BANGLADESH INTEGRATED AGRICULTURAL PRODUCTIVITY PROJECT (IAPP)

Baseline Household Survey Report

September 2013

Development Impact Evaluation (DIME) &

Global Agriculture & Food Security Program (GAFSP)

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Acronyms and Abbreviations

DIME	Development Impact Evaluation
FANTA	Food and Nutrition Technical Assistance Project (FANTA)
FAO	Food and Agriculture Organization
GAFSP	Global Agriculture and Food Security Program
GOB	Government of Bangladesh
HHS	Household Hunger Scale
IDA	International Development Association
MAHFP	Months of Adequate Household Food Provisioning
USAID	United States International Development Agency
WDDS	Women's Dietary Diversity Score

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1 Introduction

This report presents the main findings from a baseline survey for the impact evaluation of the Bangladesh Integrated Agricultural Productivity Project (IAPP), conducted between August - October 2012. After a brief introduction to IAPP, the IAPP Impact Evaluation, and the baseline data collection exercise, the report provides descriptive statistics on the following topics: socioeconomic profile of the households, access to agricultural extension services, agricultural production and commercialization, household income and expenditures, access to and use of rural financial services, food security and women's dietary diversity, and irrigation.

2 Background

2.1 Integrated Agricultural Productivity Project (IAPP)

Over the last two decades, Bangladesh has achieved impressive growth and poverty reduction. Its agricultural sector grew at a rate of 4.8 percent between 1990 and 2005. But poverty-related food insecurity is widespread, bolstered by the soaring prices of key staples. The country has a poverty rate of over 30% and the highest incidence of malnutrition of all countries: in 2008, Bangladesh's food insecure population was estimated at 65.3 million.[1] The Government of Bangladesh is pushing for increased use of technology and more intensive agricultural practices to improve food security and sustain economic growth. To that end, IAPP sponsors research to develop improved crop varieties and to promote adoption of improved varieties and production practices through the farmer field schools approach (FFS).

The IAPP project is designed to improve the income and livelihoods of crop, fish, and livestock farmers in Bangladesh. It consists of four separate components:

1. Component 1: Technology Generation and Adaptation
2. Component 2: Technology Adoption
3. Component 3: Water Management
4. Component 4: Project Management

The project will take place in 8 districts: 4 in the south, and 4 in the north. The project has selected 375 unions (sub-districts) which will receive project activities. IAPP expects to reach around 300,000 beneficiaries.

2.2 Impact Evaluation of IAPP

The Impact Evaluation (IE) of the IAPP project will contribute to understanding the drivers of technology adoption through two lenses. First, the overall project approach will be evaluated using a randomized phase-in of project villages (referred to as the "Overall Project Evaluation"). The Overall Project Evaluation will measure the effects of Components 2 and 3 of IAPP. All sub-components will be measured, with special focus on the crops and fisheries sub-components. Second, innovations will be tested through a randomized control trial to understand what approach to demonstration plots can deliver higher results (referred to as the "Demonstration Plot Evaluation"). The Demonstration Plot Evaluation is designed to test a fundamental question about technology adoption: to what extent can

[1] Food and Agricultural Organization of the United Nations (FAO) and World Food Program (WFP). 2008. "FAO/WFP Crop and Food Supply Assessment Mission to Bangladesh".

"learning by doing" increase technology adoption over "learning by observing"? It will compare the relative effectiveness of single demonstration plots (the standard approach) to more distributed demonstration strategies which allow more people to experiment with new technology. The Demonstration Plot Evaluation will focus on the crops sub-component.

The following baseline report is for the Overall Project Evaluation, which focuses on Components 2 and 3 of IAPP. Component 2 is comprised of three sub-components, all of which are included in the impact evaluation:

1. **Crops:** The Department of Agricultural Extension (DAE) will promote the use of new seeds and farming practices. These include improved rice varieties, vegetable production, legume production, farmyard manure, and green manure.
2. **Fisheries:** The Department of Fisheries (DoF) will promote new breeds and more intensive fish cultivation. Four breeds will be promoted: mono-sex tilapia, rui, thai koi, and pangas. Semi-intensive cultivation, including fertilization and feeding will be introduced.
3. **Livestock:** The Department of Livestock Services (DLS) will promote improved livestock management practices. These include goat vaccination, backyard poultry production, and improved dairy milk production.

This impact evaluation is led by the World Bank's Development Impact Evaluation Initiative (DIME), the South Asia Agricultural Development team (SASDA), and the Government of Bangladesh's IAPP project implementation unit. It is in collaboration with external research partners: the Yale University School of Management and the NGO Innovations for Poverty Action.

3 Baseline Household Survey

3.1 Data Collection

The Baseline Household Survey used a multi-module questionnaire, with a specific focus on agricultural production, access to agricultural extension services, rural finance, and food security. In addition, the questionnaire contains modules on housing, labor, education, health, income and household assets. The full questionnaire is attached as Annex 1.

Fieldwork for the Household Survey started on September 12, 2012 and continued through October 24, 2012. There were 12 field teams, each including 6 enumerators, 1 supervisor, and 1 editor. Three data entry clerks also traveled to the field. The survey was done using paper questionnaires, with first entry of the data occurring in the field concurrent to data collection. Consistency checks and error reports were routinely run on the first entry data, to insure high data quality. All questionnaires were then entered a second time by a team of data entry clerks in Dhaka. First and second entries were compared and all discrepancies corrected through manual checks of the hard-copy questionnaires. In some cases, the field team was sent back to the field for verification.

3.2 Sample

The Baseline Household Survey was implemented in all 8 project districts: Rangpur, Kurigram, Nilfamari and Lalmonirhat districts in the North and Barisal, Patuakhali, Barguna and Jhalokathi districts in the South.

6 districts (Kurigram, Nilfamari, Lalmonirhat, Patuakhali, Barguna, and Jhalokati) are included in the Overall Project Evaluation only. In these 6 districts, eight Unions were selected for the impact evaluation surveys. Within each Union, two villages were surveyed. Each of these villages is eligible for all four components of the IAPP (crops, fisheries, livestock and water management interventions). In each union, one of the sampled villages will receive IAPP interventions in the first year ("treatment") and the other will not receive interventions until the third year ("control").

Prior to the Baseline Survey, a full census of the sampled villages in these 6 districts was conducted to identify household eligible for and likely to participate in IAPP. IAPP interventions are all based at the level of the farmer group, but at the time of the baseline survey, farmer groups were not yet formed. For that reason, census data was used to construct a sampling frame of likely participants in IAPP Crop and Fisheries groups. In each village, 16 households were sampled, half of which were selected as eligible for the Crops groups and half for the Fisheries groups. Eligibility was determined by IAPP targeting criteria, prioritizing crop farmers with marginal or small landholdings, and fishermen with access to ponds between 15-50 decimals.

2 districts (Rangpur and Barisal) are included in both the Overall Project Evaluation and the Demonstration Plots Evaluation, and as such the sampling strategy in these districts was slightly different. Because the DPE tests variations in project implementation, significantly more villages had to be sampled in these districts. In each district, 110 villages were sampled. 27 villages in each of these districts will receive standard IAPP interventions; those 54 villages are included in the Overall Project Evaluation sample and included in the following Baseline Report. A separate report will be prepared for the Demonstrations Plot Evaluation.

Household selection in Rangpur and Barisal also differed. In these districts, the baseline survey was conducted concurrently to the IAPP group formation (for the OPE districts, the baseline occurred just before group formation). Of the total IAPP group members, 15 were randomly selected for the baseline survey.[2]

3.3 Sampling weights

Considering the different sampling strategies explained above, we constructed probability weights to account for the consequent overrepresentation of Barisal and Rangpur districts. Table 1 shows the distribution of the sample across districts, separated into treatment and control, weighted and unweighted.

[2]In 8 treatment villages and 12 control DPE villages, a miscommunication led to sampling the wrong farmer group (a group that had previously existed, not the new group formed by IAPP). These villages were dropped for the purpose of the baseline analysis. However, the sample will be redrawn for the follow-up survey.

	Un-weighted			Weighted		
Zilla/District	Treatment	Control	Total	Treatment	Control	Total
Patuakhali	122	122	244	122	122	244
Jhalokati	118	112	230	118	112	230
Boroguna	118	121	239	118	121	239
Kurigram	111	115	226	111	115	226
Nilphamari	102	123	225	102	123	225
Lalmonirhat	115	122	237	115	122	237
Barisal	350	320	670	114	104	218
Rangpur	554	468	1,022	114	96	211
Total	1,590	1,503	3,093	914	916	1,830

Table 1: Baseline Sample, un-weighted and weighted

3.4 Extended Baseline Questionnaire

A subset of households in each of the 6 OPE districts received an extended version of the baseline questionnaire, which included much more detailed information on plot-level agricultural production, household income, and food security. A total of 187 households in treatment villages and 204 households in control villages responded to the extended questionnaire. Table 2 shows the distribution of the extended interviews by district, with and without sampling probability weights.

	Un-weighted	Weighted
Zilla/District	N	N
Patuakhali	40	31
Jhalokati	15	31
Boroguna	45	31
Kurigram	16	31
Nilphamari	35	31
Lalmonirhat	36	31
Total	187	187

Table 2: Extended Baseline Interviews, by district

4 Validity of randomization

The impact evaluation will formally document the overall impact of IAPP in the project sites, using as a comparison group similar pre-identified sites that will receive IAPP activities later (a randomized phase-in). The main identifying assumption is that the only difference between villages that receive IAPP interventions and those that do not is the project itself.

Data from the baseline survey shows that control and treatment sites are indeed similar with respect to a large number of observable characteristics, which validates the randomization. Table 3 shows that there are no significant differences in key indicators for household characteristics, livestock, agriculture and fisheries are between treatment and control. [3]

[3] The balance test is constructed from an unweighted OLS regression estimating β_1 from the equation $var = \alpha+\beta_1(tmt)+\beta_2 X+\varepsilon$, where *tmt* is a dummy for treatment status, and X is a matrix of district fixed effects. The standard errors are robust and clustered at the village level. The P Value in the table is derived from a two-sided T-test with the null hypothesis of $\beta_1=0$.

	Treatment			Control			Balance Test
Household Characteristics	*N*	*Mean*	*SD*	*N*	*Mean*	*SD*	*P Value*
Number of children age 0-17	914	1.91	1.19	916	1.87	1.23	0.79
Number of HH members	914	5.27	2.00	916	5.25	2.02	0.87
HH head has primary education	914	0.34	0.47	916	0.35	0.48	0.43
Agriculture							
HH has one or more plots	914	0.92	0.27	916	0.94	0.24	0.35
Average plot size (ha)	841	0.14	0.14	857	0.14	0.14	0.95
Total plot size (ha)	841	0.68	0.68	857	0.66	0.58	0.81
Boro rice yield (kg/ha)	478	3,787	1,042	498	3,864	969	0.81
Aus rice yield (kg/ha)	103	1,996	1,102	96	1,813	958	0.57
Aman rice yield (kg/ha)	20	1,711	939	19	1,813	1,002	0.99
Boro gross yield (taka/ha)	478	76,131	22,774	498	77,297	20,808	0.95
Aus gross yield (taka/ha)	103	39,778	25,666	96	33,118	19,565	0.42
Aman gross yield (taka/ha)	20	37,936	21,883	19	38,677	23,997	0.79
Total agricultural gross yield (Taka/ha)	841	359,404	452,695	857	350,576	436,958	0.56
Total agricultural net yield (Taka/ha)	841	325,096	443,989	857	316,713	428,099	0.55
Livestock							
HH owns one or more cows	914	0.62	0.49	916	0.62	0.49	0.75
Total milk production (kg)	912	4,425	8,019	916	4,246	7,485	0.89
Income from milk production (Taka)	907	1,608	4,776	909	1,390	4,128	0.74
Fishery							
HH has one or more ponds	914	0.74	0.44	916	0.74	0.44	0.42
Average pond size (ha)	677	0.07	0.08	676	0.06	0.07	0.97
Total pond size (ha)	677	0.10	0.16	676	0.09	0.14	0.82
Total fishery gross yield (Taka/ha)	677	121,308	197,494	676	126,454	184,070	0.56
Total fishery net yield (Taka/ha)	677	64,382	170,384	676	65,882	167,124	0.89

Table 3: Balance tests of data from treatment and control villages

Note: The remainder of the report refers to data from the treatment villages only.

5 HH profile

This section describes the households and their socioeconomic status, including characteristics of the household head, the dwelling, access to water and sanitation, energy sources, and health. The baseline survey covered a rural population, in northern and southern Bangladesh.

5.1 Household Composition

The average household has just over 5 members, and 37% of the households have at least one child under 5. Most households are headed by married men in their late 40s. Just 2.3% of households are female-headed.

More than half of the population above the age of 6 has never attended school. Only 14% of adults over the age of 17 have completed high school. Nearly half of the household heads (47%) have no formal education. Less than 20% have completed more than primary education.

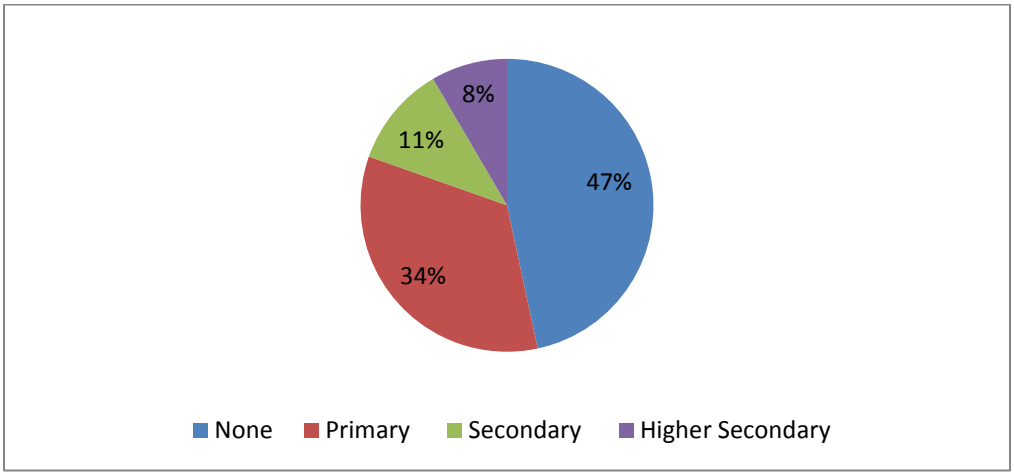

Figure 1: Education Level of HH Head

The extended baseline questionnaire included details on the household head's employment. Most household heads (92%) did some agricultural work in the month prior to the survey. The main occupation of the majority of household heads is work on their own farm. 13% primarily worked in a household business, and an additional 13% worked a salaried job. 4% were primarily engaged as agricultural day laborers.

Most household members (98%) did some agricultural work in the month before the baseline survey (either paid or unpaid). The primary occupation for most household members, as for household heads, was work on the household farm. 17% worked a salaried job, and 9% were primarily engaged with a household business.

	HH Member	HH Head
Own farm or sharecropping	59%	57%
Salaried job	17%	13%
Own business	9%	13%
Agricultural day labor	4%	4%
Other occupation	9%	6%

Figure 2: Primary Occupation (month prior to baseline survey)

5.2 Characteristics of the dwelling

98% of the households interviewed own the houses that they live in, as shown in Table 4. Two-thirds of the dwellings have walls made from iron sheets, and nearly all have metal roofs. A third is made from mud or reeds. 97% use a tubewell as their primary source of drinking water. Nearly all households rely on tubewells for the water they use domestically.

Housing Characteristics	mean
Occupancy status	
Own	97.9%
Provided for free	0.8%
Renting	0.4%
Wall material	
Iron sheeting	66.3%
Concrete or brick	15.3%
Bamboo/straw/palm leaf	12.1%
Wood	3.2%
Mud	2.5%
Roofing material	
Iron sheeting	96.7%
Concrete or brick	1.8%
Bamboo/straw/palm leaf	0.4%
Primary source of drinking water	
Tubewell (own/neighbor's/community)	97.5%
Piped inside or outside house	1.7%
N	914

Table 4: Housing characteristics

Over a third of households are connected to the electric grid, as shown in Table 5. However, half rely on either a lantern or kerosene for lighting. For cooking, most households use firewood.

Electricity	
Palli Bidyut Samity [4](PBS)	36.7%
Lantern	28.4%
Kerosene	11.0%
Cooking fuel	
Firewood	84.8%
Dried cow dung	5.5%
Rice bran/saw dust/straw	4.7%
N	817

Table 5: Energy Sources

6 Agricultural Landholdings & Crop Summary

6.1 Agricultural Landholdings

92% of households cultivated at least one crop from September 2011 – August 2012. Table 6 shows details of landholdings. Average total agricultural land is only 0.7ha, and land is highly fragmented. Households farmed 6 plots during the year, of an average size of 0.14ha each. The crop mix is quite diversified: households typically cultivate more than 10 types of crops over the course of the year, the most common of which are rice, fruits, fiber crops, and pulses.

[4] Electricity through the Rural Electrification Board of Bangladesh, a semi-autonomous government agency

	N	mean	SD	median
Number of plots	841	6.18	4.86	5.00
Total plot size (ha)	841	0.68	0.68	0.53
Mean size of a plot (ha)	841	0.14	0.14	0.10
Number of crops planted	841	10.56	5.77	10.00

Table 6: Agricultural Landholdings

Table 7 shows the distribution of sample farmers across the farm-size classifications commonly used by the Government of Bangladesh. Nearly half the households have less than 0.5ha of land. More than 80% have less than 1ha, meeting the target criteria for IAPP beneficiaries.

Farm Size	***N***	**%**
"Landless" (0.01 - 0.2 ha)	841	12.08%
Marginal (0.21 to 0.5 ha)	841	35.84%
Small (0.51 to 1 ha)	841	34.81%
Medium (1.01 to 2.00 ha)	841	13.48%
Large (>2.00 ha)	841	3.79%

Table 7: Farm-size Classification

The majority of plots are owned by the same households that cultivate them, as shown in Figure 3.

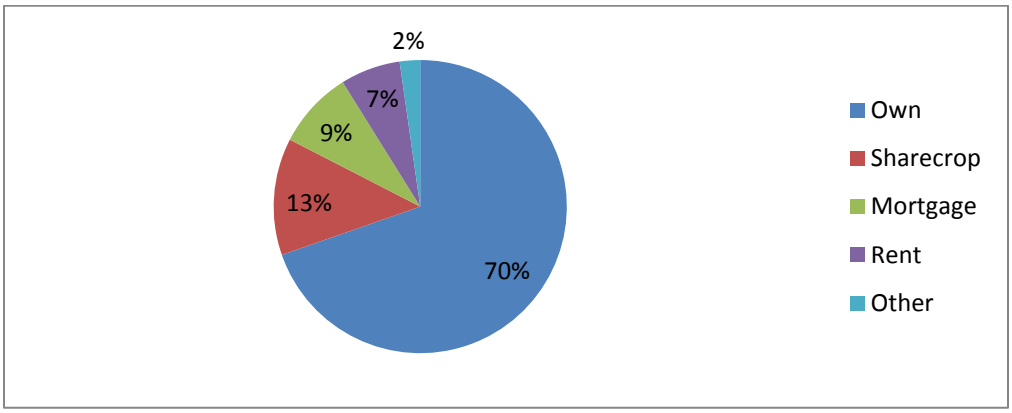

Figure 3: Plot Ownership Status

6.2 Plot Management

Just as most households are headed by males, most agricultural decision and work is provided by males. Table 8 shows the primary decision maker and the primary laborer for each of the 4,475 plots asked about in the baseline survey. Male household members are the primary decision maker for 98% of plots, and they are the primary labor source for 88% of the plots. Households typically manage their own plots; decisions are almost never made by non-household members. Household members provide the primary source of labor for 90% of plots.

