Katalyst Working Paper Series

Poverty profiling using the Progress out of Poverty Index (PPI)

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Executive Summary

The objective of this paper is to present a clear and transparent methodology for a precise and assessable formulation of what the concept 'pro-poor' means for Katalyst. The study is based on the Progress out of Poverty Index framework (PPI) which is being actively used by various multilateral donor organisations and NGOs around the globe. The paper identifies and justifies two cut-off PPI scores (30-34 and 55-59) for the two poverty lines (USD1.25/day [PPP 2005]) and USD2.5/day [PPP 2005]) to be used to assess the pro-poorness of a sector.

To this end, and as a pilot case, this paper examines in detail the poverty incidence of the target beneficiaries of Katalyst's prawn and maize sectors. The study was conducted in January 2011, covering roughly eleven of Bangladesh's northern and southern districts. The total sample size was in excess of 300, and results showed that according to the above definition, both sectors are pro-poor, and the maize sector significantly so. The paper also provides a snapshot of the progress Katalyst has achieved in implementing this system over the one year since its introduction. It concludes by discussing the scope and some of the limitations of the present study, and by providing recommendations.

Dhaka, May 1, 2012 *Muaz Jalil, Markus Kupper, Hasan Shahriar*

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1. Background

In early 2008Katalyst formulated its *Pro-Poor Growth in Practice* strategy paper. The objective of this paper was to show the link between Katalyst's work and pro-poor growth. It provided a theoretical foundation to elucidate how working based on market development approach can result in pro-poor growth. Using extensive secondary data and field level validation, *Pro-Poor Growth in Practice* was able to show how Katalyst's sector portfolio and market development approach target the poor and contribute to poverty alleviation. The paper successfully showed that it was 'profitable' cropping patterns which played the decisive role in deciding the incidence of poverty among small farmer households. Significantly, it also established the fact that the sectors in which Katalyst work (such as fish, maize, vegetable, and prawn) are profitable, and thus provides the best opportunity for small farmers to progress out of poverty.

With respect to validating Katalyst's portfolio, the strategy paper was successful. However, in terms of its broader objective – to answer how pro-poor Katalyst sectors actually were – it was less precise. Questions remained as to whether Katalyst's approach and work were actually targeting the poorer segments of its sectors. The present paper constitutes a step towards answering those questions. Although limited in its scope by the number of sectors chosen – only the two core sectors, prawn and maize, are covered – the paper provides specific guidelines for replicating this study across all Katalyst sectors. It is hoped that it may thus provide a stepping stone towards a more rigorous and comprehensive understanding of how the poor involved in Katalyst activities are targeted. It is not intended as a means of reviewing whether Katalyst's work has resulted in pro-poor growth, but rather in providing an accurate identification of poverty distribution among its target beneficiaries (within the chosen sectors). It is hoped that such an exercise will result in increased accuracy in pro-poor targeting of Katalyst activities in the future, and at the same time provide requisite information for external parties, for whom such information may be useful.

Section 2 outlines the theoretical foundation of and methodology employed in this paper. Section 3 discusses the survey methodology, and section 4 deals with summary findings and supplementary analysis. Section 5 deals with defining what pro-poorness means for Katalyst, and addressing the degree to which the maize and prawn sectors are pro-poor. The final section examines some of the caveats of the study and provides a roadmap for rolling it out across all Katalyst sectors.

2. What is PPI?

This section explains the Progress out of Poverty Index (PPI). It draws heavily on the Chen and Schreiner paper (2009) and interested readers are encouraged to consult the reference of the present paper for further information[1]). The PPI is a simple and accurate tool which measures poverty levels of households and individuals, and assists organisations working in the field of poverty alleviation to improve their performance. It uses ten verifiable indicators (such as "What is the main construction material of the walls [of your house]?" and "Does the household own a television?") to obtain a score that correlates closely with results of other, exhaustive poverty status surveys. The PPI scorecard for Bangladesh is based on data from the 10,080 households in the Household Income and Expenditure Survey (HIES 2005) conducted by the Bangladesh Bureau of Statistics, which provides the latest and largest household dataset in the country to date (HIES 2010 has yet to be published). Indicators are selected on the basis of being inexpensive to collect, easy to answer quickly, simple to verify and that they correlate closely with poverty. All points in the scorecard are non-negative integers, and total scores range from 0 (most likely to live below a poverty line) to 100 (least likely to live below a poverty line).

The use of scorecards for poverty targeting is nothing new and literature abounds with such methodologies. Gwatkin *et al*, Stifel and Christiaensen (2007), Zeller *et al* (2006), Sahn and Stifle (2003 and 2000), and Filmer and Pritchett (2001) use principle component analysis for establishing their scorecards. Wodon (1997) uses five indicators and the 1991 HIES dataset. Haslett and Jones (2004) use 'poverty mapping' and the 2000 HIES dataset in order to estimate poverty rates in Bangladesh at union level; however, their objective was to help governments design pro-poor policies rather than to devise better ways of targeting poor. Similar efforts were made by Kam *et al* (2004) who applied a nutritional poverty line, which used calorific value rather than income. Zeller, Alcaraz and Johannsen (Zeller, Alcaraz and Johannsen, 2004) developed a very similar PPI-type scorecard for Bangladesh (although using older and smaller datasets. However, they differ in a number of significant aspects, which are discussed in Chen and Schreiner (2009). Other tools have been developed, such as by IRIS (2007), Cortez *et al* (2005) but they all differ from PPI in their objective, methodology and in terms of ease of use.

