SEASONAL MIGRATION TO INCREASE
INCOMES OF POOR HOUSEHOLDS IN BANGLADESH

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Benefits and costs of addressing
Bangladesh's seasonal hunger challenges

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Seasonal Migration to Increase Incomes of Poor Households in Bangladesh

Bangladesh Priorities

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The Challenge: Seasonality

Globally, approximately 805 million people are food insecure,[1] of which about 600 million are rural poor.[2] Estimated conservatively, half of these people—300 million of the world's rural poor—suffer from seasonal hunger.[3]

Seasonal hunger often occurs between planting and harvest in agrarian economies. During this time, rural families, particularly the landless poor who supply agricultural labor on others' farms, experience hunger as their food stock dwindles and the demand for agricultural labor falls. Affected households have a reduction in income and miss meals for a two- to three- month period. This is especially costly for pregnant women and young children because it can lead to poor physical and cognitive development in the long run.[4] The challenge is global in scale and has consequences that transcend the lean season itself.

Parts of Northern Bangladesh experience a lean season linked to the agrarian cycle. During the pre-harvest lean season between September and November when farmers wait for the crop to grow, job opportunities in the village are scarce, wages fall, prices rise and this combination leads to widespread vulnerability amongst the landless poor. Close to 50% of Rangpur's 15.8 million inhabitants live below the poverty line,[5] and are subjected to the seasonal drop in income and increases in food prices during the lean season (see Figure 2).[6] Nearby urban and peri-urban areas do not face the same seasonal downturns, and these locations offer low-skilled employment opportunities during that same period.[7] This contrast suggests a seasonal labor misallocation, and an opportunity for rural workers to find seasonal work in cities, a phenomenon macroeconomists have documented in many countries.[8]

Despite this apparent spatial arbitrage opportunity, the areas prone to seasonal poverty display a low degree of domestic remittances (5%) compared to the rest of the country (22%).[9] Why are many poor rural households not taking advantage of income-generating opportunities in nearby urban areas to avoid hunger during the lean season? Work by Gharad Bryan, Shyamal Chowdhury and Mushfiq Mobarak[10] suggests that people living close to the margin of subsistence are unwilling to take on the risk of sending a member away for work. During the lean season, for the very poor a small chance that the cost of migration fails to generate income could push household below the subsistence level of income. Thus, the persistent risk of the lean season among the landless poor could stem from a poverty cycle, in which the extreme poor fail to take advantage of profitable income opportunities because they are so poor.

The Solution: Seasonal Migration

Temporary migration can address low food consumption and income reduction during the lean season in a cost-effective way. Rigorous evidence suggests that a program offering small travel grants to low-income agricultural workers enables them to migrate during the lean season to nearby areas with higher wages and better work opportunities and consequently mitigate the adverse effects of the seasonal downturn at home.

Evidence in favor of this intervention is supported by a series of randomized evaluations conducted in Bangladesh between 2008 and 2014 that have demonstrated persistent impact on the take-up of seasonal migration for employment and welfare gains for families at risk of famine. These studies provided small travel grants (~$8.50 USD[11]) covering the cost of a round-trip bus ticket and a couple of days of food.

The evidence is quite compelling that the provision of the subsidy substantially increased migration rates. In the original study, grants increased migration rates by 22 percentage points (a 61% increase compared to households in non-incentivized villages). Moreover, this effect extends beyond the intervention period. Households targeted by the intervention were 9 percentage points (25%) more likely to migrate in the subsequent lean season in 2009, and 7 percentage points (22%) more likely to migrate two-and-a-half years later, in 2011—without receiving an additional travel grant. Many of the grant recipients travel back to work for the exact same employer, so one long-term benefit of the program is that it allows migrants to develop a relationship with urban employers.

Figure 1
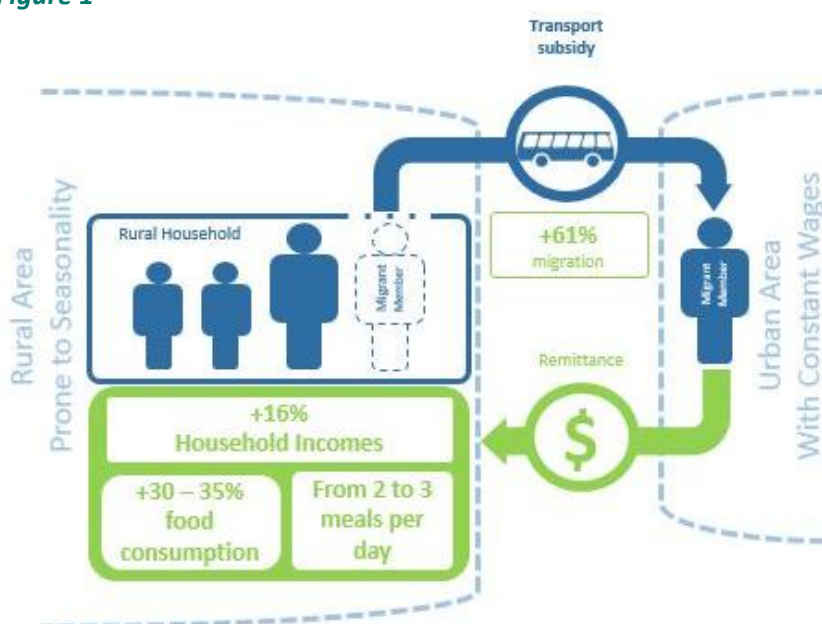
Figure 1: The core action (temporary migration) and core impact (increased welfare) of the migration subsidy program.

The evidence also shows that seasonal migration in response to receiving a travel grant generated large welfare gains for migrant families. This includes an increase in caloric intake of 758 calories per person per day in 2008 and 435 in 2009; and an increase in consumption and expenditure of 355 taka (37%) per person per month in 2008 and 260 taka (23%) in 2009. All of these effects are statistically significant at the 5% confidence level.

The $8.50 investment therefore generated very large returns (see Figure 1), suggesting that this type of program offers a cost-effective intervention in areas that face a lean season and disparities in available wage.

The Evidence

Evidence for internal migration as an effective means to mitigate seasonal poverty comes from a multi-year randomized evaluation of an intervention, as reported in Bryan, Chowdhury and Mobarak (2014), plus an evaluation of a scaled up version of the program conducted in 2014-15 and reported in Mobarak, Akram and Chowdhury (2015).[12] These findings supplement and complement existing evidence for the problem of seasonality in Bangladesh and other regions,[13] as well as evidence that international migration leads to large improvements in welfare.[14]

Figure 2

Figure 2: Households spend less money overall but spend more on food during the lean season in the last three months of the year. In addition, the figures illustrate that this increased expenditure is due to a rise in the price of rice (rather than a rise in quantity), and that quantity of rice consumed in fact falls.