	Total	
Primary decision maker	N	mean
Male household member	4,475	97.5%
Female household member	4,475	2.4%
Non-household member	4,475	0.1%
Primary worker		
Male household member	4,473	87.8%
Female household member	4,473	2.1%
Non-household member	4,473	10.1%

Table 8: Agricultural Decisions & Work

7 Access to Agricultural Extension & Use of Improved Technologies

7.1 Access to Agricultural Extension

Households have limited access to agricultural extension services at baseline, as shown in Table 9. Only 1 in 5 households were visited by a government extension worker in the 12 months prior to the survey. 1 in 20 was visited by an NGO extension worker. However, households that were visited had significant interaction, averaging 5 visits per household over the 12 month period for government extension workers and 4 visits for NGO extension workers. 1 in 10 respondents reports having accessed agricultural information through their mobile phone in the previous 12 months.

	N	%
Extension worker from government visited farm in last 12 months	914	19%
Number of visits from government extension worker (if visited)	176	5.1
Extension worker from an NGO visited farm in last 12 months	914	5%
Number of visits from NGO extension worker (if visited)	49	4.1
Respondent accessed information using mobile phone	914	11%

Table 9: Access to Agricultural Extension

There is a clear correlation between access to agricultural extension services and income, as shown in Table 10. Farmers in the top income quartile are three times more likely to have been visited by a government extension worker, and more than four times as likely to have access agricultural information using their mobile phone.

	Quartile I	Quartile II	Quartile III	Quartile IV
Extension worker from government visited farm in last 12 months	10.57%	17.08%	22.65%	29.78%
Extension worker from an NGO visited farm in last 12 months	4.43%	4.73%	5.66%	6.76%
Respondent accessed information using mobile phone	4.88%	6.43%	11.80%	21.85%
N	269	229	207	209

Table 10: Access to Extension Services by Income Quartile

Access to agricultural extension services is also clearly correlated with farm size, as shown in Table 11. Landless farmers are the least likely to interact with public extension workers, or access information via their mobile phone. Farmers with large landholdings, in contrast, are far more likely than any other

group to have interacted with a public extension worker and to access agricultural information via mobile phone. Overall, the patterns show that landless, marginal and small farmers are all disadvantaged in terms of extension services, which is important to understand as these are the farmers particularly targeted by IAPP.

	Landless	Marginal	Small	Medium	Large
Extension worker from government visited farm in last 12 months	9.52%	16.44%	23.94%	28.73%	39.11%
Extension worker from an NGO visited farm in last 12 months	3.13%	5.82%	5.97%	5.35%	4.16%
Respondent accessed information using mobile phone	5.48%	9.06%	11.94%	17.97%	24.28%
N	102	301	293	113	32

Table 11: Access to Agricultural Extension (distributional analysis)

7.2 Improved Agricultural Technologies

Current adoption of the improved agricultural technologies promoted by IAPP is uneven, as Figure 4 shows. Line planting is already practiced by the majority of households. In contrast, less than 2% of households use green manure or alternate wet/dry method for rice cultivation.

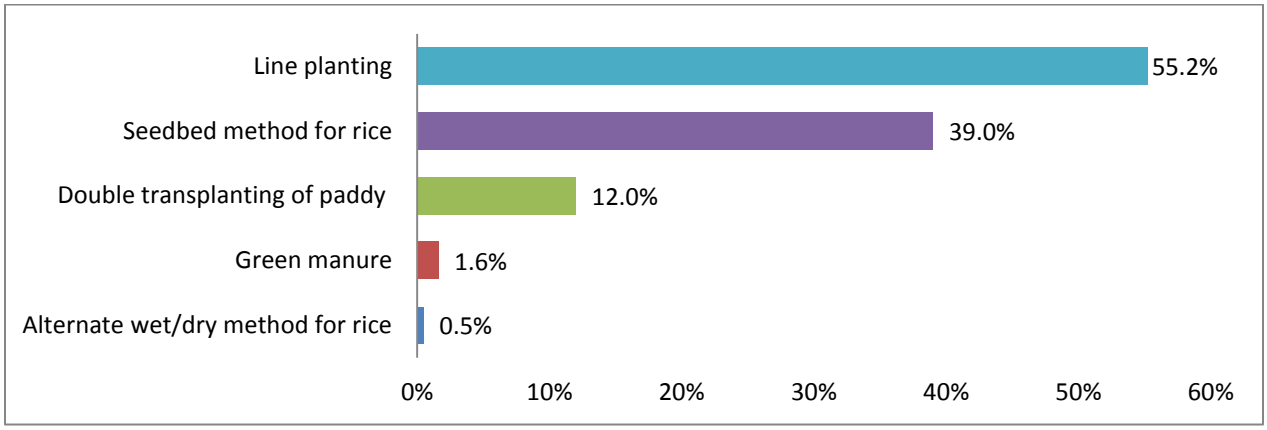

Figure 4: Adoption of Improved Technologies

Table 12 shows patterns of adoption by income quartiles. The overall rates of adoption mask a clear pattern: overall use of improved technologies is clearly correlated with income. Rates of adoption of all technologies are significantly higher for farmers in the top quartile of the income distribution, especially compared to the lowest quartile. For example, the adoption rate for seedbed rice production is 55% in the top quartile, compared to only 25% in the lowest quartile. Specifically, most technology adoption is tied to medium and large-scale farmers. This is particularly important given that these technologies are specifically promoted by IAPP.

	Quartile I	Quartile II	Quartile III	Quartile IV
Household used any technology on plots	56.94%	72.14%	80.11%	81.69%
Used Line planting	37.85%	49.73%	63.81%	68.67%
Used Seedbed method for rice	24.81%	38.60%	46.98%	54.75%
Used Double transplanting of paddy	9.33%	13.19%	13.46%	13.58%
Used Green manure	1.35%	1.68%	0.80%	2.64%
Used Alternate wet/dry method for rice	0.00%	0.87%	0.74%	0.10%
N	196	229	207	209

Table 12: Use of improved technologies, by production quartiles

8 Agricultural Production

As the main objective of IAPP is improved agricultural productivity, detailed data on agricultural practices and production was collected in the baseline survey. This section reports details of crop production from September 1, 2011 to August 31, 2012.

All households were asked for basic production information for up to 10 plots cultivated by the household during the reference period. A subset of households was asked detailed questions on use of agricultural inputs and labor for 2 of those plots (focusing on demonstration plots, plots where improved seed varieties were used, and largest plots).

8.1 Crop Production & Commercialization

By far the most commonly grown crop is rice, grown by three-quarters of households. Figure 5 shows the proportion of households cultivating each of the major crop groups. After rice, pulses are the most commonly grown crop, followed by fiber crops. The least common groups are leafy vegetables, oil seeds, and fruit, each grown by less than 10% of households.

The pattern for commercialization is similar to cultivation by crop type. Most commonly commercialized are rice, pulses, and the non-categorized crops. Least commonly commercialized are leafy vegetables, oil seeds, and fruit. The largest gap between production and commercialization is for rice, which is unsurprising given that rice is a major staple and much of a household's production of rice goes to own consumption.

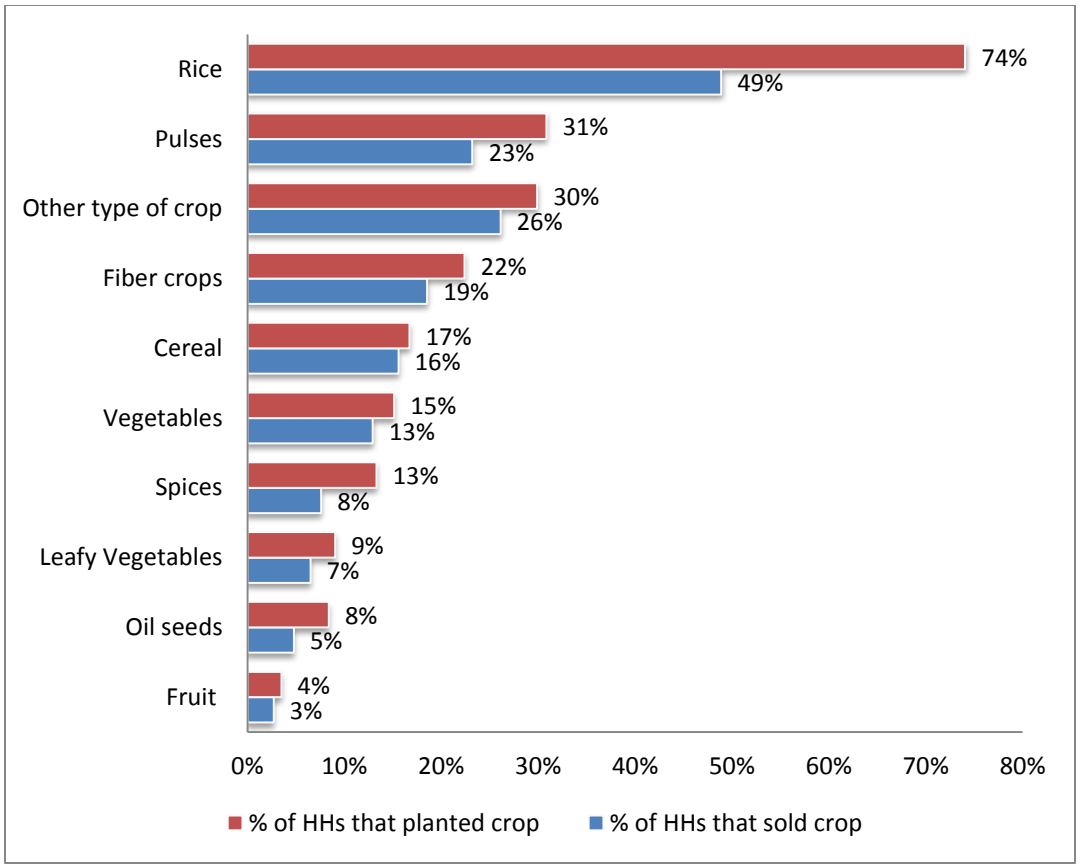

Figure 5: % of Households Cultivating & Selling Major Crops

Figure 6 shows the share of total crop income attributed to each crop type. 70% of crop-related income comes from either rice or the non-categorized crops. This is unsurprising; rice is the predominant crop, and the non-categorized ('other') includes most cash crops (tobacco, tea, sugarcane, dates, palms and bettlenut). Rice account for nearly a third of crop income.

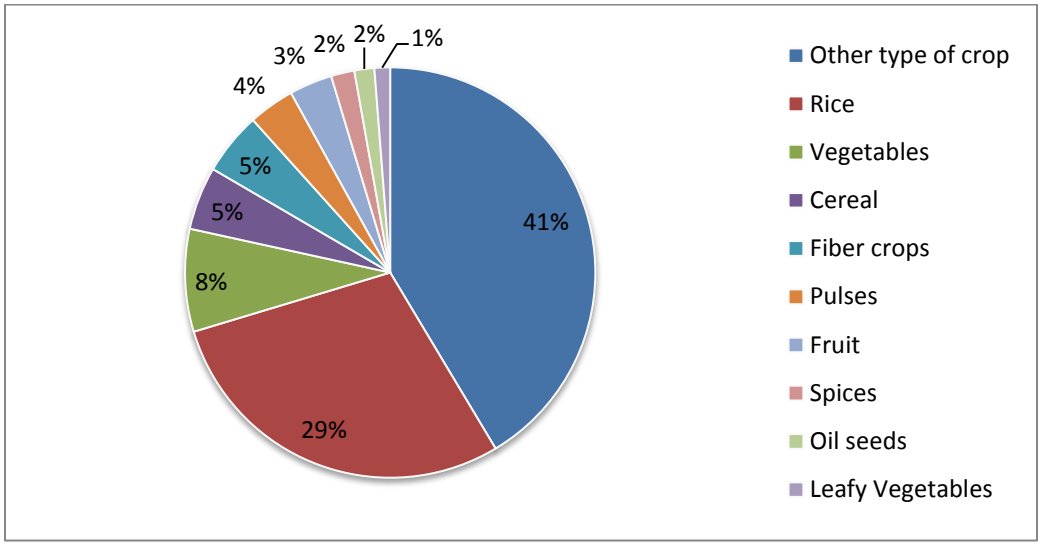

Figure 6: Crop income by crop type

The most common location of sale is at farm gate, as shown in Figure 7.

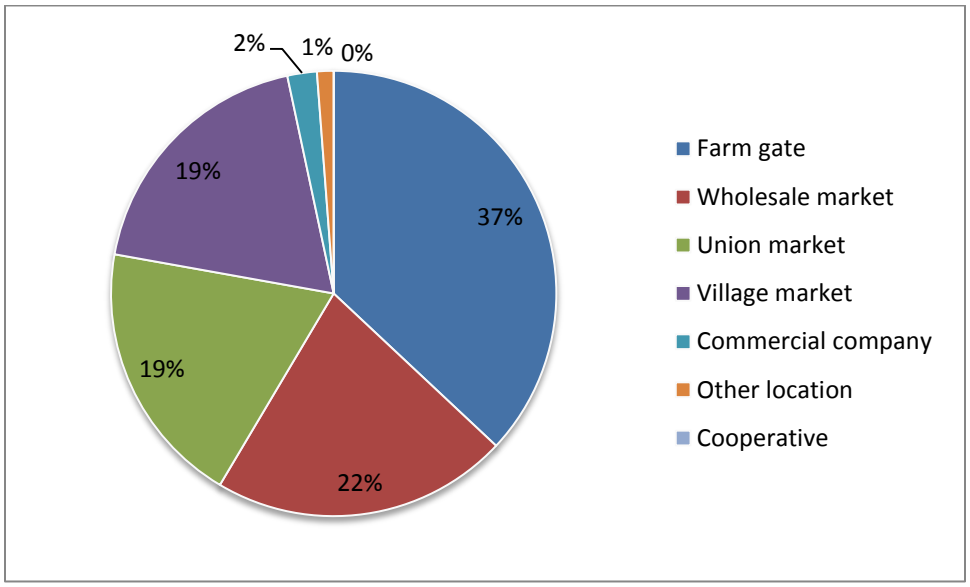

Figure 7: Primary Locations of Sale

8.2 Seeds

Overall, 90% of seed is either sourced through local markets or saved from farmers' own production. However, there is significant variation by crop. Figure 8 shows the source of seed for the common crops. Farmers are most likely to "recycle seed" (e.g. use seed from their previous harvest) for mustard, khesari, aus, and pulses. The local market is the primary source of seed for maize, jute, aman, chili and wheat. The government is only a significant source for wheat, providing nearly one-third of wheat seeds. Seed multipliers are relatively uncommon, but do account for a small portion of seeds for sesame and paddy.

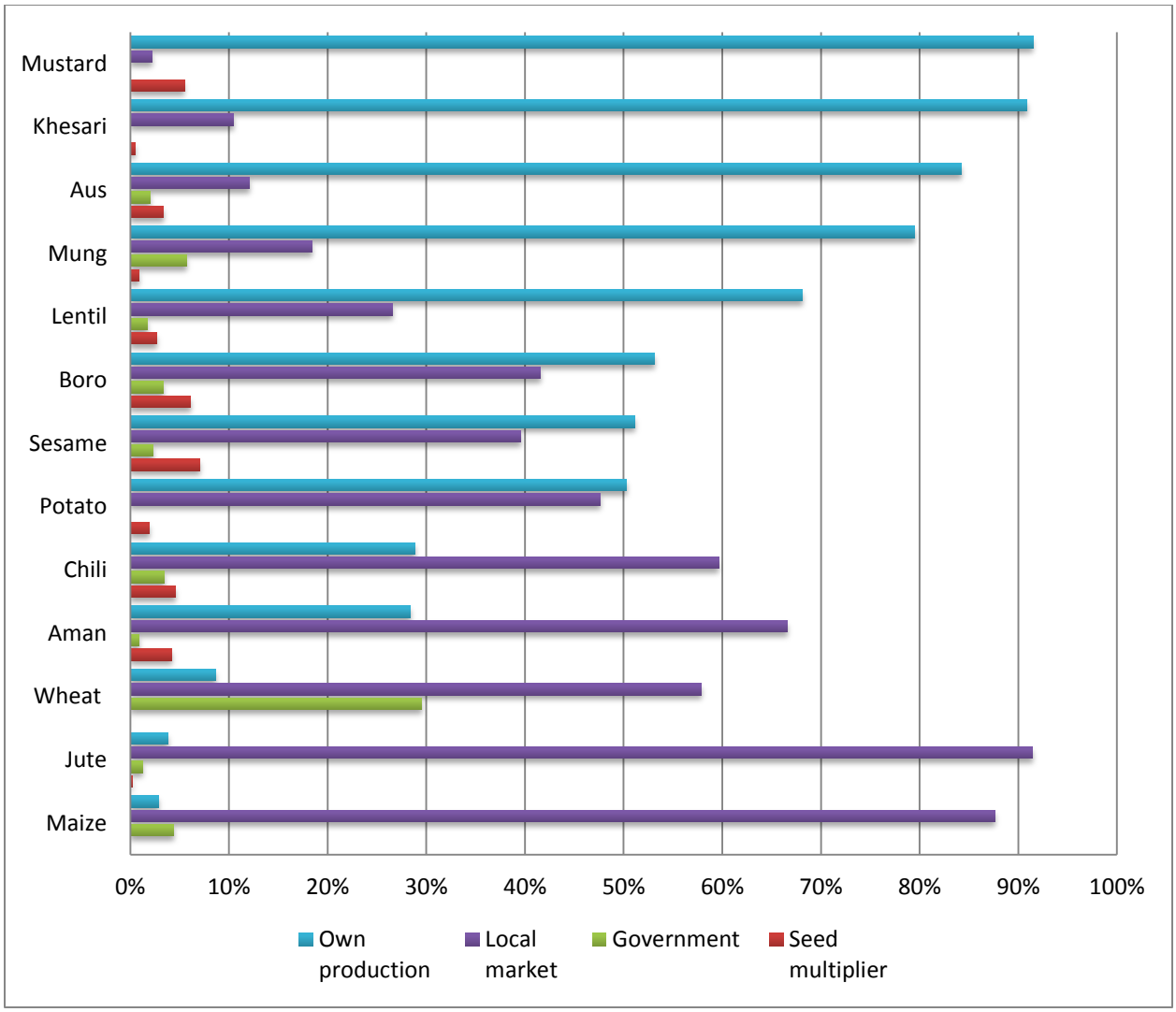

Figure 8: Source of Seed, by crop

Figure 9 shows the type of seed planted for thirteen common crops. High-yielding varieties are used most frequently for rice (boro and aman), potatoes and jute.[5] Nearly 70% of households cultivate a high-yielding variety of boro. Hybrid seeds are most common for maize, boro, wheat, and sesame. Farmers are most likely to rely on local varieties for khesari, pulses, chilis, and aus rice.

