

Resilience and Vulnerability in Long-Term NGO Clients

Findings from an RDRS Bangladesh panel survey



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Frontpage photo:

Infant child of a poor brick-gleaning woman in Rangpur, November 2007, the symbol of both growth and vulnerability

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Summary

Why this study? Why resilience and vulnerability?

Since it was founded in 1972, several hundred thousand, if not millions of poor households in the northwestern region have participated in the programs of RDRS Bangladesh. Their cumulative number is unknown; most went through an intensive phase of participation lasting several years. Thereafter, they have been in no or only intermittent contact with RDRS programs, notably as federation members, micro-credit borrowers, or targets of existential risks with which the health and disaster preparedness projects are concerned.



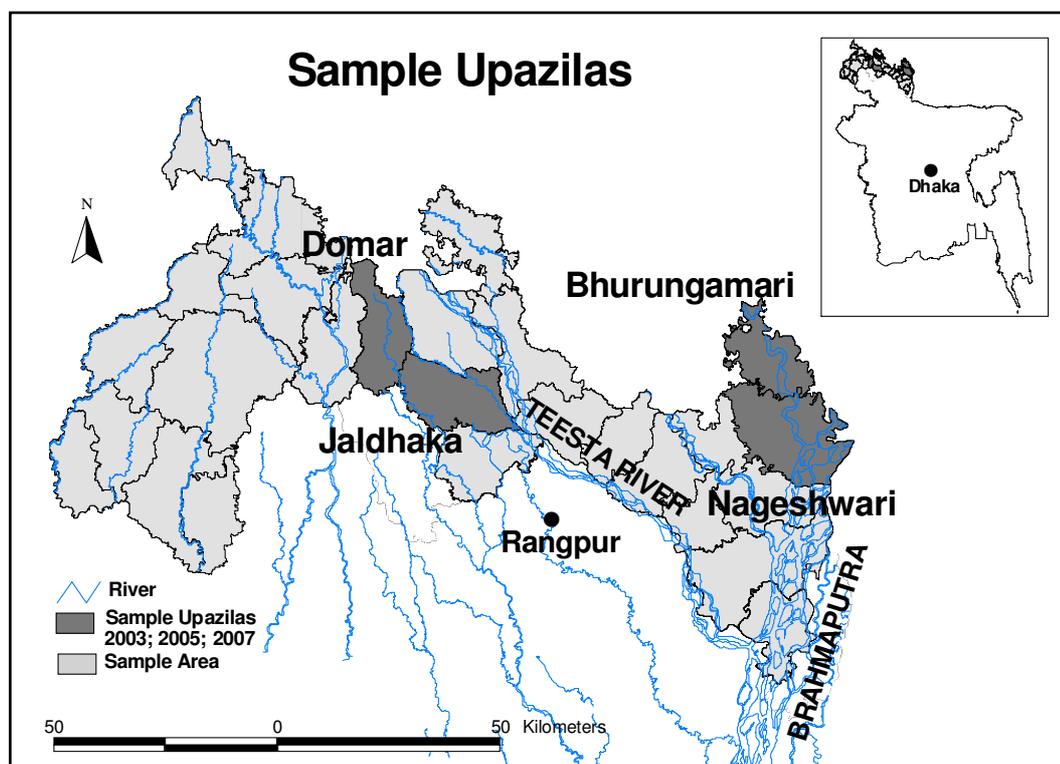
Fatema and Nazma live in Nageswari Sub-district, where RDRS has worked intensively. Two years ago, their father withdrew them from school. The family had fallen on harder times. The father was ostensibly unhappy talking about this difficult decision, but he justified it by the need to let his elder son continue in college and make savings on his daughters' education. The family exemplifies the tendency in our sample to withdraw children from school after income growth slowed down significantly in 2005-06. In Bangladesh, the government subsidizes girls' education. But Fatema and Nazma said they had to pay for books and sundry expenses.

RDRS has long been part of the struggle for women's and girls' rights; reversals in school enrolment apace with stagnating incomes are a tragic manifestation of continued vulnerability. They highlight that the enjoyment of rights has direct or opportunity costs that households under stress will cut – in Fatema and Nazma's case with lifelong consequences.

Vulnerability to poverty risks and the ability to rebound from poverty spells are critical determinants of the life chances of the poor, including those who became RDRS program participants. Knowing more about entry into, and exit from, poverty is desirable both for the historic record of RDRS and in the context of a social protection debate that is animating development policy. With the passage of time, attribution to any specific interventions of the social and economic advancement that this population has enjoyed since first contact with RDRS has become virtually impossible. Yet, an informed estimate of resilience and vulnerability is attempted here. RDRS has conducted, between 2003 and 2007, three waves of data collection on 800 carefully sampled participant households. Measurement of the income mobility, and thus of movements in and out of poverty, allows us to gauge the livelihood dimension of continued resilience and vulnerability, although not its other important dimensions such as health or human rights protection.

In addition, RDRS staff conducted intensive life-course interviews with 21 respondents drawn from the upper and lower extremes of the 2002 household income distribution. These histories were diagrammatically mapped and classified by a small number of life-time mobility types, with a view of identifying the most common crises. We offer three case studies based on them, the first as part of this summary, the others in the main body.

Figure 1: Map of the RDRS 2003 working area and of the sample sub-districts



The four sub-districts (upazilas) in the sample were randomly drawn from a list of 27 mainland sub-districts that were part of the so-called “old RDRS working area”, a crescent-shaped poverty belt on the border with India. The non-mainland area (sandbar island communities in the Brahmaputra River) was excluded as not being representative of the socio-economic situation of the larger working area. RDRS customarily divides its working area into a West Zone and an East Zone, with the River Teesta forming the border. The sample was stratified on these two socio-ecological zones so that two upazilas would be from the West, two from the East. The current RDRS working area is larger than the grayed areas; it has been extended further south, with an exclave formed by a project in northeastern Bangladesh.

In the remainder of this summary, we enumerate major study findings in a non-technical style. The main body of the report is laced with statistical expositions, tables and diagrams that readers less enamored with statistics may want to skip. We do invite those interested in the conceptual basis of vulnerability to work through the chapter called “Vulnerability”. For reasons related to current policy debates, but also because this panel survey established a rapid fall in the overall poverty rate of the sample population, our analysis is biased more to the vulnerability side than to resilience. The guiding interest is about factors that, despite the speed in poverty reduction, keep pushing a significant fraction of the formerly-poor back into poverty. Our analysis regains some evenhandedness by focusing on income mobility in both directions.

In the report conclusions, we resume the non-technical style, summarizing possible implications of vulnerability for NGO policy and reflecting on past and future Impact Surveys. We are aware of the difficulty that this text may present to some of our readers. We have tried to walk a delicate middle line between everyday concepts of poverty and vulnerability and the complex safeguards to their measurement that the technical literature advocates.

This report is one in a series of studies through which RDRS attempts to form a clearer notion of the impact that its long presence in Rangpur – Dinajpur and its manifold programs have had on a generally very poor population. Hence the term “Impact Surveys”. This type of monitoring activity was created in order to go beyond activity reporting, and beyond any of the individual projects that make up the diverse RDRS program portfolio. This particular Impact Survey uses a sample of 800 households drawn in 2003 from a 1999 list of almost exactly 20,000 neighborhood groups. These groups of 15 to 25 persons, all either women or men, had been formed several years earlier and were assisted by various RDRS programs. About half of them had graduated into the Union Federations, local voluntary associations of the rural poor promoted by RDRS. The federations have emerged as viable local NGOs are nowadays are RDRS’ key grassroots partner organizations. As mentioned in the opening lines, most households are no longer in weekly contact with RDRS staff although many continue to avail services, particularly from the micro-finance program. The same sample of 800 households was revisited twice, at two-year intervals, in 2005 and 2007. Surveys with same-sample repetitions are called panel surveys and are generally considered more powerful than surveys repeated with different samples. Whether panel surveys are more difficult to design and follow to the end is an open question, but few development NGOs appear to have the inclination or capacity for them.

Poverty measurement by official standard

To make ours more relevant in the Bangladesh context, we have used a poverty line defined and applied by the government (Bangladesh Bureau of Statistics: [BBS] 2006). The BBS surveys open a first door to presenting substantive findings *en route* to vulnerability. With a per capita income, in 2006, of Tk. 9,316 (approx. US\$ 716, taking into account what one Taka buys in Bangladesh, and one dollar in the USA), our sample population overall was much poorer than rural Rajshahi Division, of which they are part in its northern poverty belt. The BBS *extreme* poverty line, adjusted to 2006 prices, was Tk. 8,438. Against this standard, 56 percent of the RDRS sample population was living in extreme poverty. The BBS estimate for all of rural Rajshahi in 2005 was 36 percent. Note that the BBS survey sampled all households, not only those that NGOs like RDRS had recruited selectively from among the ranks of the poor and very poor.

The reported 2006 mean income of Tk. 9,316 was above the poverty line because the incomes in the sample were highly unequally distributed, with the highest incomes pulling up the mean. By way of illustration, the richest 5 percent of the sample population enjoyed per capita incomes above Tk. 20,500; the poorest 5 percent dwelt below Tk. 2,900. If the statistical inequality measure was still lower for the RDRS sample than the BBS estimate for rural Bangladesh at large, it was essentially because the richest ten percent of former RDRS program participants had not yet made it to the income levels enjoyed by the rich and very rich of the larger national society. At the bottom of the RDRS and BBS samples, the poorest ten percent were constrained to the exactly same income share – 2.3 percent. Apparently, the inequality pattern, as far as incomes are concerned, of the former RDRS program participants has converged to that of the larger society.

The inequality is, as one would expect, structured alongside other important dimensions, such as location and gender. It has been known for a long time that the disaster-prone population east of the River Teesta is poorer than that of the more secure western swathes. Called “East Zone” vs. “West Zone” in RDRS terms, these subpopulations had markedly different incomes in 2006. Less well known, differences within each Zone, depending on distance to nearby urban markets (Kurigram and Rangpur), were also remarkable. If we arrange the four sample sub-districts by disaster risk and market access, the structure leaps to the eye:

Table 1: Per-capita incomes, by sample sub-district (2006 median)

	Relative disaster risk	
	High	Low
Relative distance to urban markets		
Far	Bhurungamari Tk. 31,600	Domar Tk. 45,200
Near	Nageswari Tk. 34,120	Jaldhaka Tk. 47,030

Gender-specific findings to a degree confound expectations. It is true, of our sample as well as of the Bangladeshi society at large, that the situation of widows, divorcees and single parents remains precarious. However, most members of former women groups in our sample were *married* women. The income situation for the households of male respondents, married female respondents, widows and divorcees who were heads of their households vs. others, was very different. The picture varies greatly also as to whether one looks at per capita or total household incomes. This is so because household size typically varies with marital status.

Not to make things too complicated, we here summarize only total incomes. Widows and divorced women lived in households that, on average, were smaller and had smaller incomes. Households headed by a married man reported a 2006 total income of Tk. 39,475; households headed by a woman brought in Tk. 44,788 (married), Tk. 21,405 (widows), Tk. 16,175 (divorced), and Tk. 24,650 (separated). But even then, these variables and their interactions account only for about ten percent of the household income variance. This in all likelihood makes the meaningful targeting of ultra-poor support inputs less straightforward than orthodox assumptions about vulnerability and marital status would have it¹. The Impact Survey design was not sufficiently tuned to household lifecycle variables to ensure a more adequate understanding of these differences. For example, we presume, but do not know, that married women heading their households often were the wives of migrants who sent money home, thus their high household incomes. Remittances are one of the paths out of poverty.

¹ Since these figures were analyzed, one of us had a chance conversation with a donor representative accompanying a study team to ultra-poor project sites of another NGO. He mentioned its targeting of widows and the fact that donated cows wound up in the compounds of rich people whose extended family members the widows in point happened to be.

Striking poverty reduction

The picture of extreme poverty in the former RDRS participant households changes radically when we consider the changes over time, and it is in this temporal dimension that the panel survey shows its strengths.

The reduction in poverty is striking. In 2006 prices, the per capita incomes of the sample households moved from Tk. 7,594 (2002) to Tk. 8,655 (2004) to Tk. 9,316 (2006). The figures mean that incomes grew by 6.8 percent *per year* 2003-04, and by 3.7 percent per year in 2005-06. They correspond to deep falls in the poverty rate.

The percentage of the rural Rajshahi population living in extreme poverty, according to the BBS survey estimates, was 43.3 in the year 2000, and 35.6 in 2005. This is a drop of 7.7 percent point in five years. Extreme poverty in the RDRS sample fell from 68.4 percent in 2002, to 60.1 in 2004, to 55.7 in 2006. Within four years, it shrank by 12.7 percent points. This is part of a wider trend, not only in Bangladesh, but in the entire South Asia. The magnitude of the reduction, however, is truly remarkable.

An additional finding is worth noting for the income growth that caused the fall in the poverty rate. Relative growth was much stronger in the lower ranges of the income distribution, and this was true also of the second of our observed two-year periods, 2005-06, when growth weakened. This finding too is in line with wider trends in Bangladeshi society. Other research has found that the poorest among the *rural* poor had stronger income growth rates than the less poor and the lower middle class, in contrast to the *urban* poor, whose incomes were stagnant or shrinking across the lower spectrum. Although this has been made out to signify the success of a “pro-poor” growth strategy, the income growth pattern has gone hand in hand with increasing inequality. This holds for the larger society (as surveyed by BBS) and for the RDRS Impact Survey sample. In fact, when growth became slower, the income inequality among the former program participants accelerated.

Obviously, we are faced with a paradox. How can it be that the incomes of the poorest enjoyed the highest growth rates while at the same time the overall income distribution grew markedly more unequal?

Table 2: Movement in and out of poverty 2002 - 2006

Transition type	Poor in			Sample households	%HH
	2002	2004	2006		
1	no	no	no	162	21.46
2	no	no	yes	40	5.30
3	no	yes	no	29	3.84
4	no	yes	yes	53	7.02
5	yes	no	no	82	10.86
6	yes	no	yes	48	6.36
7	yes	yes	no	77	10.20
8	yes	yes	yes	264	34.97
Total				755	100.00

The answer is high income mobility, meaning vulnerability. High vulnerability has been the companion to the growth that took place during the panel survey period. To demonstrate this, we look at the mobility table on the previous page.

As can easily be added up in the rightmost column, no fewer than 44 percent of the sample crossed the poverty line at least once between 2002 and 2006 (transition types 2 – 7). The rates of entry to poverty and exit from it are surprisingly close. Between 2002 and 2004, 27.6 percent of the poor moved out of poverty; 28.9 percent of the non-poor fell into it. In the following transition period, 2004 to 2006, these rates were almost the same, 25.1 vs. 26.5 percent. Although the difference between entry and exit rates was minimal, the poverty rate fell in both periods. This could happen simply because the stock of poor was larger than that of the non-poor.

High vulnerability and high resilience

Thus both vulnerability and resilience were high. The same table tells us that chronic poverty and permanent non-poverty were significant. A fifth of the sample households enjoyed continued incomes above the poverty line. A third was below it during each of the three survey income years, 2002, 2004 and 2006.

These figures make more sense when they are dissolved by area. In flood-prone Bhurungamari, far from urban markets, only 11 percent of the sample households had permanently escaped from poverty (to the extent that three measurements over five years can tell). In the more secure Jaldhaka sub-district, close to Rangpur, almost a third were cruising above the poverty line. At the bottom, there was relatively little severe poverty left in Jaldhaka; there was a high and growing degree of it in Bhurungamari. Much of this, however, was *localized*, notably in Unions particularly badly hit by floods. Even in Jaldhaka, we found one Union in which severe poverty surged from 2004 to 2006, when incomes slowed.

So far, we have emphasized the apparent paradox of rapid poverty reduction and continuous high vulnerability. We now need to look at factors that may explain to coexistence of the two and also relate them more closely to types of NGO programming that, in theory, should have effects on both. A dominant critical factor in escaping from poverty is the household's ability to shift away from dependency on casual (primarily agricultural) labor and to find more rewarding employment in the non-farm sector. In Bangladesh, poorer households have been aided in these endeavors by NGO micro-finance and skills-training programs, which RDRS too has emphasized and adapted through most of its history. At the same time, the returns to non-farm employment will remain sensitive to the growth of the ambient economy. This is why the difference in income growth rates between 2003-04 and 2005-06 is so important in our survey analysis.

The former RDRS program participants have been highly successful in reducing dependency on casual labor. One needs to assume that this was true also of other segments of rural Rangpur – Dinajpur, but we do not have control groups. The income share from labor sale fell from 21 percent in 2002, to 17 percent in 2004, to 12 percent in 2006. Incomes responded strongly to the share from labor, both in 2002 and 2006, but it *appears*² that households who

² The word “*appears*” matters here. While income growth clearly slowed down in our *sample*, we have no certain knowledge that the regional economy of *Rangpur – Dinajpur as a whole* saw more sluggish growth in the same period. Official agricultural production statistics have not yet been published for the period in point; and the few local key informants from whom we tried to elicit stories for the years 2003 – 2006 were under the shock of the most recent, double-peak, flood of 2007, finding it hard to compare incomes of 2003-04 to 2005-06.

shifted earlier (during the strong growth years 2003-04) were rewarded with higher income growth than those who only moved when the economy was weaker. In other words, small businesses started in 2003 may have found a more attractive market than those that entered the fray only in 2005.

When income growth slows down

If these relationships hold true, there is an important consequence to be expected for NGO anti-poverty program impact. The effectiveness of loans and skills trainings will be strongly correlated with the growth of the ambient economy. Quality of service and effective targeting alone will not be able to offset the repercussions from slower overall growth. In fact, if more numerous new loans entail more small business starts in a slowly growing or contracting local market, they might undermine the profitability of businesses financed with earlier loans. Loans may still be helpful to alleviate vulnerability, by smoothing consumption, but they will not finance employment with higher returns. We leave this train of thought at this point to return to other findings.

In the same short term perspective 2002 – 2006, we consider how slower income growth and continued high vulnerability impact on social development. First, we note, as further circumstantial evidence that times had turned more difficult by 2005-06, the changing proportion of sample households who declared themselves food-sufficient. The percentage of food-sufficient households rose from 69 percent in 2003 to 87 percent in 2005³. It dropped to 79 percent by 2007, an indication of greater economic stress. There were similar changes, from 2005 to 2007, in the pattern of positive and negative life changes which respondents reported for the previous twelve months.

We find a clear distinction in the change pattern of health and sanitation behavior on one side, and school enrolment on the other. From 2003 to 2007, ownership of sanitary latrines and contraception increased markedly. 42 percent of the sample households owned sanitary latrines in 2003; that proportion nearly doubled to 81 percent by 2007. Among eligible couples, 75 percent were using some form of contraception in 2003; by 2007, this figure had risen to 84 percent. Importantly, prevalence became almost uniform across the income spectrum as well as between East and West Zones, closing the access gap that had earlier existed for poorer families in the East.

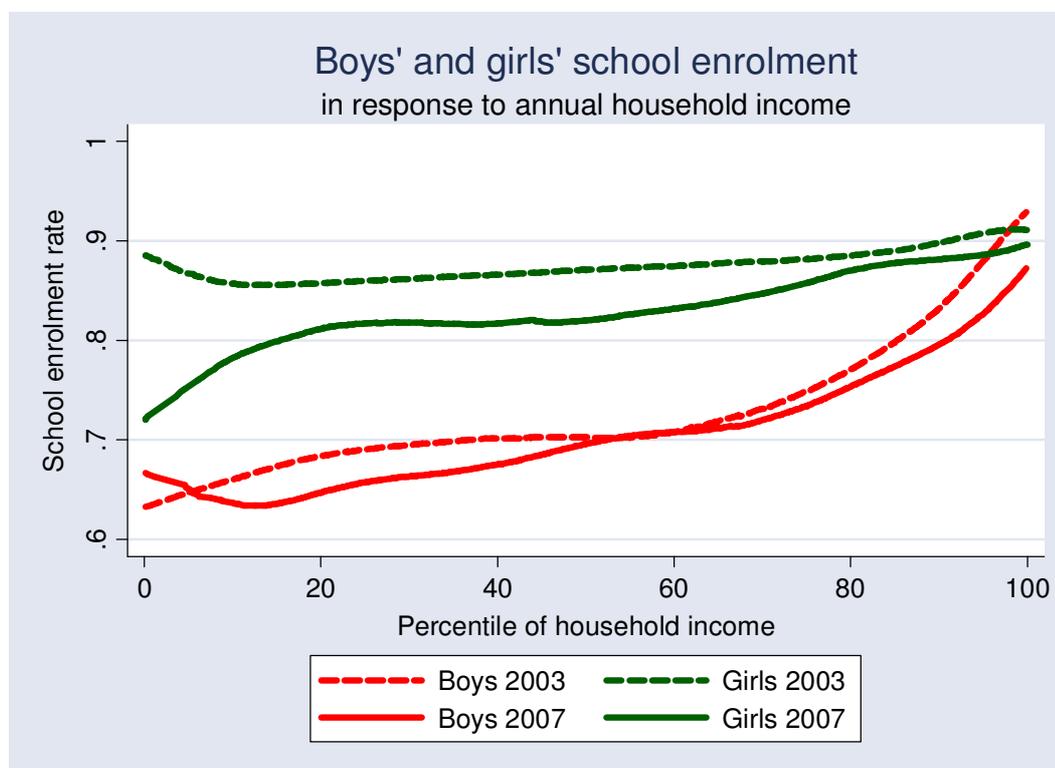
These patterns are markedly different from the response that school enrolment showed to incomes in 2002 vs. 2006. One may recall that the Government of Bangladesh has subsidized girls' education increasingly since 1991. In 2003, as a result of, among other things, that

From their sundry threads and pieces, one may again assume that the income growth patterns were localized. We attempted a test of this assumption by correlating income growth of our sample households with the loan recovery behavior of *all* RDRS micro-finance borrowers in the sample Unions. The rationale is that if the local economy comes under stress, repayments will tend to be more difficult for everyone. Details are given in the technical appendix.

³ Many readers will wonder how such a positive outcome can coexist with the high level of extreme poverty that we reported earlier for this same sample of households. Extremely poor households are not usually sufficient in food. Note that the designation of households below the BBS lower poverty line as "*extremely poor*" was given by the same agency, not by RDRS. We have no means (and no interest) to second-guess it and are solely concerned with the accuracy of our measurements and particularly with changes from one survey round to the next. Also, the perception of "food sufficiency" is subjective, yet within limits, discerning of a household's situation.

policy, girls' school enrolment was largely indifferent to household incomes⁴. For boys, this was not true; poorer families enrolled a significantly lower proportion of their school-age sons than richer families did. The following graph brings this difference out in the dotted lines for the year 2003.

Figure 2: School enrolment, in response to annual household income, 2003 and 2007



In 2007, the response was different. Compared to 2003, enrolment rates dropped for both girls and boys, across the income spectrum. Girls' enrolment became more sensitive to poverty; it dropped significantly more in the two lowest income deciles. Girls from better-off families, such as Fatema and Nazma of our title page, too were more often withdrawn or withheld.

The link between income growth and children's education is tenuous in this data because we did not enquire about education in the middle wave in 2005. The case of Fatema and Nazma, captioned on the title page, is clear. In two other sample households which we contacted specifically because their data pointed to student withdrawals, one retracted the earlier information. The parents in the other confirmed that they took a son out of school for work reasons, as well as his sister, in the expectation of being able to marry her off soon. But the link to greater financial stress in the household was not explicitly made. Overall, the fact remains that among the three selected social development indicators, school enrolment is the one manifesting a setback. Since withdrawals from school are correlated with income, we register them as an aspect of persistent household vulnerability.

⁴ These statistics are coarse. They distinguish neither between primary, secondary and other school education, nor between gross and net enrolment, nor between enrolment and attendance.

Longer-term patterns of decline and improvement

Concerned about the limitations of the short-termism of the panel survey, we turned to a small sub-sample (21 respondents) for a longer, life-history perspective. To better understand the rapport between their life experience and exposure to RDRS, this aggregate life-phase statistic may suffice:

Of the estimated 33,190 life years that the 798 respondents together passed between their birth and 2007, approximately a sixth fell into the era before the independence of Bangladesh in 1971, about half were passed between independence and joining RDRS groups, and almost a third elapsed since the enrolment with RDRS. Given also that active membership in the groups for many lasted only a few years, it is obvious that participation in RDRS programs is a significant, but not dominant life experience for most respondents and their families.