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Study Design

The researchers conducted four separate rounds of interventions in 2008, 2011, 2013, and 2014, and the results are based on seven years of data collected between 2008 and 2015. See Appendix 1 for intervention designs from 2008 to 2014.
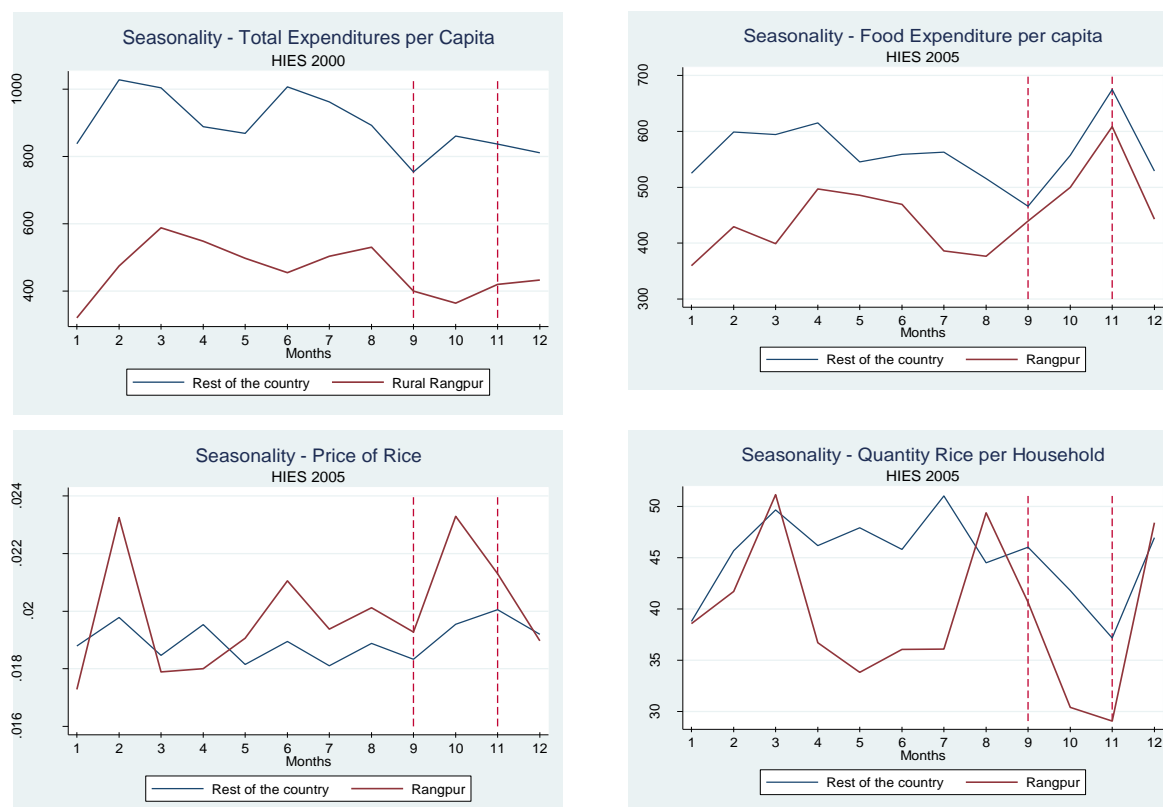
2008 Study

In 2008, the researchers randomly selected 19 at risk households[15] from each of 100 villages in two districts in Rangpur that regularly experience seasonal hunger. Of the total 1,900 households, 1,294 were offered cash or credit migration incentives (travel subsidies), in addition to information about jobs at four potential destinations. Impact was assessed by comparing migration and consumption outcomes of incentivized villages with villages that were either pure control villages without any intervention, or information-only treatment villages.

Households in the cash group were offered an unconditional basic cash grant and an additional bonus grant if the migrant reported their arrival at the destination during a specified time period. The amount of grant covers a little more than the average round-trip cost of safe travel from the two origin districts to the four nearby towns, and households were given information about available jobs.[16] The households assigned to the credit group were offered the same information and the same cash incentive to migrate, but in the form of a zero-interest limited liability loan to be paid back at the end of the lean season.

The loan was offered by partner micro-credit NGOs that have a history of lending money in these villages. There was an implicit understanding of limited liability on these loans since these were made to the extremely poor during a period of financial hardship.

2011 Study

In 2011, the researchers expanded their sample size to 2,527 households in 133 villages. They continued to provide credit incentive to induce seasonal migration, but the contracts were slightly re-designed to provide insurance in the event of 'failure' at the migration destination.

2013 and 2014 Study

In 2013 and 2014 the researchers started randomly varying the percent of the population in each village that were provided migration offers, and collected data on other households in the villages who did not receive offers. This design enabled the researchers to study spillover effects and any changes in local wages and employment opportunities when large numbers of people move out. In

2013, the data collection sample was expanded to 7,638 households from the same 133 villages. In that year, a loan for travel was provided to 10% of the eligible population in some villages, and 35% in others. In 2014, 5,721 households were offered subsidies; 10% of eligible households in some villages were offered a grant for migration ("low-intensity"), whereas in other villages, 50% of the eligible households were offered this grant ("high-intensity").

To measure contemporaneous income and wage effects well, six rounds of high frequency surveys with a seven day recall during the migration period were conducted. Along with migration rates, local prices of staple foods, wage rates, consumption, income and long term anthropometric outcomes were also tracked.

Results

How does the Subsidy Affect Migration and Re-Migration?