[5] Hybrid Aus and Aman varieties are not typically available in Bangladesh, reported figures likely reflect lack of knowledge by farmers

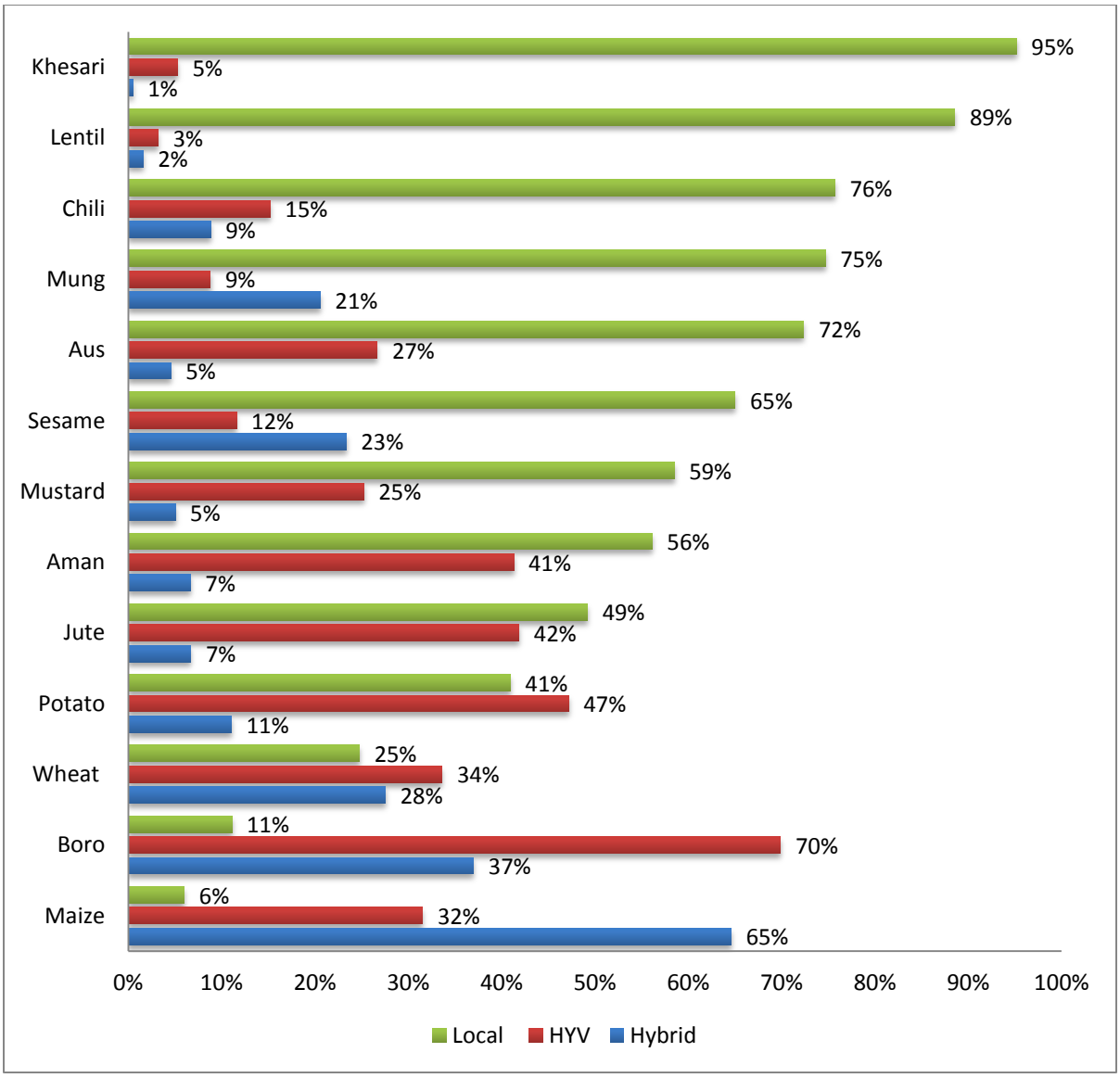

Figure 9: Use of Hybrid & High-yield Seed

There is substantial diversity in paddy varieties, and even more variation in local names for seed. Farmers were generally able to categorize the seed as HYV or hybrid, but it is plausible that those categorizations may have some inaccuracy. This poses a challenge given IAPP's focus on developing and promoting new varieties. Table 13 shows the most widely adopted varieties, among the sample of households that grew rice. Of the known varieties, BRRI-Dhan 28, Mukta BR-11, Hira, and BRRI Dhan-29 are the most common. The "other" category aggregates all varieties that were grown by less than 5% of households.

Paddy variety planted	N	%[6]
BRRI Dhan-28	576	37.9%
Mukta BR-11	576	21.9%
Hira	576	21.1%
BRRI Dhan-29	576	19.9%
Vojon	576	8.5%
Mota Shada	576	6.3%
Mota Aman	576	6.0%
Other[7]	576	24.5%

Table 13: Paddy Varieties

8.3 Agricultural Inputs

94% of households applied some type of input to their plots. Figure 10 shows the proportion of households that applied each type of input to at least one of their plots. Urea is the most common type of input, applied by more than 80% of households. Pesticides or insecticides were applied by 70% of households. TSP, SPP, Potash and MOP are also quite common, used by more than 60% of households. On the other hand, NPK or mixed fertilizer is used by only 7% of households. Nutrients such as potassium, calcium or lime are still less common, used by only 2-3% of households. Pheromone traps and ammonia were not reported by any household.

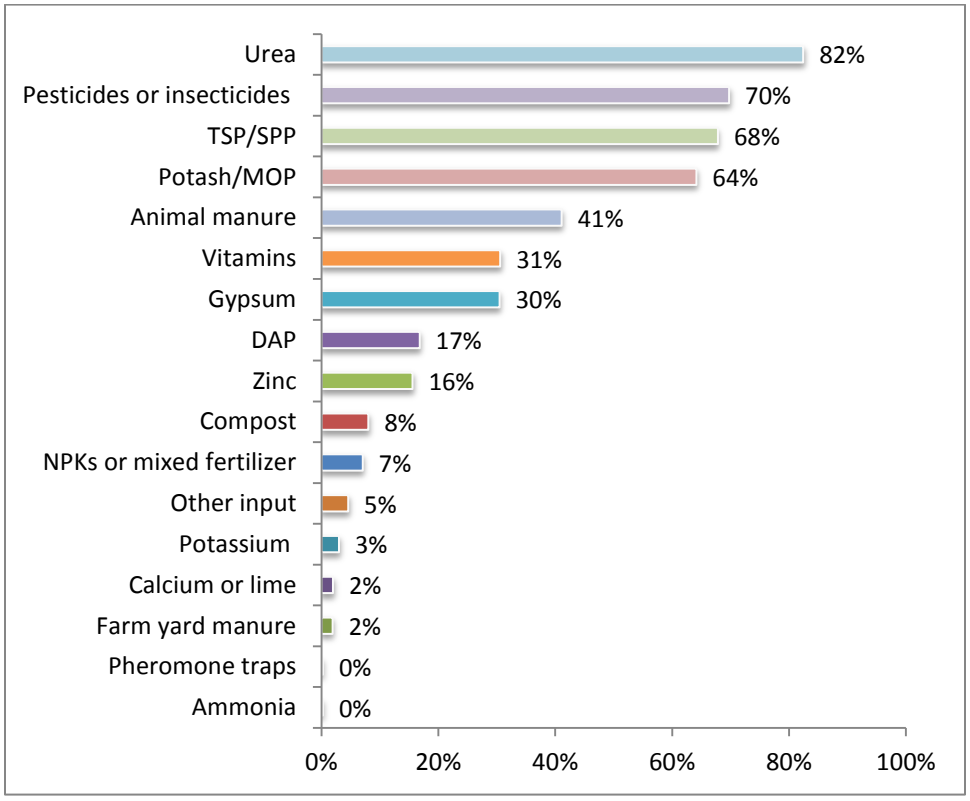

Figure 10: Use of Agricultural Inputs

[6] Note that proportions will not add up to 100%. Households that grew multiple varieties of rice are double counted.
[7] "other" includes all paddy varieties grown by less than 5% of households

The subset of the sample the received the extended version of the baseline questionnaire was asked about input expenditures. Table 14 shows expenditures on 10 common agricultural inputs, conditional on input use. In total, households spent approximately 6,556 BDT ($82) on inputs over the 12 months. Most of that money was spent on chemical fertilizers: urea, DAP, TSP, and potash.

		Taka spent on inputs if used			USD spent on inputs if used		
	N	*mean*	*sd*	*p50*	*mean*	*sd*	*p50*
Urea	158	2,595	2,710	1,694	32	34	21
Pesticide	133	963	1,134	600	12	14	8
TSP	131	1,595	1,623	1,250	20	20	16
Potash	130	1,056	1,253	680	13	16	9
Compost	90	559	1,221	0	7	15	0
Vitamins	61	338	373	204	4	5	3
Gypsum	60	648	700	425	8	9	5
Zinc	33	471	478	350	6	6	4
DAP	26	1,868	2,223	1,200	23	28	15
NPK	12	689	1,199	320	9	15	4

Table 14: Agricultural Input Expenditures

8.4 Irrigation

76% of households irrigated at least one of their plots. The subset of respondents that received the extended version of the baseline survey was asked more detailed questions regarding irrigation. Figure 11 shows that most households that irrigated their crops relied on either a tubewell or a shallow tubewell. Only 3% have access to a deep tubewell.[8]

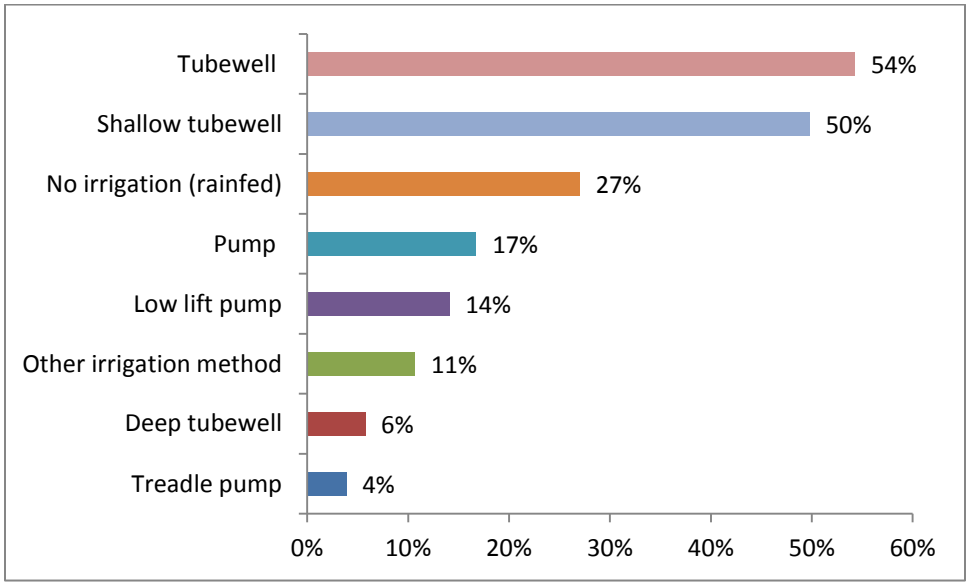

Figure 11: Irrigation methods

[8] Multiple irrigation methods per household were recorded

Two-thirds of farmers that irrigated their crops relied on a private supplier for management and/or maintenance of the irrigation system. Households that irrigated spent an average of 3,125BDT (approximately $39) on irrigation over the 12 months prior to the baseline survey.

8.5 Labor for agricultural activities

Households that received the extended version of the baseline survey provided detailed information on agricultural labor, both quantity and type. Most labor for most agricultural tasks is supplied by adult household members. More than half of the households also hired labor to assist with planting, weeding, and harvesting. In contrast, the majority of households relied on their own labor for land preparation, input application, and irrigation. Households reported little unpaid assistance from friends or neighbors. In total, adult household members contributed 43 person-days of labor over the course of the season, and paid labor contributed 66 days.

Figure 12 shows the proportion of households relying on each source of labor, as well as the allocation of labor days by task. By far the most labor intensive activity is land preparation. Although only slightly more than a third of the households hired labor for land preparation, those households hired an average of 89 person days of labor.

Labor for agricultural activities (person-days)					
Land preparation	*N*	*% of HHs*	*N*	*mean*	*sd*
Adult HH members	165	91%	150	12	11
Unpaid labor	162	2%	3	2	1
Paid labor	162	40%	60	89	68
Planting					
Adult HH members	165	82%	136	9	7
Unpaid labor	162	3%	6	2	1
Paid labor	162	64%	109	18	16
Weeding					
Adult HH members	165	67%	110	7	7
Unpaid labor	162	1%	2	11	15
Paid labor	162	63%	104	13	12
Applying inputs					
Adult HH members	165	76%	126	4	4
Unpaid labor	162	4%	6	2	2
Paid labor	162	16%	26	5	5
Harvesting					
Adult HH members	165	69%	114	10	11
Unpaid labor	162	3%	4	5	5
Paid labor	162	76%	127	15	15
Irrigation					
Adult HH members	165	54%	89	18	25
Unpaid labor	162	1%	1	3	0
Paid labor	162	10%	16	15	22

Figure 12: Agricultural Labor Days

On average, households spent approximately $120 on paid labor during the 12 months prior to the baseline. Table 15 shows the expenditures on labor by major agricultural activities. Most money was spent on planting and harvesting, which aligns with the above allocation of days.

		Taka			USD		
	N	*mean*	*sd*	*p50*	*mean*	*sd*	*p50*
Land preparation	65	2,486	2,564	1,675	31	32	21
Planting	106	3,664	3,202	2,550	46	40	32
Weeding	104	2,414	2,199	1,800	30	27	23
Applying inputs	26	931	895	600	12	11	8
Harvesting	127	3,026	3,242	2,100	38	41	26
Irrigation	16	1,422	1,203	875	18	15	11
All activities	132	9,496	10,323	6,200	119	129	78

Table 15: Expenditures on Agricultural Labor

8.6 Agricultural Production Value

Total agricultural production is measured in BDT, and represents the total market value of crops harvested, regardless of whether or not they were sold. The value for crops is generated by assigning a price to each crop based on the best available estimate of farm gate prices. For crops that are frequently sold among survey respondents, the prices are calculated based on self-reported sales data at the upazilla level. For crops where insufficient sales data is available in the baseline data, estimated prices were obtained through interviews with the Upazilla Agricultural Officers. The prices used for each crop can be found in Appendix 2.

Table 16 reports statistics for total agricultural production for all households that cultivated at least one plot.[9]

	N	mean	sd	median
Total production (kg)	841	1,369	2,131	680
Total production (Taka)	841	168,414	197,481	103,684
Total production (USD)	841	2,105	2,469	1,296

Table 16: Total Agricultural Production

Table 17 shows production by crop, for all households that cultivated the crop. Production value is highest for potatoes, boro, and maize.

[9] All production variables are winsorized at the 1% level at the upper and lower tails to decrease the influence of outliers.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Boro	510	34,391	31,339	25,920	430	392	324
Khesari	196	9,153	10,216	6,000	114	128	75
Potato	169	35,056	52,752	16,000	438	659	200
Jute	155	8,165	7,614	6,000	102	95	75
Maize	117	24,874	27,975	14,400	311	350	180
Aus	118	13,520	13,356	9,520	169	167	119
Mung	110	9,729	11,977	5,600	122	150	70
Chili	90	5,959	10,588	2,800	74	132	35
Lentil	38	5,944	8,998	3,000	74	112	38
Wheat	26	7,501	4,516	6,160	94	56	77
Mustard	24	3,935	3,791	2,155	49	47	27
Aman	24	10,362	18,484	4,080	130	231	51
Sesame	14	1,583	1,649	1,300	20	21	16

Table 17: Total Crop Production

8.7 Agricultural Income

Agricultural income is defined as the total amount of money received from crops sold. Table 18 presents total agricultural income in Taka and USD for all households that cultivated at least one plot. Income is much lower than total production, which reflects the fact that most household production goes to household consumption.

	N	mean	sd	median
Agricultural income (Taka)	841	27,335	41,611	11,550
Agricultural income (USD)	841	342	520	144

Table 18: Agricultural income (Taka)

Table 19 shows average income per crop, for households that cultivated the crop. Potatoes create the most income for farmers who grow them, followed by boro and maize.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Boro	510	14,580	20,526	7,040	182	257	88
Aus	110	3,931	5,615	1,400	49	70	18
Aman	24	2,765	3,216	2,900	35	40	36
Khesari	197	3,578	4,797	2,000	45	60	25
Potato	169	26,355	40,773	9,600	329	510	120
Jute	155	6,582	6,856	4,900	82	86	61
Maize	118	12,733	12,760	9,300	159	159	116
Mung	118	4,830	7,839	0	60	98	0
Chili	90	2,894	5,649	690	36	71	9
Wheat	38	1,140	2,143	0	14	27	0
Mustard	26	5,013	4,373	3,600	63	55	45
Lentil	24	3,368	8,015	0	42	100	0
Sesame	14	508	1,212	0	6	15	0

Table 19: Crop Income

Agriculture income is clearly correlated with farm size, as shown in Table 20. Average annual farm income is only $62 for 'landless' farmers. Average income for medium and large farmers is more than ten-fold higher.

		Total agricultural income (Taka)			Total agricultural income (USD)		
	N	mean	sd	median	mean	sd	median
Landless	102	4,984	8,891	500	62	112	6
Marginal	301	15,473	22,889	9,000	193	286	113
Small	293	31,649	39,135	20,300	396	489	254
Medium	113	56,477	53,823	45,990	706	673	575
Large	32	67,490	92,801	16,400	844	1160	205

Table 20: Agricultural Income, by Farm Size

8.8 Agricultural Yields by Weight

Table 21 shows yield in kgs and tons per hectare for the most commonly harvested crops.

		Gross Yield (kgs/ha)			Gross Yield (Tons/ha)
	N	*mean*	*sd*	*median*	*mean*
Rice (all varieties)	841	3,465	1,259	3,563	3.5
Khesari	175	760	612	617	0.76
Potato	165	14,844	8,668	12,840	14.84
Jute	149	1,853	739	1,749	1.85
Maize	108	5,600	2,423	5,487	5.60
Mung	92	613	473	494	0.61
Chili	82	2,658	3,827	1,235	2.66
Lentil	37	582	497	412	0.58
Wheat	26	2,768	1,074	2,743	2.77
Mustard	24	883	485	823	0.88
Sesame	12	509	369	393	0.51

Table 21: Gross Yield for Common Crops by weight

Table 22 shows more detailed data on rice yields, disaggregating by variety and seed type. [10][11]

		Gross Yield (kgs/ha)			Gross Yield (Tons/ha)
	N	mean	sd	p50	mean in ton/ha
Boro	478	3,787	1,042	3,768	3.8
HYV	54	3,132	1,307	3,359	3.1
Hybrid	331	3,629	951	3,658	3.6
Local	181	4,288	1,090	4,179	4.3
Aus	103	1,996	1,102	1,746	2.0
HYV	26	2,106	1,061	2,285	2.1
Hybrid	4	2,727	1,124	3,008	2.7
Local	75	2,006	1,208	1,654	2.0

Table 22: Rice Yields

[10] Rice yields are raw paddy yields are scaled by a factor of 0.67 to account for milling
[11] Because the baseline data collection took place before most farmers had harvested aman, sample size for aman yield was less than 20HHs and therefore is not included in Table 22.

8.9 Agricultural Yields by Monetary Value

Agricultural yields were also calculated in monetary terms, representing the value per unit of cultivated land. Value of production was calculated as described in the previous section, and plot area is based on self-reporting. Gross yield is calculated using the total value of harvested crops per hectare. Net yield subtracts money spent on inputs from the gross yield figures. This includes money spent on seeds, fertilizer, pesticides, hired labor, and irrigation. However, it does not impute a cost for household and other unpaid labor. Net yields are only slightly lower than gross yields, reflecting the low amount of input usage in the sample. However, as the labor section shows, household members provide a significant amount of labor, so the net yields should be seen as an upper bound.

Table 23 shows overall gross and net yields.

	N	Mean	SD	Median
Gross yield (Taka/ha)	841	389,255	431,689	263,508
Gross yield (USD/ha)	841	4,866	5,396	3,294
Net yield (Taka/ha)	841	354,996	424,947	245,196
Net yield (USD/ha)	841	4,696	5,312	3,065

Table 23: Agricultural Yields (Taka/USD)

Table 24 shows net and gross yields in monetary values for common crops.