Not surprisingly, then, the ascending and descending episodes over the entire course of life to date amount to many more significant experiences than the times of active involvement with RDRS hold. Perhaps more surprisingly, the balance between lifelong careers that displayed an overall improvement trend and those dominated by descending trajectories is almost the same as that between the exit from poverty and entry into poverty in the short-term panel survey periods. The RDRS monitors coded 10 of the 21 life histories as improving, and 11 as declining. To the extent that this small sample reveals any significant associations, there is one with gender: 7 of the 10 male, but only 3 of the 11 female respondents belonged to ascending households.

In reviewing the 21 trajectories, the monitors isolated a total of 86 events or episodes that the respondents had cited as causes of decline. Similarly, they noted 61 starts of upswings. Other research has found that descending households were subject to more erratic, unpredictable “non-structural” factors (such as sudden crises) whereas ascending ones capitalized on favorable “structural factors” to which their local environments exposed them systematically. This may be correct as far as externally caused crises befalling the poor go, but typical family lifecycles events such as costly dowry and debilitating asset division are hardly non-structural in the socio-economic fabric of our sample. They are very much part of the social structure.

While improvement spells may be long and slow, conventional wisdom has it that crises are sudden, brief and deep. We were surprised to find that the median durations of improvement and decline spells were similar – looking at all identifiable instances, we estimated, quite imprecisely, that a spell would typically run for between 2.5 and 4 years, whereupon the direction of the respondent’s fortune would change. In line with other studies from numerous poverty contexts, health crises were the most frequent drivers of poverty. The quick rhythm at which fortunes turn is likely to have more profound implications for the relationships between NGOs and the poor than this Impact Survey can fathom out. For example, fast changing fortunes limit the capacity to expand businesses through consistent longer-term loan careers with the same lender or to serve as leaders in local associations over several terms.

[Sidebar:] “Snakes, ladders and traps”

We initially looked with some distrust at our finding that fortunes change so rapidly, for both upwardly and downwardly mobile households. We found indirect support for it in the mobility patterns that Kabeer studied in two villages elsewhere in Bangladesh (Kabeer 2004: 33). Although her household sample had much lower poverty rates, several of her findings are broadly compatible with ours. Of special interest at this point, however, is the frequency of household crises that she reported for the

period 1998 – 2001. In her sample, 70 percent of the chronically poor households suffered some crisis. The rate among those households who were never poor was not much lower – 61 percent were struck by some crisis in just three years. She aptly called her study: “Snakes, ladders and traps”, after the popular game of frequent and sudden ups and downs, and adding traps for those who could never find ladders to escape from the bottom rungs.

The types of crises, however, were different: 48 percent of the chronically poor suffered death, illness or accidents in the family; for the never-poor, such events befell a lower, but still significant 29 percent. International migration was a special crisis trigger in the never-poor (and in the upwardly or downwardly mobile as well!): eight percent of these households fell into financial hardship when migrants or attempts to migrate abroad lost them money. But not among the chronically poor; they could not afford this kind of investment to begin with.

Kabeer’s three-year crisis tabulation provides another interesting detail: Hardship due to dowry payment upset six percent of both the chronically poor and the never poor. For the upwardly mobile, there seemed to be a special dowry penalty; 13 percent of these households sunk into crisis trying to meet the obligations that their rising status entailed.

The fact that two thirds of her sample households confronted some type of crisis within just three years supports our observation of fast-changing fortunes. Kabir, however, does not believe that these change for the majority of the chronically poor. *“Certain sections of the population, many of them characterized by extreme forms of poverty or chronic forms of exclusion, are unlikely to benefit from the ‘normal’ processes of economic growth, however broad-based these might be, because their disadvantages cannot be reduced to purely economic deficits”* (ibid.: 44). She singles out two types of vulnerabilities that threaten all groups of society, but are most devastating for the poorest: abusive health care systems, and male misbehavior in the shape of drugs, alcoholism and gambling. RDRS has traditionally worked on these two risks through, among other things, its health program (including a long-standing constructive collaboration with government health services) and by supporting the federations, which allow women to bring community pressure on destructive husbands and in-laws.

The key points to take away

In sum, this study offers two paramount findings: First, this sample of former (and some still active) RDRS small group member households has experienced strong income growth in recent years. The growth rates were stronger at the lower end of poverty, a regularity noted also in other studies, including of rural Bangladesh. As a result, the poverty rate of this population dropped considerably between 2003 and 2007, and by more percent points than a BBS-surveyed sample population in rural Rajshahi did between 2000 and 2005, applying the same standard (the lower of the two BBS poverty lines).

Second, despite strong income growth, the vulnerability to new income poverty remains high. The exit rate from poverty was almost the same as the entry rate, and the sample poverty rate fell during this period only because the stock of poor was much larger than the non-poor. Within four years, 44 percent of the households crossed the poverty line at least once. This high income mobility is associated with growing inequality, which some observers deem unavoidable in the growth path of rural Bangladesh, despite some of its “pro-poor” characteristics.

The fall in the poverty rate and the continuous high vulnerability were observed over two two-year periods, which is such a short timeframe that we should refrain from sweeping conclusions. However, the growth rate in household incomes was much slower in the second period, and this gave occasion to correlate other behaviors, such as those measured by social development or most-significant-life-change indicators, with the incomes of 2002 and 2006. We find that several of these (but not sanitation and contraceptive use) respond to these changes sensitively.

In such a socio-economic environment, the question then arises of how an NGO like RDRS can further contribute to poverty and vulnerability reduction. It seems unlikely that NGOs can stabilize their program participants beyond an initial empowerment phase. Instead they may be most productive when they find effective and novel ways to create an enabling environment for the poor and for the recent escapees from poverty. This is a tough conclusion, difficult to avoid in the face of such vulnerability, but less dreadful if we take into account also the strong resilience.

In part, it answers also a question that our partners often ask: For how long should individual beneficiaries be assisted by RDRS? The answer is that there are no longer uniform client careers, with set recruitment, facilitation and phasing-out rules. The poor who become partners access different programs at different times, for needs that change, and as a function of the changing RDRS program mix. Practically, RDRS offers the poor opportunities to move out of poverty, but no guarantees to stay out of it. Ethically, it must work in the area as long as the environment remains hostile to the poor. The rapid poverty reduction is proof that large numbers of the poor have seized these opportunities; their lasting vulnerability reflects an environment that is less benign than the sum of all pro-poor policies made us hope.

More work, and more creativity, is needed also to enhance social protection systems, such as in micro-insurance. RDRS works with the federations of poor people, which fill quasi-insurance functions, though in limited ways (see sidebar below). RDRS also retains a base capacity for emergency relief. Advocacy and rights-based movements can nudge the state into a more effective social protection function.

But in all this, RDRS is but one player among many in northwestern Bangladesh. Further poverty and vulnerability reduction among the people who participate in its programs will predominantly depend on the strength of the ambient economy and of wider institutional frameworks, far beyond RDRS' direct impact. RDRS' creativity will be challenged to modulate its program offers in tune with these larger evolutions.

[Sidebar:] RDRS programs with a quasi-insurance function

While formal insurance is not widely developed among Bangladeshi NGOs, a number of program types – financial and other – have an informal or quasi-insurance function for the poor:

- In the history of RDRS programming, savings were encouraged and facilitated before the micro-loan program was started, and they continue to play an important function in buffering against economic shocks. In October 2007, group member savings deposits totaled Tk. 312 million, more than a third of the Tk. 737 million in loans outstanding.
 - Programs for the ultra-poor, especially asset creation and transfer supported by the WFP, account for a significant part of the RDRS turnover. They increase not only the income capacity of some of the current poor, but also the probability for families newly falling into severe poverty to get access to productive resources helping them to recomb.
 - Health care (about half of all pregnancies in the working are benefit from RDRS ante-natal care), support for women's rights (challenging domestic abuse, taking up legal cases), support of federations (resulting in dispute mediation and VGD card access), and disaster preparedness measures fill risk-mitigating functions.
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Future Impact Surveys

The Impact Survey experience from 2000 to 2007 has been a positive one, if only by demonstrating that a regional NGO, fairly isolated from most research networks, was able to document some aspects of its task environment in ways that go beyond routine project reporting. The current household sample has most likely run its course; it needs to be replaced with other units more directly involved in current programs. Also, the sample surveys must be done more rapidly. In theory, they could serve a sentinel function, perhaps less concerned with the impact of past programs and more with changes that can inform or inspire immediate or future policies.

One idea is to explore the large RDRS micro-finance database, first as a sampling frame for surveys, and second for patterns of saving, borrowing and repayment that teach us more about the vulnerability of the northwestern communities, and then break out with the financial data in hand to meet the communities and hear their side of the story. In addition to highly-structured questionnaire interviews that are the typical data collection method in household panel surveys, data from qualitative methods such as the life course histories used in the latest round will help to paint a more complete picture of program impacts, one that sheds light also on the finer-grained processes leading to them.

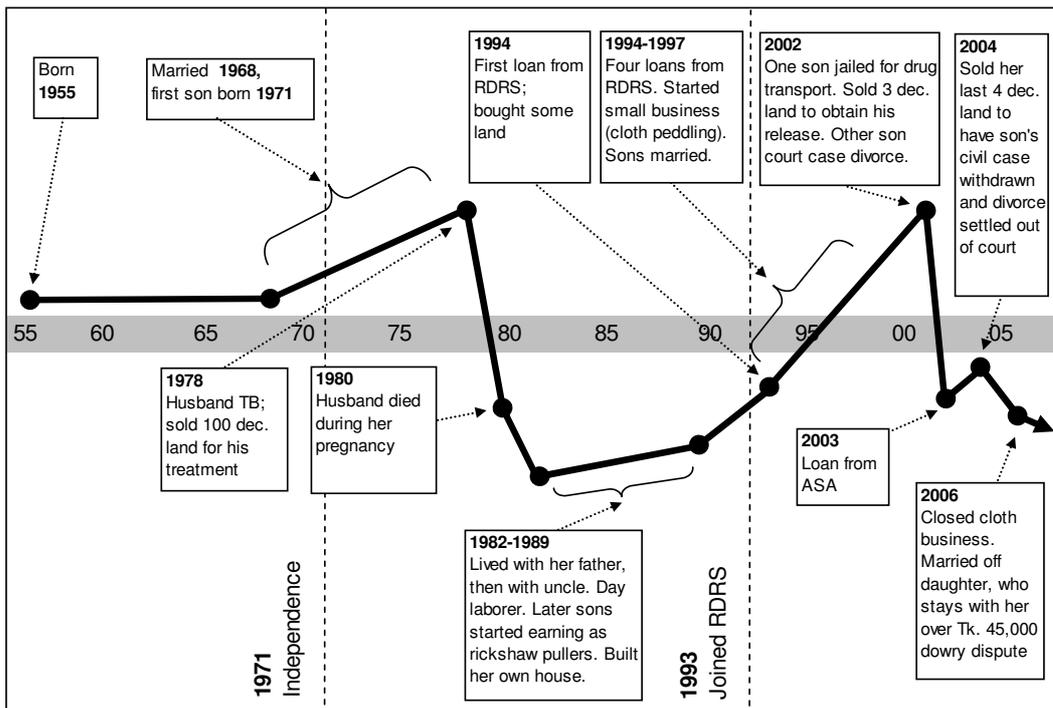
The challenge for regional NGOs like RDRS is to build and maintain a staff who continue in their conceptual growth while spending most of their time doing the lowly chores of program monitoring. Household panel surveys, rounded off with other approaches, can indeed stimulate such growth.

[Case study:] Shaheda

To meet Shaheda, we cross a warren of small lanes and a compound of several huts behind the central bazaar of Nageswari town, to an inner family yard that doubles as the kitchen for a restaurant in one of the main streets. Some of us met her already in 2005 when she was part of a small follow-up study of some of the 2003 sample households. Knowing a bit about her life rich in ups and downs, we are anxious to find out how her fortunes have grown since then. Also, Shaheda had given an interview as part of the third survey wave just a few months back, in June 2007. It is a sunny, cool Friday morning, the week's holiday, which is why the kitchen is quiet. We are received by the restaurant owner, a friendly elderly man, who was Shaheda's late sister's husband and is her current employer and, in a manner of speaking, substitute guardian. He arranges table and chairs, sends for Shaheda and, once introductions completed, shields the interview from a stream of curious neighbors.

Shaheda, an outspoken woman of 52 or 53 years of age, has no trouble guiding the team through her life story and confirming at regular intervals that the diagram being drawn in front of her conveys its essential turns of the road. Married when she was 13, she bore her first child at age 16. The family was not greatly affected by the independence war, but by 1978 her husband had come down with TB. They sold much of their land to defray treatment costs, to no avail; he died, in 1980, during another of her pregnancies. This chimed in a period of descent of almost nine years. She changed residences between her father's and an uncle's, worked as a day laborer, and built her own house once her two sons started earning as rickshaw pullers.

Figure 3: Shaheda's life history diagram



Shaheda joined an RDRS group in 1993, *after* she had already managed to stabilize her declining situation. The period from 1994 to 2002 she described as one of uninterrupted improvement. With the help of four successive loans from RDRS, she purchased some land, saw to the marriage of her sons, and started a small business, peddling sarees and cloth door to door in Nageswari town and in its surrounding villages.

These halcyon years came to a brutal end in 2002 when both of her sons faced court cases. One was jailed as an accomplice to ferrying illegal drugs. The other had divorced his wife; her father went to court. Shaheda first sold land in order to obtain her son's release. In 2003, a loan from ASA provided a breathing space, but in 2004 she sold her last land [and much of her business inventory, as we know from a previous interview] to have the divorce case settled out of court. She closed her business in 2006 and moved in with this restaurant operation, where she receives food, although no salary. She says she is lucky; the owner's new wife, although morally not obliged to support her, likes her well. Another neighbor loaned her a plot on which she erected a hut.



Together with other women working in the restaurant kitchen, Shaheda (second from left) prepares vegetables for curries that customers eat as early as 7 a.m. in a main street dining place. The scene was arranged; the kitchen was not active on this holiday morning, but we were assured that this was the arrangement on most mornings as soon as the *ahsan* called, while it was still dark. Also helping is Jasmine (far left), Shaheda's already married daughter, who is staying with her, pending the resolution of a dowry dispute.

Her troubles are not yet over. In 2007, she had her 16-year old daughter Jasmine married. Jasmine has not moved in with her husband over unresolved dowry issues. Shaheda cannot raise the Tk. 45,000 that they are demanding⁵. Jasmine meanwhile is staying around as a kitchen helper, knowing that she cannot endlessly go on living with her mother.

While her checkered life course may not be exceptional for the poor in Bangladesh, what makes Shaheda special is her upbeat, unbroken spirit in the face of many woes and the fortune to fall on friendly people who have come to her rescue. She may be virtually penniless, but she is not homeless. She is respected and has enough to eat.

As in many life stories, this one has its repressed corners, because privacy so demands, or because intense pain locks them away. Where in the story is Jasmine's father? Her son was jailed for his alleged role in a drug-smuggling operation; if he was lawfully convicted, how did his mother's money buy his release? He has since disappeared from her life; how are his wife and the other son doing? Is it presumptuous of us to end the life course diagram in a downward-pointing arrow, anticipating more trouble for Jasmine and her mother? Or, rather, are there forces of resilience at work which our interview skills were not good enough to probe?

A few general observations, more detached from the personal aspects, seem in order.

Deep declines are often triggered or aggravated by circumstances over which the poor, regardless of their prior fortunes, have little control. The institutional environment in which they can be contained, however, changes over time. For example, also as a result of RDRS' long-term involvement in health care, the detection and treatment of TB are nowadays more effective than at the time when the scourge took away Shaheda's husband.

Second, one of the realms in which the poor do exercise substantial control is family life and community solidarity. Researchers acknowledge, in terms of "social capital", the important solidarity of neighbors, kin or kind-hearted people of any relation; and RDRS policy amplifies it through the federations. Yet, there is a darker side to the household dynamics of the poor - one filled with dowry, divorce and costly family court cases - that exacerbates their vulnerability. Our Impact Survey design did not anticipate this component adequately until the life history interviews brought it home.

Finally, Shaheda's use of loans makes one wonder whether the successful ones among the micro-borrowers are those who gained a measure of stability *prior* to their business growth. If so, then loans may not be helpful for the ultra-poor in free fall; for such, asset donations or special social protection measures may be more appropriate.

Shaheda was interviewed by Faruque Ahammed and Nirmala Rani Das. The case story was written up by Aldo Benini, with their assistance.

⁵ Tk. 45,000, at a realistic purchasing power parity exchange rate, is about US\$ 3,400. Shaheda, during an interview in summer 2007, calculated her 2006 annual income to have been in the neighborhood of Tk. 6,900.

RDRS in a Nutshell

RDRS Bangladesh was established in 1972 as a field program of the Geneva-based Lutheran World Federation / Department for World Service (LWF/WS), when Bangladesh was an emerging nation and the vast majority of its population lived on the edges of starvation. Its first task was to provide relief and rehabilitation for refugees and those left destitute after the War of Independence. RDRS derives from “Rangpur Dinajpur Rural Service”, named after the Rangpur and Dinajpur region in north-west Bangladesh.

During the period 1976 to 1990, RDRS completed its transformation from a relief agency to a multi-sectoral rural development NGO, retaining its regional identity and focus in the northwestern poverty belt. In 2007, RDRS worked in eleven district (two of those, Habiganj and Moulvibazar, are in northeast Bangladesh), 57 upazilas (sub-districts) and 430 unions (local communes). An estimated 13.8 million population lived in its working area. More than two million were directly associated with RDRS development programs.

During the 1990s, a radical shift took place in RDRS’ philosophy and field activities towards a group-based delivery system, with Union Federations and other community-based organizations emerging as the medium for the message. In this decade, RDRS, like many other Bangladeshi NGOs, built up a large micro-finance program.

In 1997, after 25 years as a field program with expatriate senior administrators, RDRS finally became an autonomous, national development NGO, governed by a Board of Trustees and run by Bangladeshi managers. The supportive relationship with LWF Geneva and its partners continues. In 2007, RDRS was working with approx. 20,000 organized groups, with members drawn from 331,000 households. It had a total staff of 2,351, of whom twenty-four percent were women, and administered resources worth US\$ 10.1 million (excluding micro-finance).

This information has been compiled from the Annual Reports and from internal documents of the North Bengal Institute, a research and advocacy unit associated with RDRS.

Acknowledgements

The authors wish to thank numerous unnamed RDRS Federation leaders for their help in locating respondents. We thank Mozammel Haque, RDRS Micro-Finance Department, for an extract of loan repayment data used in our calculations, as well as Mahmuda Khandker, North Bengal Institute (NBI), for river flow data and time series of food prices and daily wages. We are grateful to Pia Schneider, World Bank, Washington DC, as well as to Sufia Nurani, RDRS Dhaka office, for helping out with literature. We appreciate the flexibility of the Lutheran World Federation, World Service, Geneva, in rescheduling other work so that this analysis could go ahead in November 2007. We thank Allen Armstrong for helpful comments on an earlier draft.

The Research Team

The authors listed on the title page, together with other NBI colleagues not involved in this particular production, designed, conducted and analyzed the 2003, 2005, and 2007 waves of the Impact Surveys including the case studies used in this report. Aldo Benini, as a consultant and RDRS Strategic Advisor, performed most of the statistical analyses and wrote the bulk of the report. The views offered in this report do not necessarily reflect those of the RDRS management, and any errors, factual or other, are solely the authors’.

Abbreviations and Acronyms

BBS	Bangladesh Bureau of Statistics
CBN	Cost of Basic Needs method
CDP	RDRS Char Development Program (char = sandbar island)
CPI	Consumer price index
FGT	Foster - Greer – Thorbecke. A family of poverty indices
LSMS	Living Standards Measurement Survey
NBI	North Bengal Institute, in Rangpur, an RDRS-affiliated research unit
NGO	Non-governmental organization
PPP	Purchasing-power parity
RDRS	RDRS Bangladesh, formerly known as Rangpur Dinajpur Rural Service
UNDP	United Nations Development Program
VGD	Vulnerable Group Development
WFP	World Food Program

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Introduction

Since it was founded in 1972, several hundred thousand, if not millions of poor households in the northwestern region have participated in the programs of RDRS Bangladesh. A cumulative number is not possible; there is no agreed unit of exposure or involvement. Although currently the RDRS Microfinance Department alone manages several hundred thousand customer identities, an even larger magnitude must have entered and exited the diverse programs to which the far-flung RDRS field presence invited them. What became of those people? How vulnerable to new poverty are those that escaped from the old, by their own efforts and with the help of RDRS and others? How resilient are those still in poverty? These are questions of a complexity that rule out simple answers, but nevertheless require some answer. This study makes a small first step towards one.

Until the late 1990s, program exposure and participation were relatively easy to document. RDRS was the largest NGO in its working area; and households participating in its programs did so chiefly through membership in small groups that had a clear identity on RDRS' books, in terms of baseline information and regular updates on a small number of key variables. This data was complete and fairly reliable, although kept in formats that resisted all but the most basic analyses. It had serious validity issues. Beyond basic accounting, it was not clear what was counted, and for what purpose.

Amid the organizational turbulence generated by a rapidly expanding microfinance program, and in the hubris of aggressive computerization, the initial paperbound baseline data was discarded, and the program careers of groups and member household increasingly grew diverse, entwined with other NGOs and accessible in partial segments, as loan histories or through rare sample surveys. Of course, there had always been participant turnover, but the pretense of a unified, stable membership in the RDRS beneficiary fold had to cease in favor of weakly correlated separate identities as borrowers and savers, as members of RDRS-supported community-level federations, and as short-lived clients in other service delivery programs in the health, relief and disaster preparedness, and livelihoods fields. Fueled by the competition from microfinance NGOs, large numbers of participants fluctuated between providers without formally terminating their status as RDRS borrowers. By one count, about 80,000 of 390,000 households that the microfinance database recorded for a putative federation membership have ceased being active customers, and nobody can determine who in fact are active members of a federation (RDRS 2007a). Both the micro-finance department and the unit most closely allied with the 260 federations work in separate information streams indifferent to each other.

These administrative considerations may seem to distract from the subject of poverty and vulnerability. However, they determine how big and clear the window opens on these subjects. Three stakeholders want to see it wide open: RDRS itself, its partners, and the Bangladeshi public.

Narratives and anecdotal evidence of all sorts of vulnerable and resilient persons and groups abound among RDRS' 2,000 workers. To have a more reliable understanding of what is occurring on the ground, RDRS has devoted scarce financial and human resources to enhance its monitoring capacity. This study is a return to this investment.

Second, RDRS operates in an aid market that creates increasing pressure for demonstrated impact. A demonstration that meets high standards is not easy. Besides the absence of baseline information, the heterogeneity of participant histories is one of the major obstacles to cogent program evaluations. The resulting problems of attribution seem almost intractable. Yet, the pressure to make impact credible does not go away.

Third, domestic audiences are asking the impact questions more impatiently. In the region, RDRS is well known for its dense coverage of a crescent-shaped poverty belt formed by 29 sub-districts. One often hears comments of the kind: *“You NGOs have been working here since Independence, and there are still so many poor people. What have you done?”* It is therefore a question of burning interest as to how the people of the northwest, many of whom former long-time partners of RDRS, and others currently active, are faring in terms of poverty and the risks of transitions into and out of poverty, denoted as vulnerability and resilience.

This study attempts a partial answer.

Objectives

From program effects to vulnerability estimates

We investigate aspects of poverty and vulnerability using data that the RDRS monitoring staff collected on a systematic sample of households drawn from lists of neighborhood groups. These were the groups with which RDRS was working at the end of the 1990s. This sample of 800 households was visited three times, at two-year intervals. The sample was initially constituted as part of an “Impact Survey” meant to relate differences in participation levels to those in poverty outcomes, but after the first wave of 2003, both the difficulties of measuring participation and of attributing outcomes to this participation have become increasingly obvious.

Fortuitously for this study, the three survey waves bind together two periods of income change that differ significantly one from the other. This “quasi-experimental” approach - in a graphic, if incorrect manner of speaking - benefits additionally from the fact that the surveys returned supporting data on select social development indicators, food security, and on most significant life changes.

The objective is largely descriptive. We describe the extent of movement in and out of poverty during a relatively short period of time (2002-2006). We hope to gauge the vulnerability of those who escaped poverty (assuming that at time of selection into the RDRS programs virtually all households were poor), and of its counterpart notion, the resilience of the poor. Our application of the vulnerability concept remains limited to the extent that income information on the entire sample and in-depth life-course interviews with a small sub-sample tell a story. Between the two major contributors to welfare, livelihoods and health, our data is biased to the first, with no firm data on changes in the second.