Figure 3
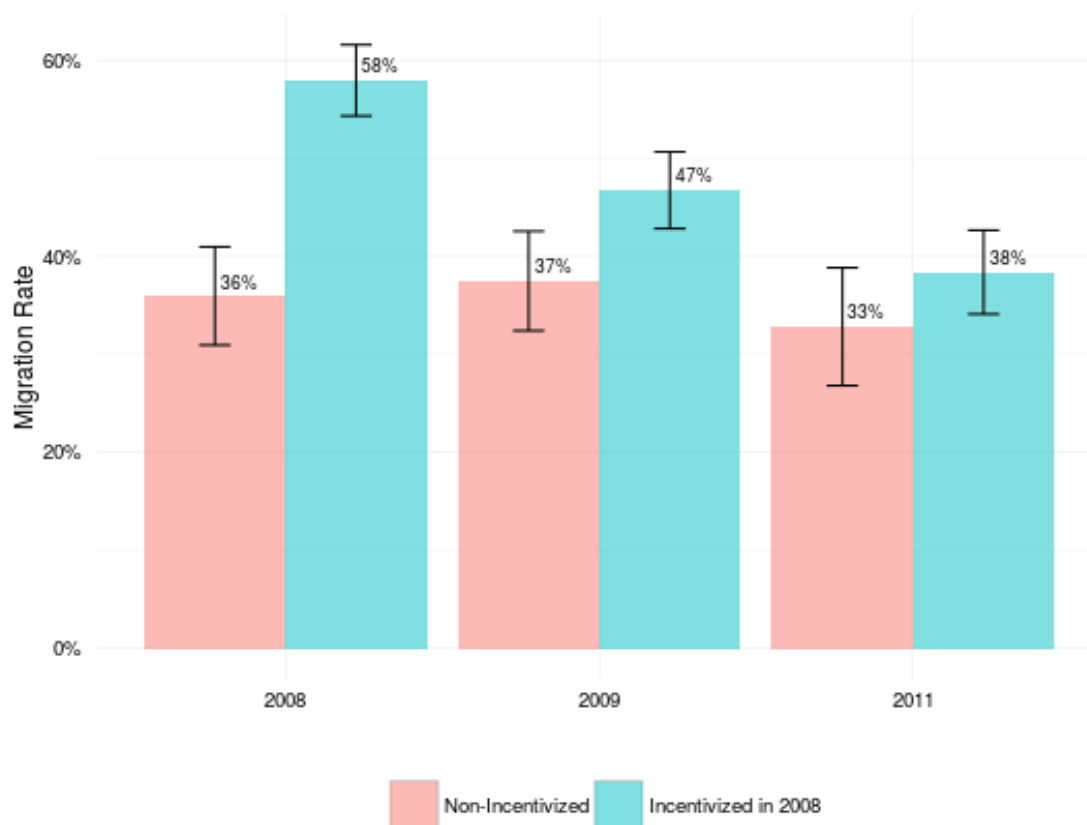
Figure 3 reports the program's effect on migration rate across the households that received an incentive (cash and credit) to migrate in the 2008 study and those who did not (information and control) over three separate periods. Note that 2011 reflects a lean season occurring at a different time of year than 2008 and 2009, which is less intense than the other.[17]

The first impact of the subsidy in 2008 was to increase rates of migration among beneficiary households. Data from the original study suggest that about a third (36.0%) of households sent a seasonal migrant even when they were not given an incentive.[18] Providing information about wages and job opportunities at the destination had no effect on the migration rate. With the $8.50 (+$3) cash or credit treatments,[19] the seasonal migration rate jumps to 59.0% and 56.8% respectively. In other words, incentives induced an additional 22 percentage points of the sample households (above the existing rate of 36%) to send a migrant.

The most recent study (2014) confirmed these results and also showed important spillover effects. Migration rates increased in both the low-intensity and high-intensity villages. Consistent with results

of the 2008 study, about one-third of the households in control villages sent a seasonal migrant (34.2%). Households offered a grant in the low-intensity group, were 26.4 percentage points more likely to migrate than a household in a village where no grant offers were made. Each household in the high-intensity group had a 42.6 percentage point higher propensity to migrate than households that were not offered an incentive. This is evidence of an important spillover – the take-up rate of the migration offer is significantly higher when a larger number of people are simultaneously planning to travel. This positive spillover even extends to those not directly receiving migration offers. Households that did *not* receive an offer in the high-intensity village had a 12.2 percentage point greater propensity to migrate than households in control villages. High spillover rates underscore existing high demand for the intervention, as long as the risk is mitigated by friends and family traveling simultaneously. Additionally, these spillovers have implications for cost-effectiveness of the intervention at scale: offering travel grants to greater numbers induces higher take-up rates.

Subsequent migration (without any incentive provision) is telling of the long-term impact of the intervention. The migration rate in 2009 was 9 percentage points higher in villages where incentives were provided a year before, even though the incentive offers were not repeated in 2009. The data indicate that those who had more successful migration experiences in 2008 chose to re-migrate a year later using their own funds. Even two and a half years later in 2011, during a less extreme lean season, without any further incentive, the migration rate remained 7 percentage points higher in the villages randomly assigned to receive cash or credit in 2008.[20]

Based on data from 2013, the most popular destination for migrants was Dhaka district, followed by Tangail and Bogra. The top three destinations jointly attract over 50% of migrants from the study area (see Appendix 2 for a table with a full list of destinations ranked by popularity).

How Does Migration Affect Consumption at Home?

Receiving an incentive to migrate in 2008 increased consumption among all household members during the lean season. Figure 4 illustrates average per-person consumption (including food and non-food goods) and average per-person caloric intake during 2008, the year the incentive was received, and during 2009, the next year when incentives were not provided.

Figure 4: Gains in Consumption and Calories in 2008 and 2009

	Total Consumption (Takas per person per month)			Total Calories (Calories per person per day)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Avg. Effect on Treated Villages	Avg. Effect on Treated Households that Chose to Migrate	Consumption without Treatment	Avg. Effect on Treated Villages	Avg. Effect on Treated Households that Chose to Migrate	Calories without Treatment
2008	60.139**	355.115**	950.8	129.901***	757.602***	1976
	(29.683)	(158.835)		(48.057)	(250.317)	
2009	48.919*	260.495**	1144	78.564*	434.602**	1934
	(24.713)	(131.851)		(40.600)	(216.670)	

a Robust standard errors in parentheses, clustered by village. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$. Households are defined as "Chose to Migrate" if at least one member of the household migrated. Columns (3) and (6) report the mean of the control group. Consumption (expenditure) is measured in Taka per month and contains both food and non-food expenditures. Caloric intake is measured in calories per person per day.