		Gross yield (Taka/hectare)		Net yield (USD/hectare)		Gross yield (Taka/hectare)		Net yield (USD/hectare)	
	N	mean	sd	mean	sd	mean	sd	mean	sd
Boro	478	76,131	22,774	952	285	33,426	23,832	418	298
Aus	103	39,778	25,666	497	321	21,914	24,260	274	303
Aman	20	37,936	21,883	474	274	20,960	20,166	262	252
Khesari	174	26,701	19,703	334	246	23,442	19,453	293	243
Potato	165	150,975	102,028	1,887	1,275	99,032	96,867	1,238	1,211
Jute	149	53,684	25,281	671	316	29,115	25,652	364	321
Maize	107	92,003	54,995	1,150	687	58,669	51,483	733	644
Mung	92	43,974	34,671	550	433	37,216	34,847	465	436
Chili	82	114,221	150,433	1,428	1,880	84,545	144,333	1,057	1,804
Lentil	37	46,027	43,810	575	548	38,864	39,678	486	496
Wheat	26	60,899	23,637	761	295	35,878	21,105	448	264
Mustard	24	31,725	17,403	397	218	18,007	13,931	225	174
Sesame	12	16,542	11,983	207	150	5,499	17,273	69	216

Table 24: Agricultural Yields by Crop

9 Fisheries

9.1 Fish Pond Characteristics

74% of households cultivated fish in the 12 months prior to the baseline survey. The ponds are typically very small, averaging 17 decimals (0.07ha) each. Most households have access to more than one pond (1.4), and total pond area cultivated by a household is 0.1ha. Pond sizes are all self-reported. Less than 2% of households reported using one of their ponds for a fisheries demonstration.

IAPP is targeting ponds of 15-30 decimals for nursery interventions, and ponds of 31-50 decimals for big fish interventions. Slightly less than half the ponds fit into these categories: 28% of ponds fit into the

nurseries category, and 10% are appropriate for big fish. Given the small size of many of the ponds, at least as reported by the fishermen, it may be necessary for the project to adjust its targeting criteria slightly.

As Figure 13 shows, the majority of ponds are owned by the household that cultivated them.

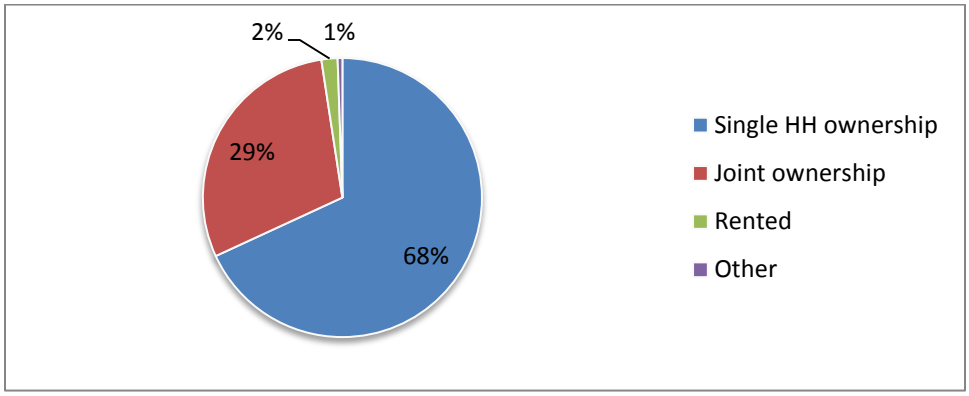

Figure 13: Pond Ownership Status

9.2 Fisheries inputs

Table 25 shows expenditures on fisheries inputs for all households that cultivated at least one pond. Households spent an average of $61 in their fish ponds over the 12 months prior to the survey. However, the variation is very high; a small number of households made very large expenditures. Half the households spent less than $20 in total. The most significant sources of expenditures are seed fish/fingerlings and fish feed.

		Taka			USD		
	N	*mean*	*sd*	*Median*	*mean*	*sd*	*median*
Fingerlings / seed fish	677	2,804	5,243	1000	35	66	13
Feed	677	1,559	4,669	125	19	58	2
Fertilizer	677	337	957	0	4	12	0
Lime	677	108	287	0	1	4	0
Pesticide	677	37	146	0	0	2	0
All inputs	677	4,912	10,899	1500	61	136	19

Table 25: Fisheries Expenditures

9.3 Fish Production

85% of households with ponds cultivated some type of fish. The most commonly cultivated fish are carp (silver, grass or mirror) and rui or ruhit, each cultivated by more than half of the households. Most of the fish are for home consumption; only a quarter of the households with ponds commercialized any type of fish. Figure 14 shows the households producing and commercializing each type of fish, as a proportion of all households that own fish ponds.

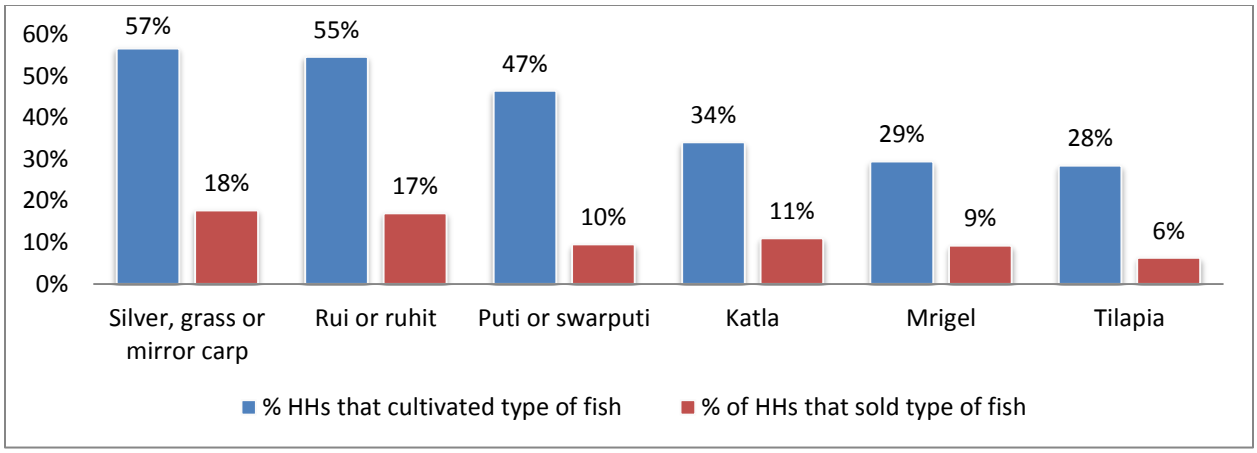

Figure 14: Fish Cultivation & Commercialization, by type

On average, households harvested 79 total kgs of fish over the 12 months prior to the baseline and sold 29kgs, as shown in Table 26. However, there is significant variation: half of the households harvested less than 30kgs of fish and half did not sell any.

	N	mean	sd	median
Total amount harvested (kg)	677	78.7	161.6	30.0
Total amount sold (kg)	677	28.7	103.6	0.0

Table 26: Fish Production

9.4 Fish Yields

Table 27 shows yield in kilograms per hectare by fish type. The highest yielding variety of fish at baseline is carp, with a gross yield of 265 kgs per hectare. Rui/ ruhit is the next highest yielding category, with approximately 150 kgs per hectare. Katla and mrigel offer the lowest yields, at 67 and 65 kgs per hectare respectively.

	N	mean	SD	median
Silver, grass or mirror carp	677	265	489	45
Rui or ruhit	677	152	278	27
Puti or swarputi	677	106	214	0
Katla	677	67	155	0
Mrigel	677	65	167	0
Tilapia	677	79	196	0

Table 27: Fish Production (kgs/ha), by type

Table 28[12] shows gross yields in monetary value. As above, the highest yielding varieties are carp and rui/ ruhit. Carp has an average value of $409 per hectare, rui $369 per hectare. Katla and Mrigel are the lowest yielding varieties in monetary value, as for weight.

[12] Only gross yields are available disaggregated by fish type, because input data was gathered at pond level.

		Gross yield (Taka/ha)			Gross yield (USD/ha)		
	N	*mean*	*SD*	*median*	*mean*	*SD*	*median*
Silver, grass or mirror carp	677	32,696	62,737	4,801	409	784	60
Rui or ruhit	677	29,509	58,229	4,938	369	728	62
Puti or swarputi	677	11,986	27,408	0	150	343	0
Katla	677	10,356	27,471	0	129	343	0
Mrigel	677	10,051	25,531	0	126	319	0
Tilapia	677	13,500	27,430	0	169	343	0

Table 28: Fish Production (Taka), by type

Table 29 shows overall fishery productivity per household. Overall gross yield is $1,516 per hectare, and net yield is $805 per hectare. Average total income from fisheries, however, was just $143 over the past 12 months, reflecting both the small average size of ponds and the low share of commercialization.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Total production	677	8,981	19,530	2,500	112	244	31
Total gross yield	677	121,308	197,494	46,914	1,516	2,469	586
Total net yield	677	64,382	170,384	14,506	805	2,130	181
Total income	677	11,409	50,263	0	143	628	0

Table 29: Fish Production

10 Livestock

97% of households owned some type of livestock. Figure 15 shows the proportion of all households that owned and commercialized each of the common types of livestock. The majority of households own chickens, cows, and ducks. Very few households own sheep or buffalo. There is little commercialization of livestock; less than 10% of households sold any animal. The most commonly commercialized were goats, bulls, and chicken. IAPP encourages farmers to see livestock as a productive asset, so it is expected that the percentage commercializing livestock will rise over the lifespan of the project.

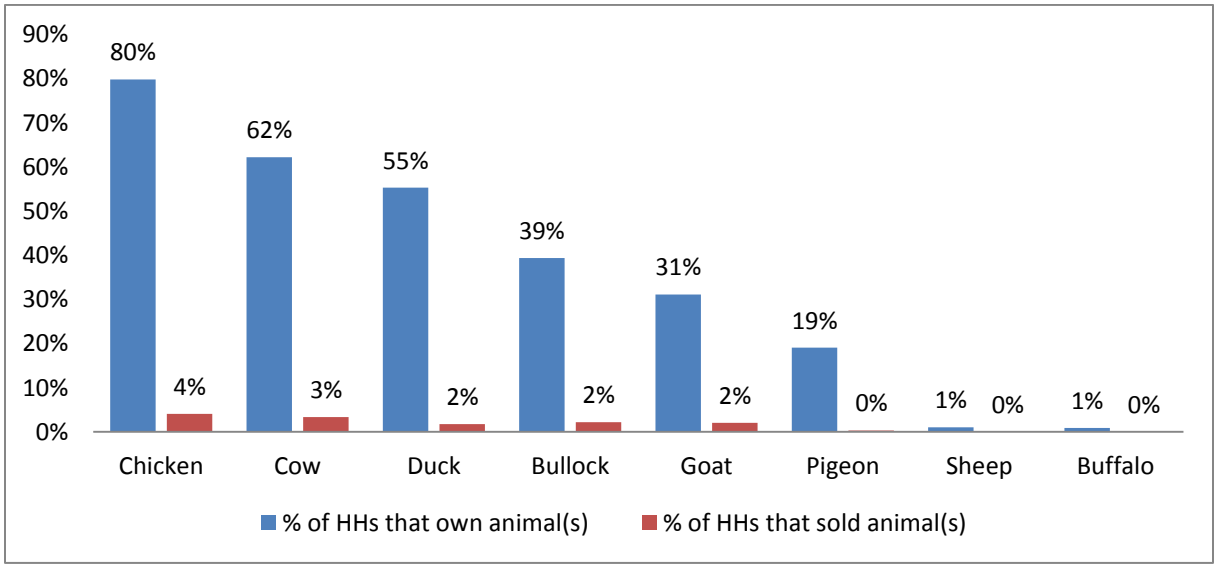

Figure 15: Livestock ownership & commercialization, by type

Table 30 shows the intensity of livestock operations.

	Number owned				Number sold				Income from selling (Taka)			Income from selling (USD)		
	N	*mean*	*sd*	*p50*	*N*	*mean*	*sd*	*p50*	*mean*	*sd*	*p50*	*mean*	*sd*	*p50*
Chicken, duck or pigeon	712	16	27	11	46	9	7	7	1,484	1,264	1,000	19	16	13
Bullock, cow or buffalo	551	3	2	3	42	2	1	2	27,443	17,137	22,000	343	214	275

Table 30: Livestock ownership, sales & income

11 Assets, Income & Expenditures

11.1 Household Assets

Detailed assets data was collected for the subset of respondents who received the extended baseline survey. Nearly all households own a mosquito net and simple furnishings such as a bed, chair and table, as shown in Figure 16. Very few households own vehicles or large electronics. In terms of communication, which may be important for IAPP agricultural extension messaging, we find that 91% of households own a mobile phone, but very few (<5%) own a radio.

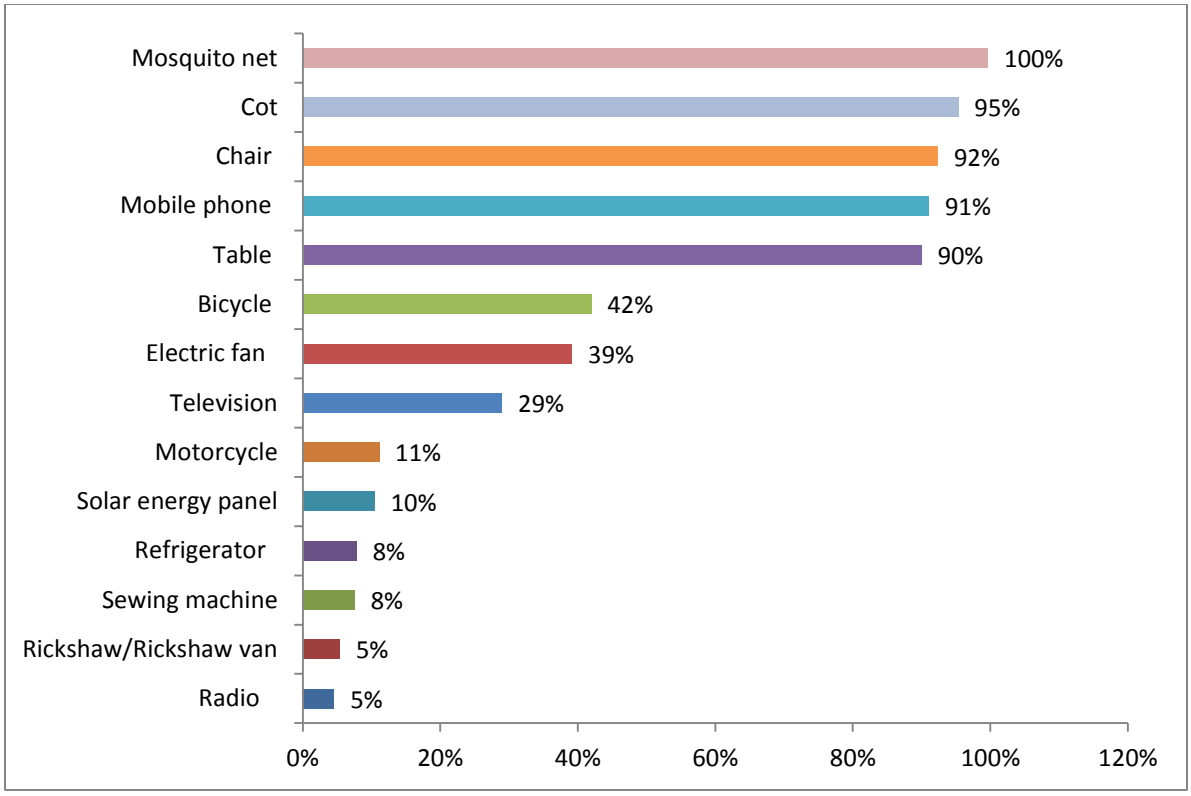

Figure 16: Ownership of Common Assets

In terms of agricultural and fishing assets, most households have basic hand tools, but very few own mechanized farm equipment, as shown in Figure 17.

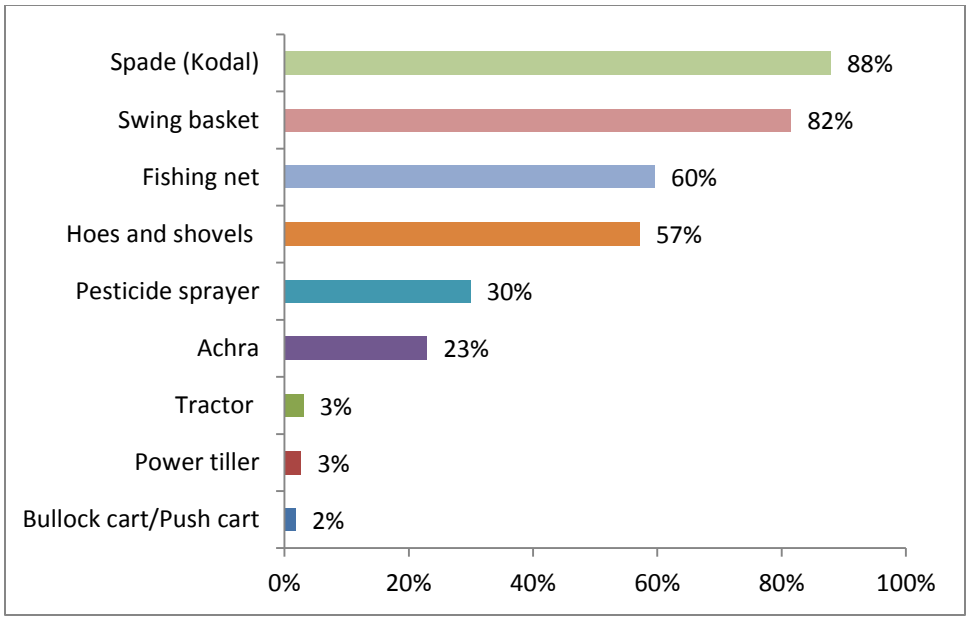

Figure 17: Ownership of Agricultural Assets

11.2 Income

Table 31 shows gross farm-related income per household, by type and aggregated. Income is measured through sales, and does not include imputed value of production. For the sample as a whole, farm-related income averaged $475 annually, most of which came from crop income.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Crops	841	27,335	41,611	11,550	342	520	144
Livestock and poultry	914	856	3,580	0	11	45	0
Animal products	914	1,892	5,001	0	24	63	0
Fishery	677	11,409	50,263	0	143	628	0
Total Farm Income	914	37,966	67,822	14,800	475	848	185

Table 31: Farm Income

Table 32 shows the variation in income across the sample, dividing into income quartiles. The lowest quartile has an average farm income of only $11 annually, less than one-tenth of the average for the highest quartile.

		Taka				USD			
	N	*mean*	*sd*	*min*	*max*	*mean*	*sd*	*min*	*max*
Quartile I	269	870	1278	0	4150	11	16	0	52
Quartile II	229	10016	3924	4200	17850	125	49	53	223
Quartile III	207	30026	8708	18000	48400	375	109	225	605
Quartile IV	209	123533	100271	48450	529900	1544	1253	606	6624

Table 32: Income Quartiles

Detailed data on other income sources was collected for the subset of households who received the extended version of the baseline questionnaire. Table 33 shows a summary of income sources, and shows that income varies widely across sampled households. The most important sources of non-farm

income are non-farm household enterprises, salary or wages from male household members, payments for casual labor to male household members, and remittances. Median annual household income was $1,478.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Total income from crops, livestock and fish	187	49,880	90,219	21,800	623	1128	273
Total farm income (agriculture and trees)	187	11,074	21,419	2,000	138	268	25
Total non-farm income	187	189,585	439,688	60,000	2370	5496	750
Total income	187	250,539	483,926	118,210	3132	6049	1478

Table 33: Household Income

The same subset of household also provided detailed expenditures data, which is reported in Table 34[13]. Households were asked to report expenditures over the last 12 months infrequent events such as purchase of land, assets, and housing, or payment of school fees or health insurance. In contrast, households reported expenditures for the last week on frequent events, such as communication, transportation, phone credit, and leisure activities. Food expenditure data was also collected for the previous week. By extrapolating weekly expenditures data for the last 12 months, we calculate median annual expenditures are $4,065.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Total infrequent expenditures	187	51,688	36,363	42,000	646	455	525
Total frequent expenditures	187	568,990	1,056,707	219,146	7,112	13,209	2,739
Total food expenditures	187	48,921	25,577	43,829	612	320	548
Total expenditure	187	669,600	1,071,114	325,190	8,370	13,389	4,065

Table 34: Household Expenditures

The most common sources of infrequent expenditures are: health expenditures and school fees. Households spent an average of $128 per year on health ($26 per capita) and $101 on school fees ($19 per capita).