Using a poverty line defined and applied by the Government of Bangladesh (Bangladesh Bureau of Statistics 2006), we compare recent changes in the poverty of our sample to that reported in the relevant government survey sample stratum - the rural population of the Rajshahi Division. However, we do not generalize our findings to this population because the RDRS working area covers the northern extreme of the Division only and, more importantly, because we do not control for the effects of program entry and exit. Ninety percent of the

sample households were enrolled between 1989 and 1999, in small groups assisted by RDRS staff. At the time, they typically were poorer than the general populace of the area; in 2007, they still were considerably poorer than the rural Rajshahi households at large.

Our analytic ambitions thus are modest; they need to be understood in the RDRS institutional context. As mentioned, RDRS faces increased pressures to demonstrate impact. It has reformed its monitoring systems with a view to documenting changes in the task environment beyond the requisite financial and output reporting, only to find itself challenged by steadily more complex measurement and attribution problems. For example, just within the four years that separate the first and third wave of this panel survey, household membership in other NGOs more than doubled, from 15 to 32 percent. It is now more prevalent than active borrowing from the RDRS microfinance program. Conversely, the microfinance program has recruited large numbers of new customers, whose variable exposure to other RDRS programs and to other development opportunities remains largely unknown.

In theory, challenges to impact evaluation of the suggested kind can be mitigated by appropriate program designs, such as randomized assignments of households to membership and benefits (Duflo and Kremer 2003). In the political economy of mid-sized development NGOs in Bangladesh, of which RDRS is one, the coexistence of semi-autonomous core programs with pre-packaged subcontracting projects frustrates coherent experimental designs. Benini (2007a) traces the information-economy and conceptual aspects of monitoring the local federations of poor people that RDRS has been fostering in the same region; at the household level, the information base is even more precarious, if only by the absence of the kind of accounting and decision records that formal organizations customarily produce. Interview-based surveys by themselves cannot adequately measure household exposure and participation in a densely-populated NGO landscape.

Nevertheless, the ability of conducting a systematic sample survey with little attrition across three waves constitutes a departure from the tradition of purely cross-sectional measurements - one that occasionally challenged the organization's monitoring resources to its limits. The data from the first wave in 2003 was used to gauge program effects; the absence of baseline information and of a control group required contrasting models making rather extreme assumptions. They led to a highly imprecise estimate of RDRS program effects on participant incomes of between 8 and 21 percent (Benini and Ferdous 2005).

In the current data situation, detailed further below, we radicalize assumptions in the sense that we consider the household incomes measured in the first wave to express all effects of prior development interventions - both from RDRS and from other agencies - as well as the effect of the households' own endowments. In other words, we no longer attribute differences to specific program impacts and instead focus on changes in the condition of the poor in the period 2002 to 2006 (and for some indicators to 2007). The focus is on their current resilience and vulnerability, in a region in which RDRS continues to operate intensively, but where many have moved in and out of programs numerous times.

Chapter structure

The study proceeds as follows:

This study lives off data that a particular monitoring activity in RDRS, the so-called Annual Impact Surveys, has supplied. The historical rationale for these surveys, the adaptation to

competing demands, and the specific three-wave panel survey used here are described, together with some more qualitative supplements taken onboard in the second and third wave.

In a first substantive chapter, a shorthand history of the vulnerability concept leads into a brief discussion of poverty lines and hence of more dynamic poverty concepts. The public debate about *monga*, a famine-like seasonal disorder in parts of northern Bangladesh, demonstrates that the sum of slow-moving private afflictions can reach a tilting point beyond which a fast-moving public attack on vulnerability emerges.

We measure poverty by income, and accordingly at first present a cross-sectional picture of the 2006 income year. We differentiate this picture along two relevant criteria – the gender aspect of poverty, and the differences between two socio-ecological zones, the flood-prone eastern part of the RDRS working area, and the more stable western part. These East and West Zones in RDRS parlance are separated by the river Teesta. A map is included in the summary of this report.

We then introduce a more dynamic perspective, looking at income growth over two periods and the poverty rates in the three points of time that bound those periods. We estimate how household income growth varied across the range of poverty in each period. We look at movements in and out of poverty and determine rates of apparent chronic poverty and of being permanently non-poor within the observed time span.

Going beyond a simple poor/non-poor distinction, we estimate the severity of the poverty in the sample population, using a class of internationally accepted metrics, the Foster - Greer - Thorbecke (FGT) indices of headcount ratio (the proportion of poor), poverty gap and poverty severity. We do so in the interest of comparability with the BBS survey and also as an exercise in identifying especially vulnerable areas that may need early redeployment of resources or further continuation of existing programs.

While our data are not sufficient to estimate an asset-based income change model, we investigate in greater detail the composition of household incomes. Of special interest is the shift from poorly rewarded casual labor to other activity types which research has shown to produce much higher returns, particularly in the non-farm sector. We use observed shifts in casual labor dependency to estimate vulnerability via income changes related to those shifts, controlling for a number of other factors.

These income changes happened in the short term. For a small sub-sample (21) of respondents, whom we interviewed in depth, we map the dynamics of advancement and decline over the entire course of their lives to date. We classify events, most of them sudden, that led to crises and decline as well as those events and episodes that the respondents felt were helpful for their advancement. We separate these counts by working area zone and by time before or after the respondent household received the first micro-loan.

To weaken, if not entirely dispel, the suspicion that the differences in overall growth rates were due to systematic measurement error (such as an upward bias in the middle-wave [2004] incomes) rather than to real-world changes, we contrast the average rates with the changing balance between negative and positive life changes that respondents noted for the most recent 12-month period. Similarly, we look at food-sufficiency over the years.

Our last substantive chapter presents the achievements of sample households on three social development indicators on which data were collected in the first and last waves. We summarily present the changes in school enrolment, latrine ownership and contraception usage. We then investigate how school enrolment and contraception responded to poverty in 2002 and 2006.

We conclude with some reflections on the relationship between growth and vulnerability among the poor associated with RDRS as well as on the experience and design lessons of this impact survey in the mould of a regional Bangladeshi NGO. An appendix holds supplementary tables and some technical descriptions, including of the exploratory local regression tools that we chiefly used to detect non-linear effect shapes.

The RDRS Impact Surveys

RDRS instituted a series of annual household surveys in 2000. They replaced the earlier full enumeration-based monitoring of thousands of neighborhood groups that RDRS had organized and supported for years. Full enumeration became unviable under the stresses that the expanding micro-finance program was creating in the field staff. The annual surveys responded to a growing desire to go beyond mere activity reporting and to assess outcomes and impacts, which is why they were termed “Annual Impact Surveys”.

While the logical frameworks of some of the specific projects that RDRS contracts call for such assessments, concepts and indicators tend to vary from project to project. Moreover, they hardly follow any recognizable research tradition or coherent model of program participant behavior. The Impact Surveys seek to offer a framework for valid and reliable estimation of program effects detached from the vagaries of individual project formulations. They lean on a pre-existing internationally recognized survey tradition, the World Bank and UNDP-promoted Living Standards Measurement Surveys (LSMS) (Grosh and Glewwe 2000), and try to ensure comparability with other poverty research in Bangladesh. In doing so, the Impact Surveys adopted the household as the basic data collection and analysis unit, repeated interviews of respondents (panel surveys), as well as poverty lines used by government-related surveys (Ahmed 2004: ; Bangladesh Bureau of Statistics 2006).

From their inception, the RDRS Impact Surveys have had to contend with capacity limits of various kinds. Impact Survey products cannot substitute for project reports; these are largely extracted from monitoring data collected against annual activity plans. The demands of timely activity monitoring as well as backlogs in the analysis of the early impact survey rounds forced a reduction of data collections to a bi-annual rhythm. The refinement of specific measurement instruments such as of household and productive assets and their value has not kept pace with the research done elsewhere in the country. There are no control groups that would allow the analysis to separate program effects from selection effects. And perhaps most consequentially, the population of former and current RDRS program participants has been opened rapidly to interventions from other rural development agencies, notably other micro-finance NGOs. This increasingly undermines attribution of household poverty changes to RDRS program variables.

Thus, the initial assumption of a continuous link between RDRS and the sample households, with unbroken group meeting, skills training and savings-and-loan careers, has to be replaced with more opportunistic membership views. The households sampled from a 1999 group census are nowadays more like free particles in a charged organizational field where intermittent program offers from various sources attract and repel them. What they have in

common is the fact that most of them were poor in the 1990s. All were recruited into RDRS programs with the intent of lifting them out of poverty through structured, although in principle open-ended, participant careers. This creates a meaningful link between poverty, its attendant vulnerability and the RDRS overall effectiveness, at least at the collective level.

While the RDRS Impact Surveys lag behind cutting-edge evaluation science, they are strong on two points. A core group of NBI staff involved in the development of the sample and the questionnaire has been responsible for the data collection as well; this has made for good reliability. Second, the discipline of panel surveys is not common in any but the largest rural development NGOs; the RDRS Impact Surveys figure at the upper end of sophistication that one can find in the monitoring toolboxes of mid-sized ones. Many NGOs in Bangladesh collect data as part of bilateral project agreements, only to surrender them unanalyzed to their donors. By building its own analytic capacity through the practice of Impact Surveys, RDRS helps to mitigate the highly stratified international development expertise system.



Towards the end of a two-hour life history interview, RDRS monitor Nirmala Rani Das ratifies a diagram with Shaheda, a widow living in Nageswari. Shaheda is the cornerstone of our case study on page 16. Life history interviews were conducted with 21 sample members in search of growth and vulnerability patterns over a longer period of time than the panel wave periods. While Shaheda told her life story in a sovereign manner, following the diagram assembly step by step, other interviewees were largely supplemented by senior family members, neighbors and fellows of their local associations. Some interviewees took matters literally into their own hands; and one insisted on a downward shift of the drawn trajectory.

The 2003 – 2007 three-wave panel survey that underlies this study worked with approx. 750 respondent households in four sub-districts of the Rangpur – Dinajpur region. The structure of the sample is further explained in the appendix. In addition to conducting standardized questionnaire interviews with respondents of the full sample, RDRS monitors conducted in-depth interviews of a more open nature with small sub-samples twice. In 2005, twelve respondents in the East Zone were revisited with a view to understanding the drivers of recent income changes. In 2007, the same twelve plus nine from the West Zone were asked to map out their lifetime mobility in terms of their personal definitions of household crises and achievements. The method loosely follows the life-history interviews pioneered by Davis (2006) elsewhere in Bangladesh. These interviews were more detailed than the elicitation,

during the standardized interviews, of *recent* significant life changes, which used an abridged version of Davies’ narrative approach to the lives of the poor (Davies and Dart 2005)⁶.

Vulnerability

Elements of the concept

Vulnerability, a close partner of poverty, in recent years has become a winning concept in development politics, notably as in “vulnerability reduction”. Its rise to prominence was arguably hastened by the World Development Report 2001, which devoted a chapter to “Helping the poor manage risks”. From it, the glossary of key terms below is taken (World Bank 2001: 139). In a recent conference in Bangladesh on “what works for the poorest”, the move “beyond poverty alleviation to vulnerability alleviation” was promoted as an essential element of appropriate social protection systems (Moore and Brauholtz 2007: 2).

Figure 4: Key vulnerability terms

Some key terms: risk, risk exposure, and vulnerability

As traditionally defined and measured, poverty is a static concept—a snapshot in time. But insecurity and vulnerability are dynamic—they describe the response to changes over time. Insecurity is exposure to risk; vulnerability, the resulting possibility of a decline in well-being. The event triggering the decline is often referred to as a shock, which can affect an individual (illness, death), a community, a region, or even a nation (natural disaster, macroeconomic crisis).

Risk, risk exposure, and vulnerability are related but not synonymous. Risk refers to uncertain events that can damage well-

being—the risk of becoming ill, or the risk that a drought will occur. The uncertainty can pertain to the timing or the magnitude of the event. For example, the seasonal fluctuation of farm income is an event known in advance, but the severity is not always predictable. Risk exposure measures the probability that a certain risk will occur. Vulnerability measures the resilience against a shock—the likelihood that a shock will result in a decline in well-being. As this chapter explores, vulnerability is primarily a function of a household’s asset endowment and insurance mechanisms—and of the characteristics (severity, frequency) of the shock.

Source: World Bank Development Report 2001 (World Bank 2001: 139)

On the measurement side, vulnerability is understood as the probability that a subject’s welfare will be reduced, often with the connotation of a rapid and dramatic change. The welfare loss is most often discussed in terms of health or income, but it may extend to any dimension of a person’s or social group’s integrity and survival. In the poverty context, “vulnerable to sudden income shocks” is a constantly used formula, but income mobility does not fully account for the complexity of vulnerability. For, as Barrett and McPeak (2003: 3) rightly underline, the poor know their vulnerability well and go to great lengths to reduce it. They do so at a cost, sometimes hidden, that may contribute to locking them in poverty traps. Strategies include holding on to unproductive assets for self-insurance or cultivating patrons who impose unfavorable terms and may still let down the poor in the hour of need.

⁶ Davis and Davies are two different researchers, both of whom developed and tested narrative methodologies in Bangladesh. Davies’ “Most Significant Change” technique applies an evolutionary model to the generation, selection and further use of stories told or written by program participants, harnessing them to the detection of new knowledge from the margins of experience. Davis’ concern is more with the importance of diversity and sequencing and the ability to abstract common typologies of life courses and hence with the distribution of narrated biographies over these types in mixed quantitative-qualitative research. The use, in our study, of Davies’ concepts for short-term changes and of Davis’ for lifetime trajectories is arbitrary and not dictated by the scope of these methodologies; we simply discovered Davis’ work much later after the 2005 wave had already used elements of Davies’ technique. For wider experience with panel surveys and life histories, see the conference report edited by Baulch and Scott (2006).

On the conceptual route from poverty to vulnerability several refinements have occurred that are percolating also into household-survey based poverty research. We loosely recapitulate the same authors, Barrett – McPeak (op.cit.), in enumerating the critical waypoints of the last thirty years. In the 1980s, progress was made in the ways of counting the poor that went beyond simple head counts and looked more closely at the depth of poverty. The resulting metrics – known as the Foster-Greer-Thorbecke headcount, gap and severity measures (or simply, FGT; Foster, Greer et al. 1984) – are now universally accepted and used both in our reference survey (BBS, op.cit.) and, for comparison with it, in this study. The FGT values, when decomposed to our sample sub-districts, for example, alert us to an increase of severe poverty from 2004 to 2006 in one of our sample sub-districts. FGT thus assists vulnerability detection in collectivities.

Kamanou and Morduch (2002: 4) usefully remind us that

“Measurement error poses a serious challenge for analysts of vulnerability. The error can come in several forms. First, errors in forming measures of consumption aggregates; second, inappropriate price deflations; third, inappropriate deflations for household size; fourth, errors in matching households in different waves of panel data.”

While we believe that the Impact Surveys carry some systematic errors (such as omission of the rental value of owned housing in annual incomes), we also believe that they are tolerably limited in the income measurements. We were most concerned about appropriate price deflations because in-depth life history interviews in 2007 would frequently refer to price hikes in essential food items much steeper than the official food inflation rate. We used RDRS-collected wage and rice price time series for the Rangpur region to determine that the Bangladesh Bank-publicized consumer price index was acceptable for inflating 2002 and 2004 incomes to 2006 prices. We speak more to this and other types of error in the appendix.

Poverty definitions

The same uniformity has not been achieved in the definition of poverty lines, the income criterion below which a person or household is considered poor (David 2002). The well-known World Bank line for extreme poverty, living below US\$ 1 per person per day (which we had used for the 2003 survey analysis), and its \$ 2 moderate-poverty consort, are chiefly used for international comparisons while within-country poverty studies rely on different concepts. This study follows the Bangladesh Bureau of Statistics (BBS) cost-of-basic-needs (CBN) method, which costs a minimum food intake commodities basket topped up with a non-food allowance (Bangladesh Bureau of Statistics 2006). BBS has set lines that vary by region, city vs. countryside and whether a low non-food allowance (extreme poverty) or a more generous one (moderate poverty⁷) are included.

The poverty lines and FGT metrics define important differences with regards to the incidence and severity of poverty, but do so in a static way. Over the last fifteen years, exploiting a growing wealth of panel survey databases that assess the poverty of the same households over several points in time, a sharper awareness has arisen not only of the magnitudes, but as well of the duration and dynamics of poverty (Baulch and Hoddinott 2000). What to the distant observer may look as a dauntingly large uniform mass of poor people, in fact is more like a teeming prison with a revolving door admitting and releasing inmates at a rapid pace. The

⁷ “Extreme poor” (lower line) and “moderate poor” (upper line) are the terms used by BBS, op.cit., 25.

pillars supporting the revolving door are made up, on one side, of the permanently non-poor and, on the other, of the chronically poor, who may take years, decades or generations to move out of poverty.

The attendant poverty distinction is between the chronic and the transitory (sometimes also called “transient”) kinds. In different poverty contexts, people move across the lines at very different speed. Barrett and McPeak (op.cit.: 1), using data from other studies, calculate that the monthly exit rates from poverty are nearly 7 percent in the USA, but only 1.3 percent in the Ivory Coast, and a mere 0.7 percent for KwaZulu Natal, a poor province of South Africa. Anticipating on our findings below, a similar back-of-the-envelope calculation yields a monthly rate of exiting from below the BBS poverty line of 1.3 percent in 2003 and 2004, and of 1.2 percent in the subsequent 2005 – 2006 period, which saw weaker income growth. At these rates, the expected median time it takes an RDRS sample household that is poor at a given point in time to exit from poverty is 52, respectively 58 months.

Note that these figures do not take into account time already passed in poverty nor the influx of formerly non-poor into the ranks of the poor. Numerous studies, at various time scales, have looked at the substantial mobility in and out of poverty. Bhide and Metha (2003) give an overview of panel study results from an Indian perspective. While their own data is rather old (from 1971 – 82), they offer a useful reminder that the mobility drivers for moderate and for severe poverty may be different. For example, for the severely poor

“the size of the village, was significant in creating opportunities while increases in literacy and larger urban population in the neighborhood were not significant, possibly reflecting the fact that it is not enough to become literate but it is also important to have income-opportunities relating to literacy” (op.cit.: 18).

The time scale matters greatly. Taking a longer-term perspective, Krishna found that the

“percentage of households crossing poverty thresholds in one or the other direction over 25 years varied from low 15 percent in villages of Gujarat, India to a high 37 percent in western Kenya” (Krishna 2007: 5).

This appears insignificant compared to the at least 46 percent of all household in our study that crossed the poverty line between 2002 and 2006. This takes us back to vulnerability.

From static to dynamic poverty concepts

One more helpful theoretical distinction is between the observed movements in and out of poverty and the underlying causes, some of which may not be directly observable. Researchers thus append to the observed pair “chronic vs. transitory poverty” the latent distinction of “structural vs. stochastic poverty”. The choice of these terms may be less than fortunate, but they gain meaning through the connection they establish from income to assets. In the words again of Barrett and McPeak (op.cit.: 2),

“the structurally poor lack asset endowments sufficient to generate expected income or expenditures above the poverty line, although observed income may exceed the poverty line due to random shocks. The stochastically poor, by contrast, have observed income or expenditures below the poverty line even though their asset holdings suffice, in expectation, for them to be non-poor. This structural-stochastic

distinction introduces an all-important mapping from income or expenditure measures to asset measures which can be subject to less measurement error.”

Assets are understood in a broad sense. One of the most important assets is the health of the poor. In fact, illness and accidents, and their consequences, have almost universally been found to be the major vulnerability of poor people. Krishna (op.cit.: 6) found them dominating all other causes of poverty in five out of his six study regions; and only in one region was another cause – indebtedness – more devastating than poor health (see table).

Table 3: Principal reasons for falling into poverty, several studies

(% of descending households)

Reasons	Rajasthan, India n=364	Gujarat, India n=189	Western Kenya n=172	Andhra Pradesh, India n=335	Uganda: Central & Western n=202	Peru: Puno & Cajamarca n=252
Poor health and health-related expenses	60	88	74	74	71	67
Marriage/dowry/new household-related expenses	31	68		69	18	29
Funeral-related expenses	34	49	64	28	15	11
High interest private debt	72	52		60		
Drought/ irrigation failure/crop disease	18			44	19	11
Unproductive land/land exhaustion			38		8	

Source: Krishna (2007: 6, Table 3)

We will report a similarly important lead of ill-health in the negative life changes that our respondents volunteered. If we do not find a significant statistical association with recent income changes, this may be due to the possibility that the interviews did not tell new acute conditions from chronic ones that had already been depressing incomes for some time. We mention this particular result at this point as an example of a cognitive difference that may confuse the dialogue on vulnerability.

Changes in public perception

The risk of sudden dramatic changes that plunge people into distress may not be necessary to constitute vulnerability, but the perception of shocks may help to frame a particular risk for effective policy debate and make the population at risk appear more vulnerable than business-as-usual lingering conditions would. In the RDRS working area, seasonal unemployment and food insecurity had for a long time been plaguing laborers and their families, historically in two distinct spring and fall seasons. In the 1990s, donors all but ended their support for seasonal employment generation programs that RDRS, government and other NGOs had routinely conducted to mitigate this distress. However, the spread of irrigation and crop diversification caused the hardship suffered during the first lean period (March to May) to be greatly reduced. Increasingly, the untackled suffering of large numbers of very poor people every autumn came to be seen as an unbearable scandal. In 2004, with media attention rallied around the banner word “*monga*” – a famine-like condition –, politicians, civil servants and

NGO leaders were suddenly compelled to debate the neglect of this vulnerable group, forcing a flurry of assessments and projects. It is doubtful that much new was learned on the specific vulnerability of the *monga*-stricken populations. However, a chronic condition which had been tolerated was transformed into a distinct crisis which a better informed and more strongly connected Bangladeshi society was no longer willing to accept (RDRS 2007b). Similar changes of public climate are entirely conceivable. For example, a radical reevaluation of micro-finance - a big piece in the toolbox for vulnerability alleviation - would modify the task environment of most Bangladeshi NGOs to a major degree.

In sum, the evolution of vulnerability thinking in development policy seems to have gone hand in hand with the spread of more dynamic poverty concepts, much of it informed by the humble craft of survey research in hundreds of villages all over the developing world. The progression from a one-point statistic – the simple headcount or poverty rate – to distributionally sensitive cross-sectional measures, and from here to dynamic concepts and nowadays increasingly to causal models may have its parallels in other social problem sectors – such as in the transformation of the 19th century police state with its simple notions of crime and punishment to the post-modern “optimal rate of prevention”. But it finds its special relevance in the sheer magnitude of poverty and in the very unstable prospects for massive and durable poverty reduction.

At the local level, where practitioners consume the results of vulnerability research, some of the dynamics of poverty is well known from practice and intuition, and causal models abound in the qualitative realm. More precise measurements of the effects on vulnerability may be difficult to estimate, communicate and translate into practice. With this study, while not living up to demands of cause-and-effect demonstration, we hope to more precisely convey the position and momentum of large numbers of poor people whose struggles have made them find common cause with RDRS Bangladesh.

Incomes and Poverty

Incomes and inclusion

Incomes are significant not only as the basis of income-defined poverty, but also in the perspective of social inclusion and exclusion, an approach that has grown in stature and refinement in modern development thinking. While concepts of social *integration* of the poor appealed to a normative order – for the most part, that of the middle classes to which the poor were thought to naturally aspire - *inclusion* is closely related to the acquisition and loss of status in functionally differentiated subsystems, such as the market economy, schools and universities, the health care system, the family, and others. Incomes prefigure the answer to the question about payment/non-payment that is central to the economy; inability to pay triggers cascading loss of status in several subsystems. One loses his job, is evicted by the landlord, and abandoned by one’s spouse.

Regardless of their philosophies, therefore agencies tasked with assisting the poor are obliged to consider ways to strengthen their clients’ ability to make payments, in other words, to grow their incomes. For many Bangladeshi NGOs, including RDRS, the question is also one of their own survival; for the poor borrow from their microfinance programs and are firmly expected to make payments towards those millions of loans. The incomes of the poor, therefore, take on dimensions that go far beyond their personal welfare and reach deeply into the depth and quality of their inclusion in the wider institutional fabric.

The distribution of 2006 incomes

Thus, what incomes are the poor who passed through the RDRS programs making these days? For a first figure, we estimate that the *per capita* income in the sample population amounted to Tk. 9,316 in the most recent survey income year, 2006 (US\$ 716 at 2006 PPP⁸).

This figure is up 8 percent from 2004 (Tk. 8,655, adjusted to the 2006 Consumer Price Index, CPI) and 23 percent from 2002 (Tk. 7,594), implying 3.7 percent real annual growth in the sum of incomes 2005 and 2006, vs. 6.8 percent in 2003 and 2004. The slowing of income growth after 2004 will concern us further.

These figures are more meaningful when we compare them to the poverty lines that we will be using in the distributional analyses.