Villages where migration incentives were offered experienced statistically significant increases in consumption and per person calories in 2008. Average monthly household consumption increased by 60 taka amongst households in incentivized villages (an increase of 6% over the households that were not given an incentive), which corresponds to 130 extra calories per person per day. When considering only households that *took* the incentive and sent a migrant (as opposed to all those who were *offered* it), total consumption and caloric intake increased by 37% and 38%, respectively, relative to households that did not send migrants. In terms of magnitude of effects, monthly consumption among migrant families increased by about $5 per person, or $20 per household due to induced migration. When compared to the cost of the travel subsidy, these numbers imply a gross return of 273% to seasonal migration for a household.[21]

Moreover, these positive consumption results persisted in subsequent seasons when households were no longer incentivized. Figure 4 shows that 2009 effects are about 60-75% as large as the consumption effects in 2008, both on average in treatment villages and among households who took the grant and sent a migrant, and still statistically significant. In 2009, migration is associated with a 23% increase in total household consumption. The data also suggests that protein consumption (a marker of welfare in very poor populations) increased significantly in migrant households, especially from meat and fish. For the Bangladesh context, this reflects a shift toward a higher quality diet, as meat and fish are considered more attractive, "tasty" sources of protein. Households who migrate also have 3,300 extra taka in earnings and savings on average. There were no changes in female labor force participation, school attendance, or agricultural investment.

Effects on Income and Wages

The 2014-15 study collected detailed information on wage rates, hours worked and total income, both at the origin and at destinations for migrants and non-migrants alike. Households in villages where migration incentives were provided also saw gains in income. Income increased for households in both the high and low intensity treatment villages, driven by increased work hours and wages earned outside the village, and no change in wages at the destination. Households offered the grant in high-intensity villages had an on average income increase of 5,077 taka (over a 5 month period starting mid-September through mid-February), an increase of 86%. For households that were induced to migrate, the income increase was an estimated 10,855 taka.

Importantly, this increase in income outside the village was not simply a displacement of income that otherwise would have been earned in the village. Even though prime working members within treated households migrated away and had work activity outside the village, income generated at home by this household did not decline (nor increase) relative to control households. This suggests that the large movement of people away (especially in the high intensity villages, where 33% of the relevant landless population were successfully induced to migrate) presumably reduced overall labor supply in the village, which either increased the wage rate or freed up work opportunities at home for those household members who remained behind. This increased the earning potential of the non-migrant members competing in the home labor market. Data on wage rates and work hours was collected, which revealed that the agricultural wage rate at home increased relative to control villages. Estimates indicate that a 10% outflow of the working age male population increased agricultural wages in the village by 2.81%. An important spillover benefit of inducing seasonal migration is that other poor households remaining behind in the village earn more, because they face fewer competitors for the scarce jobs.

This estimated elasticity of wages with respect to migration outflows can provide some suggestive indication of the potential effects of a hypothetical larger scale migration subsidy program on wages at the destination. A program at scale would induce approximately 117,268 people from Rangpur districts to migrate seasonally. Data on migrants' destination choices shows that this would increase the seasonal population of Dhaka (the popular destination for migrants – see Appendix 2) by approximately 1%. If the wage elasticity for the village that we estimate above were to apply to Dhaka, then this might reduce wages by 0.28%. In reality, the economy in Dhaka (or in any other destination city) is a lot more diversified than the village economy, so the destination effects are likely to be even smaller.

To put the scale of migration in perspective, the number of migrants a potential program might generate have been provided in Appendix 2 (the program is being designed by Evidence Action and RDRS). The potential influx at destination districts (as a percentage of the working age male population) ranges between 0.3% and 4%. For the most popular destination, Dhaka, the influx is less than 1%.[1]

Understanding Seasonal Migration Patterns

Why Don't People Migrate in the First Place?

If seasonal migration provides these substantial benefits, why don't the rural poor already engage in such profitable behavior? Answering this question is fundamental to designing an effective policy intervention to overcome seasonal shortages through temporary migration. For an intervention to have the best chance of success, the constraint preventing poor households from engaging in profitable seasonal migration must be identified so that the intervention can be designed to target that specific impediment. In extreme circumstances, an intervention may not even be appropriate if there is no impediment and people are already making the 'right' decision for themselves. The research program was therefore designed to identify the constraint, if any.

The evidence suggests that the constraint is related to two key facts: (a) migration is risky, and (b) households are already close to subsistence, so migration failure is very costly. This insight implies that there is a role for an intervention that helps poor people alleviate those constraints. Further, these insights enable better design and targeting of the intervention.

Risk in Migration

Migration is risky because there is a chance that the migrant will not find work and will return empty-handed, after the family has paid the cost of migration. When households are already living at subsistence, this outcome would prove disastrous if the combination of lost savings (to pay for the migration) and lost income (if the migrant were unable to find work) forced them below the subsistence level.

"Success" at the destination was measured in various ways, such as the migrant finding a job and earning a sufficient amount, or performing as well or better than he had expected, or as demonstrated

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[1] Note that data is being collected on other unintended consequences.

by his ability to repay the migration loan. Along these measures, about 75-80% of the migrants can be characterized as successful.

The calorie consumption data indicate that the 20-25% chance of failure can be very costly for families, absent the migration subsidy. The data show that if migrants had to pay the travel cost themselves, but failed to find employment in the city, their consumption would fall to 100-300 taka per month which, corresponds to caloric intake at or below subsistence.

The migration incentive payment buffers families from these negative consequences and allows them to take on the risk of migration and chase the 75-80% possibility of a positive return. With the travel subsidy, they can attempt to find employment elsewhere, and be no worse off if they have to return home without having secured a job.

The Typical Migration Experience

Based on the data collected over seven years, a picture of the typical migrant and the typical seasonal migration experience emerges. Although in general poorer people migrate, the extreme poor living on 1,500 calories per day and spending almost all their money on food were not migrating because paying for the travel cost was deemed too risky. These are the types of households that are induced to experiment with seasonal migration through this travel subsidy program, especially when their friends and contacts are also induced to travel simultaneously. The household sends a working age adult male to the city when the travel subsidy is offered. Most find some work, and about 75-80% earn enough to make them feel like it was a worthwhile endeavor. The average migrant earns enough to take care of himself in the city and is able to save about half his earnings. Other family members remaining behind have an easier time finding agricultural work and earning wages in the village, especially when a large number of workers from many households in the village have left temporarily for the city.

The migrant returns home (to his family in the village) after a month with some money for a short visit, and then chooses to go back to the city on his own for another month for a second bout of work. About half of these induced migrants choose to go back to the city the next year, possibly because they now have a connection to an urban employer, who invites them back to work during the next lean season. For this subset, the earnings were large enough to offset both the monetary and non-monetary costs associated with relocation, living environment in the city, and family separation.