The most important sources of non-food weekly expenditures are HH-owned non-agricultural enterprises. Households spent an average of $83 per week on their own enterprise ($14 per capita). However, these expenditures are highly variable; half of the households had no household enterprise expenses. Other important sources of frequent expenditures are communication (credit for mobile phones), and luxury items such as paan, cigarettes, tobacco and tea. Households spent an average of $13 per week on each ($2.50 per capita).

Weekly food expenditures average $12 per household. Table 35 shows a breakdown of expenditures by food category. The majority of households purchased root vegetables, other vegetables, beans, fish, oils and fats, sweeteners and condiments during the last week. Medians of zero for most categories indicate that the majority of households did not purchase food from those categories, instead relying on their own production. The highest expenditures were for fish, spices and condiments, red meat, and oils and fats.

[13] Expenditures data is winsorized at 5%

		Taka per week			USD per week		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Flour or bread	187	16	29	0	0.20	0.36	0.00
Rice	184	85	248	0	1.06	3.10	0.00
Noodles	187	8	26	0	0.10	0.33	0.00
Other cereals	187	0	2	0	0.00	0.03	0.00
Root vegetables	187	68	50	72	0.85	0.63	0.90
Vegetables	186	41	43	30	0.51	0.54	0.38
Fruits (fresh and dry)	184	35	79	0	0.43	0.99	0.00
Beans & lentils	186	54	48	45	0.68	0.60	0.56
Nuts & seeds	187	3	14	0	0.03	0.17	0.00
Eggs	186	24	35	0	0.30	0.44	0.00
Dairy products	183	21	53	0	0.27	0.66	0.00
Meat (goat, beef, lamb)	187	120	185	0	1.50	2.31	0.00
Poultry	187	53	122	0	0.66	1.52	0.00
Fish (fresh and dry)	185	160	157	120	2.00	1.97	1.51
Oil//fats (ghee, butter, oil)	187	102	59	120	1.28	0.74	1.51
Sweeteners	187	38	36	30	0.48	0.45	0.38
Soft Drinks, tea, fruit juices	185	24	33	0	0.30	0.41	0.00
Condiments & spices	187	124	85	100	1.55	1.06	1.25
Meals prepared outside HH	178	18	42	0	0.23	0.53	0.00

Table 35: Weekly Food Expenditures

11.3 Access to rural finance

Just over half of the households have any savings, formal or informal, as shown in Figure 18. A quarter of the households had taken out a loan to finance agricultural input purchases in the last 12 months. Approximately two-thirds of the households had outstanding loans at the time of the baseline.

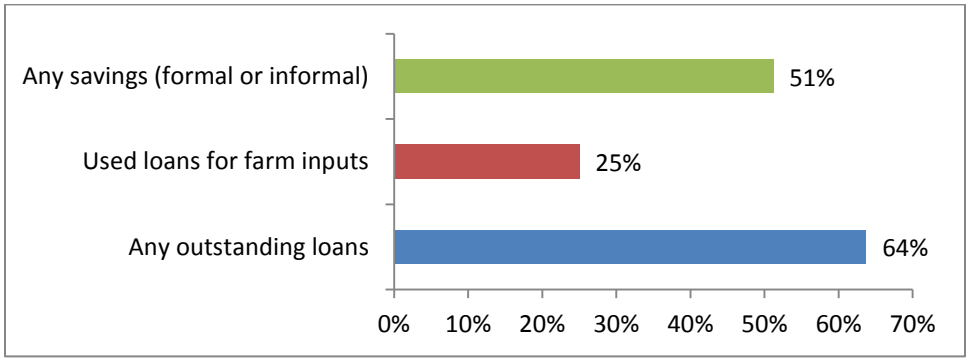

Figure 18: Rural Finance

Table 36 shows average levels of savings and debt. Households with savings reported an average balance of $258, but half of the households had $63 or less in current savings. Average household debt burden is $563 per household, but $250 or less for half of the households. Loans related to farm inputs averaged $353 per household.

		Taka			USD		
	N	*mean*	*sd*	*median*	*mean*	*sd*	*median*
Current amount of savings (if HH has any savings)	468	20616	45640	5000	258	570	63
Current amount of outstanding loans (if HH has any outstanding loans)	583	45049	69627	20000	563	870	250
Total amount of loans for farm inputs (if HH took any farm input loan)	229	28349	33669	20000	354	421	250

Table 36: Access to Rural Finance

12 Food Security

The baseline questionnaire included three measures of food security designed and tested cross-culturally by the Food and Nutrition Technical Assistance (FANTA) Project, USAID and the FAO. The three food security measures are: Household Hunger Scale[14], Women's Dietary Diversity Score, and Months of Adequate Household Food Provisioning. Together the indicators provide a comprehensive profile of food security. Multiple measures are necessary, since food security depends at once on adequate availability of food, adequate access to food, and appropriate food utilization and consumption.

The Household Hunger Scale is a simple, cross-culturally applicable indicator developed by FANTA to measure the prevalence of household hunger. The HHS is the most basic measure of the GAFSP food security indicators. It consists of six questions that measure occurrence and frequency of food insecurity events (such as a household member going to sleep hungry because there was not enough food). It estimates the proportion of households affected by three different severities of household hunger: little to no hunger, moderate hunger, and severe hunger, using a reference period of the previous 12 months. The HHS focuses on the food quantity dimension of food access. It measures food availability and access, but does not measure dietary quality.

The Women's Dietary Diversity Score (WDDS) is an indicator developed by the Food and Agriculture Office (FAO). It is meant to reflect, in a snapshot form, the economic ability of a household to access a variety of foods. Individual dietary diversity scores aim to reflect nutrient adequacy, as the evidence shows that an increase in individual dietary diversity score is related to increased nutrient adequacy of the diet. The WDDS is an aggregate of nine food groups with important micronutrients. Although there is no internationally-recognized benchmark, a low WDDS is proven internationally to be correlated with micronutrient deficiencies such as anemia or low vitamin A. The dietary diversity module was administered to an adult female household member, using a reference period of the previous 24 hours. The respondent was asked about her own food consumption.

The Months of Adequate Household Food Provisioning is a simple indicator of household food access. Respondents are asked if in any months of the past 12, there was not enough food to meet the needs of all household members, and in which months the shortages occurred. The MAHFP is measured on a scale of 0-12, in which 12 means the household met its food needs in all 12 months, and 0 means the household was not able to meet its food needs in any of the 12 months.

[14] The Household Hunger Scale is a required indicator for Feed the Future, the US government's global hunger and food security initiative (http://www.feedthefuture.gov/), and the US Agency for International Development's Food for Peace program,

12.1 Household Hunger Scale

The HHS shows that severe hunger is not prevalent in the sampled areas, as shown in **Error! Reference source not found.**. Less than 1% of the sampled household suffers severe hunger, and 96% report little to no food shortages.

	mean
Household hunger is little to none	94%
Household hunger is moderate	5.1%
Household hunger is severe	0.9%
N	685[15]

Table 37: Household Hunger Scale

Table 38 shows a more detailed analysis of the household hunger scale, breaking the sample down by farm size category. Landless households are significantly more likely to be food insecure. The rates of moderate and severe food insecurity are twice as high amongst the landless households compared to the overall sample. On the other hand, there is no severe hunger for households with medium or large landholdings.

Household hunger categories	Landless	Marginal	Small	Medium	Large
Household hunger is little to none	86.59%	94.74%	97.03%	97.47%	95.83%
Household hunger is moderate	10.98%	4.39%	1.98%	2.53%	4.17%
Household hunger is severe	2.44%	0.88%	0.99%	0.00%	0.00%
N	82	228	202	79	24

Table 38: Household Hunger Scale, by agricultural production quartile

12.2 Women's Dietary Diversity Score

While the HHS shows that accessing sufficient calories is not a significant problem for most households in the sample, the nutritional composition of diet is a greater concern. In the subset of households that received the extended version of the baseline questionnaire, an adult female in the household was asked detailed questions about her food consumption during the day prior to the interview. Less than a third of women report a highly diverse diet (6 or more food categories). The majority of women had medium levels of dietary diversity, consuming 4-5 different food groups. 16% of women had low dietary diversity, consuming foods from 3 or fewer food groups.

The most commonly consumed food groups are starchy staple foods, meat and fish, and fruits and vegetables (excluding leafy greens and vitamin-A rich fruits or vegetables). The correlation between nutrition / micronutrient access and dietary diversity is clear. Table 39 shows the food categories eaten by the majority of women in each dietary diversity tercile. Women with low levels of dietary diversity relied on staple food and fish. Only women with high dietary diversity are consuming nutrient-rich foods such as dark green leafy vegetables, eggs, and dairy products.

[15] This module of the questionnaire was included in 6 of the 8 districts, excluding Barisal and Rangpur.

Food Groups Consumed by ≥50% of women by Dietary Diversity Category		
Lowest Dietary Diversity (≤3 groups)	*Medium Dietary Diversity (4 – 5 food groups)*	*High Dietary Diversity (≥6 food groups)*
Starchy Staples Meat & Fish	Starchy Staples Meat & Fish Other Fruits & Vegetables Legumes, Nuts & Seeds Vit. A Rich Fruits & Vegetables	Starchy Staples Meat & Fish Other Fruits & Vegetables Legumes, Nuts, Seeds Vit. A Rich Fruits & Vegetables Dark Green Leafy Vegetables Eggs Milk & Dairy Products
n = 30	*n = 100*	*n = 57*

Table 39: Women's Dietary Diversity - Proportion of women consuming significant food groups

Figure 19 shows the overall proportion of women consuming different types of foods.

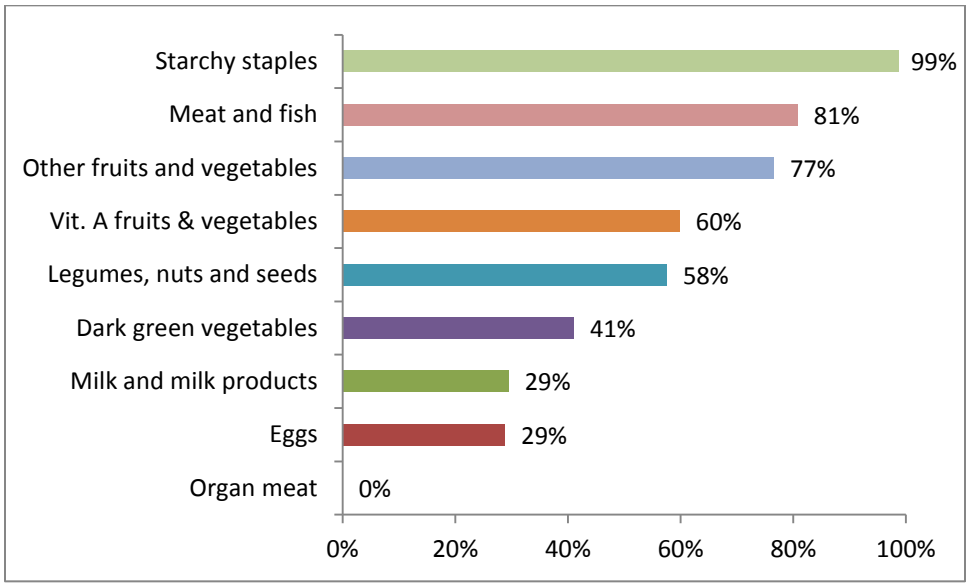

Figure 19: Proportion of Adult Women Consuming Food Group

Dietary diversity and the household hunger scale are clearly related. All of households classified as food-insecure by the HHS have low WDDS scores.

12.3 Months of Adequate Household Food Provisioning

83% of households reported no shortages of food in the past year. For the sample as a whole, the months of adequate household food provisioning was 11.7 out of 12. For the 17% of the sample reporting food shortages, in contrast, the MAHFP is 10.

The most common months for households to suffer food insecurity were Karthik 1418 (8% of households reported inadequate food), Ashin 1418 (7% of households), Chaitra 1418 (4%), Ashar 1419 (4%) and Srabon 1419 (4%). Less than 1% of the households reported inadequate food provisions in Ograhayon 1418, Poush 1418, and Magh 1418.

Households classified as food insecure by the HHS were much more likely than average to have had inadequate food: 93% of food-insecure households reported at least one month of food insecurity, compared to only 13% of food-secure households. Food insecure households had an average MAHFP of 9.7. The relationship between adequate food provisioning and dietary diversity is weaker. Households with low levels of dietary diversity were no more likely to report inadequate food over the past year than households with medium to high diversity.

12.4 Kitchen Gardens

Households who received the extended version of the baseline questionnaire provided information on household kitchen gardens. 29% report a kitchen garden, used to provide vegetables for household consumption. The most common crops in the kitchen gardens are: water gourd, pui shak, and lal shak. 80% of households applied inputs such as urea, manure, or fertilizer, or pesticides to their kitchen gardens.

APPENDIX 1:
DIME IAPP Impact Evaluation Concept Note

Bangladesh

The Global Agricultural and Food Security Program (GAFSP)

Integrated Agricultural Productivity Project (IAPP)

Impact Evaluation Concept Note

5 October, 2012

Contents

List of acronyms

BADC – Bangladesh Agricultural Development Corporation

DLS – Department of Livestock Services

DAE – Department of Agricultural Extension

DANIDA – Danish International Development Agency

DIME – Development Impact Evaluation Initiative

DoF – Department of Fisheries

FFS – Farmer Field School

GAFSP – The Global Agricultural and Food Security Project

IAPP – Integrated Agricultural Productivity Project

ICC – Intracluster Correlation

IFPRI – International Food Policy Research Institute

IPA – Innovations for Poverty Action

IPM – integrated pest management

IE – Impact Evaluation

MDES – minimum detectable effect size

MDG – Millennium Development Goal

PIU – Project Implementation Unit

USAID – United States Agency for International Development

1. Introduction

Over the last two decades, Bangladesh has achieved impressive growth and poverty reduction. Its agricultural sector grew at a rate of 4.8 percent between 1990 and 2005. But poverty-related food insecurity is widespread, bolstered by the soaring prices of key staples. The country has a poverty rate of over 30% and the highest incidence of malnutrition of all countries: in 2008, Bangladesh's food insecure population was estimated at 65.3 million.[1] The Government of Bangladesh is pushing for increased use of technology and more intensive agricultural practices to improve food security and sustain economic growth. In 2009, the Bangladeshi Government expanded its social safety net programs and allocated US$500 million in stimulus packages to support its agriculture among other sectors.

The Global Agriculture and Food Security Project (GAFSP) sponsors the Integrated Agricultural Productivity Project (IAPP) in Bangladesh, which is designed to develop new technologies and boost adoption through the farmer field schools approach (FFS).

The Impact Evaluation (IE) of the IAPP project will contribute to understanding the drivers of technology adoption through two lenses. First, the overall project approach will be evaluated using uses a randomized phase-in of project villages. This will be referred to as the "Overall Project Evaluation." Second, innovations will be tested to understand, within the approach, what mechanisms can deliver higher results. We will refer to this as the "Demonstration Plot Evaluation"

The Demonstration Plot Evaluation is designed to test a fundamental question about technology adoption: to what extent can "learning by doing" increase technology adoption over "learning by observing"? To answer this question, we will explore methods to improve technology adoption in farmer groups by comparing the relative effectiveness of single demonstration plots (the standard approach) to more distributed demonstration strategies which allow more people to experiment with new technology. This will be a randomized controlled trial, assigning different approaches to demonstration to different farmer groups. This IE will help the government understand how to best organize demonstration within a FFS, providing rigorous evidence on what approach leads to the highest level of technology adoption. It is designed to provide actionable results early in the project, allowing the government to incorporate its findings into the program implementation.

This impact evaluation is led by the World Bank's Development Impact Evaluation Initiative (DIME), the South Asia Agricultural Development team (SASDA), and the Government of Bangladesh's IAPP project implementation unit. It is in collaboration with and external research partners, the Yale University School of Management and the NGO Innovations for Poverty Action.

[1] Food and Agricultural Organization of the United Nations (FAO) and World Food Program (WFP). 2008. "FAO/WFP Crop and Food Supply Assessment Mission to Bangladesh".

2. The IAPP Project

The IAPP project is designed to improve the income and livelihoods of crop, fish, and livestock farmers in Bangladesh. It consists of four separate components:

1. Component 1: Technology Generation and Adaptation
2. Component 2: Technology Adoption
3. Component 3: Water Management
4. Component 4: Project Management

After consultations with the government and the Bank teams, it was decided that the impact evaluation would concentrate on the Components 2 and 3, which promote the adoption of more productive agricultural technology (including irrigation).[2]

The technology adoption component is comprised of three sub-components which will be promoted:

1. **Crops:** The Department of Agricultural Extension (DAE) will promote the use of new seeds and farming practices. These include improved rice varieties, vegetable production, legume production, farmyard manure, and green manure.
2. **Fisheries:** The Department of Fisheries (DoF) will promote new breeds and more intensive fish cultivation. Four breeds will be promoted: mono-sex tilapia, rui, thai koi, and pangas. Semi-intensive cultivation, including fertilization and feeding will be introduced.
3. **Livestock:** The Department of Livestock Services (DLS) will promote improved livestock management practices. These include goat vaccination, backyard poultry production, and improved dairy milk production.

IAPP will promote technology adoption through the Farmer Field School approach (FFS). FFS involves forming groups of farmers who meet bi-weekly to discuss their most important challenges in farming and work with extension agents to develop solutions to these problems. These groups become an important venue to promote and diffuse new technology. Farmer groups will consist of "Demonstration Farmers", who receive subsidies from IAPP to demonstrate new technologies, and "Adoption Farmers", who consist of the rest of the group and are encouraged to adopt the new technology with limited subsidies (but will receive training and guidance in the technology as part of the FFS).

FFS represents represent a major shift from the traditional agricultural extension approach practiced in Bangladesh, commonly referred to as the training-and-visit system (T&V).[3] Under T&V,

[2] Since the IE will be conducted early in the lifetime of the project, Components 2 and 3 will be promoting previously-developed technologies. Technologies developed by Component 1 should be part of the adoption efforts of IAPP, but only in later years.

extension agents meet with small groups of farmers to introduce new technologies, and urge these farmers to spread their experiences to their neighbors. FFS hopes to provide farmers with not just new technologies, but the knowledge to become informed and continually improving producers.[4] Under FFS, farmers are encouraged to interact with extension agents to develop customized solutions to their problems, and work to best adapt new technologies to their specific conditions. In theory, FFS will be more effective at technology adoption since it teaches farmers to be critical users of technology, as opposed to just adopting based on the urging of extension officials.

The project will take place in eight districts: Rangpur, Kurigram, Nilfamari and Lalmonirhat districts in the North and Barisal, Patuakhali, Barguna and Jhalokathi districts in the South. The project has selected 375 unions (sub-districts) which will receive project activities. IAPP expects to reach around 300,000 beneficiaries.

The Overall Project Evaluation will measure the effects of Components 2 and 3 of IAPP, with special focus on the crops and fisheries sub-components. The Demonstration Plot Evaluation will focus on the crops sub-component.

3. The Demonstration Plot Evaluation

3.1 Motivation

The IAPP promotes a very ambitious change in the way extension services are implemented in Bangladesh. The DIME-GAFSP collaboration offers a unique opportunity to use impact evaluation (IE) to take this learning experience to the next level and rigorously assess the benefits of different models. The proposed IE is closely aligned with the project objectives, and will allow the team to find out which approach to demonstration leads to higher rates of technology adoption within the farmers field school model.

