income poverty line and $2.00 a day line, respectively. The final column denotes the percentage of people who are poor according to the national income poverty line. The table on the right-hand side reports various descriptive statistics for the country. The monetary poverty statistics are taken from the year closest to the year of the survey used to calculate the MPI. The year is provided below each column in chart A.

A. Comparative Poverty Measures



Summary

Multidimensional Poverty Index	0.128
Percentage of MPI Poor (H)	28.0%
Average Intensity of Deprivation (A)	45.7%
Percentage of Income Poor ($1.25 a day)‡	11.9%
Percentage of Income Poor ($2.00 a day)‡	31.7%
Percentage of Poor (National Poverty Line)‡	46.2%

‡ The World Bank (2012). "The World DataBank". Washington, DC. [available at http://databank.worldbank.org/data/home.aspx, accessed September 2012]

Comparing the Headcount Ratios of MPI Poor and $1.25/day Poor

Chart B shows the percentage of people who are MPI poor (also called the incidence or headcount ratio) in the developing countries analysed. The column denoting this country is dark, with other countries shown in light grey. The dark dots denote the percentage of people who are income poor according to the $1.25 a day poverty line in each country. Chart A tells you the year this data comes from for this country. Dots are only shown where the income poverty data available are taken from a survey fielded within three years of the MPI survey year.

B. Headcounts of MPI Poor and $1.25/day Poor