Benefit Cost Analysis

Context

Evidence Action and its partner in Bangladesh, RDRS (a local NGO), are planning to implement a scaled version of the intervention described. With input from RDRS, Evidence Action produced a detailed budgeting and planning tool to scale this program to a large geographic area in the Rangpur region. Figure 5 shows the four year rollout plan that builds in time to further optimize operational aspects of the program and fine-tune costs during the first two years.

According to the scale plan, year four will provide the most representative estimates of this program at scale. Therefore, projections for year four are used to build the Benefit Cost model. Beneficiaries are calculated based on the expected number of households reached at scale, and the cost is taken from the budget estimates that are inclusive of all operational costs. Previous rounds of study measure the impact of this program in terms of consumption and income gains and this evidence-base is used to calculate benefits for households reached at scale. Below are details of the assumptions and calculations in the Benefit Cost Analysis.

Figure 5
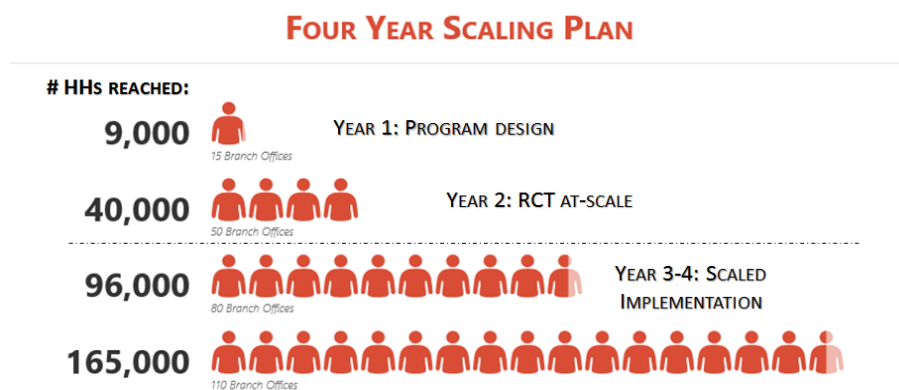
Benefits

Over the study rounds, the benefits of migration were measured in two different ways (1) Increased consumption and (2) Income gains, and each of these provides a separate basis for benefit calculation. The first rounds of study in 2008 and 2009 included a detailed consumption module. Consumption is a widely accepted measure of welfare for poor households.[22] In the 2014-2015 round of study, the surveys focused on measuring income gains instead of consumption. We use these impact estimates to construct two different benefit models, one that focuses on increased consumption as the main benefit and another that looks at income gains as the benefit.

The consumption benefit is based on an increased consumption per household member, per day of the lean season that can be attributed to migration, based on the estimates presented in Bryan et al. (2014). This estimate of 616 taka per household member includes consumption gains of 355 taka measured in the year of the original intervention (2008 lean season) and consumption gains of 261 taka from remigration measured in the subsequent year when households did not receive an additional incentive to migrate (2009 lean season).[23] The consumption estimate was multiplied by the average number of household members (4 members) and by the duration of the lean season (2 months). The 2-month duration of the lean season is a conservative assumption on the duration over which consumption benefits accrue. Households may choose to spread out consumption from the extra migration income over a longer period. We use a discount rate to scale down consumption gains during the second year.

These benefit estimates were converted from 2008 and 2009 taka values to 2014 taka values using CPI ratios from the World Bank's CPI data website.[24] Specifically, converting from 2008 taka to 2014 taka used a factor of 1.54, while converting from 2009 taka to 2014 taka used a factor of 1.46. All estimates were converted from taka to US dollar using a rate of 78.06 taka to 1.00 dollar. After these conversions, the consumption benefit per household is estimated at $95.20 prior to applying the discount rate.

The income benefit is estimated using the gain in income from migration in the latest round of study (2014 – 2015). The increase in earnings per household induced by migration was measured over a five month period from mid-September 2014 through mid-February 2015. Currently available estimates suggest an income gain by beneficiary households of approximately 13,206 taka ($169).[25] Income gains were measured for one year only, and the benefits are therefore not subject to discounting. In the baseline case we assume that the subsidy is provided in the form of a cash grant. As detailed in the cost section, we provide alternative estimates assuming that the migration subsidy is allocated in the form of a limited liability loan. For this second scenario, we reduce the estimated income by the amount of the subsidy that would be repaid after a successful migration episode. Therefore, the amount used to calculate benefits in a loan scenario is 11,606 taka (13,206 – 1,600 = 11,606 taka).

Beneficiaries

Beneficiary households are defined as the number of households that were induced to send a member temporarily for work outside the village. The average household size is four people. Data from the latest round of study indicate that 34.2% of households would have sent a migrant regardless of the intervention (the rate of migration reported by control households in the 2014 – 15 round of study). Results show that the intervention induced an additional 40% of households offered the subsidy to

migrate. It is this 40% of the total offered population that is considered a beneficiary and it is the appropriate figure to use when identifying people who benefited.

Based on the full-scaled mock-up of the program (as designed by Evidence Action and RDRS), the likely number of beneficiaries is projected to be 117,268 households or 469,072 people (117,268 households X 4 members per household), annually.

Costs

Costs were calculated using a full-scale mock-up of the program with fully-loaded costs i.e. not just the cost of the subsidy, but also the implementation, monitoring and supervision costs. Additionally, program costs include expenditure for all households that would take the grant (including those who would have migrated anyway). Thus, the cost of the program is the full cost incurred for all those households that would claim the travel grant (unlike the benefits calculation, which included only the subset of households that migrated due to the inducement of the travel grant).[26]

We present results under two different assumptions on costs. The higher cost estimate is derived from a fully loaded program that disburses grants, while the low cost scenario assumes that a loan is disbursed with recovery (a conservative 70% recovery rate is assumed). The choice of grant or loan is a design consideration that Evidence Action and RDRS will investigate.

The migration subsidy was set to $19.23 per household. According to current design and budgetary considerations, a grant based program is projected to incur an annual cost of $5,118,373, while a loan based program would incur a cost of $2,749,142 annually.

Discount

The discount factor came into play only for the benefits that accrue in years after the intervention. In the benefit estimate increased consumption attributed to re-migration as measured in the year 2009 was discounted using 3%, 5% and 10% discount rates.

Results

A benefit cost analysis yields favorable results for a seasonal migration incentive program, with a benefit-cost ratio ranging between 2.10 and 6.34. In other words, every dollar invested in the seasonal migration program generates 2-6 dollars in benefits. Figure 5 provides the key results and a range of benefit-cost ratios.