(1) Standard demonstration plots work by transferring certain types of knowledge about a new production process to farmers. Primarily, this is information about the availability of the demonstrated crop and an example of yields *under certain conditions* on the plot of the demonstration farmer. However, farmers who are thinking about adopting a new farming process don't know how these yields that they are observing compare to yields they would themselves receive. These differences could be due to differences in soil quality, input usage, cultivation knowledge, etc. In fact, it is well documented that yields on farmer's fields in Bangladesh rarely approach the yields on

[3] Picciotto, R (1997). "Reconsidering agricultural extension". *The World Bank research observer (0257-3032)*, 12 (2), p. 249.

[4] Gotland, Erin M., Elisabeth Sadoulet, Alain De Janvry, Rinku Murgai, and Oscar Ortiz. 2004. "The Impact of Farmer Field Schools on Knowledge and Productivity: A Study of Potato Farmers in the Peruvian Andes." *Economic Development and Cultural Change* 53, no. 1:63–92.

demonstration plots.[5] If demonstration plots do not provide a realistic indication of potential yields from a new technology, this is likely to affect their ability to promote technology adoption. Additionally, it might result in a situation where farmers adopt crops ill-suited to their land, resulting in welfare loss.

One way to overcome this problem may be to simply have **(2) more demonstration farmers**: if farmer group members see more of their neighbors becoming successful growing a new crop[6], they are more likely gain accurate information about their chance of success. Furthermore, this allows more member of the farmer group to 'learn by doing', possibly making them more likely to continue growing the new crop. In a study on technology adoption during the green revolution in India, Foster and Rosenszweig[7] find that farmers' own experiences and that of their neighbors are important drivers of technology adoption and income.

Perhaps the greatest effect of 'demonstration' could even come from **(3) complete decentralization**. Under this model all members of the farmer group are encouraged to cultivate small 'demonstration' plots on their own land, essentially moving from 'learning by observing' to 'learning by doing'. In this case, all participating farmers would have an opportunity to learn how to cultivate the new crop, and would get a more accurate measure of what the yields on their own farm would be. But demonstration plots are costly to support, requiring the project to invest in seeds fertilizer, advice, and other inputs. Given a fixed amount of funding, increasing the amount of demonstration farmers requires having smaller plots, and potentially giving up on economies of scale. It's not clear what the optimal number of demonstration farmers is. In addition, farmers may need some additional incentives to participate in this scheme, given that they are not yet confident that the new crop will be an improvement over their old practices.

With these concerns in mind, the IAPP and DIME are planning to evaluate the relative effectiveness of three different demonstration approaches: standard demonstration plots, shared demonstration plots, and self-demonstration. Results from this evaluation will be rapid, with a survey in 2014 that will measure which approach led to the greatest adoption of the new seeds. These results can be immediately fed into the IAPP strategy for new and existing farmer groups, and can also be used to improve the design of future projects.

3.2 Evaluation Question and Description of Demonstration Approaches

The Demonstration Plot Evaluation attempts to test which approach to crop demonstration will cause the most farmers to adopt improved technologies in the following season. The three different demonstration approaches tested are:

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[5] Sattar, Shiekh A. "Bridging the Rice Yield Gap in Bangladesh". In Bridging the Rice Yield Gap in the Asia-Pacific Region. By Minas K. Papdemetriou, Frank J. Dent and Edward M. Herath. Food and Agricultural Organization of the Uniiter Nations Regional Office for Asia and the Pacific. Bangkok, Thailand. October 2000.

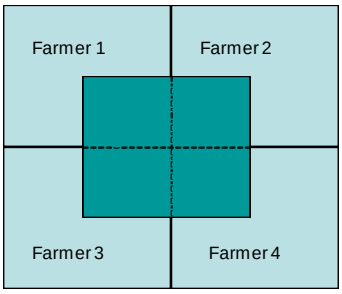
[6] Note that this "new crop" can be thought of as a different crop or simply a new variety of a previously cultivated crop.

[7] Rosenzweig, Mark R. "Learning by Doing and Learning from Others: Human Capital and Technical Change in Agriculture". University of Chicago Press. Journal of Political Economy, Vol. 103, No. 6 (Dec., 1995), pp. 1176-1209

1. **Regular Demonstration plots**- This is the status quo in IAPP. For each type of technology introduced into the group (1-4 crops), one demonstration farmer is chosen. These demonstration farmers receive a 'package' of free seeds, fertilizer, and training. The selected farmers cultivate the promoted crop in the first year, and the rest of the group is expected to learn from this experience. In the second year, the rest of the farmers are encouraged to grow the crop. Farmers that adopt the technology in the second year receive free seeds but no inputs or special training from the project.

2. **Shared Demonstration Plots**- In this intervention, each demonstration 'package' (seeds, fertilizer and trainings) will be shared by two to four group members, as opposed to just one in the standard IAPP project. Where possible, the selected farmers will create demonstration plots on contiguous patches of land (see Figure 1 for a schematic), and they will be encouraged to work together to capture economies of scale. As in the demonstration plot intervention, demonstration farmers will receive free seeds, free inputs and trainings, but these resources will be spread over more farmers.

Figure 1: Shared Demonstration Plot. Dark green represents improved seed production.



3. **Incentives for Self-demonstration**- In this intervention, all members of the farmer field group are given the opportunity to grown the promoted variety in the first year, and the inputs that would be used on demonstration plots are instead spread out over all farmers who wish to participate. Farmers will be encouraged to grow the new crop on a small patch of land to test it out. Farmers who agree to grow the new crop in the first year will also receive an additional incentive: if the promoted variety does not perform as well as the old variety, they will receive a small cash payment (1000 taka, around $12.3 USD). The primary purpose of this payment is to send a signal to the farmers that the extension providers are confident that the new seed will perform better than the old. In order to see whether the payment should be applied, at the beginning of the season each participating farmer will pick a neighbor growing an older variety of the crop to be a reference farmer. If output on the reference farm is lower than output of the promoted variety, the farmer would receive his

small payment.[8] These payments would be made by DIME's research partner, the NGO Innovations for Poverty Action (IPA) using their own core research funding for Bangladesh.

3.3 Demo Plot Evaluation Design

The technology adoption experiment will be evaluated using a randomized controlled trial in two districts, Rangpur and Barisal. Within these districts, 220 villages will take part in the evaluation.

Before the cropping season, these villages will be randomly allocated into five treatment arms:

1. **Long Term Control (20 villages)**: Standard project activities (demonstration plots) beginning the final year of the project. Until then, they will have no project activities, and will just receive normal extension services from the government (roughly corresponding to the T&V system described above.)
2. **Short Term Control (36 villages)**: These villages will have standard project activities (demonstration plots) beginning in 2014. Until then, they will have no project activities, and will just receive normal extension services from the government.
3. **Demonstration Plots (54 villages):** These villages will have the standard IAPP project activities beginning in 2012.
4. **Shared Demonstration Plots (56 villages):** These villages will have demonstration plots shared among multiple farmers, as described above. These villages will start project activities in 2012.
5. **Incentives for self-demonstration (54 villages):** Instead of demonstration plots, all farmer group members will be offered an incentive to adopt the new crop variety, as described above. These villages will start project activities in 2012.

The short-term impact of the various treatment arms on variables of interest will be captured by comparing the outcome variables of each treatment group with both control groups, with data taken right before the project is rolled out in the short term control villages in 2014. Long-term impact will be determined with another round of data collection before the project is rolled out in the long term control villages in 2016.

3.4 Sampling

This section contains the sampling strategy for the Demonstration Plot Evaluation. This evaluation is taking place in two project districts, Rangpur and Barisal, as a pilot to inform scale up. Rangpur and Barisal were selected due to their high crop activity, and to give representation of one village from the North and one from the South.

[8] Note that this measurement will be done during the seeding phase of the plant, which gives a good prediction of the harvest, and will be conducted by IPA under supervisions of DIME. For data analysis purposes, yields will be measured post-harvest using household surveys. Since the surveys are not tied to the payouts, there should be no incentive to mis-report. Additionally, farmers will have to sign a contract saying they will cultivate the new crop to the best of their abilities, and this will be monitored by the FFS. To the extent that it is observable, farmers will not be able to receive a payout if they purposefully try to obtain poor yields on their demonstration plots.

3.4.1 Village Sampling

For the evaluation, we sampled 220 villages, 110 from Rangpur and 110 from Barisal. The village sampling strategy was as follows.

1. Start from the list of all villages eligible to receive the crop component in 2012.
2. Select a random sample of 220 villages, 110 from each district.
3. Randomize the 220 groups into the five treatment arms described above, stratifying by district.

This randomization was done by the DIME team using the randomized number generator in STATA, and was approved by the PIU.

3.4.2 Individual Sampling

For the Demo Plot Evaluation individuals were sampled for the baseline survey after farmer groups were formed. In each farmer group, 15 members were randomly chosen to be surveyed from the complete list of all members of the farmer group.

3.4.3 Power Calculations

In order to inform the sampling strategy, power calculations were undertaken using data from a recent USAID agricultural survey conducted by the International Food Policy Research Institute (IFPRI). This survey data was ready for one district that is part of the IAPP project (Barisal) which was used to conduct the power calculations. For calculating the predictive power at the baseline a panel survey is required, so we used data from an agricultural panel in India.[9]

The main outcome variable for the Demonstration Plot Evaluation will be the number of farmers who adopt and sustain use of the promoted crops. As the demonstration techniques are new, we don't have an accurate prediction of the effect size. (Note that we will be using a linear probability model to detect effects.)

Given these constraints, we used the data on paddy yield from our reference data to calculate intra-cluster correlation, and then settled on a sample size that resulted in a reasonably low minimum detectable effect size (MDES) given economic and logistical constraints.[10] As shown in Table 1, the MDES between any two treatment arms is .3

[9] The R^2 value calculated using total agricultural revenue from farmers in Gujarat, India. Survey described in: Cole, Shawn Allen, Giné, Xavier, Tobacman, Jeremy Bruce, Townsend, Robert M., Topalova, Petia B. and Vickery, James I., Barriers to Household Risk Management: Evidence from India (April 11, 2012). Harvard Business School Finance Working Paper No. 09-116

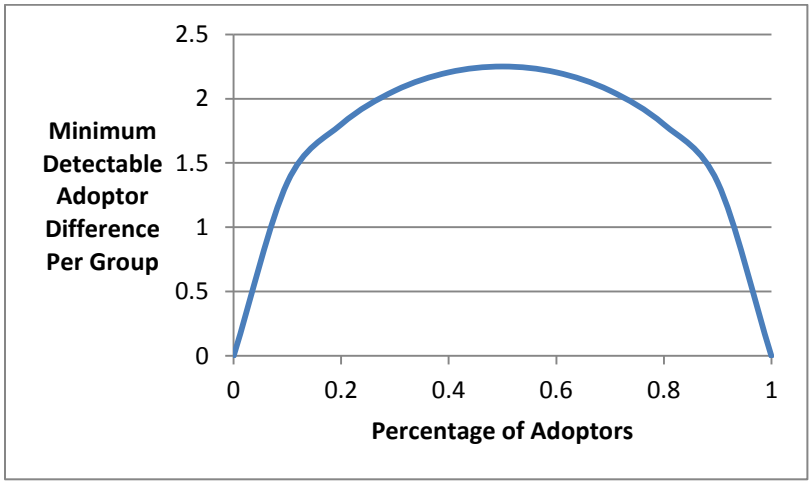
[10] The minimum detectable effects size is the minimum difference between two treatment arms that can be detected with a given power, normalized in standard deviations of the outcome variable. Therefore, an MDES of .3

Table 1: Power Calculation Data

Number of Villages	55
People Sampled Per Village	15
Intra-Cluster Correlation	.146
R^2 from baseline	.5
Size (α)	.05
Power	.85
MDES	.3

How can we interpret this MDES of .3? Since the outcome variable is binary, we can calculate its standard deviation for all values, and then calculate the difference in adoption to detect an effect of .3 for all possible average values of the outcome variable. This is presented in Figure 2 below:

Figure 2: Interpretation of MDES of .3



As Figure 2 shows, this MDES of .3 will allow us to detect relatively small effects in differences between the number of adopters in each treatment arm. Even in the situation where the effect is hardest to discern (which is where half the sample adopts), we will need an average difference of just over two adopters (per group of 15) to detect effects between treatment arms.

4. The Overall Project Evaluation

means that we can detect a difference between any two treatment arms of .3 standard deviations of the mean of the outcome variable.

The Overall Project Evaluation measures the overall effect of IAPP activities on farmer livelihood. Its primary focus is on crops and fisheries groups, while also attempting to measure the effect of livestock and water management activities.

4.1 Motivation

Although Bangladesh has seen increases in agricultural productivity over the last decades, its farmers are still producing far below potential. The estimated yield gap for paddy corresponds to a potential yield increase of 24% and 55% for the boro and aus seasons respectively.[11][12] Additionally, there is much opportunity to increase fish yields; in 2005/06 Bangladeshi fish farmers had an average productivity of 3.24 t/ha, which is far below potential yields.[13]

The Bangladeshi government continues to invest in increasing the productivity of crop, fish, and livestock farmers through a large network of agricultural extension providers. Under normal circumstances, local agents engage in demonstrations and outreach, using an approach based on the T&V model discussed earlier.[14] IAPP provides an evolution of this strategy through the use of the farmer field school (FFS) approach.

In theory, Farmer field Schools should provide improved results over T&V through a number of mechanisms. One way to codify this is through Rogers' influential description of the "innovation-decision" process.[15] Rogers breaks down this decision into five steps: knowledge, persuasion, decision, implementation, and confirmation. While both FFS and T&V spread knowledge, FFS goes much further along each step of the process. By providing continued classes extolling the virtues of new technology a FFS is much more *persuasive* than the T&V approach. By providing input subsidies, FFS makes the initial adoption *decision* much easier. Through continued classes and instruction, the farmer is more likely to have a successful *implementation* of the technology, making him more likely to *confirm* his decision by continuing use of the technology. While there are many different approaches to FFS, they all provides a far more intensive and prolonged effort to spur technology adoption.

Farmer field schools were first introduced in Indonesia in the 1980s to promote integrated pest management (IPM), and spread to Bangladesh by 1994.[16] While they have subsequently been

[11] A. H. M. M. Haque, F. A. Elazegui, M. A. Taher Mia, M. M. Kamal and M. Manjurul Haque. "Increase in rice yield through the use of quality seeds in Bangladesh." African Journal of Agricultural Research Vol. 7(26), pp. 3819-3827, 10 July, 2012. http://www.academicjournals.org/ajar/PDF/pdf2012/10%20Jul/Haque%20et%20al.pdf

[12] Sayed Sarwer Hussain. "Bangladesh, Grain and Feed Annual 2012" USDA Foreigh Agricultural Service. http://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Dhaka_Bangladesh_2-22-2012.pdf

[13] Dey MM, Bose ML, Alam MF. 2008. Recommendation Domains for Pond Aquaculture. Country Case Study: Development and Status of Freshwater Aquaculture in Bangladesh. WorldFish Center Studies and Reviews No. 1872. The WorldFish Center, Penang, Malaysia. 73 p.

[14] Although T&V describes the traditional approach to agricultural extension in Bangladesh, it's not entirely accurate to assume that non-project areas (including control villages) are precisely practicing T&V. Some places might group-based approaches, but not with the level of organization and resources provided by IAPP.

[15] Rogers, Everett M. *Diffusion of innovations*. Simon and Schuster, 1995.

[16] Arnoud Braun, Janice Jiggins, Niels Röling, Henk van den Berg and Paul Snijders. "A Global Survey and Review of Farmer Field School Experience." Report prepared for the International Livestock Research Institute. June 12, 2006.

adopted to cover a wide variety of cropping patterns, much of the evidence on effectiveness of FFS covers IPM. A review of 25 impact evaluations of IPM FFS finds mostly positive effects, with FFS causing decreased pesticide usage and sometimes increased yields.[17] Studies on the impact of FFS for other technologies are far more limited. IFPRI conducted a study of FFS in three countries in East Africa, finding generally increased agricultural yields and farmer income for participants in FFS.[18] Additionally, DANIDA conducted an impact evaluation of two FFS programs in Bangladesh, finding a wide array of positive effects on farmer livelihoods.[19] However, both these evalautions relied on a retrospective creation of a control group using propensity score matching, calling into question the robustness of the results.

Despite a lack of hard evidence, the government of Bangladesh has been expanding the FFS approach past IPM[20]. However, FFS is more expensive than traditional extension approaches, so it is generally executed with donor support and is not yet widespread. This evaluation will assist the government of Bangladesh to understand the effectiveness of the intensive FFS approach versus traditional extension techniques, and to understand the extent to which it should be modified or scaled up.

4.2 Evaluation Questions

The main evaluation questions will be as follows:

- To what extent does the FFS approach promoted by IAPP cause increased and sustained technology adoption?
- What level of adoption is driven from increased subsidies (demonstration farmers) versus knowledge and learning (adoption farmers)?
- What are the differential effects for male versus female group members?
- Do the groups have spillover effects on other farmers who are not members?
- What are the long versus short run effects of IAPP? Do income effects allow continued adoption of improved crops?

[17] Henk van den Berg. "A Synthesis of 25 Impact Evaluations." Wageningen University, January 2004 Prepared for the Global IPM Facility.

[18] Kristin Davis, Ephraim Nkonya, Edward Kato, Daniel Ayalew Mekonnen, Martins Odendo, Richard Miiro, Jackson Nkuba. "Impact of Farmer Field Schools on Agricultural Productivity and Poverty in East Africa." IFPRI Discussion Paper 00992. June 2010.

[19] "Evaluation of the Farmer Field School Approach in the Agriculture Sector Programma Support Phase II, Bangladesh". Minsitry of Foreign Affairs of Denmark. November 2011.

[20] Hein W.L. Bijlmakers , Muhammad Ashraful Islam, "Changing the strategies of Farmer Field Schools in Bangladesh," Agricultures Nework. http://www.agriculturesnetwork.org/magazines/global/ecological-pest-management/changing-the-strategies-of-farmer-field-schools-in/

The Overall Project Evaluation is designed to most accurately pinpoint the effects of the crop and fisheries components, but will also produce results on livestock and water management.[21]

4.3 Evaluation Design

The evaluation is a randomized controlled trial, using a randomized phase-in of project villages for identification. The evaluation is designed to test both the long-term and short-term effects of the program.

For the Overall Project Evaluation, we include 96 villages that will receive at least crop and fisheries groups. Out of the 96 villages included in the evaluation, 48 will receive the project in 2012 (Treatment Villages), 24 will receive it in 2014 (Control Villages), and 24 (Long Term Control) will receive it in the last year of the project. These villages were randomly selected from the list of 96 villages that were eligible to begin the treatment in 2012. The villages that enter the project in later years will serve as control villages for those that enter the project in earlier years.

The randomization was jointly conducted by DIME and the PIU, using the random number generator in Microsoft Excel.

4.4 Sampling

4.4.1 Village Sampling

For the Overall Project Evaluation, 96 villages were sampled from 6 districts. In these districts, the selection of villages was conducted as follows:

1. We started with a list of all villages from each district that were eligible to begin project activities in 2012, and are slated to receive crop, fisheries, and livestock groups.

2. This list contained two villages per union (a smaller administrative unit). Therefore we randomly picked 8 unions per district to get our sampling frame of 96 villages.

3. Within each selected union, one village was randomly chosen as treatment and one as control.

4. At a later date, control villages will be divided into long term and short term control. Within each district, half of the unions will be randomly selected. These selected unions will have their control village assigned to be a long-term control (24 in total).

This results in a sample of 48 villages that will receive the project in 2012 (Treatment Group), 24 that will receive the project in 2014 (Short Term Control), and 24 that will receive the project in the final year of program operations (Long Term Control).

[21] The sampling has been done to pinpoint people who are eligible for fisheries and livestock groups, as these groups have the most restrictive criteria. These people are generally eligible for livestock and water management activities as well, and will receive them if it is logistically possible from a project perspective.