[1] Additionally readers may visit the Progress out of Poverty website maintained by Grameen Foundation at http://progressoutofpoverty.org

The PPI scorecard can measure a particular household's 'poverty likelihood', that is, the probability that the household has a per capita expenditure below a given poverty line. This paper uses the USD1.25/day [2005 purchasing power parity[2]] (PPP) and USD2.5/day [2005 PPP], which are the internationally-accepted extreme poverty and poverty line respectively. The scorecard can also be extended to reveal the poverty likelihood of a group of households, say for instance within a sector. This can be done by simply taking the average scorecard value for the entire sample household surveyed within the sector. However, if one wishes to identify the likelihood of being poor for a household involved in a certain occupation (e.g. the likelihood of a maize farmer being below a given poverty line), while at the same time maintaining statistical significance for this claim, then sample size becomes critical.

In developing PPI indicators, Chen and Schreiner (2009) started with a listing of 100 potential indicators in the areas of family composition, education, housing, ownership of durable goods, and employment. Indicators are not chosen because of their direct ability to predict poverty but rather on their extent of correlation. For example, ownership of a television is probably more likely to alter in response to changes in poverty than the education of members of the household. After this, an iterative process was initiated using a screening framework, involving both judgmental and statistical approaches. At the end of this process the list was reduced to 10 categorical indicators. The use of non-statistical criteria improves robustness through time and helps ensure that indicators are simple and make sense to users. Finally, logistic regression was used on a subsample of the total HIES (2005) dataset; this allowed the testing of sample robustness of the scorecard model.

The accuracy of the scorecard is contingent upon the stability of the relationship between indicators and poverty. So long this does not change, and the scorecard is applied to households that are representative of the same population from which it was constructed, this calibration process will produce unbiased estimates of poverty likelihoods. Unfortunately, HIES data employed in developing the latest PPI scorecard are over five years old and there is justified reason to assume that the relationship may have changed between some of the variables and poverty likelihood. This is specifically the case for questions 9-10 (Appendix I)

[2] PPPs are spatial deflators and currency converters, which eliminate the effects of the differences in price levels between countries, thus allowing volume comparisons of GDP components and comparisons of price levels. They are essentially price relatives that show the ratio of the prices in national currencies of the same good or service in different countries (EUROSTAT-OECD Methodological manual).

which refer to possession of a radio-cassette player and a wristwatch. Technological obsolescence and rapid expansion of telephone connectivity have made the latter extremely rare. Thus most farmers in the survey, while not owning a wristwatch, had a mobile phone which was also used for time keeping.

A question was also asked in relation to cropping patterns and areas cultivated under lease, in order to compare the findings of the present study with those from the 2008 *Pro-Poor Growth in Practice* paper. Hence it is not surprising that in the present study in case of both the maize and prawn sectors we saw that the greater the amount of land available to be farmed, the lower the likelihood of being poor. In the present study the questionnaire therefore, included seven additional questions beyond the ten standard PPI questions, including one on mobile phone ownership (see Appendix I). However, since the PPI scorecard is based on the original ten questions, the seven additional questions were excluded from the final results. The following section discusses the survey structure and technique employed in this study in greater details.

3. Survey Design and Methodology

The study focused on two Katalyst sectors, namely prawn and maize. Since its objective was to assess the poverty demography of Katalyst's target beneficiaries, it made sense to select the survey sample from Katalyst's beneficiaries within those sectors. In choosing the sampling methodology, resource feasibility and practicality were also taken into account. While it would have been preferable to undertake probability sampling, allowing us to make statistical inferences, the resources involved would have been prohibitive. For instance, if the target beneficiary group was in excess of 100,000 (which is the case with most Katalyst sectors), then the sample size dictated by probability sampling would be 400[3] (Israel, 1992). Such a sample selection would be compulsory if Katalyst benefitted all farmers directly, rather than targeting a particular segment through specific channels, as is the case. As Katalyst's approach entails working with scale agents and their networks (such as distributors, retailers, and CIC centres),

[3] This is assuming a 95% confidence interval with 5% precision. In addition, we assume that the attributes being measured are distributed normally or nearly so. If this assumption cannot be met, then the entire population may need to be surveyed (Israel, 1992). This implies for a PPI study to assume that the incidence of poverty (as measured by PPI) is usually distributed among Katalyst target beneficiary groups, which may not be the case.

to undertake a probability sampling the correct methodology would be a stratified sampling[4], and this would increase the required sample size geometrically. This is further complicated by the fact that Katalyst runs multiple interventions within each sector and thus any sample frame should represent that as well. This implies for each sector the requirement for a multistage stratified sampling in order to achieve a sufficient probability[5]. Considering that Katalyst intervenes in 17 sectors with an average of over 100 interventions running at any one time, time, financial and human resources for such a study would be prohibitive and simply beyond Katalyst's scope, even if it were carried out only once during the phase.

Based on this, the MRM team decided to employ a qualitative sampling plan (that is, non-probability sampling). To be specific, a snowball sampling methodology was applied, whereby service providers benefited by Katalyst interventions were asked to identify groups of farmers and target beneficiaries to whom they provided services. Even though this is not a statistical approach, it is not necessarily inexact. As long as the sample is representative of the target population, there may be a significant correspondence between the attributes being measured and the target population (which in this case is the poverty profile). One also has to take into account the fact that Katalyst's approach depends on this 'service provider-target beneficiary' relationship: embedded information is usually channeled through this delivery mechanism. Thus unless the surveyed service provider (a retailer for example, or prawn postlarvae trader) systemically chose a biased sample of their customers base, a representative sample should ensue, *ergo* our target beneficiaries.