Table 4: Per-capita sample incomes and the BBS poverty line

Year	Sample incomes	BBS poverty line for rural Rajshahi		Percent of poverty line	
		Lower (smaller non-food allowance)	Upper (larger non-food)	Lower	Upper
2002	7,594	8,438	9,860	90%	77%
2004	8,655	8,438	9,860	103%	88%
2006	9,316	8,438	9,860	110%	94%

Note: All income and poverty line figures p.a. p.c. and 2006 CPI adjusted. Sample incomes are the means for the entire sample population in the survey year.

If incomes were equal in the sample population, all would have crossed the lower BBS poverty line in 2003 and would be close to crossing the upper line. The picture, of course, is starkly different when the income distribution is taken into account.

In fact, around the mean sample p.c. income of Tk. 9,316 in 2006, the range of incomes is extremely wide. We meet the family of Mrs. Ayson in Bhurungamari sub-district, weakened from the mortgaging of all their land, the illness of the husband, and dowry payments for a daughter's marriage. They earned a mere Tk. 333 for each of the nine household members. They survived by the kindness of neighbors, for whom Ayson occasionally worked as a maid.

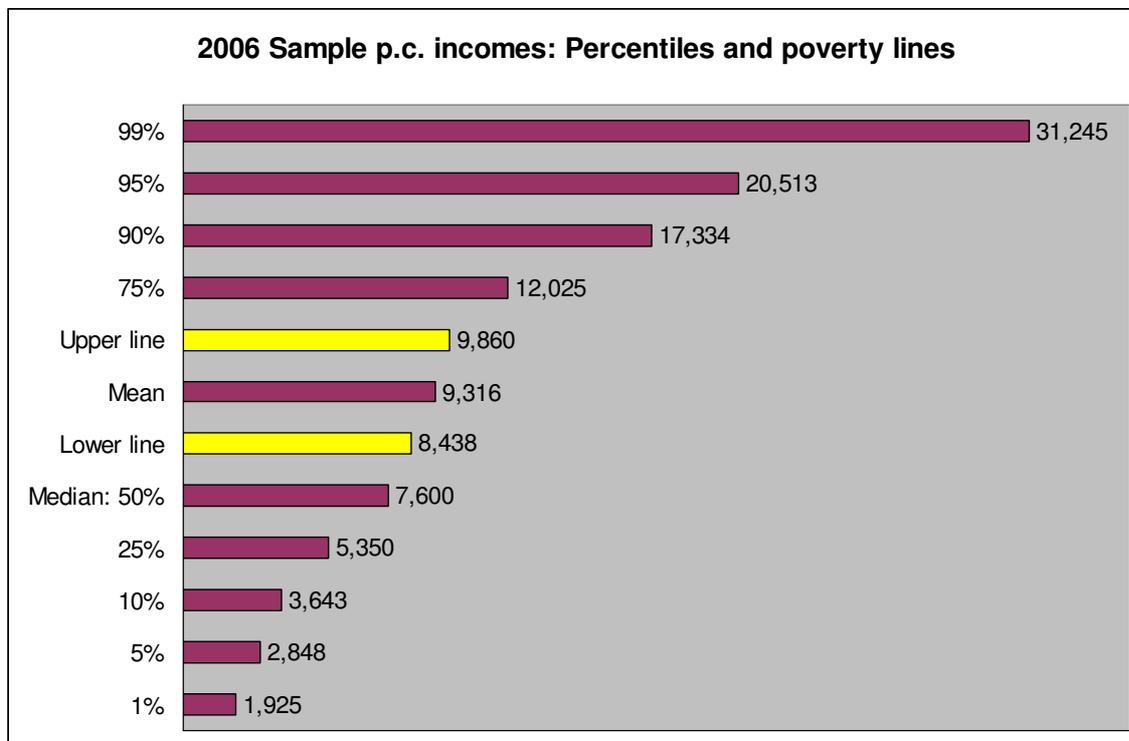
It is not entirely by accident that the other extreme is found in Jaldhaka sub-district, less flood-prone and richer than Bhurungamari. Mr. Motiar's two sons recently found employment in the city. In 2006, they sent him Tk. 96,000. Together with his own small-business profit of Tk. 90,000 and sundry other positions, the p.c. income in this household worked out as Tk. 52,500, over 150 times that of Ayson's household.

The extremes, of course, are not representative of any larger group even if they do give a first, rough idea of how much the welfare of the sample households can diverge. The more

⁸ The purchasing power parity (PPP)-adjusted exchange rate was US\$ 1 = Taka 13.010 in 2006 (United Nations Statistics Division 2007). Since we compare our results to another Bangladesh survey with income data denominated in Taka, we will not translate any further results into dollar figures. However, it is important to avoid confusion with the PPP rate applied to the famous "One dollar per person per day" poverty line, which uses the 1993 PPP exchange rate, and which has to be adjusted to changes in the local consumer price index since then. It works out much higher, approx. (depending on sources) $12.70 * (176.04 / 86.561) = 25.83$.

meaningful percentile statistics, punctuated with the two poverty lines, are displayed in the graph on the next page.

Figure 5: 2006 per-capita income percentiles and poverty lines



Note: Weighted by family size

The essential result to retain is that the majority of the sample households in 2006 lived on incomes that were still about 10 percent lower than the lower of the two BBS poverty lines. In other words, they were still, in the BBS survey terms, extremely poor. While this was true of 56 percent of the households, it may be mentioned in passing that if we measure against the much better known World Bank-promoted “One dollar per person per day” line, 68 percent of the sample were extremely poor.

The BBS survey report does not publicize income statistics for rural divisions, although it does provide division-specific rural poverty lines. Also, it offers decile-wise distributions of household incomes by rural and urban group. We compare the 2005 shares with our 2006 values.

Table 5: Income share by deciles, RDRS Impact Survey and BBS 2005

Decile	RDRS sample 2006	BBS rural Bangladesh 2005
1	2.3%	2.3%
2	4.1%	3.6%
3	5.2%	4.5%
4	6.3%	5.5%
5	7.3%	6.4%
6	8.8%	7.6%
7	10.6%	9.3%
8	13.1%	11.5%
9	16.5%	15.4%
10	26.0%	33.9%
Gini	0.361	0.428

The RDRS sample household income distribution was slightly less unequal than the national rural values. However, this is chiefly so because, starting from the lower baseline at which RDRS recruited these households years ago, fewer of them have reached incomes at the height of the national top decile. By contrast, the share of the lowest decile is almost the same as in the BBS statistic. One is tempted to infer that over the years the two populations have converged towards a very similar inequality pattern.

However, this conclusion may not hold up to selective effects of entry and exit. In the nineties, the expansion of the RDRS micro-credit attracted better-off clients. Among households recruited earlier, those who did not substantially improve their incomes may have stayed in the program for longer than the successful members of their cohorts. There is a weak non-linear association between 2006 incomes and year of enrolment that suggests such a hypothesis.

Up to this moment, we have presented the sample income distribution for 2006 in its entirety. We have not yet detailed the one for poor and non-poor, or any distribution statistics broken down by the classifications that generally are of interest in this regard, notably gender and, for RDRS, the more or less flood-prone areas. We postpone presenting poverty measures until after the section on income growth and then will directly present them in a dynamic perspective.

Incomes by gender – a confusing picture

The gender-specific breakdown is meaningful only in tandem with marital and head-of-household status. Historically, RDRS organized participants by gender-specific small groups. Most women group members are married whereas the presumption was that poverty disproportionately affected widows and divorcees. Matters are more complicated because widows and divorcees often are not the family heads; this role may fall to a son, brother or other male relative. Yet in the poverty context, these groups are of particular concern; and RDRS has made efforts to include them.

However, the picture is confusing, and does not lend itself to orthodox interpretation. The large majority of sample households were headed by a married man. Widowed respondents were only about 7 percent. Other marital status groups were tiny. For these groups at risk,

results differ greatly depending on whether we consider the total household income or income per household member.

Going by the *per-capita* figures, the typical 2006 p.c. income for households headed by a married man was Tk. 7,858. (Tk. 8,500 if a male member of the household was enrolled with RDRS; Tk. 7,580 for woman group members). However, households headed by a *married* woman made Tk. 9,998, because, one may speculate, some had husbands who had migrated and were sending home money. Similarly, widows and divorcees tended to live in wealthier households if they were the heads than if they lived in households headed by men. The distinctly poorest incomes were from atypical, small groups – five separated women who were the heads of their households (Tk. 4,435), and three married men who were *not* heads of their households (Tk. 4,367).

Relying on the *household* income, the observed differences meet common expectations better. Widows and divorced women live in households that, on average, are smaller and have smaller incomes. Households headed by a married man reported a 2006 total income of Tk. 39,475; households headed by a woman brought in Tk. 44,788 (married), Tk. 21,405 (widows), Tk. 16,175 (divorced), and Tk. 24,650 (separated). But even then, these variables and their interactions account only for about ten percent of the household income variance.

These extracts from a forest of figures produced by three-way tables and variance analysis strike one as less than enlightening. Certainly, the ever precarious condition of widows and divorcees is not in question. Being unable to control for the selective intake⁹, program and exit effects, we must conclude that gender effects cannot be sensibly elucidated with this kind of reduced statistical analysis, and that additional information on family dynamics would be helpful. Kamanou and Morduch (2002: 4), in a study of vulnerability in the Ivory Coast, found that as much as a quarter of the variation in per capita consumption was due to changes in household size. In a rapid attempt to model the impact of family size changes 2003 – 07 on income changes 2004 to 2006, we found only about 2 percent explained by this factor, but might obtain different results with differently specified models.

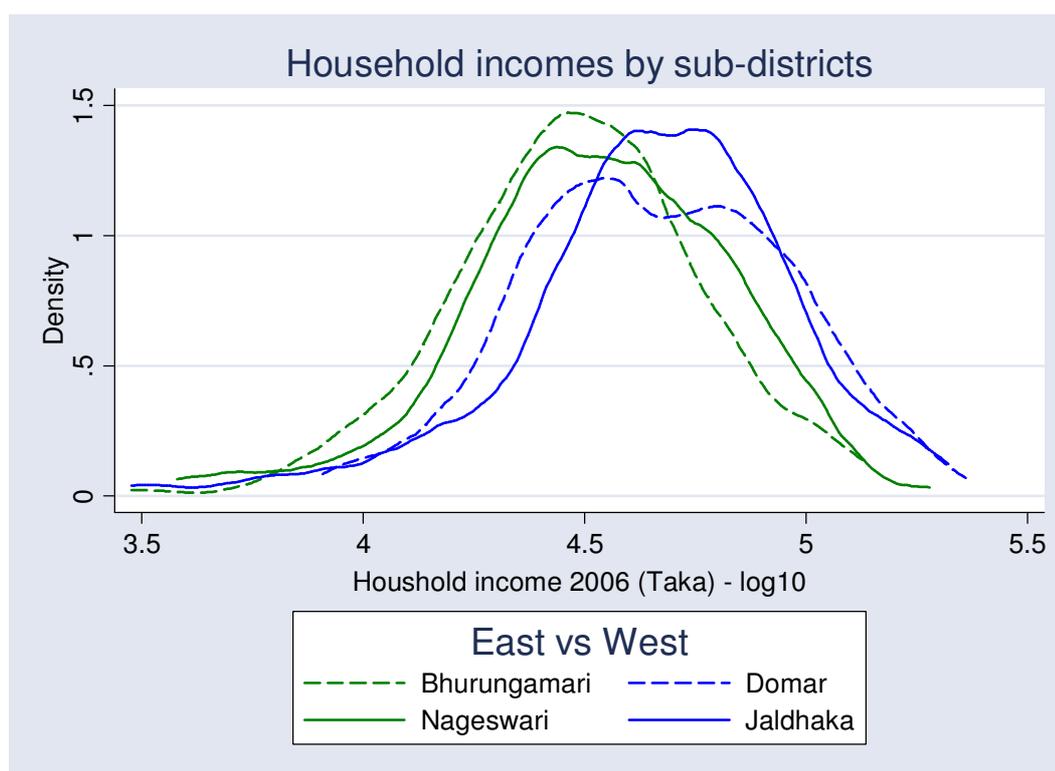
Between the flood-prone East Zone and the more secure West

The classical RDRS working area is divided, according to the organizational definition, into an East Zone and a West Zone, with the river Teesta forming the border. The east – represented in the sample by the Nageswari and Bhurungamari sub-districts - is bisected by two major rivers, the Brahmaputra and the vicious Darla. It is notoriously poorer, both on the mainland and in sandbar island communities. The west is largely immune to yearly flooding, with the rare exception of a few parts close to the Teesta, including one or two unions in our sample sub-districts, Domar and Jaldhaka. Official above-danger-level day summaries for these three rivers are given in the appendix.

We choose a logarithmic representation of the incomes, to see the degree to which the four distributions approximate the expected lognormal distribution.

⁹ For a study of NGO program effects in Bangladesh that does model selection effects (via Heckman models), see Zaman (1999).

Figure 6: Household incomes 2006, by sub-district



As expected, sample households in the flood-prone East-Zone sub-districts (green lines) were poorer. In addition, this representation gives away that the sub-districts more distant from their regional towns (Bhurungamari from Kurigram; Domar from Rangpur – dashed lines) are relatively poorer than their more accessible zonal counterparts. This parallels the observation made by Bhide and Metha (op.cit.) for villages in India¹⁰.

Table 6: Median household income 2006, by sub-district

Sub-district	Households in sample	Income 2006	
		Median (Taka)	Log10
Bhurungamari	185	31,600	4.50
Nageswari	185	34,120	4.53
Domar	194	45,200	4.66
Jaldhaka	192	47,030	4.67
Total	756	38,000	4.58

One might dismiss this picture as the conventional wisdom, telling those already acquainted with northwestern Bangladesh nothing new. However, once we introduce the time dimension we will see that added vigilance for the situation of the East Zone poor is warranted.

¹⁰ Note the tendency, from poorer to richer sub-districts, toward two modes, an indication of mixed regimes following an omitted variable (flooding in parts of Domar and Jaldhaka?), or of correlated measurement error.

Growth and Poverty

Income growth and poverty reduction

It was mentioned above that real p.c. incomes grew appreciably, although at different speed, in 2003-04 and again in 2005-06. In 2006 prices, these incomes moved from Tk. 7,594 (2002) to Tk. 8,655 (2004) to Tk. 9,316 (2006). The figures yield annualized growth of 6.8 percent in the first, and 3.7 percent in the second two-year period.

The reduction in the incidence of poverty has been striking. Using the lower of the two poverty lines, we find that the percentage of poor has fallen substantially in the general rural Rajshahi population (BBS) as well as in the RDRS impact survey sample population. The rural Rajshahi rate fell by almost eight percent points within five years; the RDRS sample, starting at a higher level, shed nearly 13 points in 4 years.

Table 7: Percent population living in extreme poverty, RDRS Impact Survey and BBS Rajshahi Division

Year	BBS rural Rajshahi sub-sample	RDRS Impact Survey
2000	43.3	
2001		
2002		68.4
2003		
2004		60.1
2005	35.6	
2006		55.7

**Note: BBS cost-of-basic needs lower line.
Source for rural Rajshahi rates: BBS
(2006: op.cit., 27)**

The trends in rural Rajshahi are, of course, not isolated from the wider context. Except for a slight reversal in Barisal, poverty rates by the lower line fell for the rural populations of all Divisions between the 2000 and 2005 BBS survey years. The Rajshahi rate, traditionally the highest, fell below that of Barisal. The drop in Bangladesh likely was an extension of trends operating elsewhere in South Asia although we do not have data on hand for the same period. Borrowing from Chen and Ravallion (2004: 152), we find that poverty reduction in South Asia started building momentum in the early eighties. It continued, despite several reversals, until the end of their reporting span. The drop in South Asia (excl. India) from 33.1 to 19.7 percent against the one-dollar-a-day line between 1993 and 1996 is particularly dramatic.

Table 8: Headcount indices of poverty for two poverty lines, major developing regions

1981–2001 (%)								
<i>Poverty line and region</i>	<i>1981</i>	<i>1984</i>	<i>1987</i>	<i>1990</i>	<i>1993</i>	<i>1996</i>	<i>1999</i>	<i>2001</i>
\$1.08 a day (1993 PPP)								
East Asia	57.7	38.9	28.0	29.6	24.9	16.6	15.7	14.9
China	63.8	41.0	28.5	33.0	28.4	17.4	17.8	16.6
East Asia excluding China	42.0	33.5	27.0	21.1	16.7	14.7	11.0	10.8
Eastern Europe and Central Asia	0.7	0.5	0.4	0.5	3.7	4.3	6.3	3.6
Latin America and Caribbean	9.7	11.8	10.9	11.3	11.3	10.7	10.5	9.5
Middle East and North Africa	5.1	3.8	3.2	2.3	1.6	2.0	2.6	2.4
South Asia	51.5	46.8	45.0	41.3	40.1	36.6	32.2	31.3
India	54.4	49.8	46.3	42.1	42.3	42.2	35.3	34.7
South Asia excluding India	42.2	37.0	41.0	38.7	33.1	19.7	22.9	21.0
Sub-Saharan Africa	41.6	46.3	46.8	44.6	44.1	45.6	45.7	46.4
Total	40.4	32.8	28.4	27.9	26.3	22.8	21.8	21.1
Total excluding China	31.7	29.8	28.4	26.1	25.6	24.6	23.1	22.5
\$2.15 a day (1993 PPP)								
East Asia	84.8	76.6	67.7	69.9	64.8	53.3	50.3	47.4
China	88.1	78.5	67.4	72.6	68.1	53.4	50.1	46.7
East Asia excluding China	76.2	72.0	68.4	63.2	56.7	53.2	50.8	49.2
Eastern Europe and Central Asia	4.7	4.1	3.2	4.9	17.3	20.7	23.8	19.7
Latin America and Caribbean	26.9	30.4	27.8	28.4	29.5	24.1	25.1	24.5
Middle East and North Africa	28.9	25.2	24.2	21.4	20.2	22.3	24.3	23.2
South Asia	89.1	87.2	86.7	85.5	84.5	81.7	78.1	77.2
India	89.6	88.2	87.3	86.1	85.7	85.2	80.6	79.9
South Asia excluding India	87.3	84.0	85.0	83.5	81.0	71.3	70.5	69.0
Sub-Saharan Africa	73.3	76.1	76.1	75.0	74.6	75.1	76.0	76.6
Total	66.7	63.7	60.1	60.8	60.2	55.5	54.4	52.9
Total excluding China	58.8	58.4	57.5	56.6	57.4	56.3	55.8	54.9

Source: Authors' calculations based on national household survey data.

Source: Chen and Ravallion (2004: 152)

Historically, therefore, rates of 3 percent or more per annum in poverty reduction have not been unknown. Although the speed of reduction is similar, the RDRS sample population is still captive to a poverty that is much higher than the rate of 21.0 percent that these authors calculated for non-Indian South Asia in 2001. Taking the same \$ 1.08 a day, 1993 PPP-adjusted, yardstick that they used, we established rates of 78.7 percent (2002), 73.9 percent (2004), and 67.6 percent (2006) in our sample¹¹.

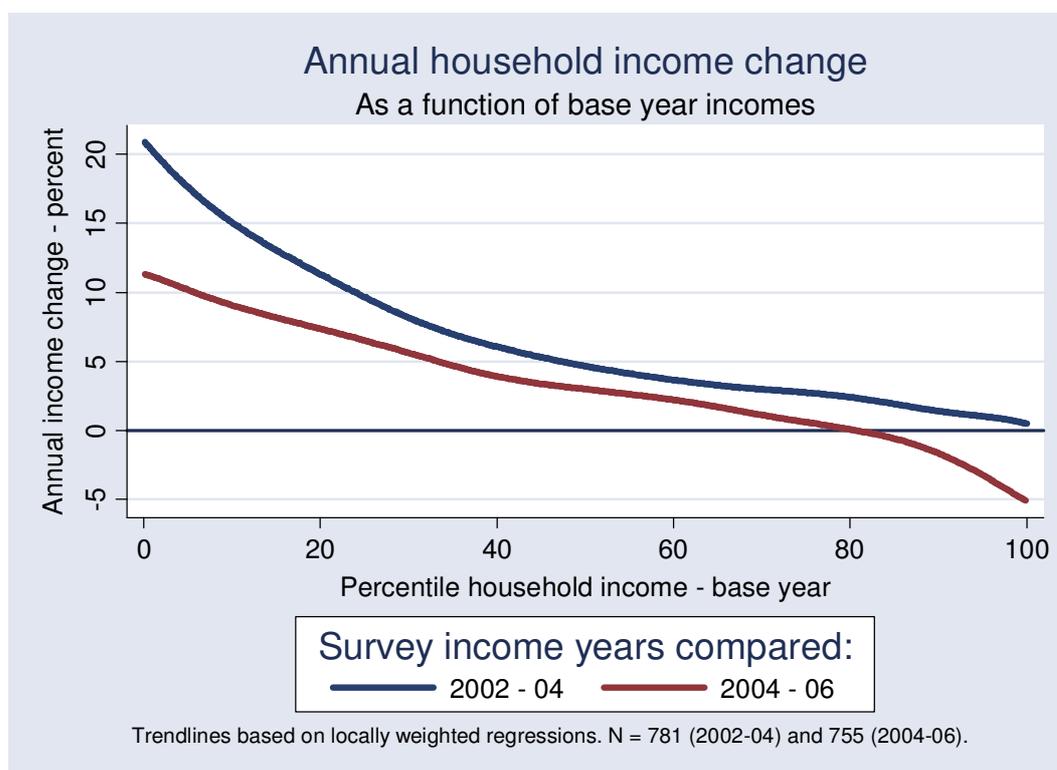
Growth rates across the sample poverty spectrum

The growth rates reported above were based on the sum of incomes that the sample members earned (adjusted for sample attrition) – just as one would calculate for a national or regional economy. The picture is different when we compare the rates at which the incomes of individual, richer and poorer, households grew.

¹¹ This is based on a PPP-adjusted exchange rate for 1993 of US\$ 1 = Taka 12.701 and a CPI for 1993-94 of 86.561 (1996-96 = 100), calculated after Sillers (2005) and Bangladesh Bank (2007). Note that the PPP-adjusted exchange rate recorded for 1993 by the United Nations Statistics Division (2007) was different, namely Tk. 10.041.

Figure 7 presents a mapping of income growth rates against the comparison year before, the average growth rates for 2003 and 2004 against a ranking of 2002 income, and those for 2005 and 2006 against the 2004 incomes. The slowing of growth in the second period is clearly visible.

Figure 7: Income growth incidence curves, 2002-04 vs. 2004-06

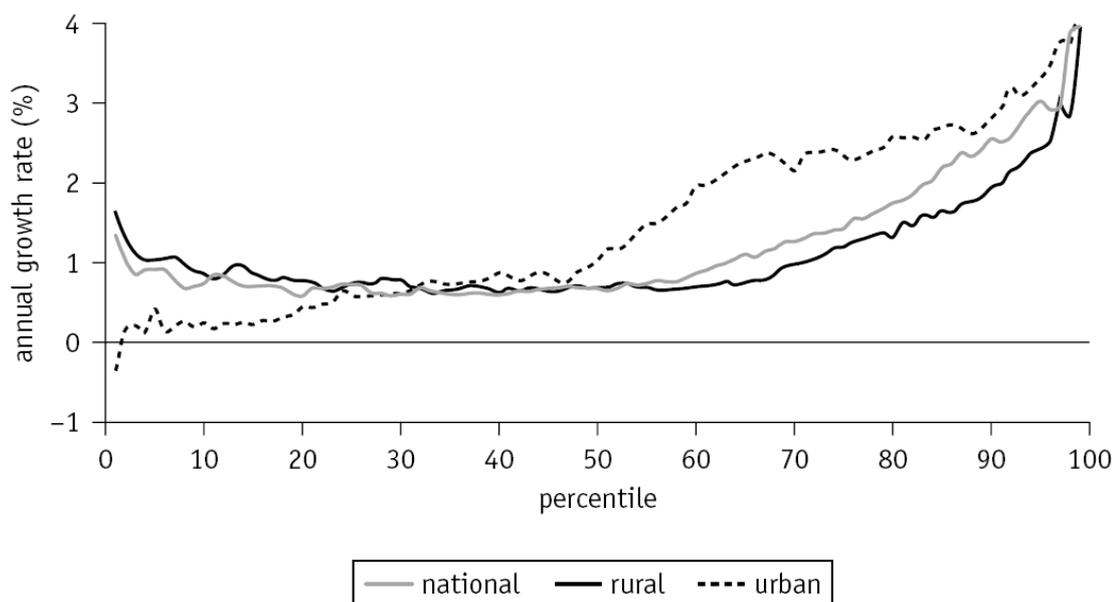


The major message from the growth incidence curves is that the incomes of the very poor achieved stronger relative growth. This finding is, if not a direct extension from, at least compatible with the growth pattern reported for rural Bangladesh in the 1990s.