4.4.2 Individual Sampling

The project will primarily affect households who join farmers groups. However, these groups do not exist at baseline, and activities start quickly after group formation, leaving no time for a baseline to take place on these groups.[22] Hence we will sample based on a pre-identification of households that would be most likely to join farmer and fisheries groups, based on observable characteristics, and then re-sample to add other respondents during the midline and end line if needed. The sample was drawn from village-level lists of households that met the minimum eligibility criteria according to a rapid census, and also live close to one another, as geography is an important consideration in group formation. The IAPP team took this information into account when forming groups, which eased the operations on the ground and implies that most of our sampled population is likely to be included in the formed groups.[23]

Prior to sampling, a census was conducted in each village to determine group eligibility criteria and also determine other factors which make farmers more likely to join groups. Farmer groups consist of both demonstration farmers and adoption (non-demonstration) farmers, and there are different eligibility criteria for each. As we want to measure the program's impact on both types of farmers, our approach sampled a mix of demonstration and adoption farmers. The eligibility criteria were:

- **Crop, Adoption Farmer:** Small/Marginal farmer (< 2.5 ha cultivable land, prioritizing those with .21-5ha)
- **Crop, Demo Farmer:** Access to .5-1 ha of cultivatable land, willingness to engage in demonstration
- **Fisheries, Adoption Farmer**: Small/Marginal farmer, owns or rents a fish ponds between 13-100 decimals
- **Fisheries, Demo Farmer:** Small/Marginal farmer, owns or rents a fish ponds between 13-50 decimals

The other factors considered were:

- Size of family (larger families likely to join)
- Whether Crops/Fisheries are the primary source of income
- Grow grains/legumes/oilseeds (more likely to join crop group)
- Willingness to engage in demonstration

Based on these criteria, we developed a list of people most likely to join farming or fisheries groups, and then selected a cluster of 8 people (each for fish and crops) to sample for the baseline.[24]

[22] We did survey after group formation for the Demonstration Plot Evaluation, but due to limited time it was not possible to survey the villages for the Overall Project Evaluation as well in this short time frame.
[23] The groups are formed using a village participatory approach, so the IAPP team has limited control over who ends up in groups.
[24] The selection algorithm used GIS data select based on eligibility and geographical distance from a central node.

Additionally, one of the evaluation questions is to understand the spillover of project effects to people who do not join groups. This strategy will result in sampling some people who are eligible to join groups but do not end up doing so, which will allow us to test for spillover effects of the program.

4.4.3 Power Calculations

As in the previous section, power calculations were undertaken primarily using data from a recent USAID agricultural survey conducted by IFPRI in Barisal district (which is one of the IAPP districts). Estimates of the predictive power of baseline statistics come from a panel dataset in India.[25]

The IFPRI survey contains data on three of our primary outcome indicators: paddy yield, fish yield and household expenditure. Therefore, we concentrate on these measures for the power calculations. For an estimate of the program's effects, we turn to the results framework, which predicts a short-term increase of 300 kg/ha for paddy and 500 kg/ha for fish. It predicts a long-term increase of 500 kg/ha for paddy and 700 kg/ha for fish.

Although not included in the results framework, we also seek to measure the effect on household income, which is proxied by per capita expenditure. The IAPP project documents do not contain an estimate for the expected effect on per-capita income, so we apply a standard assumption of a standard effect size of .2 for the short term, and .25 in the long term.

Finally, we need to account for the increase in precision provided by our baseline. As the IFPRI survey is a cross-section, it is not informative about the expected R^2 from baseline data. Therefore, we use estimates from an agricultural survey conducted in India to make informed guesses about the R^2 for income and yield. This survey did not contain data on fish yields, so we estimate the R^2 for fish to be zero in order to remain conservative.

The data necessary for the power calculations is illustrated in the table below:

Table 2: Power Calculation Data

	Average	Standard Dev	Incremental Change Expected (Long Term)	Expected Normalized Effect Size (Long Term)	Incremental Change Expected (Short Term)	Expected Normalized Effect Size (Short Term)	Village Intracluster Correlation (ICC)	R^2 from baseline
Paddy Yield (kg/ha)	3410	1977	500	.25	300	.15	.146	.5

[25] For the R^2 We use agricultural revenues as a proxy for yield and total expenditure to proxy for income.

Fish Yield (kg/ha)	1836	1944	700	.36	500	.25	.054	0
Expenditure (taka/month /hh)	2713	1553	311	.25	389	.2	.098	.25

For crops, in addition to the 96 villages sampled for the Overall Project Evaluation, we will also use data from 110 villages that are part of the Demonstration Plot Evaluation to increase precision.

In some specifications, the number of villages is not balanced among treatment and control or the number of people sampled is not the same in all villages. When this lack of balance occurs, we perform power calculations using formulas assuming balance, but replacing the unbalanced elements with their harmonic means.[26] For the short term analysis of crops, our sample has 206 villages with an equivalent of 10 people surveyed per village. For long term analysis of crops, we have an equivalent of 129 villages (again with 10 people surveyed).

Samples and their predicted MDES are summarized in Table 2:

Table 3: Sampling Results (85% power)

	Individuals / group (Balanced Equivalent)	Number of groups (Short Term)	Expected Normalized Effect Size (Short Term)	Short Term MDES	Number of groups (Long Term, Balanced Equivalent)	Expected Normalized Effect Size (Long Term)	Long Term MDES
Paddy Yield (kg/ha)	10	206	.15	.17	129	.25	.21
Fish Yield (kg/ha)	8	96	.25	.27	72	.36	.30
Expenditure (taka/month /person)	15	412	.2	.12	227	.25	.16

[26] This strategy is suggested in the user's guide for Optimal Design software, which was used to perform these calculations. User guide can be found here: http://pikachu.harvard.edu/od/od-manual-20111016-v300.pdf.

For crops, at a power of 85% these numbers result in a minimum detectable effect size (MDES) of .17 for the short term comparison. [27] For the long term comparison, we foresee a MDES of .21.

For fisheries, we will have 96 villages in the short term and the equivalent of 72 in the long term. Based on surveying 8 people per group, this leads to an MDES of .27 in the short run, and .30 in the long run.

We can calculate income changes using people from all crop and fisheries groups. If we pool the income effects from both components, and assume clustering at the group level, we end up with 412 groups short term and 227 long term, with a sample of 10 people per group. This achieves an MDES of .15 in the short term and .18 in the long term.

As shown in Table 2, nearly all the results achieve comfortable power with the given sample. The one exception is the short term estimate of paddy yield, where the expected normalized effect size is a bit smaller than the short term MDES. In this case, the power to detect the predicted effect size of .15 is 79%, which is a bit lower than ideal. However due to logistical constraints it was not feasible to increase the sample size.

5. Data

The data for the impact evaluation (both the Overall Project Evaluation and the Demonstration Plot Evaluation) will come from three household surveys: a baseline survey conducted from Aug-Oct 2012, a follow-up to be conducted from July-Sept 2014, and an endline to be conducted from July-Sept 2016. The survey questionnaire will be guided by project goals, the results framework, and the GAFSP monitoring and evaluation framework. It will collect detailed data on crop, fisheries, and livestock practices, and will directly report on the causal impacts of the project on the Project Development Objectives as defined in the results framework:

- *Improved Crop Productivity:* The main indicator will be crop yields, measured in kg/hectare, during all three growing seasons (particularly Kharif and Rabi). We will also the exact variety of crop grown, and usage of inputs such as irrigation, improved seed, fertilizer, farmyard manure, and green manure, along with adoption of promoted crops such as mung and cucumber. The collection of inputs will allow measurement of not both revenue and agricultural profits.
- *Improved Fisheries Productivity:* The main indicator will be fish yields, measured by kg/hectare. We will also track the adoption of improved fish varieties and cultivation practices.
- *Improved Livestock Productivity:* For cows, we will measure liters of milk per cow per day. For goats and chickens, we will look at sales and consumption of meat and eggs.

[27] All calculations assume a chance of Type I error to be 5%.

We will also include the following indicators from the GAFSP monitoring and evaluation framework:

- Total Income
- Total income from agriculture (disaggregated by crop, fisheries, and livestock)
- Food security (measured by Household Hunger Score and Dietary Diversity Score)

Since many of these new technologies will require increased spending on inputs (including family labor), we will also measure input spending closely in order to evaluate farm profits. We also will map the social networks within groups in order to understand how relationships affect technology adoption.

Costing exercises will also be carried out to understand how much it would cost to scale up both the overall IAPP FFS model and the different demonstration approaches in the Demonstration Plot Evaluation. This will allow us to conduct cost-benefit analysis.

6. Internal and External Validity

The main threat to internal validity of this study is that the assignment of treatment and control villages may not be respected. Although the PIU has agreed to the evaluation plan, local officials are not always aware of the need to avoid operating in control groups, and exactly where and how to implement the different interventions in the Demonstration Plot Evaluation.

In order to mitigate this risk, DIME is working with Innovations for Poverty Action (IPA) to closely monitor the situation on the ground, and work closely with local officials to ensure that they respect the evaluation plan to the best of their abilities. During the implementation of the Demonstration Plot Evaluation, monitors from IPA will attend the group meetings to ensure that the interventions are taking place in the correct villages, and to gather data on who agrees to be a demonstration farmer. Similarly, IPA monitors will assist with the measurement of crops which determine the incentive payout.

The main threat to external validity is if the villages selected for our sample are not representative of Bangladesh as a whole. As we were provided with a list of eligible villages from the district officials, it is not clear whether they constitute a representative sample. However, it was necessary for the evaluation to work within the constraints of the project, which could only work in areas where it had the required resources in place.

6. Evaluation Team

This evaluation will be managed by DIME, with close collaboration with the IAPP World Bank Project Team and the IAPP PIU. The DIME team consists of:

- Florence Kondylis, Economist: Task Team Leader, GAFSP-DIME Impact Evaluation Portfolio
- Daniel Stein, Economist: GAFSP-DIME Impact Evaluation Portfolio
- Maria Jones, Research Analyst: GAFSP-DIME Impact Evaluation Portfolio

- Cindy Sobieski, Field Coordinator: IAPP Impact Evaluation Field Coordinator

DIME is also working with Innovations for Poverty Action, a research NGO that specializes in impact evaluations. IPA will provide research support on evaluation design, data gathering, and implementation monitoring. The IPA team is led by Mushfiq Mobarak, an associate professor at the Yale University School of Management.

7. Budget

Based upon quotes from our selected data collection/research firm (Innovations for Poverty Action) and our prior ample experience with impact evaluations, we expect the following costs. The costs for the survey are as follows:

1. Census to create sample: $33,560.
2. Baseline Survey: $166,003
3. Monitoring and Oversight of Demo Plot Evaluation: $48,708
4. Midline Survey: $181,248
5. Endline Survey:$190,000

There will also be costs associated with oversight of the evaluation, and development of reports

1. Cost of a field coordinator for four years at $40,000/yr = $160,000
2. Total travel costs for lead researchers during 5-year period = $75,000
3. Research assistance for data cleaning and report preparation: $37,500/yr, total of 1 year = $37,500.

We estimate the total cost to be $891,389. These funds have been made available by GAFSP, and will not come out of project funds.

8. Timeline

The first steps of the project proceeded as follows:

1. **Identification of project villages**: Each department involved in the project (DAE, DoF, DLS, BADC), selects the villages in which they are able to work. The PIU will then select the villages for inclusion in the project, giving preference to villages where all project components are feasible. Working with local officials, the PIU successfully completed this on August 1, 2012.

2. **Selection of IE Village Sample**: As the project hopes to cover over 5,000 villages, the impact evaluation will necessarily need to concentrate on a subset (316) of these villages. The subset conforms to the sampling strategy described above. This process was completed by August 31, 2012.

3. **Census of Households for Surveying**: In order to conduct sampling for the Overall Project Evaluation, a brief census of all households in sampled villages was conducted. The census covered eligibility for joining different project components: land ownership, livestock ownership, and access to fish ponds. This was completed by Sept 20, 2012.

4. **Sample of Households to Be Surveyed:** Using the census, households were chosen to be part of the baseline survey for the Technology Adoption Evaluation. For the demo plot evaluation, households were randomly sampled after farmer group formation. This sampling was completed during Sept-Oct 2012.

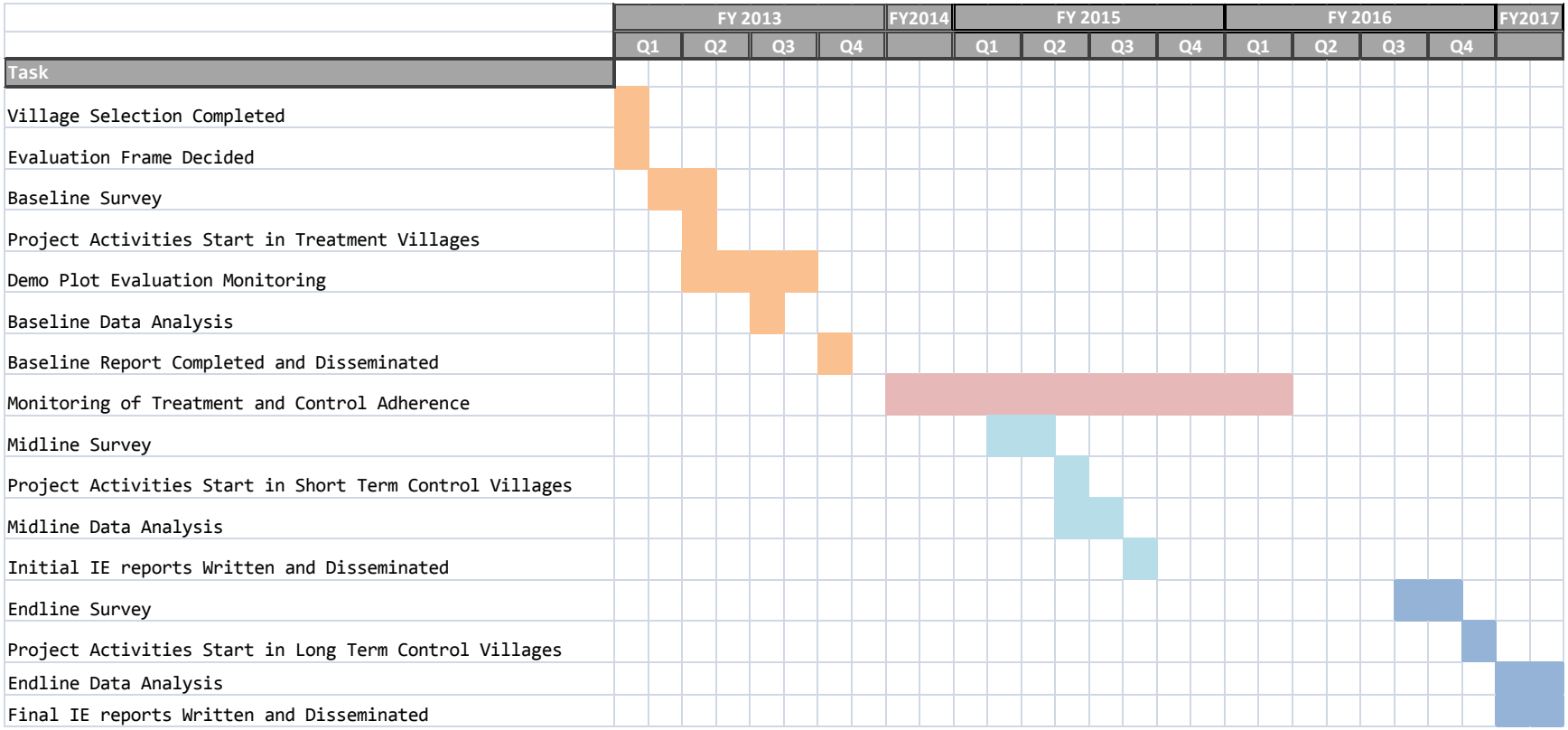
5. **Randomized Selection of Treatment Arms and Control Villages:** Once the impact evaluation sample was selected, the sample was randomly divided into treatment and control arms, as described in the evaluation strategy above. This was completed by October 1, 2012.

6. **Baseline Survey**: A baseline survey of sampled households in both control and treatment villages was completed by October 31, 2012.

7. **Implementation of Demonstration Plot Evaluation:** DIME is monitoring and collecting data on selection of demonstration farmers for those groups that are part of the demonstration plot evaluation. This will be completed by December 15, 2012.

The long-term timeline can be found in Figure 3 below:

Figure 3: Long Term Timeline



Appendix 2:
IAPP Baseline
Unit Price Data

Unit pricing was obtained from the Upazilla-Level Officers Questionnaire.

	Unit price for crop (Taka/Kg)									
Upazilla	Aus	Aman	Boro	Maize	Jute	Mung	Khesari	Chili	Potato	Lentil
Aditmari	14.00	16.00	14.00	12.00	45.00	60.00	48.00	20.00	12.00	96.00
Agoiljhara	15.00	14.00	15.00	20.00	28.00	55.00	24.00	50.00	12.00	60.00
Amtali	10.00	11.00	11.00	30.00	NG	100.00	50.00	120.00	10.00	80.00
Babuganj	14.50	15.00	14.00	16.00	13.00	60.00	30.00	40.00	12.00	60.00
Bakerganj	13.00	18.00	14.00	-	-	60.00	50.00	110.00	15.00	100.00
Banma	12.50	13.00	12.50	20.00	-	40.00	20.00	80.00	15.00	80.00
Banaripara	9.00	16.00	15.00	25.00	18.00	75.00	35.00	30.00	7.00	70.00
Bawphal	11.00	13.00	12.00	12.00	-	75.00	55.00	80.00	8.00	70.00
Bhuru-amari	12.00	12.00	12.00	15.00	24.00	60.00	30.00	10.00	8.00	50.00
Badarganj	13.00	12.00	15.00	13.00	40.00	60.00	-	30.00	10.00	80.00
Chilmari	14.00	13.50	13.00	21.30	35.00	58.00	45.00	20.00	10.00	90.00
Dimla	12.50	13.00	12.00	11.00	25.00	100.00	-	15.00	10.00	90.00
Domar	-	12.00	12.00	15.00	25.00	70.00	-	18.00	8.00	-
Ga-achara	14.00	15.00	15.00	13.00	22.00	60.00	50.00	30.00	10.00	70.00
Golachipa	17.50	17.50	20.00	-	-	80.00	50.00	80.00	10.00	60.00
Gournadi	15.00	14.00	15.00	18.00	30.00	60.00	23.00	60.00	15.00	85.00
Hatibandha	13.00	12.00	14.00	25.00	40.00	60.00	40.00	20.00	18.00	100.00
Hizla	14.00	14.00	15.00	18.00	32.00	70.00	50.00	80.00	15.00	100.00
Jaldhaka	12.00	16.00	13.00	15.00	40.00	42.00	37.00	20.00	10.00	70.00
Kalapara	15.00	18.00	16.00	30.00	-	55.00	35.00	100.00	15.00	60.00
Kaliganj	13.00	13.00	14.00	24.00	40.00	60.00	44.00	20.00	20.00	90.00
Kathalia	16.00	18.00	17.00	15.00	-	70.00	30.00	150.00	14.00	80.00
Kaunia	15.00	15.00	15.00	14.00	33.00	80.00	40.00	20.00	20.00	100.00
Kishorganj	15.00	12.00	15.00	12.00	30.00	80.00	-	20.00	10.00	70.00
Mahendigonj	16.00	15.00	13.00	42.00	32.00	75.00	40.00	110.00	14.00	110.00
Mithapukur	12.50	12.00	12.50	13.00	25.00	55.00	-	80.00	12.00	80.00
Muladi	14.00	14.00	15.00	18.00	26.00	50.00	24.00	60.00	16.00	75.00
Nageswari	10.00	12.00	12.00	16.00	42.00	80.00	48.00	18.00	8.00	70.00
Nalchiti	10.00	11.00	13.00	12.00	30.00	60.00	25.00	60.00	11.00	100.00
Patharghata	10.00	12.50	12.00	30.00	-	70.00	40.00	70.00	12.00	70.00
Pirgacha	13.80	13.80	13.80	16.30	31.30	-	-	50.00	7.50	60.00
Pirganj	12.50	14.00	15.00	20.00	30.00	60.00	-	12.00	10.00	60.00
Rajapur	14.00	15.00	14.00	15.00	-	95.00	30.00	120.00	20.00	110.00
Rajarhat	15.00	17.00	15.00	16.00	30.00	60.00	50.00	15.00	12.00	150.00
Patuakhali Sadar	14.00	12.00	13.00	15.00	-	100.00	30.00	150.00	15.00	120.00
Barisal Sadar	8.00	10.00	12.00	10.00	30.00	30.00	20.00	100.00	10.00	60.00
Lalmonirhat Sadar	13.00	15.00	14.00	13.00	35.00	70.00	40.00	40.00	7.00	80.00
Jhalokathi Sadar	12.50	12.50	13.00	17.00	-	60.00	30.00	35.00	10.00	67.50
Boroguna Sadar	18.00	17.00	20.00	25.00	-	70.00	30.00	60.00	15.00	100.00
Nilphamari Sadar	12.00	15.00	12.00	9.00	18.00	50.00	-	30.00	5.00	50.00
Taraganj	15.00	14.50	15.00	15.00	35.00	80.00	35.00	30.00	20.00	95.00
Ulipur	13.50	14.00	12.50	15.50	30.00	37.50	-	30.00	14.00	60.00
Uzirpur	10.00	14.00	13.00	-	27.00	55.00	45.00	30.00	10.00	70.00

Unit pricing was obtained from the Upazilla-Level Officers Questionnaire.