Figure 5

Assumptions			
Beneficiary Households (induced to migrate)	117,268		
Total cost - loan with recovery	$2,749,142		
Total cost - grant (no recovery)	$5,118,373		
	3% Discount	**5% Discount**	**10% Discount**
Consumption Model			
Consumption gain per beneficiary	$94	$93	$92
Total benefits (consumption gain x beneficiaries)	$11,029,835	$10,945,154	$10,746,923
Benefit-Cost ratio (low cost – credit subsidy)	**4.01**	**3.98**	**3.91**
Benefit-Cost ratio (high cost – cash subsidy)	**2.15**	**2.14**	**2.10**
		Discount n/a	
Income Model			
Cash subsidy		$169	
Income gain per beneficiary household		*$19,838,505*	
Total benefits (income gain x beneficiaries)			
Credit subsidy		$149	
Income gain per beneficiary households		$17,434,930	
Total benefits (income gain x beneficiaries)			
Benefit-Cost ratio (low cost-credit subsidy)		**6.34**	
Benefit-Cost ratio (high cost – cash subsidy)		**3.88**	

Figure 5: The cost estimates are for a mocked up program to deliver the travel subsidy as a grant or as a loan. The mock-up includes a full set of costs, i.e. cost of grant, implementation, monitoring, and supervision. The upper panel provides benefit-cost ratios using consumption gains over 2 years as the benefit, while the lower panel provides the same using income gain as the benefit.

Policy Implications

Simplicity, Scalability, and Cost Effectiveness

The series of studies conducted and the evidence that they have generated point to a simple and scalable solution to combat seasonal poverty that can complement existing programs and efforts. The intervention itself is a simple travel grant in the form of a cash transfer. The implementation thus far (i.e. in the series of studies described before) has been through a micro-credit institution, which is seemingly the most natural fit for a product such as this (i.e. disbursement of funds to - and in the case of non-compliance, collection from - the poorest segments of society). The simplicity of the product along with natural partners for implementation make this a very scalable solution to seasonal poverty.

Moreover, the impact of this one-time travel subsidy was compared with food- and cash-transfer interventions in Bangladesh using cost-effectiveness estimation, which requires a measurement of impact in addition to a calculation of costs. The impact of interest is the increased income per taka spent. The total taka spent is based on the fully mocked-up program,[27] and the cost-effectiveness calculation [28] was compared to four other existing food and cash transfer programs that the International Food and Policy Research Institute (IFPRI) has estimated cost-effectiveness for: Food for Asset Creation (FFA), Food Security Vulnerable Group Development (FSVGD), Income-Generating Vulnerable Group Development (IGVGD) and Rural Maintenance Program (RMP). The programs IFPRI studied provide a very relevant comparison group as they focus on transfers to vulnerable populations (i.e., poor households with low land ownership).

The same scale projections, budget, beneficiary calculations, and impact estimates outlined in the Benefit Cost Analysis are used to derive cost-effectiveness. Based on these estimates, a subsidy for a bus ticket is more cost-effective than each of the four comparator programs, as presented in Figure 6. The migration subsidy increased income generated by between 3.88 and 6.34 per 1 BDT spent compared to 2.13 in the FSVGD food and cash intervention per 1 BDT.

To be clear, the purpose of this comparison is not to advocate an end to any of these programs. There may be other benefits of these comparative programs that may not be captured in a strict income analysis, such as reaching other vulnerable populations like women. Instead, the purpose of this comparison is to exemplify the cost-effectiveness of seasonal migration in the context of Bangladesh and to highlight the high returns of an investment in travel subsidies for poor households.
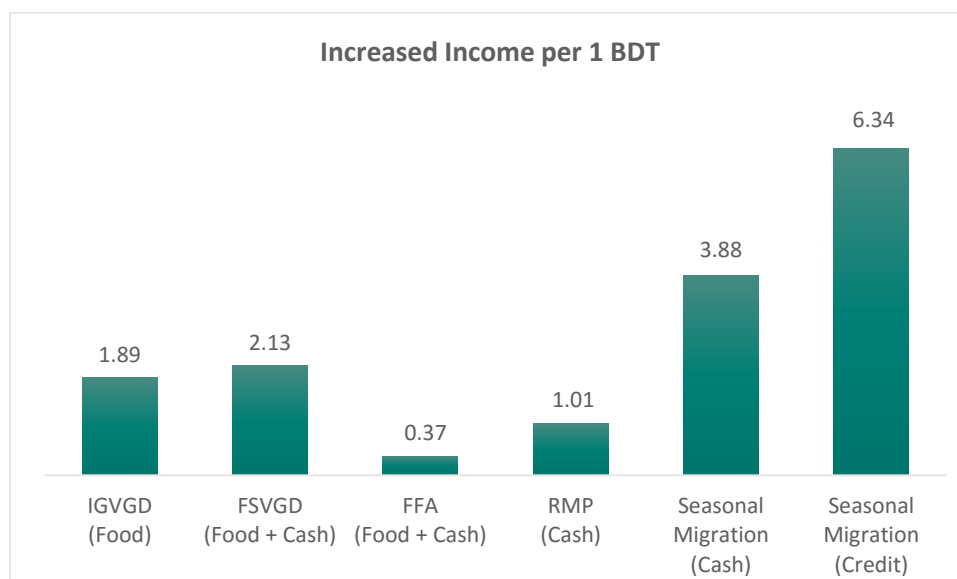
Figure 6

Figure 6: The first 4 columns show income added by existing food and cash transfer programs[29], while the column titled "At-scale Program (Cash)" provides income added by a travel grant program in the vein of Bryan et al (2014)[30] as a cash grant and the column titled At-scale Program (Credit)" provides income added by a travel grant program in the vein of Bryan et al (2014) as a recoverable loan (both options were tried in Bryan et al (2014).

One-time Subsidy with Recurring Benefit

Unlike most food and cash transfer programs which may alleviate hunger in the short-term but do not create lasting change, the travel grant provides an opportunity for a one-time investment to achieve sustained impact. As explained above, households who receive a travel subsidy are about 22-42 percentage points more likely to migrate in the season of the transfer and at least 9 percentage points more likely to migrate during the subsequent season, absent any further transfer. This demonstrates that the travel grant does more than reduce the risk associated with migration on a one-off basis. The evidence suggests that a single migration experience provides actionable information about the true costs and benefits of seasonal migration and enables migrants to develop relationships with urban employers that they can rely on in future lean seasons.