The sample frame also had to take into account a geographical focus, since Katalyst's activities concentrate on certain regions: prawn in southern districts, maize more in the northern districts of Bangladesh. To this end, the prawn sector survey covered six southern districts of Bangladesh, while for maize, five northern districts were chosen. Even within these districts,

[4] Stratification is the process of dividing members of the population into homogeneous subgroups before sampling. Random or systematic sampling is then applied within each stratum. In Katalyst's case this would first mean a random selection of the trained retailers/CIC centres/postlarvae traders/contractors, and then randomly selecting target beneficiaries (farmers) from their customer base (resulting in a two-stage probability sampling).

[5] One could argue that if Katalyst had a sample frame comprising all their touched/treated farmers/beneficiaries, then we could randomly select 400 individuals from that sample frame, thus avoiding multistage stratified sampling. While theoretically this is possible, practically speaking there is no such dataset available, and building one for the entire sector would again be prohibitive considering the potential for errors and omissions. Even in multistage stratified sampling it would be very difficult to pick random beneficiaries from a client base of service providers, as in most cases such a database does not exist (in case of the 7676 Banglalink intervention it is possible, as they have a large client database. The Katalyst MRM team is utilising this; however this is a unique case).

more weight was given to those areas where Katalyst was working more intensively. So in the maize sector for example, greater emphasis was given to *char* areas, where the majority of Katalyst target maize farmers are located.

The sample consisted of target beneficiaries of interventions completed in 2009-10. In the prawn sector, Katalyst's strategy involves working with post-larvae traders, depot owners and hatcheries; in the study all these service providers were interviewed and a farmer sample was drawn from their customer base. Similarly, with maize,[6] the sector strategy entails working with retailers, dealers and contractors; the study thus interviewed farmers touched by these service providers. Again, it is worth noting that we did not select a statistically significant number of service providers. Our results can thus be inferred to be representative of Katalyst beneficiaries, insofar as our service provider sample is representative of our overall service providers in the respective sectors. The following table shows the sample size and regions covered during the study period.

Table 1: Sample size and geographic distribution

Sectors	District Covered	Sample Size	
		Farmers	Labourers
Prawn	a) Jessore b) Khulna c) Narail d) Satkhira e) Bagerhat f) Chittagong	110	39
Maize	a) Kurigram b) Lalmonirhat c) Gaibandha d) Bograe) Sirajgonj d) Satkhira e) Bagerhat f) Chittagong	165	

When it came to the prawn sector, we also looked at the labourer group, since conservative estimates suggest that there are around 20,000-30,000 economically deprived labourers working in the value chain, not including farm labourers. We included both permanent and temporary labourers working in depots, hatcheries or postlarvae trading houses, as well as permanent labourers working in processing plants[7]. Katalyst intends to include a PPI

[6] For maize and prawn we did not interview farmers targeted via feed mills and processing plants respectively, as interventions via these channels are still at a pilot stage and their inclusion might thus have biased the sample. If these interventions are scaled up, then the PPI profile of the sectors ought to be revaluated to include these farmers.

[7] Katalyst intends to take this up in greater detail in the upcoming Employment Study where the prawn sector is likely to be one of those investigated; inclusion of these labourers in the present PPI study constituted a preliminary step towards this.

questionnaire in all assessments due this year, which will result in a poverty profile of growing robustness for each individual sector (including of course prawn and maize). The following table provides the detail time plan and human resource involvement for the study.

Table 2: Time plan for the study

Steps	Jan-11				Number of Person Days	Resource People Involved[8]
	2nd to 6th	9th to 13th	16th to 20th	23rd to 27th		
Research methodology and sampling plan finalized					3	GM: 1; SBC: 2
Pre-testing of questionnaire					6	SBC: 1; R: 1
Field research and data input					20[9]	GM:1; SBC: 3, BC: 3; R: 3; CF: 4
Analysis					2	GM: 1, SBC: 2, BC: 1
Draft report					3	GM: 1
Total					34	

In the next section we look into the summary findings of the study and discuss the poverty profile of our target beneficiaries in the prawn and maize sectors.

[8] GM: MRM Group Manager; SBC: Senior Business Consultant; BC: Business Consultant; R: MRM Researcher; CF: Co-facilitator.

[9] The maize sector team conducted two early signs of impact simultaneously; hence only half the number of person-days involved was attributed to the PPI study.

4. Summary Findings

Table 3 summarizes the descriptive statistics of the important variables characteristic of average farmers in the prawn and maize sectors:

Table 3: Descriptive statistics

Characteristics	Prawn	Maize
Average household size (number of family members)	5.48	6.12
% families with more than 1 child	40%	58%
% household with members working for a daily wage	44%	33%
% of households with less than 4 rooms	85%	70%
% of households with walls made of mud or CI sheet	61%	97%
% of households with roofs made of tile or CI sheet	91%	100%
% of households with less than 1 acre cultivable land	68%	46%
% of household with mobile phone connectivity	76%	21%
Average land size cultivated under lease arrangement (in *decimals*)	86.27	70.71