In their study of how Bangladesh was able to achieve what they call “pro-poor growth”, Sen, Mujeri and Shahabuddin (2007: 87) calculate that the poorest rural dwellers enjoyed slightly stronger growth rates than the lower middle class. By contrast, in the urban areas the poorest saw their incomes stagnate or even contract. At the same time, as their graph (see below) makes clear, growth rates at the top of the rural distribution were nearly four times the middle-class rate. This rural income structure, therefore, was headed for modest *relative* improvements at the bottom, as well as for greater inequality overall. The latter is borne out by the BBS surveys returning an increase in the rural income Gini coefficient – a measure of inequality – from 0.393 in 2000 to 0.428 in 2005. An even steeper increase in inequality is observed in our sample households – the Gini rose from 0.273 in the first wave, to 0.309 in the second and 0.361 in the third¹².

¹² These values are from unweighted household incomes. The increase is milder if based on (household member-weighted) per capita incomes: 0.283 (2002), 0.291 (2004), and 0.330 (2006).

Figure 8: Bangladesh's growth incidence curves, 1991/92-2000, rural vs. urban



Source: Estimated from the unit-record data of Household Income Expenditure Survey 1991/92 and 2000 (Bangladesh Bureau of Statistics 1991/92 and 2000).

Source: Mujeri and Shahabuddin (2007: 87)

The distribution and dynamics of incomes in our sample, therefore, are consonant with those of the larger rural society in Bangladesh, as far as we can infer from the Sen et.al. review. Because RDRS targeted the very poor, the measured inequality has not yet reached the level found in the BBS survey, but it is clearly growing.

There is an apparent paradox between the superior growth rates of the very poor and the increasing inequality in incomes, particularly when the growth rates for the top decile are negative. It is resolved by the double fact that the *absolute* income growth for the poorest was modest, and that income mobility across the two-year intervals was strong. In statistical terms, the previous annual incomes, measured in 2002 and 2004, explain only 52 percent of the 2006 income variance, and 48 percent, therefore, are due to factors not implied in the 2002 and 2004 values. For an easier to understand illustration, the average household income in 2004 was Tk. 44,393. The average absolute change – up or down – from 2004 to 2006 was Tk. 16,162 (both figures in 2006 prices). In other words, overall, incomes changed up or down by more than one third.

Movement in and out of Poverty

As long as poverty is measured in income terms, it is therefore not surprising to find strong movement in and out of poverty across the three waves of this panel survey. If household expenditure figures were available, the poor / non-poor changes in our sample might be less frequent, due to the expected ability of many households to smooth consumption over very variable income streams.

Table 9 breaks down the sample into the eight possible combinations of the poor/non-poor status (defined, as usual, by the lower of the BBS poverty lines) over the three income years.

To the extent that three measurements capture permanency, a fifth of the sample households were permanently non-poor, and over a third were chronically poor. Also shown are the typical incomes from which the groups started in 2002. The permanent non-poor enjoyed incomes more than double those of the chronically poor.

Table 9: Sample household movement in and out of poverty 2002 - 2006

Transition type	Poor in			Sample households	%HH	Median HH income 2002 (2006 prices)
	2002	2004	2006			
1	no	no	no	162	21.46	55,834
2	no	no	yes	40	5.30	50,564
3	no	yes	no	29	3.84	50,687
4	no	yes	yes	53	7.02	43,890
5	yes	no	no	82	10.86	37,197
6	yes	no	yes	48	6.36	32,076
7	yes	yes	no	77	10.20	28,898
8	yes	yes	yes	264	34.97	25,285
Total				755	100.00	35,734

Conversely to the permanent groups, no fewer than 44 percent of the sample crossed the poverty line at least once between 2002 and 2006. The rates of entry and exit are surprisingly close. Between 2002 and 2004, 27.6 percent of the poor moved out of poverty; 28.9 percent of the non-poor fell into it. In the following transition period, 2004 to 2006, these rates were almost the same, 25.1 vs. 26.5 percent. Although the difference between entry and exit rates was minimal, the poverty rate fell in both periods. This could happen simply because the stock of poor was larger than that of the non-poor. But unless the exit rate gains over the entry rate, it is obvious that poverty reduction will slow down¹³.

A study by Binayak Sen (2003) offers limited comparison material. Sen used data from two panels separated by a much longer interval (1987-88 to 2000). He found that 31.4 percent of his sample was chronically poor, and 25.1 percent were non-poor at both points. Another 25.8 percent transitioned from poor to non-poor, and 17.7 percent from non-poor to poor. However, the comparison remains limited because of the very different time intervals considered in Sen's and our study.

¹³ Of course the poverty rate will ultimately settle into a steady state (academically at least, by way of a first order Markov chain process) also if the exit rate exceeds the rate of entry – for the same reason why the number of poor fell in the two periods – the different stocks of poor and non-poor at the beginning of each transition period. Practically, transition probabilities will not stay constant, and a much more interesting question is how they will be affected by growth and redistribution in the larger society.

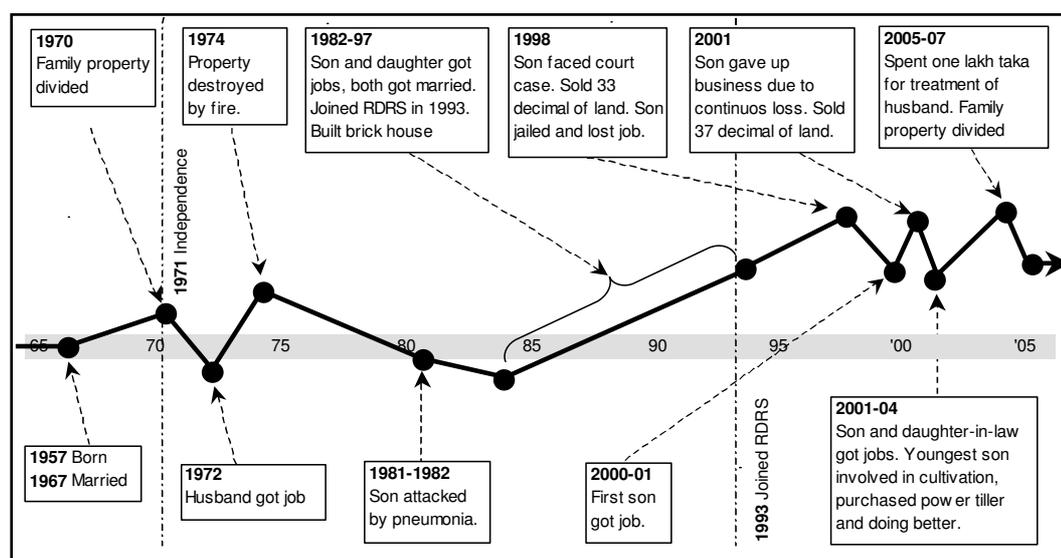
[Case study:] Aleja Khatun

We met Aleja Khatun in a village of Domar Upazila in Nilphamari District. She was 54 years of age and living with her husband. Like many other rural Bangladeshi women, most of her time has been spent looking after normal household affairs. At her age, she has experienced many ups and downs in life.

She got married at an early age (12) approximately three to four years before the war of independence (in 1971). That time her husband was unemployed. Her father-in-law had rice and jute business and was doing quite good in the business. In course of time, her sister and brother-in-laws got married and they became separated somewhere before the liberation war. Aleja, her husband, father and mother-in-law kept staying in the same family peacefully.

The family didn't face any property loss during the liberation war. She remembers that occasionally they had to hide here and there to avoid any facing with the military. After a few days of the war, Aleja's husband found a job in govt. agriculture farm. Two years later (1973) the couple was blessed with a son. Life seemed quite meaningful to them at this rising stage.

Figure 9: Life history diagram of Aleja Khatun



But roads are not always so straight. There are also certain curves on the path. One day in 1974 their jute storage beside their house caught fire. It spread over the house and all the rooms and belongings were burnt into ashes. The family faced an unimaginable loss. However, the house had to be rebuilt with the help and contributions from the relatives. The jute business had to be given up. The following year (1975) Aleja lost both her father and mother in law within a week's interval.

Within next ten years she became mother of a daughter and two more sons. All of her children completed their education from a local Madrasha (religious school).

Over time, her husband Afizer Rahman became a local elite and started playing leadership role in disputing problems through mediations.

Major and sudden illness of family members results tangible and intangible losses for the families. Aleja's second son suffered from pneumonia in 1982. She had to spend a reasonable amount for his treatment.

Her elder son got married in 1988 and in the same year managed a job in army. Her only daughter found a job as a schoolteacher in BRAC School in 1990. Within following few years the family became able to buy new land and build a structured house having several rooms.

Aleja joined a RDRS group in 1993 and took some loan (Tk.4000) from RDRS to meet part of the expenses of her daughter's marriage. Aleja got her daughter married in a solvent family in 1994 spending huge amount of money for dowry. The major spending was made out of her husband's previous earnings and savings.

In 1995 the eldest son married another woman without informing his first wife. Three years later, being informed about this incident, the first wife suited a case against him. In consequence, Aleja's eldest son lost his job from army and had to spend around 1,00,00 taka to face the court case. For the purpose 1 bigha of land had to be sold out. Lately he had to divorce his first wife and be in custody for four months.

After getting released from jail, he found a clerical job in local land registration department spending 25,000 taka as bribe. Meantime the youngest son started a business but ended up with huge loss. Lastly he turned as a devoted agriculture farmer who is now doing quite well. Aleja's husband provided him a power tiller.

The second son managed a job in Domar agriculture farm as a security guard in 2002. But he had to manage around 1,00,000 taka selling 1 bigha of land to provide as bribe for the job.

Aleja's husband became paralysed in 2005 and it required around 1,00,000 taka for the treatment. Her sons also shared the expenses for the treatment. Now her husband is doing better and joined back to his service. Her sons now live separately.

Aleja and her husband had come across the colours and complications of life. They are now at a stage to see how well their sons and daughters are doing.

Note: In earlier interviews, Aleja Khatun reported total household incomes of Tk. 74,639 for 2002, Tk. 88,002 for 2004, and Tk. 2,30,050 for 2006. Her household had 9 members in 2003, and 13 members in 2005 and 2007. Applying the BBS lower poverty line, we counted this household as poor in the first two survey waves, and as non-poor in the third.

Aleja Khatun was interviewed by Nirmala Rani Das, who also wrote up the case study. Jasim Uddin Ferdous translated it. Faruqe Ahammad drew the diagram.

Not surprisingly, the transition rates are different for poorer and richer areas. For brevity, we present only the fraction of permanently non-poor and chronically poor by sub-district:

Table 10: Proportion permanently non-poor and chronically poor, by sub-district

Zone	Sub-district	Permanently non-poor	Chronically poor
East	Bhurungamari	10.8%	48.1%
	Nageswari	14.7%	40.2%
West	Domar	29.4%	27.3%
	Jaldhaka	30.2%	25.0%
Total		21.5%	35.0%

The simple poor/non-poor model, inspired by the BBS poverty line and the poverty rate defined by it, is not very illuminating. After all, in any society of which a census is taken with only two classes that are permeable, one expects to find a substantial amount of mobility. Other researchers have thus undertaken to estimate mobility rates across a more detailed grid of poverty classes. For example, in a study of movement in and out of poverty among Kenyan farmers (Burke, Jayne et al. 2007), welfare terciles were used to distinguish better the very poor, moderately poor and others. This, over three points in time, leads to a set of $3 * 3 * 3 = 27$ transition types.

We do not want to go this way because it would hamper our conceptual neighborhood with the BBS study and make for less convenient exposition for the reader. Instead, we want to introduce the FGT metrics regarding the extent, depth and severity of the poverty in our sample. We do this in the interest of comparison - BBS too produced FGT values - and also because differences, over time and between our sample sub-districts, in the measure of severe poverty may raise red flags. Moreover, although poverty rates are necessary and appealingly easy to communicate (researcher and reader both believe they understand that “50 percent extreme poverty” in a community stands for a serious condition), vulnerability analyses may want to make use of the continuous income variables, rather than classifications with their unavoidable information loss. We will return to this later.

The Severity of Poverty

From its inception as a relief agency, RDRS had a deep concern for the poorest. In its transition to a development NGO, that concern became a defining moment for the design of most of its programs. Even programs that political or market forces nudge towards the rural middle class are equipped with corrective mechanisms, such as, in microfinance, special programs for the ultra-poor. Participant selection into programs is sometimes aided by baseline surveys or by the intermission of the federations. Qualification for subsidized credit exemplifies the first, some of the farmer field schools the second mechanism. While there have been different criteria used over time (including literacy, land ownership and food security), analyses on the poverty of entire groups have been rare. A notable exception, although not billed as poverty analysis, is found in the comparisons that RDRS routinely makes of the performance of different loan programs.

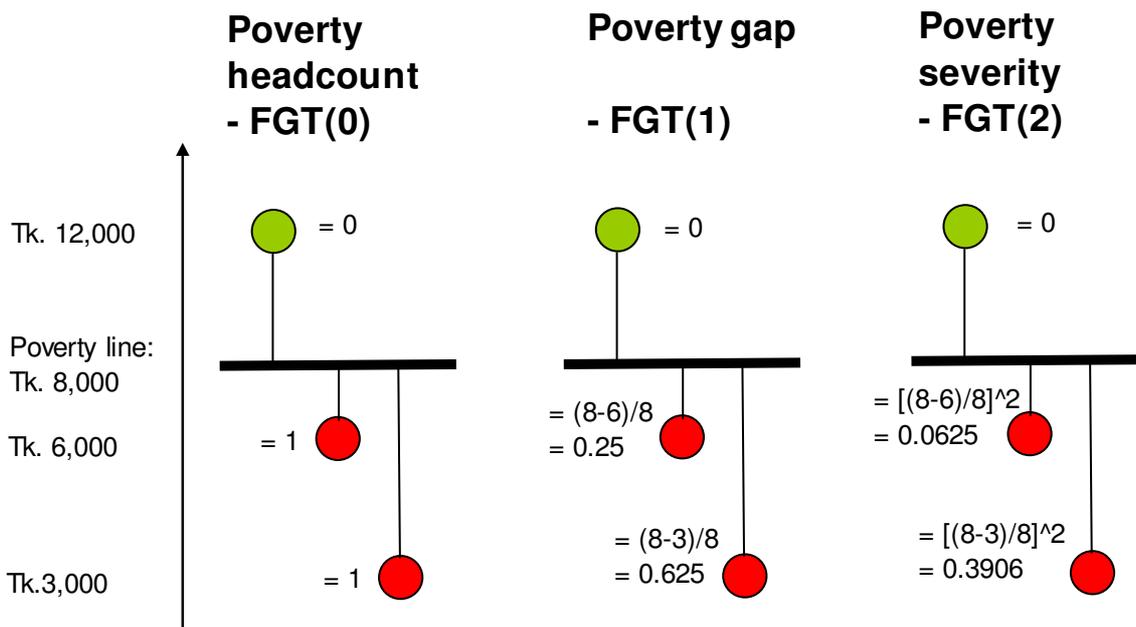
Often the criteria were ad-hoc, not comparable with publicized indices from other sources, and not followed over time. The income data from these three Impact Survey waves gives the

opportunity to express the situation of an RDRS clientele in terms of a universal metrics that are sensitive to the extent of their poverty, and to scan them for recent changes. The FGT indices meet these requirements when they are applied to each survey wave. Given their wide use, it may be beneficial for RDRS personnel involved in policy discussions and for some of its interlocutors in donor circles to be minimally familiar with the underlying concept.

[Sidebar:] The Foster-Greer-Thorbecke (FGT) poverty indices

FGT define three measures that are increasingly sensitive to severe poverty. FGT(0), known as headcount ratio, simply counts the poor against a known line (in most cases, an income or expenditure line) and determines the fraction in the population with non-missing values. FGT(1), the poverty gap, assigns zero to all non-poor and weights each poor entry (household, individual, etc.) by its shortfall from the poverty line. FGT(2) measures the severity of the poverty, intuitively by valuing the poorest most strongly, technically by taking the square of the income or expenditure shortfall. The diagram shows, in a simplified way, how the contributions to each of the indices from a non-poor household and two poor ones are computed. The point is that as we move from FGT(0) to FGT(1) and finally FGT(2), the family at the bottom, surviving on only Tk. 3,000 p.c. p.a., grows increasingly important. FGT(2) is biased to the poorest. Other beneficial technicalities of the metrics, such as normalization and decomposition, need not concern us here.

Figure 10: The mechanics of the FGT metrics



We first compare the values that our full sample takes on the three metrics to those of the BBS sample.

Table 11: Foster-Greer-Thorbecke poverty indices, FGT(a)

Survey	Income year	Proportion poor	Poverty gap	Poverty severity
		a=0	a=1	a=2
BBS	2000	0.433	0.105	0.036
BBS	2005	0.356	0.065	0.018
RDRS	2002	0.684	0.246	0.118
RDRS	2004	0.601	0.196	0.087
RDRS	2006	0.557	0.203	0.097

Note: BBS values are for rural Rajshahi Division stratum. Source: BBS 2006, op.cit. BBS values from report pages 27 (proportion) and 28 (gap and severity). BBS gap and severity values divided by 100, to be comparable to RDRS display.

In the BBS survey population, the poverty rate, gap and severity all declined between the two survey years. The RDRS sample experienced substantial reductions in all indices from 2002 to 2004. However, more recently the proportion of poor kept falling, but the income gap and income-based poverty severity rose again.

The reversal is slight and may have been temporary, but from a vulnerability viewpoint it calls for vigilance. As always, one is advised to check for an association with the greater vulnerability of the flood-prone eastern sub-divisions. For simplicity, we limit the presentation to the severity measure.

Table 12: Poverty severity – by sub-district and survey year

Zone	Sub-district	Year		
		2002	2004	2006
East	Bhurungamari	0.13	0.12	0.15
	Nageswari	0.18	0.11	0.11
West	Domar	0.07	0.05	0.07
	Jaldhaka	0.09	0.06	0.06

By simply calculating the change in the severity enumerator¹⁴, we can put a name on those most affected and flag them for follow-up, possibly together with others at the welfare bottom. This token list of the ten households with the largest severity changes suggests a number of possibilities:

¹⁴ NGO monitors can do this on their own, without recourse to full FGT algorithms, using a spreadsheet formula such as “= HHmembers07 * if(HHinc06/HHmembers07 < 8437, 1, 0) * (HHinc06/HHmembers07 - 8437)^2 - HHmembers05 * if(HHinc04/HHmembers05 < 8437, 1, 0) * (HHinc04/HHmembers05 - 8437)^2”. Tk. 8,437 is the BBS poverty line for rural Rajshahi. The values were not normalized for this purpose.

Table 13: Households subject to the largest increases in poverty severity, 2004-06

Relative change in poverty severity 2004-06	Sub-district	Union	Respondent	Gender	Family members 2003	Family members 2007	Household income 2004 (2006 CPI)	Household income 2006
5.25	Nageswari	Newashi	Abdur Ali	M	4	11	19,600	13,300
3.89	Bhurungamari	Sonahat	Ayson	F	8	9	27,285	3,000
3.03	Bhurungamari	Paiker	Chhara Latif	M	5	10	28,664	26,100
2.51	Nageswari	Bhitarband	Bibijan	F	3	7	18,669	15,950
2.44	Bhurungamari	Sonahat	Firoja	F	7	10	14,820	12,000
2.06	Jaldhaka	Khutamara	Rasedul	M	7	12	24,241	33,780
1.93	Bhurungamari	Joymanirhat	Hamida	F	9	9	86,394	33,000
1.80	Jaldhaka	Khutamara	Lucky	F	4	5	27,515	11,400
1.80	Bhurungamari	Joymanirhat	Fatema	F	7	7	54,054	23,256
1.76	Jaldhaka	Khutamara	Kepaton	F	2	4	12,120	6,400

Increases in family size, together with stagnating or contracting incomes, make households particularly vulnerable to severe poverty. The case of Mrs. Ayson was singled out earlier, as the poorest household in the sample. In this listing of severity change, she is topped by the Abdur Ali family, who had to face the advent of seven new family members at a time of decreased incomes. Rank #6 is held by Mr. Rasedul, whose yearly income did increase, but whose poverty became more dramatic by a disproportionate increase in family size. As this simulation suggests, the internal family dynamics plays a big part in the ups and downs of poverty careers. Although clearly relevant to vulnerability, NGOs have traditionally considered it amenable to programming in narrow limits (e.g., through special programs for widows) and have, if they collected any pertinent data on it at all, not widely analyzed it.

Second, despite a justified concern with the situation in flood-prone Bhurungamari (84 out of 258 households with increased severity values are from there), and in a lesser measure with Nageswari, three cases made it into the top ten from Jaldhaka, believed to be relatively secure. They are from the same Union, Khutamara. On further inspection, 15 out of the 38 sample households of Khutamara show an increased severity value. Such clustering would warrant some further scouting.

In seven of the top ten cases, the respondent was a woman. If this is suggestive of a tendency, it does not hold up to the full sample. As in the breakdown of incomes, the interactions are more complicated. Households headed by men show higher severity change increases, and even more so when the respondent (i.e., the RDRS group member) too was male. This again points to the importance of a factor not sufficiently considered in the design of the impact surveys, the complexities of household relations beyond the gender of the RDRS group member.

Income Composition and Labor Dependency

At this junction, some mention of causal factors in the income poverty dynamics is in order even if our impact survey data is not capable of supporting fully fledged causal models. The factors fuelling income growth in rural Bangladesh are the numerous ones identified by Sen et.al, who place them in the overarching concept of “pockets of excellence in a poor institutional environment” (2007: op.cit., 102). These authors give credit to factors from

institutional realms as diverse as the management of a stable macroeconomic environment, a commitment to social development immune to political regime change, the doubling of effective rural market centers in less than a decade, the deployment of NGO resources, and the social learning among the poor (op.cit., passim).

One factor on which they supply detailed quantitative estimates is the higher returns to non-farm employment. Already our first-wave survey analysis (Benini and Ferdous 2005: op.cit.) documented the significant income effects on RDRS participants of lesser casual labor dependency. In all Bangladesh, the returns to labor by members of different poverty strata working in different sectors are starkly different, as Sen et al.'s calculations (op.cit., 98) make clear:

Table 14: Returns to labor by mode and sector of employment and by poverty status in rural areas, 1999/2000

<i>Poverty status</i>	<i>Farm</i>		<i>Nonfarm</i>		
	<i>Self-employment</i>	<i>Casual wage labor</i>	<i>Casual wage labor</i>	<i>Self-employment</i>	<i>Salaried wage labor</i>
Extremely poor	16.43	30.15	40.53	38.47	56.10
Moderately poor	25.76	35.93	49.93	65.60	71.38
Moderately nonpoor	36.07	35.70	57.16	85.75	85.85
Rich nonpoor	47.73	37.39	72.42	239.58	125.30
All poor	22.75	33.33	45.70	57.22	63.75
All nonpoor	40.51	36.71	61.10	157.68	107.28
All households	33.51	33.85	51.98	116.08	96.29

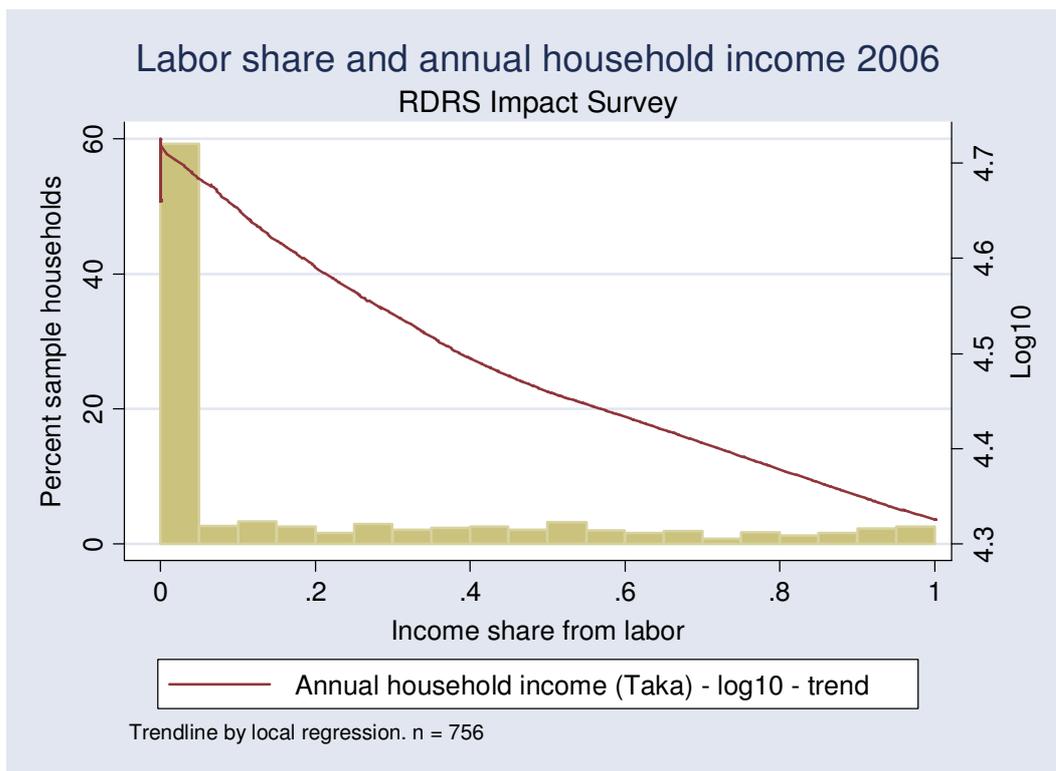
Source: Osmani and others 2003.