This increased propensity to re-migrate has three important policy implications. First, the propensity to re-migrate without additional help indicates that households benefited from migration. Second, the persistence of re-migration from 2009 to 2011 suggests that households learned something valuable from the initial experience that allowed them to keep migrating. Finally, this one-time cash infusion pays off not just over one seasonal migration event but over multiple subsequent migrations.

Broader Gains from Temporary Migration

Internal movement of labor has been associated with fast-growing developing countries and poverty reduction,[31] it has been a key component of East Asia's development experience, and the World Bank has cited it as being a core part of future development in Africa.[32] However, as an income strategy for vulnerable populations, internal temporary labor movement has been underutilized despite the potential for welfare gains. A strong evidence base supports the welfare gains from temporary work migration.[33] First, country case studies comparing long term panel data from China, Vietnam, the Philippines, and Thailand showed that income increased and poverty was reduced for subsistence farmers through temporary movement of labor.[34] While each country had unique agricultural and work opportunities, in all cases the movement of labor resulted in poverty reduction. In addition to contributing to poverty reduction, non-farm jobs were found to be less subject to seasonality, making it a viable option to overcome the volatility of agricultural seasons.[35]

Second, internal remittances tend to be targeted most at lower income groups and contribute to improved investments in long term assets such as agricultural capital and education. A study in Pakistan found that internal remittances had a positive impact on rural income distribution and households invested in rural asset accumulation, such as groundwater wells, tractors, and machinery.[36] An analysis on the impact of non-farm income of rural households in the Philippines[37] and Thailand[38] found that investment in schooling was positive and significant. Studies from Sri Lanka[39] and El Salvador[40] indicate reductions in school dropout rates associated with migrant remittances.

These studies and the multiple years of data from Bangladesh show positive returns to poor households by investing in travel subsidies. Furthermore, these findings support the development of large scale programs that provide travel subsidies to poor households for seasonal migration.

Appendix 1: Interventions between 2008 and 2014

1st Experiment – 2008

Treatment	Village	Household
Cash	37	703
Credit	31	589
Information	16	304
Control	16	304
Total	100	1,900

2nd Experiment – 2011

Treatment	Village	Household
Rainfall Insurance	24	456
Rice Price Insurance	24	456
Unconditional Credit	15	285
Conditional Credit	15	285
Job Lead	20	380
Control	35	665
Total	133	2,527

2008 2009 2010 2011 2012 2013 2014

3rd Experiment – 2013

Treatment	Village	Incentivized HH	Non-incentivized HH
Job Lead (10%)	24	508	450
Job Lead (35%)	24	1,788	448
Credit (10%)	24	503	456
Credit (35%)	23	1,672	423
Control	38	N/A	1,390
Total	133	4,471	3,167

4th Experiment – 2014

Intensity	Village	Incentivized HH	Incentivized HH (Endline Survey)	Non-incentivized HH (Endline Survey)
10%	48	893	833	564
50%	47	4,828	981	584
Control	38	N/A	N/A	724
Total	133	5,721	1,814	1,872

Appendix 2: Magnitudes of Migrant Influxes

District Name	Popularity*	Migrants**	Destination***	Migrant Influx****
Dhaka	22.97%	26,942	2,738,832	0.98%
Tangail	14.10%	16,538	679,815	2.43%
Bogra	12.15%	14,253	675,603	2.11%
Munshigonj	9.74%	11,426	281,105	4.06%
Comilla	9.33%	10,945	936,628	1.17%
Gazipur	7.44%	8,720	722,795	1.21%
Feni	4.41%	5,172	262,828	1.97%
Chittagong	3.38%	3,969	1,493,801	0.27%
Narayangonj	3.18%	3,729	601,454	0.62%
Rangpur	2.05%	2,405	556,618	0.43%
Rest of sample	11.23%	13,170	.	.

* Percentage of sample that migrated to this destination.
** Absolute number of migrants that go to a particular destination from the set of compliers - year 4 of NLS.
*** Half of the absolute number of destination district's working age male population defined as males 10+ years of age. From Bangladesh Bureau of Statistics.
**** Maximum number of migrants generated by Evidence Action program (in year 4) as a percentage of destination district's working age male population.

Notes

[1] Food and Agriculture Organization, Hunger Portal, from <http://www.fao.org/hunger/en/>.

[2] Devereux, Hauenstein and Vaitla (2009). Seasons of Hunger: Fighting Cycles of Starvation among the World's Rural Poor. Pluto Press.

[3] Devereux et al. (2009).

[4] Khandker, Shahidur R.; Mahmud, Wahiduddin. 2012. Seasonal Hunger and Public Policies: Evidence from Northwest Bangladesh. Washington, DC: World Bank.

[5] Bangladesh Bureau of Statistics (2011).

[6] Khandker (2012).

[7] Zug, Sebastian. "Monga-Seasonal Food Insecurity in Bangladesh: Bringing the Information Together." *Journal of Social Studies-Dhaka-* (2006): 1–14. Web.

[8] Zhang, Xiaobo et al. "Rising Wages in Bangladesh." *IFPRI Discussion Paper 01249*, International Food and Policy Research Institute, March (2013): 28.

[9] Bryan, Gharad, Shyamal Chowdhury, and Ahmed Mushfiq Mobarak. "Under-Investment in a Profitable Technology : The Case of Seasonal Migration in Bangladesh." *Econometrica* 82.5 (2014): 1–43. Web.

[10] Bryan et al. (2014).

[11] Grant amount in original study.

[12] Mobarak, Mushfiq, Agha Ali Akram and Shyamal Chowdhury. "Effects of Migration on Rural Labor Markets". Working Paper (2015).

[13] See Khandker (2012), Khandker, Khaleque and Samad (2011), Khandker and Mahmud(2012), Zug (2006), Rahman (1995), Sen (1981), and Banerjee and Duflo (2007)

[14] See Clemens et al (2008), Rosenzweig (2006), Gibson and McKenzie (2010), Clemens (2011), Rodrik (2007) and Hanson (2009).

[15] Criteria for being "at risk" was that a household reported (a) that they owned less than 50 decimals of land, and (b) that a household member was forced to miss meals during the prior (2007) monga season. 71% of the census households owned less than 50 decimals of land, and 63% responded affirmatively to the question about missing meals. Overall, 56% satisfied both criteria.

[16] Migration behavior was carefully monitored and strictly imposed the migration conditionality, so that the 600 Taka intervention was practically equivalent to providing a bus ticket. The strict imposition of the migration conditionality implied that some households had to return the 600 Taka if they did not migrate after accepting the cash.