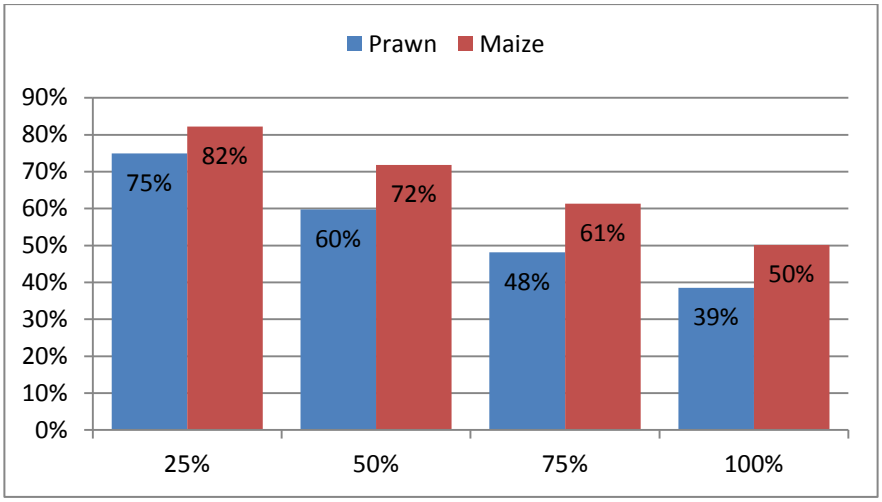
This shows a number of significant differences between the two groups. It may seem predictable that the incidence of poverty would be lower in the prawn sector than in maize. Most of Katalyst's maize farmers are located in impoverished *char* areas. Maize farmers also tend to have larger families, which results in higher dependency. This is further strengthened by the fact that within the sample, an additional 20% of maize farmers had more than one child. It is however surprising to see that a higher proportion of prawn farmers work for a daily wage. This might be attributable to the fact that in *char* areas, among the maize farmers, there are fewer opportunities for such wage earning (or hiring) than in prawn growing areas. Additionally findings from the study show that in the maize sector 52% households have walls made of mud or hemp whereas in the prawn sector this is 34%.

When it comes to ownership of land, the fact that prawn farmers tend to own less land is to be expected: the price of land in the fertile *ghers* is higher than the less accessible *char* land in northern maize growing districts. This is further supported by the fact that 41% of prawn farmers have a land size of less than 50 *decimals*, as opposed to only 24% of maize farmers (not shown

in the table). The difference in accessibility of land and its economic value within both sectors is also reflected by the fact that prawn farmers have a larger amount of leased land than maize famers. In addition, 50% of prawn farmers hold leased land, maize farmers only 32%. While farmers in the prawn sector may own smaller holdings than a typical maize farmer, they are much more likely to engage in tenant farming or farming on leased land. This confirms the *Pro-Poor Growth in Practice* findings (2008): that it is not necessarily land size that matters but what is being cultivated or produced. Also of note is the disparity between the two sectors in mobile phone connectivity: 76% prawn farmers (but only 21% of maize farmers) had a mobile phone in their household..

In order to evaluate the incidence of poverty within each sector, we need to measure the average of estimated poverty likelihood of the individual households in the group[10]. Here, as already mentioned, we use the USD1.25/day [2005 PPP] and USD2.5/day [2005 PPP] guidelines[11].

Figure 1: Poverty likelihood below USD1.25/day [2005 PPP]



In Figure 1, the X-axis represents the percentile of the sample surveyed, from lowest to highest. Thus the 25% of prawn farmers includes that 25% with the lowest PPI score. Similarly, the 75%

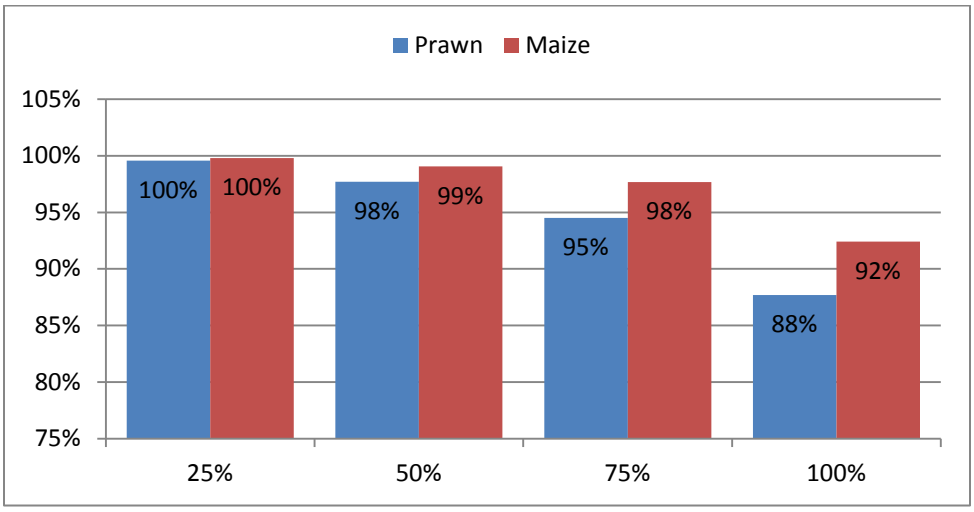
[10] Suppose our sample has three household with scores of 20, 30, and 40, corresponding to poverty likelihoods of 85.0, 67.3, and 39.9% (USD1.25/day [2005 PPP line]). The group's estimated poverty rate is the households' average poverty likelihood of (85.0 + 67.3 + 39.9) ÷ 3 = 64.1%. *The group's poverty rate is not the poverty likelihood associated with the average score*. Here, the average score is (20 + 30 + 40) ÷ 3 = 30, and the poverty likelihood associated with the average score is 67.3% (Chen & Schreiner, 2009, Section 7, p 42).

[11] A complete table of the PPI scorecard and poverty likelihood can be provided upon request.

includes that 75% with the lowest PPI score. The true average of the complete sample is thus the 100th percentile, which includes the entire sample. From this we can see that the lowest quartile (25%) in both the prawn and the maize sectors has a very high likelihood (75% and 82% respectively) of being ex[tremely poor, when we define extreme poverty as having an income below USD1.25/day [2005 PPP]. In the case of the 50% percentile, the likelihood decreases by 10 to 15%; however, for both sectors the likelihood is still higher than 50% (this likelihood diminishes as higher percentiles are taken, which is to be expected).