Note: Estimated from the unit records of Household Income and Expenditure Survey, 2000. The rural population is divided into the extremely poor (bottom two deciles), the moderately poor (next three deciles), and the rich nonpoor (top two deciles).

Source: Sen, Mujeri et al. (2007: 98)

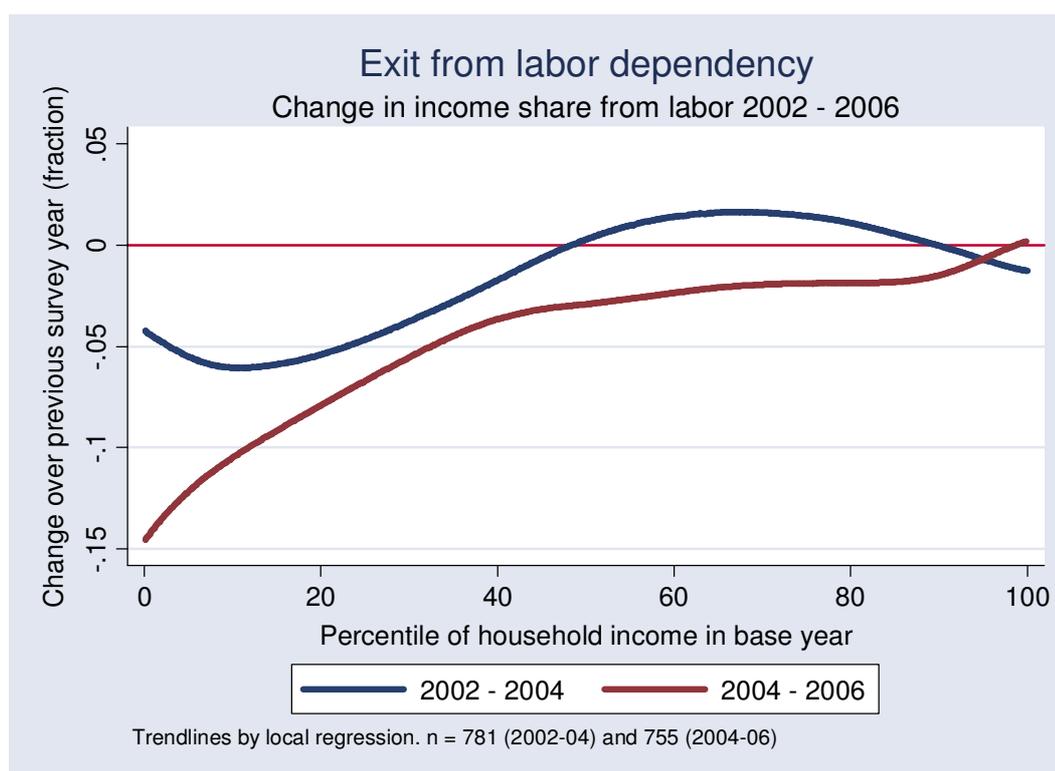
Note the range from Tk. 16 reported as the average daily wage of an extremely poor person farming for herself to the Tk. 240 that a rich person takes home from a day's self-employment in the non-farm sector. Others (Toufique and Turton 2003) have described the diverse picture of the labor shift from farm to non-farm occupations. Our own analytic approach has concentrated on labor selling and income diversification, knowing fully well that it covers only one among the "multiple routes for poverty reduction" (Sen 2003: 527). The rising 2006 incomes, when casual labor is replaced with other forms of employment, follow a very similar pattern to the one we found for 2002. The mean for those drawing more than 90 percent from labor sale was Tk. 26,621; for those depending on labor for less than 10 percent of their incomes it was Tk. 56,838. The trend is almost linear in the labor share.

Figure 11: Labor share and annual household income 2006



Since 2002, the income share from labor sale has fallen in our sample households, from 21 percent in the total income mass (2002), to 17 percent (2004), and finally to 12 percent (2006). This change has been rapid and accelerating and has disproportionately benefited the poorest (some of it by definition; for, the non-poor had in large parts shed their labor dependency earlier). There is a weak association between loans taken from RDRS in 2006 and the degree of labor dependency reduction, and similarly between membership in other NGOs and this reduction, suggesting a role for micro-credit in the transformation.

Figure 12: Change in income share from labor 2002-2006, as a function of household income in base year



While changes in casual labor dependency may have been particularly consequential for the poorest, the overall picture is still one dominated by farm-based income. Its share in the total income mass in 2006 was 47 percent, up from 38 percent four years earlier. While off-farm employment is important (one third of the incomes are made there), its share has not grown consistently. This may have something to do with the crowding in rural markets of small businesses started or expanded with micro-loans, but we have no material to support such a suspicion, no more than data on farm-gate prices, which would be needed to understand the increased share of farm-based incomes.

Formal employment, locally known as “service”, has shown a stagnant share of 6 percent. Clearly, the RDRS sample population has not been successful in making a larger inroad into it. We have not yet investigated the association between service incomes and factors like education; our data is limited to the years of schooling of the respondent while income from service may be earned also by other family members. Outside the impact service, we keep hearing stories of service holders having paid large bribes to obtain employment; if this is the case generally, it will debar many of the poorest (Sen, Mujeri et al. 2007: op.cit., 107, find that the poorest are generally excluded from non-farm formal employment.).

The following table renders the composition of the 2006 incomes by activity type. Those for 2002 and 2004 are given in the appendix. They are divided by the respective sample household populations and inflated to 2006 prices for comparability. The tables also give the income shares, percentage of households for which the particular activity type produced the largest income share, and the percentage of households who derived at least 20 percent of their income from it. Since a family may derive such income shares from more than one type, this column sums to more than 100 percent.

Table 15: Annual income composition, by activity (per capita 2006)

Activity type	Sample p.c. incomes 2006 (Tk.)	Income share	HH w. largest share from activity type	HH deriving >20% from act. type
Farm-based	4,375	47%	41%	69%
Labor sale	1,116	12%	20%	30%
Off-farm	2,968	32%	31%	44%
Service	560	6%	5%	10%
Other	296	3%	3%	8%
Total	9,316	100%	100%	161%

Back to Vulnerability

With the importance of shifts from casual labor dependency established, we want to tie various findings together within the vulnerability perspective. In a short-term perspective, we want to probe for associations between vulnerability, recent opportunities, earlier poverty, and exposure to RDRS program offers. The longer-term perspective recognizes that our survey respondents spent most of their years before they joined any of the RDRS small groups that we sampled. Their families were part and parcel of growth and impoverishment dynamics some of which carried on stubbornly beyond the advent of RDRS.

Short-term income changes

Vulnerability is understood as the risk of reentry into poverty (and, in an extended perspective, also the risk for the poor to descend into more severe poverty). Generally, one would therefore test for factors associated with the crossing of various poverty lines. Technically, for instance, Burke et al. (2007: op.cit.) use probit models to estimate asset, family dynamic and market participation effects on the probability to stay permanently non-poor or chronically poor. In their study setting in Kenya, NGO program selection effects do not matter. In our case, where selection effects do matter and asset data is less complete, we choose an approach that is less dependent on functional forms. Also, we assume that the latest income changes (2004 to 2006) can proxy for vulnerability to income poverty.

We use an exploratory procedure to investigate the impact on the 2006 incomes of four factors. These are:

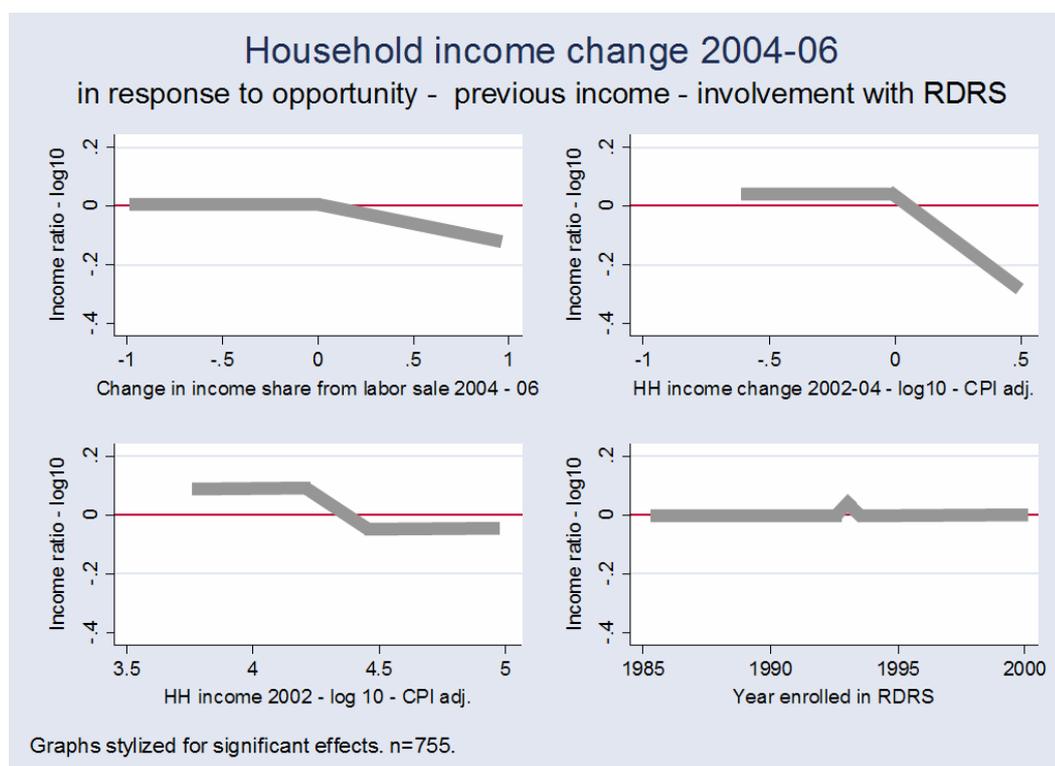
- the change, between 2004 and 2006 in the income share from labor,
- the household income growth in the previous period 2003 and 2004,
- the 2002 household income, and
- the year when the group member enrolled with RDRS.

The assumption is that decreases in the income share from casual labor stand for opportunities that the household seized in other activity types (such as micro-loan-financed small businesses). The previous-period income change is included because of the possibility that the mid-point incomes (2004, our second wave) were transitorily over- or under-shooting with respect to the structural incomes that the household assets permitted. The 2002 incomes are included as a pseudo-baseline, assuming that they express all previous conditions, selection and program effects. In view of that, the inclusion in the model of the year of enrolment with RDRS is somewhat illogical; we do so essentially for reasons of

completeness, to test for any residual program effects beyond those absorbed in the 2002 incomes.

We realize that this technical description is trying and offer a stylized diagram to somewhat ease the exposition of our findings.

Figure 13: Response of household income change 2004-06 to opportunity, previous income, and enrolment in RDRS



We comment on the labor share effect last. Some of the other effect shapes are as expected. The poorest had stronger relative income growth than the less poor; this effect is echoed also from the earlier 2002 baseline. Changes in income that took place in 2002 – 04 are to a point compensated for in the following period, although the effect is not linear. Households with strong growth in 2002-04 – many of them overshooters – tend to lose in proportion with the earlier gains; those losing earlier – many undershooters – are mildly rewarded in a more uniform way. The effect curve for time with RDRS is almost entirely flat and zero, with a small blip in 1993, perhaps related to one of the many policy changes in the rapidly expanding microfinance that affected also recruitment patterns.

The effect of the greatest policy interest is that of the change in the income share from casual labor, seen in the top left panel. In fact, the other three variables were essentially used as controls, to see the robustness of the labor income share effect. The effect pattern is not particularly encouraging, but they need to be interpreted in tandem with the effect of such changes in the earlier period.

Those households which had to revert to a higher casual labor dependency in 2005-06 – say, because they lost land or a non-farm business – saw their incomes contract. The reverse is not true. Households that diminished their casual labor share in this period were not rewarded

with higher incomes. This is different from the preceding period during which incomes would respond positively to diminishing labor dependency.

One may suspect that in the second period, characterized by slower overall income growth in the sample population, small-business starts or farm land additions were less profitable. This interpretation is difficult to firm up in the absence of a control group, or at least strong indications that the local economy slowed down. For a test, albeit a weak one, we looked at the change in the RDRS loan recovery rate in the sample Unions. The change of rates is for all borrowers in a Union, not the sample households – in other words it is an ecological variable meant to express the change in the strength of the local economy. There is indeed a faint effect in the sense that when the recovery rate in a Union deteriorated between the two two-year periods, it would tend to depress the incomes of the sample households living there. The effect fails to reach statistical significance. The diagram for this model is in the appendix.

If our assumption about a close association between the growth rate of the local economy and the income response to a shift away from casual labor holds true, this is likely to have consequences for vulnerability alleviation. It would imply that the productivity of interventions like loans and skills trainings, staples of NGO income generating projects for poor people, may be highly sensitive to the growth of the local economy at large. In other words, the choice of micro-level vulnerability alleviation strategies would need to vary more rapidly with the changing macro-economic environment.

In the next versions of this study, we will have a look at land ownership data. Collected in the 2002 and 2006 waves, this data implies considerable asset mobility. Also, it is the only productive asset type of which the valuation by survey workers appears to be tolerably reliable. Involuntary loss of land has always been understood, in the Bangladesh context, to be closely related to a downward spiraling economic trajectory of families damaged by floods, household division, or distress sales. It should therefore be considered one of the pieces in the vulnerability puzzle. At the same time, in a diversifying rural economy considerable land liquidation should be normal.

Life-course dynamics, crises and recovery

Of the estimated 33,190 life-years that the 798 respondents together passed between their birth and 2007, approximately a sixth fell into the era before the independence of Bangladesh in 1971, about half were passed between Independence and joining the small groups of our sampling frame, and almost a third elapsed since the enrolment with RDRS. Most of the small groups organized in the 1980s and 1990s ceased to function a number of years ago.

It is obvious that the typical respondent – 41 years of age at the time of the last interview – has lived only a minor part of her life in an intensive RDRS small-group framework. When asked, about half of the respondents profess to be members of their local federations, but active involvement appears to be a minority affair currently¹⁵. During in-depth interviews, participants would anchor their RDRS experience primarily in terms of their loan history, alongside loans taken from other agencies. References to RDRS skills trainings, the federations or acquaintance with individual RDRS staff members also occurred, but rarely so. They were told matter-of-factly, without manifest emotional attachment to the organization or

¹⁵ The information that the 2007 Impact Survey collected on this subject has not yet been thoroughly evaluated. See a tentative Mokken scale of participation variables in the appendix, though.

accounts of the initial enrolment in the kinds of conversion or rescue frames that were habitually offered in pre-microfinance era conversations.

The income statistics had revealed that within two years slightly more than a quarter of all non-poor households in the sample fell into poverty (see page 44). Not surprisingly, over the current lifetimes a much larger proportion of our in-depth interviewees signaled some serious crisis. Not all crises would plunge households into poverty; divorce, property division in wealthier extended families and, in the case of a young respondent, two subsequent failed school exams were also considered serious crises. Many of these crises, one must presume in the absence of income data, did push households into poverty, or already poor households into more severe poverty.

Davis classified the mobility of his respondents (who may have belonged to different households in the course of their lives) by the direction and pattern of their trajectories. Among 90 life histories (Davis 2006: op.cit., 10), eight distinct types emerged. RDRS monitors using the same scheme activated only four types to accommodate their 21 respondents:

Table 16: Trajectories of improvement and decline, from 21 life history interviews

Trajectory		Respondent gender		
Direction	Pattern	Male	Female	All
Improving	Saw-tooth	7	3	10
Declining	Smooth	0	1	1
Declining	Saw-tooth	3	6	9
Declining	Multi-step	0	1	1
Total		10	11	21

Saw-tooth trajectories are those that change direction at least once. Both smooth and multi-step directories are monotonous; multi-step ones have more dramatic sudden changes though in the same direction. Saw-tooth trajectories were the type followed by almost all of the respondents' lives, meaning that most of those able to improve their station did so despite setbacks while those declining were not able to make temporary upswings permanent.

The correlation between life-time improvement / decline and gender of the respondent is obvious. It needs to be repeated here that most female respondents in the full sample were RDRS group members or ex-member who were married, and this is true also of seven of the eleven women who share their life histories with us in 2007. Female respondents with declining trajectories tended to be in poorer and smaller households in 2002 than the rest (typically two persons vs. five; Tk. 31,824. vs. Tk. 70,949 median HH income CPI adj.). The case study starting on the next page fits this bill perfectly.

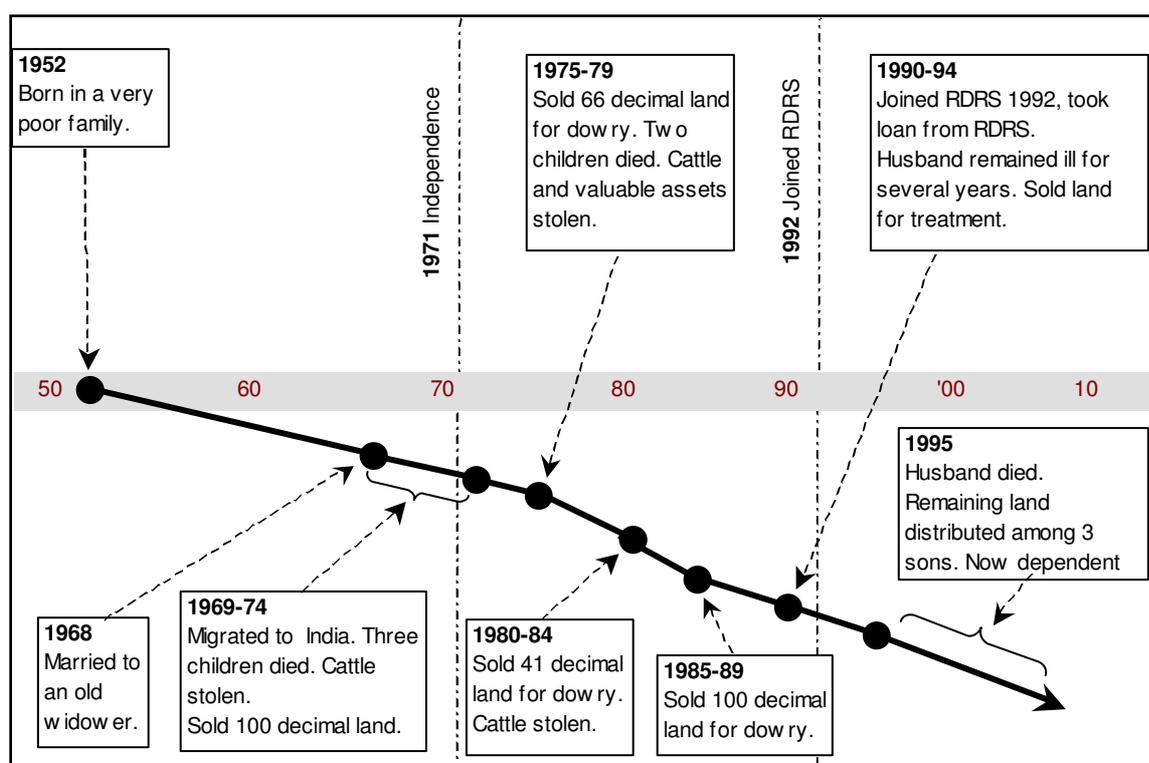
In reviewing the 21 trajectories, the interviewers isolated a total of 86 events or episodes that the respondents had cited as causes of decline. Similarly, they noted 61 starts of upswings. We separated these points and their interpretations into periods before and after the respondent's start of the micro-finance borrower career (regardless of which agency extended the loans).

[Case study:] Gano Bala

Gano Bala (55), a poor widow, has hardly found any stable period in her life. She almost has no sweet memories that she can let others know. Her life diagram denotes a steadily downward line meaning that she never had the opportunity to turn around.

Gano Bala presently, being dependent on her three sons, lives in Pangamutukpur Union of Domar Upazila under Nilphamari District.

Figure 14: Life history diagram of Gano Bala



She was born in a poor family and did not have any scope to attend school. In 1968, at her 16, she had no choice but to marry a poor widower (40), Mohesh Babu who had lost his two wives earlier and already had two daughters and a son. At that time, Mohesh Babu had around 20 bighas of land.

After a year of her marriage, Gano Bala became mother of her first child (son). During liberation war in 1971, as like as other Hindu families, they had to migrate to India and during that tense period her two-year aged son died there.

After the independence of Bangladesh, they came back from India and sold 2 bighas of land to rebuild their house. She was again blessed with a son in 1972 who is still living with her. During the periods from 1973 to 1985, she gave birth to four other babies all of whom 3 died within a span of one or two weeks of their birth. The lucky one who survived was a daughter.

In 1974 her husband bought two cows by selling one bigha of land. But within a short period, both the cows and some other valuables were stolen. Sometimes later, in 1976, her husband again bought a cow by selling another one bigha land. In the same year 41 decimals of land had to be sold to meet marriage expense of her stepdaughter. The following year her stepson got married.

On account of repeated theft and feeling of insecurity they were thinking of shifting their house to another place. Finally they could make it in 1980 and for the purpose 17 decimals of land were sold out. Two years later more 37 decimals of land had to be sold for getting her daughter married. Gradually their total landholding decreased, and they became more vulnerable.

Gano Bala came in contact with RDRS in 1992 and became a RDRS' group member. But she hadn't made much out her association with the group. Her husband died in 1995 after suffering from long illness and around 30 decimals of land had to be sold in that connection. They family had only 10 bighas of land left, distributed among the three sons. She has no property in her name. Now Gano Bala is completely dependent on her sons, who feed her by rotation. At times she visits her daughter's house for a change.

Looking at Gano Balas life history one can hardly find any upward movement. She had faced repeated downfall and miseries in her life and now she is a complete vulnerable women who does not know what to do if her sons and grand children don't feel obliged to take care of her for whatever reasons.

Gano Bala was interviewed by Md. Abdul Hakim and Md. Eyasin Ali Sarker. Ali Sharker wrote the case study; Jasim Uddin Ferdous translated it. Farque Ahammed drew the diagram.

Table 17: Ratio of improvement causes to decline triggers, before vs. after first loans

Region	Improvement causes vs. decline triggers		
	First loan		After /
	Before	After	Before
West Zone	9/23	19/25	1.94
East Zone	17/25	16/13	1.81
All	26/48	35/38	1.70

The ratio of positive to negative episodes improves by about 70 percent from the period before the first loan was received (which essentially is the time from birth to first loan) to the time passed since then. This cannot be construed to prove the effectiveness of micro-loans for vulnerability reduction, not only because of the small sample, but also because of multiple

potential measurement errors¹⁶ and, more importantly, because people are likely to recall distant disasters more keenly than distant slow-moving positive events. However, it does indicate that in the subjective evaluations of their life trajectories the poor have seen things brightening up a bit since they gained access to credit. What is also important here is that the improvement in the ratio was almost as strong in the poorer and more disaster-prone East Zone.

We may be treading on safer ground when we look at predominant causes of decline. Many decline episodes start suddenly, as a result of a distinct crisis event, to which it makes eminent sense to attribute causal power. Others may be more ambivalent or co-efficient with other causes. Davis (op.cit., 7) explicates temporal contexts of causality, but it is all too obvious, given data and sample, that we are strictly operating within attributions by us, the fleeting observers of upwardly and downwardly mobile households. All the same, interviewers and respondents share a common set of meanings for most of these crisis events, and this should make for a somewhat valid picture of the relative frequencies of event types.