[17] A household was counted as having a seasonal migrant if at least one household member migrated away in search of work between September 2008 and April 2009, which captures all migration during the Aman cropping season and, as a consequence, all the migration associated with Monga.

[18] In a large survey of 482,000 households in the Rangpur region, 36.0% of people report using "out-migration" as a coping mechanism for the Monga (Khandker et al. 2011). This result appears very consistent with the large-sample finding. Interestingly, survey respondents who qualified for government safety-net benefits were no more likely to migrate than households that did not.

[19] Since households appear to react very similarly to either incentive, the two are combined and termed the "incentive" group for much of the following analysis.

[20] Overall, 953 out of 1871 sample households sent a migrant in 2008 (and 723 of them traveled before our December 2008 follow-up survey), and 800 households sent a seasonal migrant during the 2009 monga season.

[21] It is not straightforward to evaluate the returns to migration based on these estimates, and the precise value will depend on assumptions about the period over which the consumption gains are realized, and how to treat the cost that some migrants choose to incur to return home and take a second trip. Under a reasonable assumption that the consumption gains are realized over the 2 months of the monga period, households consume an extra Tk. 2840 (Tk. 355 per capita per month estimated in Table 3 * 4 household members * 2 months) during the monga by incurring a migration costs of Tk. 1038 (Tk.600/trip*1.73 trips).

[22] The measure is well received in the economics community. See: Deaton, Angus (1997): The Analysis of Household Surveys: A Microeconometric Approach to Development Policy. Baltimore: Johns Hopkins University Press for the World Bank. [1685,1697]

[23] These values are available in Table III, "Panel A: 2008 Consumption" row titled "Total consumption" column titled "IV" and Table III, "Panel B: 2009 Consumption" row titled "Total consumption" column titled "IV" respectively. Page 1686, Bryan et al. (2014).

[24] See: http://data.worldbank.org/indicator/FP.CPI.TOTL?page=1

[25] This estimate is preliminary and subject to change.

[26] For details on the calculation of costs, please contact Guillaume Kroll (guillaume.kroll@evidenceaction.org) at Evidence Action.

[27] The estimated impact used for a mocked-up seasonal migration program used data from high-intensity villages in the 2014 intervention, since this figure is closest to representing scale. The calorie estimate was based on a comprehensive consumption survey from the initial 2008 study.

[28] All programs provide a host of co-benefits along with the specific benefits that are being compared. Based on Dhaliwala et al., this approach has merit and provides an easy way to compare a travel subsidy program with existing transfer programs. See: Dhaliwal, Iqbal et al. *Comparative Cost-Effectiveness Analysis to Inform Policy in Developing Countries: A General Framework with Applications for Education*. 2012. Web. 2 Sept. 2014.

[29] E.g. Khandker and Mahmud (2012) state that "Grameen Bank's presence [… increases] total consumption (by 4.4 percent) and [reduces] both moderate poverty (by 4.5 percentage points) and extreme poverty (by 5.3 percentage points)" from Ahmed, Akhter U. et al. *Comparing Food and Cash Transfers to the Ultra-Poor in Bangladesh*. International Food Policy Research Institute, 2009.

[30] Source for comparators: Quisumbing, A. R., Nasreen, M., Hoddinott, J. F., & Bryan, E. (2009). *Comparing food and cash transfers to the ultra poor in Bangladesh*. Washington, DC: International Food Policy Research Institute. Calories for a grant program at scale are based on the estimation of 758 calories per beneficiary/day from the 2008 study. Beneficiaries are defined as migrants induced by such an intervention and their household members (calculated using an average of four members per household). The calculation spreadsheet is available upon request.

[31] Collier and Dercon (2009).

[32] Weerdt, J. De, & Hirvonen, K. (2013). *Risk Sharing and Internal Migration*. *Policy Research Working Papers*. The World Bank. doi:doi:10.1596/1813-9450-6429.

[33] Adams Jr, R. H. (1998). Remittances, investment, and rural asset accumulation in Pakistan. *Economic Development and Cultural Change*, *47*(1), 155-173; and, Bryan, Gharad, Shyamal Chowdhury, and Ahmed Mushfiq Mobarak. "Under-Investment in a Profitable Technology : The Case of Seasonal Migration in Bangladesh." *Econometrica* 82.5 (2014): 1–43.

[34] Otsuka, K., Estudillo, J. P., & Yamano, T. (2010). The role of labor markets and human capital in poverty reduction: evidence from Asia and Africa. *Asian Journal of Agriculture and Development*, *7*(1), 23.

[35] Estudillo, J. P., Matsumoto, T., Chowdhury, H., Uddin, Z., Kumanayake, N. S., & Otsuka, K. (2013). Labor Markets , Occupational Choice , and Rural Poverty in Selected Countries in Asia and Sub-Saharan Africa. *Background Paper for the World Development Report 2013*.

[36] Adams Jr., Richard H.. "Remittances, Investment, and Rural Asset Accumulation in Pakistan". *Economic Development and Cultural Change* 47.1 (1998): 155–173.

[37] Estudillo, J. P., Y. Sawada, and K. Otsuka. 2008. "Income Dynamics, Schooling Investment, and Poverty Reduction in Philippine Villages, 1985-2004."In Otsuka, K., J.P. Estudillo, and Y. Sawada (eds.). Rural Poverty and Income Dynamics in Asia and Africa. Abingdon, UK: Routledge.

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[40] Ambler, Kate   Aycinena, Diego Yang, Dean. Channeling Remittances to Education: A Field Experiment among Migrants from El Salvador. *American Economic Journal: Applied Economics* 7 2207-32 2015.

Bangladesh, like most nations, faces a large number of challenges. What should be the top priorities for policy makers, international donors, NGOs and businesses? With limited resources and time, it is crucial that focus is informed by what will do the most good for each taka spent. The Bangladesh Priorities project, a collaboration between Copenhagen Consensus and BRAC, works with stakeholders across Bangladesh to find, analyze, rank and disseminate the best solutions for the country. We engage Bangladeshis from all parts of society, through readers of newspapers, along with NGOs, decision makers, sector experts and businesses to propose the best solutions. We have commissioned some of the best economists from Bangladesh and the world to calculate the social, environmental and economic costs and benefits of these proposals. This research will help set priorities for the country through a nationwide conversation about what the smart - and not-so-smart - solutions are for Bangladesh's future.

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