Next we look at the USD2 poverty line, defined by Chen and Schreiner (2009) as USD2.5/day 2005 PPP. The following figure clearly demonstrates that almost all the farmers within the sample have a very strong likelihood of being below this poverty line. Thus both in the prawn and the maize sectors, all the farmers within the sample have a very high likelihood of being poor (defined as being below USD2.5/day).

Figure 2: Poverty likelihood below USD2.5/day [2005 PPP]



This discussion of percentile PPI distribution allows us to form an overall poverty scenario for the respective sectors. While this might be helpful it does not allow us to answer the question of whether Katalyst's maize and prawn sectors are indeed pro-poor. To answer this we need to define what 'pro-poorness' means to Katalyst, and we undertake this in the following section.

5. Katalyst's definition of pro-poor: how pro-poor are the prawn and maize sectors?

In defining pro-poorness as it applies to the work of Katalyst, we have to define a threshold (or cut-off) PPI level. Households with PPI scores at or below the cut-off are then – for programme purposes – considered to be below a given poverty line and thus labeled poor. There is however a distinction between *targeting status* (scoring at or below a targeting cut-off) and *poverty status* (having expenditure below a poverty line). Poverty status is a fact, dependent on whether expenditure is below a poverty line as directly measured by a survey. In contrast, targeting status is a policy choice that depends on a cut-off and an indirect estimate from a scorecard. Accuracy of targeting is thus contingent upon the level of correspondence between the scorecard and actual poverty status.

Targeting is successful when households truly below a poverty line are targeted (inclusion) and when households truly above a poverty line are not targeted (exclusion). Of course, no scorecard is perfect, and targeting is unsuccessful when households truly below a poverty line are not targeted (undercoverage) or when households truly above a poverty line are targeted (leakage). The following table depicts these four possible targeting outcomes (Chen and Schreiner, 2009).

Table 4 : Targeting outcomes

True poverty status	Targeting segment: Targeted	Targeting segment: Non-targeted
Below poverty line	Inclusion Under poverty line Correctly Targeted	Undercoverage Under poverty line Mistakenly Non-targeted
Above poverty line	Leakage Above poverty line Mistakenly Targeted	Exclusion Above poverty line Correctly Non-targeted

If we choose a high PPI score (say, 50-54) as our cut-off point for USD1.25/per day [2005 PPP] poverty line, then we run the risk of having a higher percentage of leakage (30.8%) than that obtained with a lower cut-off point. Thus a PPI score of 15–19 has a leakage percentage of

1.6%. On the other hand, if we are too conservative and select a very low PPI score then we run the opposite risk of significantly reducing inclusion or increasing undercoverage. So if we were to choose a score of 15-19 for USD1.25/per day [2005 PPP] poverty line as our cut-off point then inclusion would be 17.5%, while in the case of 50-54 it is 53.1% (Chen & Schreiner, 2009, Appendix, p149).

Chen and Schreiner (2009) offer various methodologies to select such a threshold value (total net benefits method, total accuracy method, preset poverty rate etc), and propose a score of 35-39 for the USD1.25/day [2005 PPP] line. In the validation sample, the total net benefit is greatest (76.5) for this cut-off point, with about three out of four Bangladeshi households correctly classified. However, a household with a PPI score of 35-39 has a poverty likelihood of 49.8% of being below the USD1.25/day [2005 PPP], which seems low. The following table gives the comparative targeting classification score, total accuracy and BPAC parameter value for PPI scores 25–29, 30–34 and 35–39. The Balanced Poverty Accuracy Criterion (BPAC[12]) has been adapted by USAID as its criterion for certifying poverty scorecards (IRIS Center, 2005).

Table 5: Households by targeting classification for selected PPI score

PPI score	Inclusion (I) in %	Under coverage (U) in %	Leakage (L) in %	Exclusion (E) in %	Total Accuracy (I+E) in %	% Targeted who are poor	Poverty Likelihood	BPAC
25–29	23.2	24.3	3.8	48.7	71.9	86	74.7	5.6
30–34	29.3	18.2	6.3	46.2	75.5	82.4	67.3	36.5
35–39	35.5	12	11.4	41	76.5	75.6	49.8	73.6

From the above table we can see that the PPI scores 30-34 and 35-39 perform really well. However, a 30-34 score may seem preferable as its poverty likelihood is significantly higher than that of a 35-39 score, while its BPAC and accuracy seem reasonably close to that of a 35-39 score. In addition, it is important to Katalayst that we are conservative in our estimate of sectoral incidence of poverty rather than too optimistic. Thus for us the priority is to ensure that we can reduce the percentage of leakage and increase the percentage of exclusion, without

[12] BPAC depends on the difference between the estimated poverty rate and its true value (a difference that is minimized by minimizing the absolute difference between undercoverage and leakage) and on inclusion, that is, the share of households who truly have a per capita expenditure below a given poverty line and who are also correctly classified as 'below the poverty line'. The formula is: *(Inclusion – {Undercoverage – Leakage}) x [100 ÷ (Inclusion + Undercoverage)].* A higher BPAC implies more accuracy.

significantly impinging upon accuracy/inclusion. Based on the these discussions, Katalyst chooses 30-34 as its cut-off point for the USD1.25/day [2005 PPP] poverty line and believes that this cut-off point reflects our focus. However, it is critical to note that the optimal cut-off point is contingent upon the choice of poverty line which thus will be different for the USD2.5/day [2005 PPP] poverty line.