Table 18: Major causes of decline, from life history interviews

Cause	West Zone			East Zone			All instances
	First loan			First loan			
	Before	After	Both periods	Before	After	Both periods	
Ill-health and death in family	12	9	21	6	5	11	32
Crimes and natural disasters	6	5	11	5	0	5	16
Dowry and divorce	3	3	6	1	2	3	9
Loss of land	1	1	2	3	3	6	8
Household recompos. (excl. divorce)	0	1	1	5	0	5	6
Court cases	1	2	3	1	2	3	6
Various other causes	0	4	4	4	1	5	9
Total	23	25	48	25	13	38	86

Despite the small sample, there is a significant lead of health-related causes of decline. This is in full agreement with studies from other poverty contexts (see table on page 33). Crimes and natural disasters are lumped together here as events in the face of which the poor are mostly helpless. Although in the second rank, the coded instances are only half the number of health-related events. The paradoxical scarcity of such events in the East Zone may be an artifact, depending on how loss of land was coded for the two zones. Dowry and divorce come in third. Loss of land is often mentioned, but is a mixture of distress sales and river erosion. Household recomposition other than from divorce usually means separation of households and division of assets when sons marry, over family disputes, or over extended family break-up; occasionally also taking in additional relatives. Court cases, which tend to be ruinous for both parties when they do occur, are relatively rare.

The leading risks are characterized by events that do not result from immediate decisions by the poor although their decisions help determine exposure to these risks, particularly in health. As victims of crime and natural disaster, the poor in most cases can only pick up the pieces and go on with life. In seeking health care for family members, the situation is different. The

¹⁶ The East Zone life history interviews took place after the monitors had analyzed those from the West Zone. In other words, significant cognitive conditioning took place between the two batches. Episodes from these were subsequently reviewed, classified and counted by different persons, without any inter-rater controls.

poor bear the risk also of depending on uncontrollable experts that may prompt them to make financial and treatment decisions that accelerate the decline. We will find that health problems are the leading type of negative life changes in the short term as well.

The length of untrammelled decline or improvement spells varies widely. Exact measurements are difficult. We set out in the assumption that crises come suddenly causing steep falls, most of which, though, would be halted after a short time, whereas recoveries would take much longer. This may be the case of some of the poor who, at the end of an acute crisis, fall on their feet and slowly work their way up the recovery ladder. However, looking at the 12 Nageswari life histories once more, we are inclined to think that the median duration is similar for decline and improvement spells. An imprecise estimate is between 2.5 and 4 years. The longest uninterrupted decline period spelt out by our interviewees in this small sample lasted for 8 years; the longest improvement spell ran for close to 14 years.

Income Growth and Recent Life Changes

Respondents were asked, by way of the same open-ended questions in 2005 and 2007, to volunteer changes that they deemed particularly significant in their lives over the past twelve months. These periods overlapped with about half of the income years recorded in those same interviews. It seems reasonable to assume a relationship between the direction of income change and problems and achievements voiced in adjacent periods. The life changes were categorized; the following table details those that were nominated by at least ten percent of the respondent in one or both periods.

Table 19: Significant life changes in the past 12 months, for two periods

	Twelve-month period during:	
	2004-05	2006-07
	Percent of respondents	Percent of respondents
Positive changes		
Housing improvement	38.2	22.5
Income increased	35.7	23.3
Land purchase or lease	31.8	23.7
Other asset purchase	16.4	9.0
Livestock purchase	14.5	15.9
Various other positive	23.0	25.3
Total incl. multiple	159.5	119.6
Negative changes		
Illness of family members	28.6	35.6
Loss of assets other than land	13.7	26.9
Decreasing income	13.4	7.8
Giving dowry	10.2	9.1
Loss of land	1.8	11.2
Various other negative	18.6	23.3
Total incl. multiple	86.3	113.9

The association between the response pattern and the growth rates of the two associated income growth periods is obvious and captured in this table. Among the more specific

changes that leap to the eye, loss of land and other assets was deplored much more frequently while the ability to acquire more land and assets (other than livestock) declined.

Table 20: Income growth and most significant life changes, for two periods

			Period	
			2003-04	2005-06
Mean HH income growth rate p.a. ¹⁷			4.19%	0.43%
Changes reported per respondent	Positive		1.6	1.2
	Negative		0.9	1.1

These changes are perhaps not surprising – consumer and investor confidence sink in times of slower growth, and assets are liquidated to keep up consumption and investment for which current earnings cannot pay - but they give us added confidence that the difference in the average growth rates between the two periods is real and not rooted in a systematic measurement or inflation-adjustment error. Added corroboration comes from the movement in the fraction of households that declared themselves food-sufficient: 69 percent in 2003, 87 percent in 2005, and a drop to 79 percent in 2007.

Income Growth and Social Development

Bangladesh is one of the low-income countries considered to have achieved disproportionate gains in social development, notably in education and preventive health care. High participation rates are found also in our sample households. Data were collected twice, in 2003 and again in 2007, on several indicators, of which those on school enrolment, contraception use and latrine access have been partially evaluated. This table gives a summary.

Table 21: Select social development indicators, 2003 and 2007

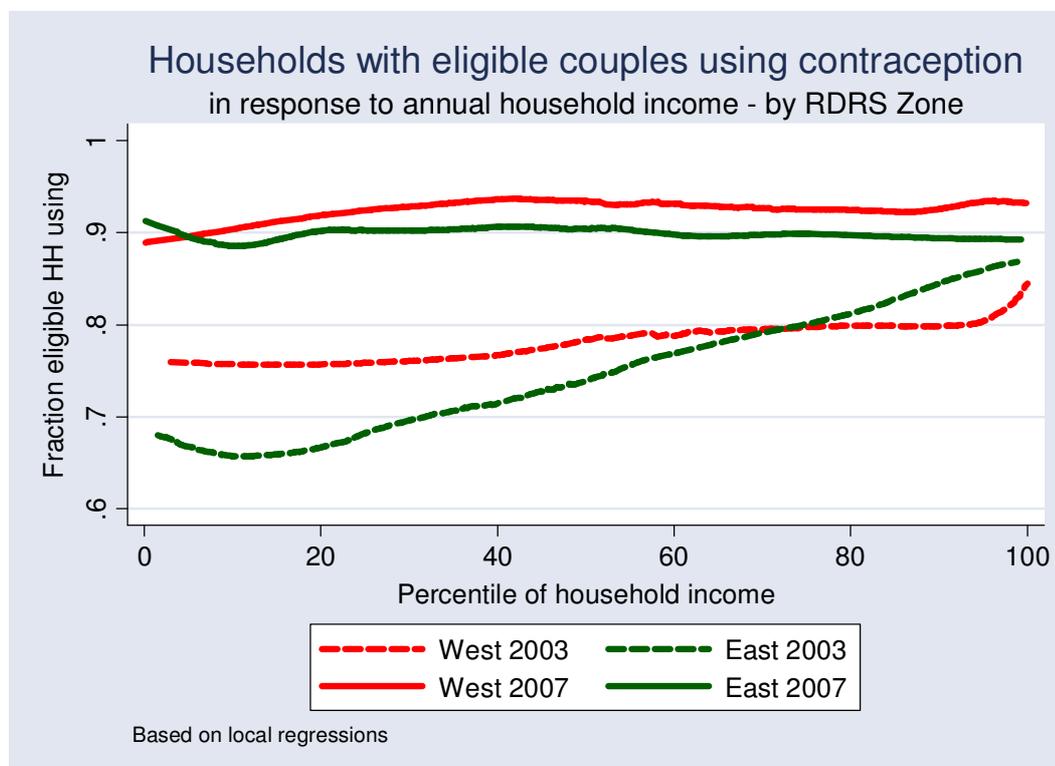
	2003	2007
Overall school enrolment rate in sample		
Boys	78.1%	75.5%
Girls	89.3%	86.3%
Type of latrine used (households)		
Open defecation	38.2%	10.2%
Katcha (mostly bamboo structures)	20.1%	8.7%
Sanitary	41.7%	81.1%
Contraception		
HH with eligible couples practicing	74.6%	83.5%

These participation and usage rates are high. Contraception use grew from an already high level; the ownership or use of sanitary toilets (this definition includes ring slab toilets) doubled within four years. Our figures do not distinguish between primary and secondary school enrolment; girls' enrolment was higher, responding to government subsidies for educating girls. The enrolment rates for both girls and boys slipped between these two survey

¹⁷ Annualized harmonic mean of individual household income growth changes, not the annualized change in the total volume of sample household incomes.

points. Below is a two graph relating contraception use to the income rank of the previous year. A graph displaying the rates of school enrolment as a function of income rank was presented in the summary.

Figure 15: Contraceptive use, in response to annual household income, 2002 and 2006



Note: The rates shown in this graph are somewhat higher than those in the table above. They are based on the fraction of households with eligible couples that had some practicing couple. The tabled rates use the number of couples, not households. We plan to revise the graph in a later version.

The breakdowns look at different criteria. The education graph is split by gender, the usual suspicion being that girls’ education may be one of the casualties of growing economic hardship. The contraception graphs looks at usage rates for different geographical zones, assuming that the poorer couples of the East may face greater access obstacles.

The findings on the education rates are alarming; those on contraception are encouraging. Withdrawals from school, or non-enrolment of children ready for school, have occurred for both girls and boys. However, while boy’s enrolment was strongly correlated with poverty already in 2003, at the time girls were in school almost ninety percent, and largely at the same rate across the income range. By 2007, however, the drop in enrolment affected primarily the poorer families. Not surprisingly, 20 of 45 households in which we noted a larger gap between school age and school going girls were from Bhurungamari. Despite the subsidy for girls’ education, families incur opportunity costs of some kind – e.g., when the elder daughter is in school, the mother may have to stay home to look after the younger children – which they are less willing to bear in harsher times.

The contraception graph tells a success story. While practice has increase for both East and West Zone, and the poorer East Zone is almost on par with the West, the practice deficit found in the poorer households in the East in 2003 has disappeared by 2007.

Conclusion

Vulnerability

This study offers two paramount findings, around which a host of qualifications, nuances and ramifications can be woven into a fabric that may strike some as ordinary, and others as displaying some surprising new stripes.

First, this sample of former (and some still active) RDRS small group member households has experienced strong income growth in recent years. The growth rates were stronger at the lower end of poverty, a regularity noted also in other studies, including of rural Bangladesh. As a result, the poverty rate of this population dropped considerably between 2003 and 2007, and by more percent points than a BBS-surveyed sample population in rural Rajshahi did between 2000 and 2005, applying the same standard (the lower of the two BBS poverty lines).

Second, despite strong income growth, the vulnerability to new income poverty remains high. The exit rate from poverty was almost the same as the entry rate, and the sample poverty rate fell during this period only because the stock of poor was much larger than the non-poor. Within four years, 44 percent of the households crossed the poverty at least once. This high rate of “poverty churning” would likely appear somewhat more moderate if we used household expenditure rather than income, because of consumption smoothing from asset sales and savings.

This high income mobility is associated with growing inequality, which some observers deem unavoidable in the growth path of the rural economy in Bangladesh, despite some of its “pro-poor” characteristics. As others have demonstrated, and our income composition data fully confirms, strong household income growth goes hand in hand with the ability to shift away from casual labor dependency. In this regard, too our sample households made strong and accelerating progress, lowering their income share from labor sale from 21 percent in 2002 to 17 percent in 2004, and finally to 12 percent in 2006.

However, capital investments and labor effort in small businesses and farms yield higher returns only if the growth of the ambient economy ensures demand for the goods and services that these formerly poor or relapsing poor households offer. Income growth in this sample slowed down remarkably in the second of the observed two-year periods, but we have only scant circumstantial evidence that the economies of the four sample sub-districts did so as well, and why. However, we can see that, within the sample households, the income response to shifts away from casual labor was less favorable during 2005-06 than in 2003-04.

The consequences of slowed growth showed up in a number of diverse fields, in a decreasing proportion of food-sufficient households, in a less favorable ratio of positive to negative significant life changes, and in drops in one (but not all!) social development indicators, school enrolment. In the second period, more families withdrew, or withheld, children from school. Withdrawal of girls, formerly resistant to higher poverty (because the government subsidizes girls’ education), grew stronger at the bottom of the income distribution. On the other hand, sanitation and family planning continued their advance despite slowed income growth.

The strong correlation of income growth with several other welfare dimensions such as food sufficiency, social development and other positive life pursuits (e.g. the ability to marry off

sons and daughters, to continue medical treatments) is in itself part of the vulnerability conundrum. If incomes stagnate or contract, other welfare components will behave similarly. This may result in one or the other well-known kinds of poverty cycles unless protective or anti-cyclical elements are brought to bear. This is where the government and NGOs are essential. We were starkly reminded of this as our interviewer teams moved out of Nageswari, past lines of trucks that moved in, carrying RDRS relief goods for people damaged in the 2007 floods.

There is incontrovertible evidence, both from full-sample standardized questionnaire interviews and from in-depth life histories of a smaller group, that health-related problems are a prevalent cause for people to return to poverty, or to fall from poverty to more severe forms. This confirms findings from multiple other poverty settings in the world. Health crises, natural disasters, crime victimization, but also voluntary household recompositions can turn vulnerabilities into personal and family disasters. A strong economy will not remove those causes, but may determine which households reach the trigger point, and which may outrun the crisis.

Recovery may be impossible for some and slow for others. Yet upswings appear almost as frequent as decline episodes, testifying to the strong resilience of at least a good part of the poor. Here the question arises what useful roles an NGO like RDRS can play to alleviate the high vulnerability. Particularly so if, as the Impact Survey suggests, that of individual poor households is tightly linked to the fortunes of the ambient local economy.

NGO policy questions

One may therefore suspect that it is near impossible for NGOs to stabilize the welfare of their program participants beyond an initial empowerment phase. NGOs do not make economic policy beyond the micro-level, and they cannot pump Keynesian demand into sputtering local growth machines. The diversity of risks that the poor face may be beyond the coordination capacity even of larger NGOs working in several sectors. RDRS no longer achieves, nor intends, the same tight integration of multi-sectoral programs, with extension workers from different services literally knocking at the doors of the same poor households, as it did in the 1980s. Instead, it offers xxx In fact, the integration burden nowadays is on the poor, who are left to search for solutions to their problems in the government and NGO “market place”. Sen (2003: op.cit., 527) found that households successfully fleeing poverty were the ones who “*demonstrated the ability to integrate various anti-poverty strategies.*”

In counterpart to the greater independence that NGOs must grant their program participants, the policy focus may need to be on enabling environments as well as on longer-term work on social protections. RDRS, for example, works with the federations and retains a base capacity for emergency relief. It may want to investigate expanding its micro-finance program into micro-insurance.

Some of the survey findings interrogate the taken-for-granted side of contemporary rights-based approaches, whose lingo is being eagerly absorbed, if not always understood, by virtually any NGO wishing to stay fundable. The enjoyment of rights, even of those effectively institutionalized such as girls’ education in Bangladesh, comes at an opportunity cost, and sometimes direct cost as well. Poor households may not be able or willing to bear these costs. In our sample, we observed withdrawal of girls from school, disproportionately among the poorer ones, at a time when income growth slowed. This demonstrates that rights cannot be effectively claimed if those entitled reject the associated costs or are under the

authority of others who reject them. Poor people balance their pressing needs by a mixture of asserted rights and cultivated patronage. Shaheda, of our case study, eats at the table of friendly folks, who have no duty, moral or legal, to entertain her. High vulnerability implies, almost by definition, that a rights philosophy must be integrated into a needs perspective, because the enjoyment of rights and the provision for needs cannot be synchronized momentarily. Only their convergence can be enhanced over time.

Future Impact Surveys

At the same time, we should humbly recognize the limits of this Impact Survey and refrain from sweeping conclusions for which it offers scant empirical support. If an outside observer looked at the survey rounds that the RDRS monitors have conducted since 2000, he might find a mixture of strengths and weaknesses, in design as well as in execution. Persisting in a multi-wave panel survey is rare with most NGOs but the largest - those who boast strong research departments and effective research networking - yet the RDRS monitors did persist.



Nowhere in this text have we highlighted the fact that the poor and vulnerable are continuously doing their own impact surveys, aided not (yet) with laptops, but with bicycles and increasingly with mobile phones, moving much more nimbly than institutions do. This young cloth peddler, whose words we quote at the end of this section, shared with us his thoughtful assessment of why income growth may have slowed down in his area in 2004-05.

They drew a correct probability sample and realized it faithfully, with surprisingly little attrition. Data collections proceeded with care and dedication although correlated interviewer errors must be assumed as a result of fatigue and repetition. If income measurement was satisfactory, measurement of asset values was not. Scales for household wealth measurement were poorly understood, but qualitative life history interviewing was enthusiastically adopted.

Generally, and this may hold for many NGO-driven surveys and assessments, non-sampling errors were more important than sampling errors. The design was not highly model-based, but comparability was achieved with an official poverty survey. Given the isolation of Rangpur from the Dhaka-centered research networks, the Impact Surveys have traveled a respectable middle road between the staid cross-sectional survey and the cutting-edge full panel design.

RDRS must now determine the future direction of its Impact Surveys. The current sample has run its course; these households are nowadays too far detached from active program participation to inform effectiveness research. If systematic probability sampling of households is to be continued, there will be little choice but to turn to the large RDRS micro-finance database for a sampling frame. This will again leave the problem of selection bias unattended unless some control group can be added externally, such as by way of a

spatially defined cluster sample. Moreover, the speed of the Impact Survey enterprise must be turned up. In theory, regular survey rounds could serve RDRS in a sentinel function, similar to that delivered by its nutritional surveys earlier. The NBI staff, for example, have the skills to compute a worsening of severe poverty off the data from one sub-district vs. another, but to do so regularly, they would need to be more aggressive.

[Sidebar:] Panel surveys – the gold standard for poverty research?

Since the first draft of this report was written, the literature on vulnerability and resilience was further enhanced by a collection of studies, published by the World Bank: “Moving out of Poverty: Cross-Disciplinary Perspectives on Mobility” (Narayan and Petesch 2007). The editors summarize the contributions from panel survey research and call this methodology nothing less than the “gold standard for examining poverty transitions” (ibid.: 31). From the dozens of panel surveys conducted in numerous countries, they see five policy messages flowing:

- Poverty escapes depend heavily on the macro context, notably the economy’s size and growth, but growth is not enough when inequalities are large.
- In the short-term, churning in and out of poverty knows very high rates in many societies. Many people fall into poverty, and many find the means to work themselves out of it.
- The downward churning is driven importantly by illness. Thus safety nets with access to health care and insurance allow large numbers of people to avoid or escape from poverty.
- Education is crucial for poverty escapes, particularly from one generation to the next. However, returns to education vary with the macro-environment, and increasingly primary (or even secondary) education is no longer enough to boost incomes.
- Geography matters. Within one country or region, the same policies can produce different results, depending on local conditions (abstracted from ibid.: 31-32).

Narayan and Petesch complain that “*statistics consume research and policy attention while the factors that interact to get people out of poverty or keep them stuck there remain a black box*” (ibid.: 30). Policy makers like numbers, but there is more to life. In a small measure, this study has tried to broaden the perspective beyond the survey statistics, important as they are, by letting some of the RDRS group members tell their entire life stories. This has yielded a more complete picture.

In a radical alternative, statistical description of program impact could be abandoned in favor of more narrative styles. The local ownership of case study research has always been stronger than that of statistical studies. But there is a complacent reflex in some staff of writing repetitive feel-good stories of yet another widow whom micro-finance helped to a couple of goats, and who, as a result, lives happily forever. The connectivity between data and persuasive interpretive frames is the result of hard work, in any kind of research. The challenge for regional NGOs like RDRS is to build and maintain a staff who continue in their conceptual growth while spending most of their time doing the lowly chores of program monitoring. Household panel surveys, rounded off with other approaches, can indeed stimulate such growth.

Nobody knows that better than the vulnerable poor. Said the friendly young cloth peddler who had sat in with one of the life history interviews: “*I used to be alone in the circuit of these villages here. Now we are three of us, each one trying to sell the same wares. I just have to move more.*”

Appendices

Income composition for survey income years

Table 22: Income composition, all three survey income years

2006:

Activity type	Sample p.c. incomes 2006 (Tk)	Income share	HH w. largest share from sector	HH deriving >20% from sector
Farm-based	4,375	47%	41%	69%
Labor sale	1,116	12%	20%	30%
Off-farm	2,968	32%	31%	44%
Service	560	6%	5%	10%
Other	296	3%	3%	8%
Total	9,316	100%	100%	161%

2004:

Activity type	Sample p.c. incomes 2004 (Tk), 2006 CPI adj.	Income share	HH w. largest share from sector	HH deriving >20% from sector
Farm-based	3,805	44%	38%	67%
Labor sale	1,434	17%	27%	40%
Off-farm	2,454	28%	26%	42%
Service	537	6%	6%	9%
Other	425	5%	3%	9%
Total	8,655	100%	100%	167%

2002:

Activity type	Sample p.c. incomes 2002 (Tk), 2006 CPI adj.	Income share	HH w. largest share from sector	HH deriving >20% from sector
Farm-based	2,852	38%	35%	63%
Labor sale	1,599	21%	28%	39%
Off-farm	2,341	31%	27%	40%
Service	446	6%	5%	8%
Other	356	5%	5%	11%
Total	7,594	100%	100%	161%

Methodological elements

The sample

Previous data collections

RDRS started to collect impact survey data in 2000. Design, data collection and analysis were done by the Research, Monitoring and Evaluation Section, which was absorbed into the North Bengal Institute (NBI), an RDRS-affiliated research and advocacy unit in Rangpur, in 2004. NBI collected data in 2000, 2001, and 2002. The 2002 survey was a re-survey of the 2000 sample. A conjoint analysis has not been done. In each round, a respondent each from close to 800 group member households was interviewed using a structured questionnaire. These three rounds were essentially considered a learning period. RDRS staff performed limited analyses and circulated small reports on the 2001 and 2002 rounds internally (Ferdous 2002: ; Ferdous 2003). The 2003 round, together with the data and in-depth interviews of a small sub-sample in 2005, was analyzed in the above-cited report “The Incomes and Participant Careers of the Poor” (Benini and Ferdous 2005).

The 2003, 2005 and 2007 rounds form three waves of a panel survey analyzed in this report.

Sampling procedure

Planned

Each of the four annual Impact Survey waves 2000 – 2003 aimed at 800 RDRS member households. The sample size was determined by capacity, not estimation considerations. Households were sampled from lists of all RDRS-supported neighborhood groups that the NBI obtained from the Micro-finance Department. Groups with less than three years with RDRS were excluded. Also excluded were groups assisted by the RDRS Char Development Project (CDP), who were living on sandbar islands (chars), primarily in the Brahmaputra River. Their vulnerability is significantly different from, and worse than, that of the mainland groups.

Groups were distinguished by group status. In RDRS lingo, “primary groups” were those intensively followed by extension workers and not yet certified to join local federations; “secondary groups” had less intense contact with RDRS staff and were encouraged to join federations. Many secondary groups were in fact members of federations, but the actual membership status was not available in the sampling frame.

From the remaining list 14,999 mainland groups (Ferdous 2002: 9, Table 3.3), the sample was drawn as a stratified multistage random sample. Strata were formed on disaster vulnerability (proxied for by the East and West Zones - the zones formed by cutting the crescent-shaped working RDRS area along the river Teesta) and on group status. Each stratum was to have 200 units.

In each zone, one of the mainland RDRS Project Units (field coordination units, one or two per district) was randomly selected, and then from within it two Upazilas (sub-districts). Within a selected Upazila, 5 Unions were selected, within each Union 20 groups, and within each group two member households. This table shows the factors that each stage added:

Table 23: Stages of the sampling process

Unit	Multiplier at unit stage	Units in sample
Project Units	1 from each zone excl. CDP	2
Upazilas	2 from each selected Project Unit	4
Unions	5 from each selected Upazila	20
Groups	20 from each selected Union (10 primary and 10 secondary groups)	400
Households	2 from each selected group	800

The size of the sample frames at a given level varied. For example, there were 16 Upazilas in the West Zone (counting Thakurgaon East and West as two), and 12 in the East. The average number of Unions in an Upazila was 9. The mean number of listed groups per Union, for the 5 Unions selected in Bhurungamari Upazila for example, was 61. The mean number of member households per group in the Bhurungamari 5-Union sampling frame was 17.

Thus, although the sample is not an equal probability sample, it is a true probability sample in the sense that the probability for each group to be selected can be computed.

The realized 2003, 2005, 2007 samples

The 2003 round returned surveys of 798 households totaling 4,150 household members, after replacing unavailable group members or defunct groups ad-hoc in the field. 776 of these produced listwise complete information for the regression models for the 2005 analysis.