We will run the same exercise as before to establish the optimal cut-off point for USD2.5/day [2005 PPP] poverty line. The following table gives the comparative targeting classification score, total accuracy and BPAC parameter value for PPI scores of 50–54, 55–59, 60–64 and 65–69. These four PPI scores were chosen because of their high BPAC value, poverty likelihood and accuracy parameter.

Table 6: Households by targeting classification for selected PPI score

PPI score	Inclusion (I) in %	Under coverage (U) in %	Leakage (L) in %	Exclusion (E) in %	Total Accuracy (I+E) in %	Targeted who are poor	Poverty Likelihood	BPAC
50–54	73	13.4	3.4	10.2	83.2	95.5	85.1	72.9
55–59	78.5	7.9	4.9	8.7	87.2	94.2	76.6	87.3
60–64	81.5	4.9	6.3	7.3	88.8	92.9	63.6	92.8
65–69	83.4	3.0	8.0	5.5	88.9	91.2	64.9	90.7

Table 6 shows that 50-54 and 55-59 are the optimum cut-off values, as they have a high poverty likelihood (>70%), accuracy and BPAC value. In terms of the 'percentage targeted who are poor', all four scores fare well. Similarly, 50-54 and 55-59 have comparatively lower leakage and higher exclusion values. Our poverty estimates are thus more likely to be conservative than optimistic. Although the 50-54 score has significantly higher poverty likelihood than the 55-59 score, it comes at the cost of much lower accuracy and BPAC value. Thus based on these discussions Katalyst chooses 55-59 as its cut-off point for USD2.5/day 2005 PPP poverty line.

Now that we have defined the optimal cut-off PPI scores for Katalyst we can answer the question of how pro-poor a particular sector is. The following table shows the proportion of target beneficiaries (farmers) within the surveyed sample of prawn and maize sectors who fall below the identified cut-off PPI scores.

Table 7: Percentage of individuals (within the sample) with PPI score below the cut-off

Poverty Line	Cut-off PPI Score	Prawn	Maize
USD1.25/day [2005 PPP] poverty line	30-34	25%	41%
USD2.5/day [2005 PPP] poverty line	55-59	87%	93%

6. Caveats and recommendations

As Chen and Schreiner (2009) point out, as long as the relationship between indicators and poverty does not change, and the scorecard is applied to households that are representative of the same population from which it was constructed, this calibration process produces unbiased estimates of poverty likelihoods. Obviously the relationship between indicators and poverty does change with time and also across sub-groups of Bangladesh's population, so the scorecard will generally be biased when applied after the 2005 HIES fieldwork end date. This is particularly reflected in the fact that most farmers reported that they no longer use radio-cassette players (over 90% in both sectors) or wristwatches (83% in the maize sector and 51% in the prawn sector)[13]. Although some indicators may now have a lower linkage with poverty, it is difficult to predict how exactly they have changed. Until HIES 2010 data become available this is a shortcoming we cannot avoid. The Summary Report of the HIES 2010 was released in 2011 , however final dataset is unlikely to be available prior to the end of 2012. Only when the dataset is available can a new PPI scorecard be developed. This in itself takes a year or so, making it unlikely that it would be available to use within the current project period.

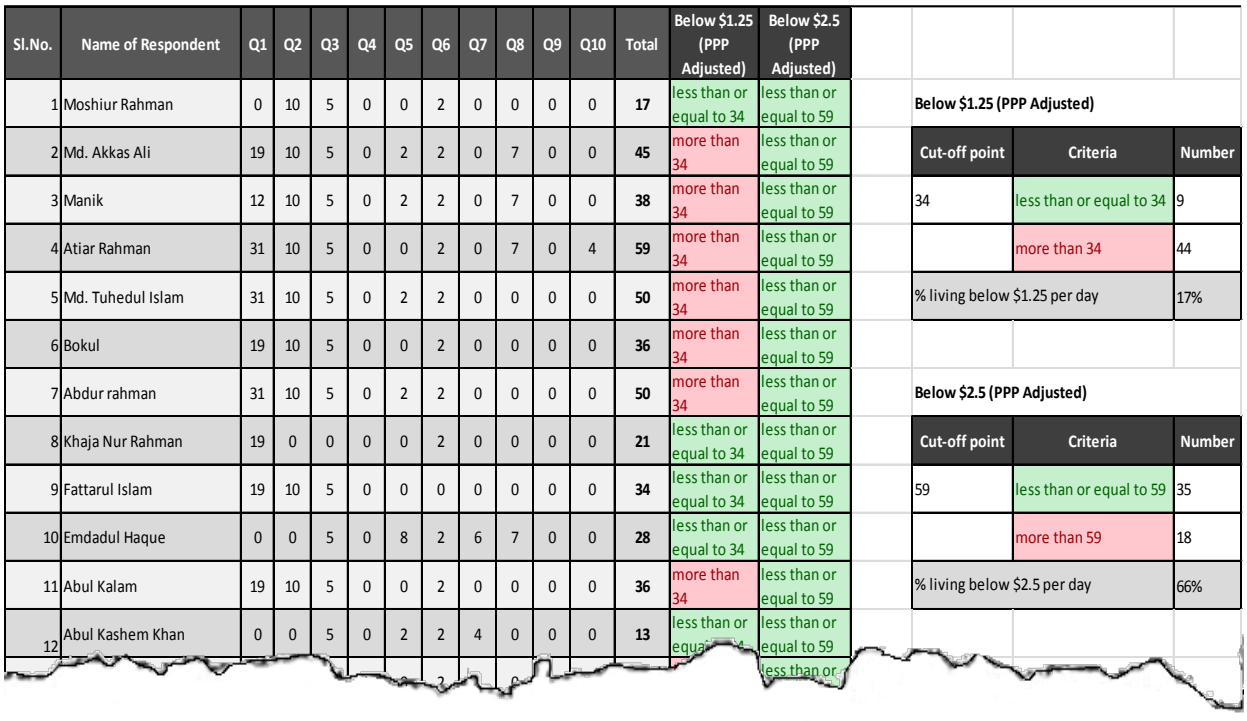
In the prawn sector it might be that, due to the sample structure, the poverty rate has been understated. In the Sathkhira region, specifically around Karibila, surveyors found numerous houses with cement and brick walls; this increased the PPI score by 8 points. Further investigations in the area unearthed some interesting facts. Due to the soil structure of the region it hosts numerous brick factories; the resultant intense competition reduces the price for 1,000 bricks to around BDT2,200-3,000 – less than half of the price of those sold in the metropolitan area. The factories also provide easy access to interest-free credit, with repayment

[13] Initially we hypothesized that these have been replaced by CD players and mobile phones respectively. However statistics on this are not clear; in both sectors the use of CD players was found to be negligible (13% in prawn and 0% in maize); on the other hand, use of mobile phones was very high in the prawn sector (76%) and relatively low in the maize sector (21%).

periods in some cases of more than two years. In addition, numerous NGOs operate in the region and offer house building loans. All this means that a farmer can build a two-roomed brick house for BDT50,000, compared to a cost of BDT25-30,000 to build a mud house. Coupled with this is the fact that the region is flood-prone and a mud house has a life span of only three years. It thus makes sense for farmers to take advantage of this situation and invest in brick houses, even though it takes them an average of five years to repay the loan. Obviously this does not imply that we should change our estimate for PPI findings in the prawn sector, but it is important that we take these additional factors into account.

In terms of rolling out this study for the whole of Katalyst's work, the following template has been used to tabulate results from PPI assessments for each sector.

Figure 3: Katalyst sector PPI worksheet



Sl.No.	Name of Respondent	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Below $1.25 (PPP Adjusted)	Below $2.5 (PPP Adjusted)
1	Moshiur Rahman	0	10	5	0	0	2	0	0	0	0	17	less than or equal to 34	less than or equal to 59
2	Md. Akkas Ali	19	10	5	0	2	2	0	7	0	0	45	more than 34	less than or equal to 59
3	Manik	12	10	5	0	2	2	0	7	0	0	38	more than 34	less than or equal to 59
4	Atiar Rahman	31	10	5	0	0	2	0	7	0	4	59	more than 34	less than or equal to 59
5	Md. Tuhedul Islam	31	10	5	0	2	2	0	0	0	0	50	more than 34	less than or equal to 59
6	Bokul	19	10	5	0	0	2	0	0	0	0	36	more than 34	less than or equal to 59
7	Abdur rahman	31	10	5	0	2	2	0	0	0	0	50	more than 34	less than or equal to 59
8	Khaja Nur Rahman	19	0	0	0	0	2	0	0	0	0	21	less than or equal to 34	less than or equal to 59
9	Fattarul Islam	19	10	5	0	0	0	0	0	0	0	34	less than or equal to 34	less than or equal to 59
10	Emdadul Haque	0	0	5	0	8	2	6	7	0	0	28	less than or equal to 34	less than or equal to 59
11	Abul Kalam	19	10	5	0	0	2	0	0	0	0	36	more than 34	less than or equal to 59
12	Abul Kashem Khan	0	0	5	0	2	2	4	0	0	0	13	less than or equa	less than or equal to 59
								2						less than or

Below $1.25 (PPP Adjusted)

Cut-off point	Criteria	Number
34	less than or equal to 34	9
	more than 34	44
% living below $1.25 per day		17%

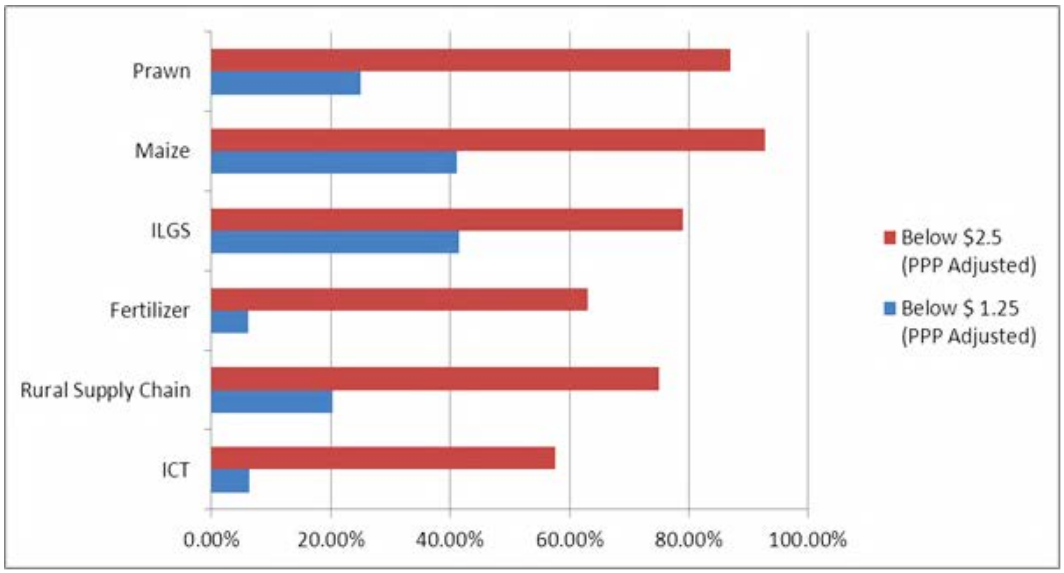
Below $2.5 (PPP Adjusted)

Cut-off point	Criteria	Number
59	less than or equal to 59	35
	more than 59	18
% living below $2.5 per day		66%

Based on these sector-level assessments, a PPI summary table has been developed for Katalyst. In total, 11 sectors have been covered, with a total sample of over 1500 respondents in more than 60 of Bangladesh's *upazilas* or sub-districts. As PPI assessments will be carried out on a rolling basis, some sectors have samples which are yet to cover a representative population of the sector.