17 of the 798 respondents in 2003 were lost in 2005, and a further 26 were lost in 2007. One respondent unavailable in 2005 was re-interviewed in 2007.

Attrition by 2007 is significantly associated with ecological zone, with larger losses in the RDRS East Zone, which traditionally has higher migration rates. Otherwise, the logit regressions of 2007 participation show no significant association with age, respondent gender, 2003 family size or 2002 p.c. incomes.

For most analysis, therefore, the listwise complete sample size is 755 or 756.

Sampling weights and correction for attrition bias

We do not use sampling weights or weights inverse to the probability of staying in the sample to correct for attrition bias. We believe that non-sampling errors are more important than those induced by the sample structure. Therefore the considerable effort to calculate probability weights does not seem justified. Moreover, our analytic workhorse, the STATA procedure *mrunning* (see separate reference), does handle analytic weights but not probability weights. Inverse probability weighting as a result of probit or logit analyses of attrition is not done; attrition was minor and was not significantly correlated with greater poverty.

Measurements

Changing thematic foci by survey wave

The thematic elements of the Impact Survey evolved in parts over the three waves 2003 – 2007. Annual household incomes for 2002, 2004 and 2006 were measured identically (except for an additional category for income from operating rickshaws or vans added for 2006). Asset values for land, other productive assets and non-productive assets were elicited in 2003 and 2007. Items on non-productive assets were more numerous in 2007. Social development

variables, including contraception and latrine use and school enrolment of children, were included in 2003 and 2007. Significant positive and negative life changes in the twelve months prior to interviews were elicited in 2005 and 2007. Involvement of respondents in the local RDRS Federations was measured in 2007 only.

Household demographics and adult equivalents

The Impact Surveys did not use adult equivalents, but worked with per capita incomes. As far as we can tell from the reports (Bangladesh Bureau of Statistics 2006: ; Bangladesh Bureau of Statistics 2007), the BBS 2000 and 2005 surveys, whose poverty lines we used for comparison, did not use adult equivalents.

We did not use a fully-fledged household demographic schedule. We collected information on the number of adults and children living in the household at the time of interview. The numbers of girls and boys of school-going age as well those of currently attending school were also collected.

Zaman (1999: 20, fn. 27) used the following adult equivalent scale: adult male (1), adult female (0.83), 10-14 year olds (0.83), 5-9 year olds (0.7), 1-4 years (0.5), babies (0.2), based on earlier work by the World Bank.

Annual household incomes

Income data is arguably the most important part of the Impact Survey. A field calculation proforma was developed, as part of the questionnaire. Net income was transferred to the database for each of the 13 categories. For this study, categories # 1 - 6 were lumped together as farm-based income, # 7 and 8 as off-farm business income, and # 11 – 13 as other income. In 2007, a category was added for income derived from operating rickshaws or vans. It was lumped together with off-farm business income. The rental value of owned dwellings or of free accommodation was not calculated.

Figure 16: Annual income proforma

Annual household income (last year income in Taka)

Income source	Involved family members	Gross income	Production/Operational cost	Net income
1. Home-gardening				
2. Tree-product sales				
3. Crop production				
4. Livestock rearing				
5. Poultry rearing				
6. Fish-culture				
7. Off-farm IGA				
8. Small business				
9. Service (salary)			[x]	
10. Labor sale (wage)			[x]	
11. Rental income				
12. Remittance			[x]	
13. Other				
Total annual income	-	-	-	

CPI adjustments

We inflate 2002 and 2004 incomes to 2006 consumer prices (instead of deflating 2004 and 2006 incomes to 2002 prices). The inflators used were based on a Bangladesh Bank CPI table. The table below also holds purchasing power parity (PPP)-adjusted US dollar to Taka exchange rates. For the year 1993, to which the “One dollar a day a person” extreme-poverty line is anchored, our two sources do not agree. We use Sillers’ value because his tables allow us to connect to the CPI values of later years. We use the one dollar line only for illustrative purposes, and only at one point; our analysis of poverty and vulnerability is predicated on the BBS poverty line for rural Rajshahi division and is purely in Taka.

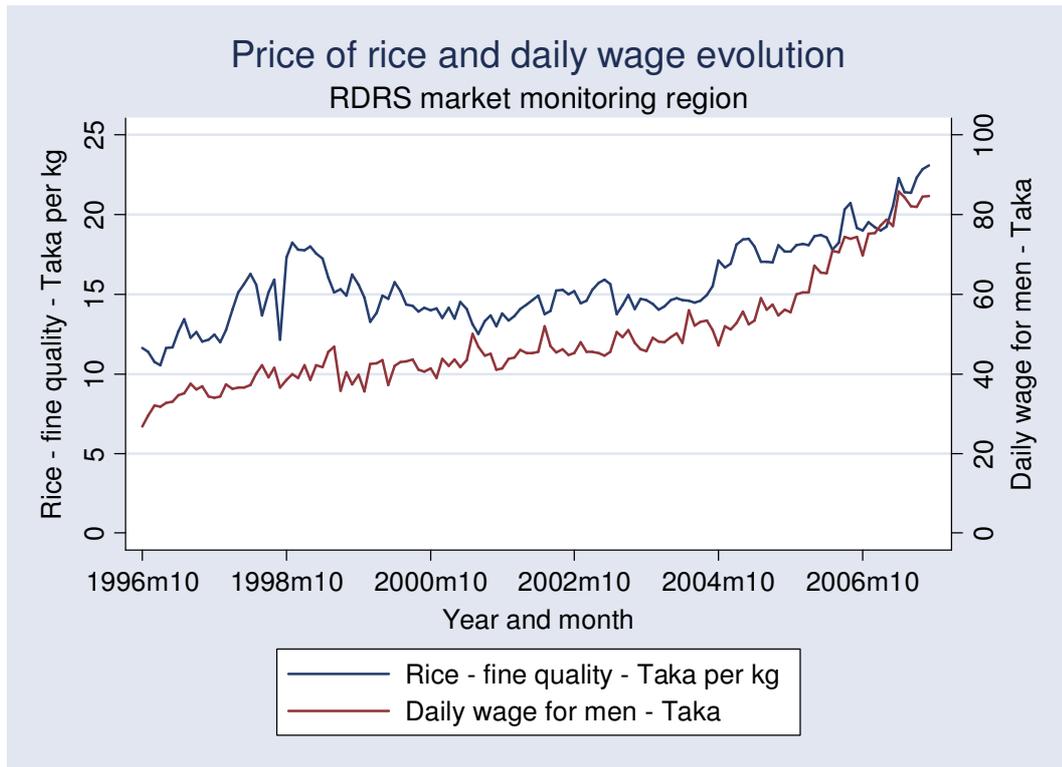
Table 24: CPI-based income inflators; PPP-adjusted exchange rates

Year or 12-m period	CPI	Inflator	Source	PPP-adj. exchange rate Sillers	PPP-adj. exchange rate UNDP
1993	86.56	2.0337	Calculated from USAID/Sillers	12.701	10.041
1995-96	100.00	1.7604	Bangladesh Bank		10.735
2002-03	135.97	1.2947	Bangladesh Bank		11.994
2004-05	153.23	1.1489	Bangladesh Bank		12.480
2006-07	176.04	1.0000	Bangladesh Bank		13.010

(Sillers 2005: ; Bangladesh Bank 2007: ; United Nations Statistics Division 2007)

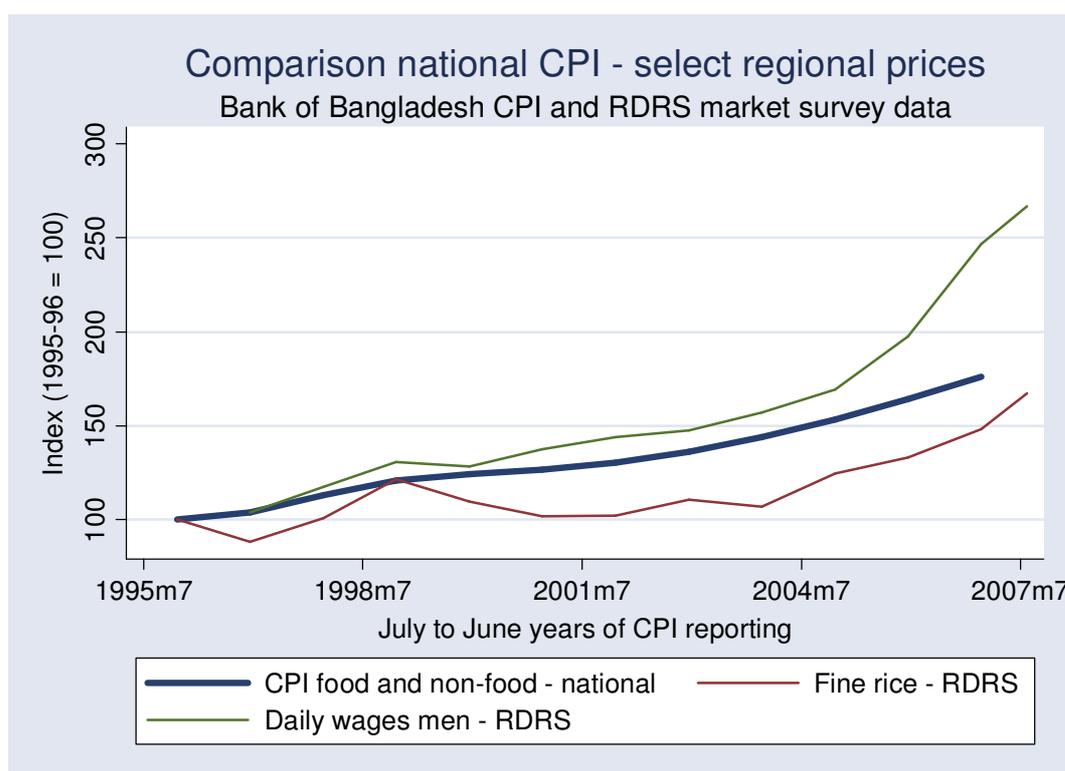
Since many of our local contacts – interviewees and bystanders – whom we met during life history emphasized the recent food price escalation, we compared the CPI changes to one of the essential food prices that RDRS has been collecting in Rangpur (through Health Program staff) on a monthly basis.

Figure 17: Prices of rice and daily labor in the Rangpur area, 1996 - 2007



It is obvious that in 2005 the relative price of rice outran that of casual labor, but wages caught up again in 2006. This discrepancy for a substantial period in 2005-06 would not in itself explain the slowing of real income growth because higher farm-gate prices may have offset part of the effect in the sample population. We do not have farm-gate price data.

Figure 18: Comparison of national CPI and select regional prices



Averaged over the CPI reporting years, the price of rice follows the CPI graph at fairly equal relative distance from 2002 to 2004, and then approaches it slightly more closely. However, we feel that we did not have enough information to second-guess the CPI as an appropriate inflator. By choosing an inflator based on RDRS-supplied food prices, we would have given priority to the high food content in the basic needs of the poor, but would also have lost the possibility to inflate the BBS 2000 and 2005 incomes to 2006 prices. We chose the CPI.

Descriptive income statistics

Here and in the remainder of this appendix, STATA output is displayed in unedited format.

variable name	storage type	display format	value label	variable label
afi02tcopy	float	%9.0g		Total annual family income 2002
afi02t06pr	float	%9.0g		Total family income 2002 - 2006 prices
afi04tcopy	float	%9.0g		Total annual family income 2004
afi04t06pr	float	%9.0g		Total family income 2004 - 2006 prices
afi06tcopy	float	%9.0g		Total annual family income 2006
afi02pc2006cpi	float	%9.0g		Income 2002 per capita, 2006 prices
afi04pc2006cpi	float	%9.0g		Income 2004 per capita, 2006 prices
afi06pc	float	%9.0g		Income 2006 per capita, 2006 prices

variable	Obs	Mean	Std. Dev.	Min	Max
afi02tcopy	798	30501.94	15110.52	3900	79800
afi02t06pr	798	39490.79	19563.55	5049.32	103316.9
afi04tcopy	781	38640.81	22781.57	4250	152300
afi04t06pr	781	44392.92	26172.86	4882.66	174971.6
afi06tcopy	756	48142.78	33963.8	3000	230050
afi02pc200~i	798	8242.338	4652.789	721.3314	37934.63
afi04pc200~i	781	9151.131	5310.738	1558.622	40123.98
afi06pc	756	9704.579	6380.759	333.3333	52500

Assets

Land

The areas and estimated value of homestead and productive (chiefly farm) land were elicited in 2003 and 2007. In 2007, information was sought also on the reasons for changes in land ownership and ownership of land with female respondents. A cursory analysis was done of some of the land-related variables.

variable name	storage type	display format	value label	variable label
t1a03	float	%9.0g		Total land area (decimals) 2003
t1a07	float	%9.0g		Total land area (decimals) 2007
t1v03	long	%12.0g		Total land value (Taka) 2003
t1v07	long	%12.0g		Total land value (Taka) 2007

variable	Obs	Mean	Std. Dev.	Min	Max
t1a03	798	70.55865	99.46679	0	710
t1a07	756	72.31135	106.2053	0	875
t1v03	798	108248.2	179243.7	0	2850000
t1v07	756	186122.9	298681.7	0	4034000

Households without any land of their own were relatively rare in both years, and so were exit from and entry to total landlessness in the four-year interval:

no1and03	no1and07		Total
	0	1	
0	645	28	673
1	20	63	83
Total	665	91	756

Using a transformation that is not scale-neutral, but includes the landless,

```
. gen log10t1a03 = log10(t1a03+1)
. gen log10t1a07 = log10(t1a07+1)
(42 missing values generated)
```

the correlation coefficient between the amounts of land owned in 2003 and 2007 is 0.81.

Value of other productive assets

Attempts, in 2003 and 2007, to measure the value of productive assets other than land were not convincing. In 2005, a measurement was not attempted.

variable name	storage type	display format	value label	variable label
vpa03	long	%12.0g		Value of productive assets (excl. land) in 2003
vpa07	long	%12.0g		Value of productive assets (excl. land) in 2007

variable	Obs	Mean	Std. Dev.	Min	Max
vpa03	798	1567.907	4021.402	0	50000
vpa07	756	2902.116	9750.575	0	136000

A large number of respondents (496 in 2003; 512 in 2007) claimed not to own any such assets.

Failure to estimate these values for each wave eliminates the possibility to estimate asset-based models of income-based vulnerability.

Non-productive assets

Most of these concerned durable consumer goods. Their valuation may be as problematic as that of the productive assets, but item-wise ownership statistics have some illustrative value.

Figure 19: Ownership rates of selected household assets, 2003 and 2007

	2003	2007
Bicycle	44.2%	45.2%
Radio or cassette recorder	15.8%	16.7%
Television	4.5%	12.8%
Table or ceiling fan	3.9%	10.1%
Motorcycle	0.1%	0.7%

Ownership of items to which others are nowadays preferred (motorcycles to bicycles; TV to radios) has stagnated. Ownership of TV sets, table or ceiling fans, and motorcycles all more than doubled in the sample households between the first and third survey wave.

An attempt, in 2007, to use a Rasch scale of household items that had been calibrated against a welfare measure of a large household sample elsewhere in Bangladesh (Benini 2007b), failed. It had been suggested as an experiment to possibly replace income measurements with household asset scale in future RDRS Impact Surveys.

Instead, RDRS monitors, during the 2007 data collection, enquired into ownership of furniture items in greater detail. Some of this information, when combined with other dichotomized variables, has medium Mokken scalability, as in:

variable	Obs	%Pos	Hi	z(H)	Label
fur07cell	756	0.087	0.470	17.850	Cell phone
fur07diningtable	754	0.099	0.407	16.324	Dining table
fur07fan	756	0.101	0.469	18.871	Table or ceiling fan
fur07tv	756	0.128	0.439	18.337	Television
fur07showcase	756	0.242	0.515	23.721	Showcase
fur07ghous	756	0.271	0.357	16.610	Good dwelling
fur07orna	756	0.485	0.362	17.375	Ornaments
fur07glatrine	756	0.552	0.367	17.575	Average or good latrine
fur07dresstand	756	0.648	0.528	24.103	Dress stand
fur07table	756	0.767	0.547	22.284	Table
fur07chairorbench	756	0.769	0.599	24.342	Chair or bench
fur07bed	756	0.963	0.819	13.535	Bed
Mokken H			0.461	46.906	

According to Mokken, $0.40 \leq H < 0.50$ is a medium scale.

More testing is needed to assess the pros and cons of income measurement vs. household item scales.

Social development indicators

For this study, we work with part of the social development indicators only on which one or several survey rounds collected data. These concern

- Ownership of latrines

- Use of contraception among eligible couples
- School enrolment of girls and boys of school-going age
- Membership in local associations
- Involvement in the local RDRS Federation.

Data on the first three was collected in 2003 and 2007; results are reported in the main body. Local association membership was selectively elicited in all three waves, with some indicators seeing their definitions changed. It is used here only sporadically, such as in a reference to growing membership of the sample households in NGOs other than RDRS. Involvement in federations was supposed to be collected in 2005 in time for a federation study, but this was done only in 2007. Only part of the indicators has been analyzed so far, as abridged below.

Involvement in the local RDRS Federation

A fairly strong Mokken scale was obtained for the following:

variable	Obs	%Pos	Hi	z(H)	Label
pfay_agm	749	0.029	0.485	11.289	Participated in Federation annual general meeting
pfay_do	749	0.060	0.538	16.767	Participated in Federation special-day manifestation (last 12 months)
pfay_o	749	0.071	0.405	13.212	Participated in other Federation activities
fvoiEVER	756	0.103	0.484	16.766	Visited Federation at least once other than meetings
pfay_mm	749	0.179	0.602	21.866	Participated in Federation monthly meeting
r_knf	750	0.377	0.601	23.665	Knows the name of the local Federation
mm_f07	756	0.492	0.651	25.598	Member Federation in 2007
r_knufc	750	0.505	0.688	26.651	Knows the name of the Federation's chairperson
r_kauf	750	0.920	1.024	14.158	Respondent knows about the Union Federations
Mokken H			0.603	41.521	

According to Mokken (1971:185), $H \geq 0.50$ is a strong scale

Various regression models gave no indication that stronger federation involvement was related to relative income change 2004-06, and thus to income vulnerability. In the opposite direction, there was weak evidence that higher household incomes favored stronger involvement by the respondent.

Flooding by major rivers

In order to better understand why income growth slowed in 2005-06, we compared also the days June through September in several years during which the major rivers flowing through or near the sample sub-districts were above danger level. The data was collected by the RDRS Kurigram Unit from government offices in the East Zone.

Table 25: Days of major rivers flowing above danger level

Year	Dharla	Brahmaputra	Teesta
1996	10	6	1
1997	4	0	0
1998	18	11	0
1999	8	0	0
2000	7	8	0
2001	0	0	0
2002	13	10	0
2003	14	12	0
2004	15	9	0
2005	7	2	1
2006	0	0	0
2007	9	9	0
Total	105	67	2

The findings, however, are counterintuitive. There were many more above-danger flow days in the two rivers endangering the East Zone populations in the period with strong growth 2003-04 than in the subsequent two-year period, when growth slowed. However, much of the flooding is local. A resident of Nageswari bazaar, for example, told us that the water rose around his house in 2005 as far as in 2007, a year that has had bad floods twice. A Rangpur contact felt the August 2004 floods had been particularly damaging, with effects carrying over far into 2005. The Teesta is regulated by a barrage; thus few above-danger level days.

Select modeling concerns

The multivariate line smoother *mrunning*

Our models are primarily exploratory ones among a small number of variables, most often the income change from 2004 to 2006 as the dependent. We have little use at this stage for parametric models since we do not know the functional form of these relationships. If our asset data were better, we might be in a position to estimate an asset-based income model; but this is not the case.

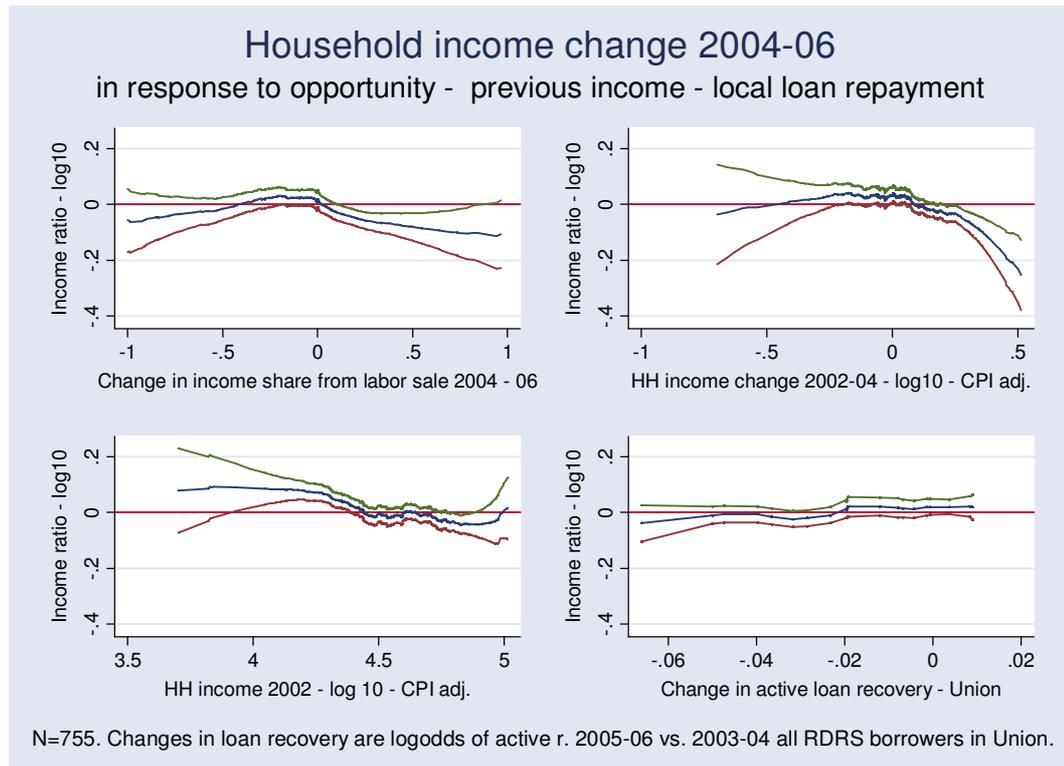
In addition to simple bivariate *lowess* (locally weighted regression) graphs, we make extensive use of the STATA procedure *mrunning*, a multivariate line smoother, described by its authors, Royston and Cox (2005). *mrunning* is a fast, versatile exploration tool capable of producing composite graphs with effect curves and confidence intervals, as exemplified in the following section.

Income change model with RDRS loan recovery rate change

Using relative household income change 2004 to 2006 as a vulnerability indicator, given the slowing of the economy, we want to explore possibly non-linear effects of economic opportunity, previous income, and a measure of stress on the local economy. We measure opportunity in terms of shift away from casual labor incomes between those years. We include the previous period 2002 to 2004 income changes to control for stochastic income changes. The 2002 income is, as elsewhere in this study, used as a pseudo-baseline, thought to express all previous baseline, selection and program effects. We measure stress on the local economy as change in the active recovery rate from 2003-04 to 2005-06 in all RDRS loans running in the sample unions. The number of borrowers from RDRS is thought to be

much larger than the 35 to 40 sample households in each sample union. The loan recovery data was provided by the RDRS Micro-finance Department as yearly union-wise percentages. Numbers of active loans or borrowers were not given. We transformed the union values for the two periods into log odds ratios, considering that a decline from, for example, 99% to 98% was a stronger change than from 93% to 92%.

Figure 20: Household income change 2004-06, in response to opportunity, previous income, and local economic stress



The first three variables have smooths with confidence intervals that lie outside the $y = 0$ line in certain ranges, suggesting significant effects. The smooth on active loan recovery runs in the expected direction, but the effect is not significant.

The most interesting substantive result is seen in the labor sale panel. Households obliged to earn a larger share of their 2006 incomes from casual labor, compared to 2004, suffered income loss. Others who reduced their labor dependency in the same period did not gain in a statistically significant degree. This is different from the effect that, in a simpler model (because the same controls were not available), the shift away from casual labor 2002 – 04 produced on income change in that period (diagrams not shown here).

We keep the above model in the appendix and place in the main body the stylized version of another model that, instead of loan recovery, includes the year of enrolment with RDRS groups in the fourth panel. Although this is not consistent with the assumption that the effect of enrolment timing too was absorbed into the 2002 income, we display this model in order to have a link between the participant career and a vulnerability measure. This is largely a concession to historic symbolism.

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