The following graph shows the poverty profile of beneficiaries in some of these sectors. It reads as follows: based on the methodology developed in section 5 of the paper, and taking ICT[14] as an example, 6.4% of the sample are below the USD1.25 poverty line (BDT31.86 per person and per day in 2005), while 57.7% are below the USD2.5 poverty line (BDT63.72 per person and per day in 2005).

Figure 4: Poverty incidence in selected Katalyst sectors



Such assessments are currently being rolled out across all the sectors, and PPI questionnaires have become mandatory section in every impact assessment. As mentioned before, samples for the survey will be built according to the snowball qualitative sampling methodology (that is, non-probability sampling), where service providers touched by Katalyst interventions will provide a list of farmers who used their services. Thus we will take into account cross-sector initiatives by assigning part of the core sector sample to a sub-sample of farmers touched by cross sector initiatives (ICT, seed etc).

The application of the PPI framework requires caution: while it might be an optimum tool with which to accurately measure incidence of poverty within a target group, it should not be used to assess the impact of intervention(s) on its beneficiaries. PPI is not a mean to prove or disprove

[14] The progress out of poverty index (PPI) was carried out for the ICT sector, covering a sample of 220 farmers across 18 *upazilas*.

the success of an intervention/framework/strategy in bringing a poor household out of poverty. The rationale for this lies in the methodical issue of unobserved variables. For instance, a Katalyst intervention may result in farmers having access to better quality seed and the requisite information with which to use it appropriately. It is possible to estimate, with reasonable accuracy, that farmers who use both the product and the information will have certain profit/income/benefit which is measurable and attributable to Katalyst. It will also be reasonable to suggest that this increased income contributes to poverty alleviation, provided the farmer was poor to begin with. However impact might be seen in a number of ways, it may be that the additional income may be spent in mitigating health-related costs to a member of the family without any change in poverty profile of the household. There might be other events, either business-related (e.g. bad investment, liquidity crisis), personal (e.g. divorce, death) or environmental (e.g. heavy storm, flood, political instability) which would have a significant impact on the poverty profile of the household. In all these cases, the benefit accrued due to the intervention is not lost but offset in terms of poverty.

It is one thing to prove that a particular intervention resulted in an increased income for a farmer and quite another to suggest that this would result in an attributable measurable change in his or her household poverty profile (as measured by PPI). Katalyst's MRM system tries to provide a robust accurate estimation of the first, while the PPI study tries to ascertain whether the target beneficiaries of Katalyst are indeed poor to begin with. Thus together they provide evidence of whether Katalyst interventions result in pro-poor income or not. In other words: Katalyst contributes to the increase of incomes of poor people, resulting from activities in farms and small enterprises.

Before we end the paper, a slight cautionary note from the people who developed the PPI framework, Chen and Schreiner (2009) :

"….*This point is often forgotten, confused, or ignored, so it bears repeating: poverty scoring simply estimates change, and it does not, in and of itself, indicate the reason for the change."*

The discussion in this paper indicates that Katalyst should use PPI for a one-time study for each sector, not as a means for validating or measuring Katalyst's impact, but as an equally valuable reason: to evaluate – and, it is hoped, demonstrate – how pro-poor our interventions are.

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Appendix I : Katalyst PPI Questionnaire[15]

Progress out of Poverty Index™ for Katalyst Sectors

Name | Date (/ /)

Researcher : _____ _____ Sector:

Interviewee: _____ _____ Occupation:

Location: _____ _____ Household size:

Indicator	Value	Points	Score
1. How many household members are 11-years-old or younger?	A. Four or more	0	
	B. Three	9	
	C. Two	12	
	D. One	19	
	E. None	31	
2. Does any household member work for a daily wage?	A. Yes	0	
	B. No	10	
3. What type of latrine does the household use?	A. Open field	0	
	B. Kacha latrine (temporary or permanent), pacca (pit or water seal), or sanitary	5	
4. How many rooms does the household occupy (excluding rooms used for business)?	A. One, two, or three	0	
	B. Four	7	
	C. Five or more	11	
5. What is the main construction material of the walls?	A. Mud brick, hemp/hay/ Bamboo or others	0	
	B. C.I. sheet/wood	2	
	C. Brick/cement	8	
6. What is the main construction material of the roof?	A. Tile/wood , hemp/hay/ Bamboo or others	0	
	B. C.I. sheet/wood	2	
	C. Cement	13	
7. What is the total cultivable agricultural land owned by the household?	A. None, or less than 0.5 acres	0	
	B. More than 0.5 acres, but less	4	
	C. More than 1 acre	6	
8. Does the household own a television?	A. No	0	
	B. Yes	7	
9. Does the household own a two-in-one cassette player?	A. No	0	
	B. Yes	5	
10. Does the household own a wristwatch?	A. No	0	
	B. Yes	4	
Total Score		Total score	

[15] The questionnaire also has a Bangla version which is used during the assessments, when necessary