Upazilla	Carp	Katla	Mrigel	Puti or swarputi	Rui or ruhit	Tilapia
Aditmari	120.00	350.00	160.00	140.00	300.00	140.00
Agoiljhara	140.00	180.00	180.00	100.00	220.00	130.00
Amtali	166.67	250.00	200.00	150.00	250.00	160.00
Babuganj	80.00	80.00	110.00	70.00	150.00	90.00
Bakerganj	96.67	130.00	120.00	80.00	150.00	100.00
Banma	283.33	300.00	250.00	150.00	250.00	120.00
Banaripara	103.33	150.00	120.00	100.00	150.00	100.00
Bawphal	163.33	200.00	180.00	170.00	200.00	150.00
Bhuru-amari	100.00	150.00	120.00	80.00	150.00	90.00
Badarganj	60.00	80.00	70.00	70.00	80.00	70.00
Chilmari	143.33	320.00	280.00	150.00	300.00	135.00
Dimla	96.67	120.00	110.00	80.00	130.00	80.00
Domar	153.33	220.00	200.00	200.00	200.00	160.00
Ga-achara	61.67	150.00	140.00	100.00	150.00	100.00
Golachipa	80.00	100.00	90.00	100.00	100.00	100.00
Gournadi	136.67	150.00	150.00	90.00	150.00	100.00
Hatibandha	223.33	300.00	200.00	220.00	250.00	180.00
Hizla	130.00	150.00	120.00	100.00	200.00	150.00
Jaldhaka	78.33	95.00	90.00	75.00	100.00	80.00
Kalapara	145.00	175.00	150.00	120.00	180.00	125.00
Kaliganj	220.00	280.00	200.00	200.00	240.00	180.00
Kathalia	153.33	180.00	150.00	120.00	180.00	120.00
Kaunia	120.00	140.00	140.00	110.00	160.00	160.00
Kishorganj	113.33	120.00	110.00	80.00	140.00	100.00
Mahendigonj	83.33	150.00	100.00	80.00	160.00	90.00
Mithapukur	100.00	200.00	200.00	150.00	240.00	160.00
Muladi	120.00	150.00	150.00	70.00	180.00	100.00
Nageswari	65.00	100.00	75.00	80.00	100.00	80.00
Nalchiti	123.33	195.00	170.00	160.00	150.00	120.00
Patharghata	100.00	150.00	120.00	80.00	120.00	130.00
Pirgacha	106.67	150.00	130.00	120.00	150.00	120.00
Pirganj	66.67	100.00	80.00	70.00	100.00	70.00
Rajapur	213.33	250.00	250.00	150.00	240.00	160.00
Rajarhat	166.67	350.00	300.00	160.00	350.00	140.00
Patuakhali Sadar	243.33	300.00	280.00	200.00	360.00	200.00
Barisal Sadar	106.67	150.00	120.00	100.00	120.00	130.00
Lalmonirhat Sadar	86.67	200.00	150.00	120.00	200.00	120.00
Jhalokathi Sadar	126.67	200.00	180.00	150.00	200.00	150.00
Boroguna Sadar	160.00	260.00	250.00	120.00	280.00	150.00
Nilphamari Sadar	61.67	110.00	105.00	70.00	120.00	70.00
Taraganj	116.67	150.00	150.00	120.00	150.00	160.00
Ulipur	90.00	130.00	120.00	100.00	150.00	70.00
Uzirpur	126.67	130.00	140.00	80.00	150.00	110.00

Unit pricing- for mustard, sesame, and wheat is the average unit price at which the crop was sold for households across all upazillas.

	Unit price for crop (Taka/Kg)
Mustard	35.91
Wheat	22.00
Sesame	32.50

Unit pricing obtained from quantity sold and income from selling.

Product	Patuakhali	Jhalokati	Boroguna	Kurigram	Nilphamari	Lalmonirhat	Barisal	Rangpur
Milk	37.21	34.82	35.58	32.19	26.03	26.89	34.90	30.27
Eggs	8.38	8.25	8.06	8.94	8.37	7.66	8.72	8.16
Manure	NS	NS	NS	NS	0.52	1.64	3.72	1.56
Dung	NS	NS	NS	NS	NS	8.00	3.33	0.80

Unit pricing obtained from quantity sold and income from selling from OI long questionnaire. Unit pricing from UAAO survey was used in place of unit pricing from OI long were available.

Fish	Patuakhali	Jhalokati	Boroguna	Kurigram	Nilphamari	Lalmonirhat	Barisal	Rangpur
Silver Carp	150.00	150.00	100.00	80.00	90.00	120.00	100.00	100.00
Grass Carp	160.00	150.00	150.00	100.00	100.00	300.00	100.00	100.00
Mirror Carp	180.00	160.00	170.00	90.00	100.00	240.00	120.00	100.00
Common Carp	NS	NS	NS	NS	NS	NS	NS	287.50
Karfu	NS	NS	NS	196.67	NS	265.00	150.00	106.67
Rui/Ruhit	200.00	200.00	250.00	150.00	130.00	250.00	150.00	150.00
Katla	200.00	200.00	250.00	130.00	120.00	300.00	150.00	150.00
Mrigel	180.00	180.00	200.00	120.00	110.00	200.00	120.00	140.00
Kalibaus	NS	NS	NS	NS	80.36	128.00	184.62	NS
Tilapia GIFT	NS	237.27	NS	35.00	NS	NS	45.45	NS
Tilapia Mono-sex	113.75	36.84	NS	NS	129.58	131.43	95.00	162.50
Tilapia	150.00	150.00	150.00	80.00	80.00	180.00	100.00	120.00
Big Head	NS	NS	NS	NS	NS	NS	NS	116.67
Pangash	72.00	NS	93.33	NS	NS	NS	90.00	NS
Other Large Fish	NS	NS	NS	600.00	NS	NS	NS	NS
Other Small Fish	NS	NS	27.78	NS	NS	NS	NS	70.00

Crop	Patuakhali	Jhalokati	Boroguna	Kurigram	Nilphamari	Lalmonirhat	Barisal	Rangpur
Aus	14.50	14.00	10.00	13.50	12.00	13.00	13.00	13.80
Aman	15.25	15.00	12.50	13.50	13.00	13.00	14.00	13.80
Boro	14.50	14.00	12.00	12.50	12.00	14.00	14.00	15.00
Wheat	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00
Maize	15.00	15.00	30.00	16.00	11.00	24.00	18.00	13.00
Jute	NS	30.00	NS	30.00	25.00	40.00	27.00	30.00
Lentil (Moshur)	65.00	100.00	80.00	70.00	70.00	96.00	75.00	70.00
Mung	75.00	70.00	70.00	58.00	70.00	60.00	60.00	60.00
Black gram (Mashkalai)	555.00	NS	NS	NS	NS	NS	555.00	NS
Chickling Vetch (Khesari)	35.00	30.00	40.00	48.00	37.00	40.00	35.00	50.00

Chick pea (Chhola)	600.00	NS	NS	NS	NS	NS	600.00	NS
Other pulses	360.00	NS	385.00	NS	NS	NS	372.50	NS
Sesame	32.50	32.50	32.50	32.50	32.50	32.50	32.50	32.50
Mustard	35.91	35.91	35.91	35.91	35.91	35.91	35.91	35.91
Ground nut/peanut	NS	NS	600.00	NS	NS	700.00	600.00	700.00
Other Oilseeds	1200.00	NS	NS	NS	NS	NS	1200.00	NS
Chili	100.00	120.00	70.00	20.00	20.00	20.00	60.00	30.00
Onion	NS	NS	NS	NS	210.00	NS	NS	210.00
Bringal (eggplant)	240.00	180.00	124.09	NS	NS	NS	181.36	NS
Patal	NS	NS	NS	NS	NS	148.97	NS	148.97
Okra	377.14	NS	220.23	NS	NS	368.57	298.69	368.57
Bitter Gourd	165.00	203.57	255.00	NS	NS	NS	207.86	NS
Arum	NS	NS	NS	NS	120.00	NS	NS	120.00
Cucumber	185.00	NS	NS	NS	NS	NS	185.00	NS
Snake Gourd	NS	160.00	NS	NS	90.00	NS	160.00	90.00
Water Gourd	142.86	NS	NS	NS	NS	NS	142.86	NS
Sweet Gourd	85.71	NS	NS	NS	NS	NS	85.71	NS
Tomato	NS	120.00	120.00	NS	NS	NS	120.00	NS
Radish	120.00	NS	NS	NS	NS	NS	120.00	NS
Turnip	NS	100.00	NS	NS	NS	NS	100.00	NS
Pui Shak	270.00	NS	NS	NS	120.00	NS	270.00	120.00
Palang Shak (Spinach)	240.00	NS	NS	NS	NS	NS	240.00	NS
Lal Shak	240.00	NS	NS	NS	120.00	91.76	240.00	105.88
Mula Shak	NS	NS	NS	48.00	NS	NS	NS	48.00
Cabbage	NS	NS	NS	NS	27.70	NS	NS	27.70
Other Green Leafy Vegetables	NS	NS	NS	255.00	54.55	NS	NS	154.77
Potato	15.00	14.00	12.00	10.00	10.00	18.00	15.00	10.00
Sweet Potato	171.43	NS	90.00	NS	NS	NS	130.71	NS
Tobacco	NS	NS	NS	NS	660.00	750.00	NS	705.00

Note: For Barisal and Rangpur
per C.Sobieski: "The North (Rangpur) and the South (Barisal) are very different, and in each of these regions Rangpur District and Barisal District are the "main" districts-- higher in terms of income, and better in terms of agriculture. That's why they were picked for the DPE interventions. Probably an average of the other three districts in the region is the best possibility. Boroguna, Patuakhali, Jhalokati for Barisal and Kurigram, Nilphamari, Lalmonirhat for Rangpur."

Appendix 3:
Comparison of IAPP Baseline with Bangladesh Integrated Household Survey

This Appendix benchmarks key indicators from the IAPP Baseline Household Survey to the International Food Policy Research Institute's 2011-12 Bangladesh Integrated Household Survey (BIHS).[1] BIHS was a baseline survey for the USAID-led Feed the Future Initiative. It is nationally representative of rural Bangladesh, representative of the rural areas of each of the seven administrative divisions of the country, and representative of the Feed the Future sphere of influence. For the purposes of benchmarking the IAPP baseline, we compare to the BIHS data that is representative of the divisions of Rangpur and Barisal divisions. It is important to note that the household sampling strategy for IAPP and BIHS differed. BIHS drew a random selection of households from all households in a village, whereas the IAPP baseline specifically targeted medium and small farmers. This difference in landholdings (Table 1), in so much as it signifies socioeconomic status, also helps to understand differences in the tables that follow, as the IFPRI sample is expected to be of somewhat higher socioeconomic status.

Table 1: Agricultural Landholdings

	IFPRI	IAPP
Marginal farmer (below 0.5 acres)	36.32	48.56%
Small farmer (0.5-1.49 acres)	44.57	43.41%
Medium farmer (1.5-2.49 acres)	11.81	5.76%
Large farmer (2.5 acres and above)	7.31	2.20%

Source: Table 4.5—Distribution of operated land by farm size groups

Table 2: Number of Plots

	IAPP	IFPRI
Number of operated plots	6.18	3.67

Source: Table 4.7—Number of operated plots by division: Rural Bangladesh

Table 3: Source of seed for different rice seasons

	IAPP				IFRPI			
	Own production	**Seed multiplier**	**Private company**	**Govt**	**Own/gift**	**From seed dealers of big seed companies**	**Private shop (unknown seed brand)**	**Govt**
Aus	84.27%	3.36%	0.85%	1.98%	47.08%	0.00%	55.22%	0.00%
Aman	28.38%	4.20%	0.00%	0.87%	49.12%	1.36%	50.74%	1.53%
Boro	53.11%	6.12%	0.63%	3.35%	42.25%	2.79%	53.81%	3.99%

Source: Table 4.17—Source of rice seed by farm size groups: Feed the Future zone and rural Bangladesh

[1] Ahmed, Akhter, 2013, "Bangladesh Integrated Household Survey (BIHS) 2011-2012", http://hdl.handle.net/1902.1/21266 UNF:5:p7oXR2unpeVoD/8a48PcVA== International Food Policy Research Institute [Distributor] V4 [Version]

Table 4: Average crop yields (metric tons/ha)

	IAPP	IFPRI
Aus (local)	1.74	3.25
Aus (HYV)	1.82	2.65
T aman (local)	1.65	2.53
T Aman (HYV)	1.96	3.15
Boro (HYV)	3.63	5.92
Boro (hybrid)	4.29	7.05
Wheat	2.77	3.08
Lentil	0.58	0.61
Mustard	0.88	1.03
Potatoes	14.84	16.44

Source: Table 4.32—Average crop yields by division: Rural Bangladesh

Table 5: Access to Agricultural Extension

	IAPP	IFPRI
Consulted Agricultural Extension Agent during last 12 months	19.33%	9%

Source: Figure 4.20—% of farmers who consulted an agricultural extension agent during 12 months preceding the survey

Table 6: Incidence of borrowing

	%
IFPRI - Took agricultural loan	69%
IAPP - Household has any outstanding loans	63.71%
IAPP - Household used any loans for farm inputs	24.31%

Source: Figure 4.23—Incidence of borrowing by farm size groups

Table 7: Methods of irrigation

	IAPP	IFPRI
Shallow tubewell	49.79%	69.10%
Deep tubewell	5.75%	17.90%
Low lift pump	14.08%	9.60%
Canal or irrigation	2.19%	0.50%
Hand tubewell	1.68%	3.00%

Source: Figure 4.14—Methods of irrigation used by farmers

Table 8: Method of irrigation for HYV/hybrid boro rice cultivation

Irrigation method	IAPP	IFPRI
Shallow tubewell	69.49%	69.10%
Low lift pump	10.97%	9.60%
Deep tubewell	21.31%	17.90%
Canal irrigation	0.00%	0.50%
Manual	0.00%	3.00%

Source: Table 4.14—Method of irrigation for HYV/hybrid boro rice cultivation by division: Rural Bangladesh

Table 9: Amount of fertilizer used (kg/ha)

	IAPP	IFPRI
Urea	350.14	256
MOP	140.43	69
TSP	179.73	103

Source: Table 4.15—Fertilizer use by type of rice and farm size groups: Feed the Future zone and rural Bangladesh

APPENDIX 4:
IAPP Baseline Questionnaire

Baseline for the Impact Evaluation of the Integrated Agriculture Productivity Project (IAPP)

SECTION A: HOUSEHOLD IDENTIFICATION

Part 1: Location (To be filled in by Enumerator before HH Visit)

A.1.1	Zilla Name		*Use Zilla Code List*	| Z |__|
A.1.2	Upazilla Name		*Use Upazilla Code List*	|UZ|__|__|
A.1.3	Union Name		*Use Union Code List*	| U |__|__|
A.1.4	Village Name		*Use Village Code List*	| V |__|__|__|
A.1.5	Para Name			
A.1.6	Bari Name			
A.1.7	Household Number			|__|__|__|
A.1.8	Household ID	Village Code + Household Number		|__|__|__|__|__|__|
A.1.9	List the closest landmarks to the house			

Part 2: Verification

A.2.1	Name of Enumerator		Code	|__|__|__|	Date |__|__|/|__|__|/2012
A.2.2	Initials of Supervisor		Code	|__|__|__|	Date |__|__|/|__|__|/2012
A.2.3	Initials of Editor		Code	|__|__|__|	Date |__|__|/|__|__|/2012
A.2.4	Initials of Back Checker		Code	|__|__|__|	Date |__|__|/|__|__|/2012
A.2.5	Initials Data Entry Operator 1		Code	|__|__|__|	Date |__|__|/|__|__|/2012
A.2.6	Initials Data Entry Operator 2		Code	|__|__|__|	Date |__|__|/|__|__|/2012

SECTION A: HOUSEHOLD IDENTIFICATION

Part 3: Date and Time of Interview

READ TO RESPONDENT AT THE START OF THE VISIT: Good day, I am [NAME]. I am part of a team of researchers from Innovations for Poverty Action (IPA) conducting a research study about Agriculture in eight district of Bangladesh.I will be asking you some detailed questions about your Agri production, food security, and household background. This information will be kept absolutely confidential. No personally identifying information will be published or shared with anyone outside the project team. There are no risks to you or your family in answering these questions. Your participation is completely voluntary and you may stop participating at any time. If you have any questions about the study or the survey at a later date, you may contact Alamgir Kabir, Operations Manager for IPA in Bangladesh at 01712121221, or the Field Coordinator for the World Bank at 01770432992.

A.3.1	Do you agree to participate?	1 = Yes 2 = No	|__|	If "2" --> STOP SURVEY
A.3.2	Name of Respondent			
A.3.3	Date	|__|__|/|__|__|/2012		
A.3.4	Date of First Visit	Day/Month/Year	|__|__|/|__|__|/2012	
A.3.5	Start Time of Interview 1	Use 24 Hour Clock	|__|__|:|__|__|	
A.3.6	Respondent Member ID	Use from HH Roster	|__|__|	
A.3.7	End Time of Interview 1	Use 24 Hour Clock	|__|__|:|__|__|	
A.3.8	Date of Second Visit	Day/Month/Year	|__|__|/|__|__|/2012	
A.3.9	Start Time of Interview 2	Use 24 Hour Clock	|__|__|:|__|__|	
A.3.10	Respondent Member ID	Use from HH Roster	|__|__|	
A.3.11	End Time of Interview 2	Use 24 Hour Clock	|__|__|:|__|__|	

Part 4: Target Respondent					
ENUMERATOR INSTRUCTIONS: Identify target respondent. You need to interview the household member who is primarily responsible for making decisions about the HH farm. This is most likely the head of the household, but if the head of the household works off the farm, it will be another household member who is responsible for the household farm.					
A.4.1	**Name of HH Head** Write Name used on official documents, with nickname in parentheses				
A.4.2	HH Head's Father/Husband's Name				
A.4.3	HH Head's Religion	1 = Muslim 2 = Hindu 3 = Buddist	4 = Christian 5 = other	|__|	
A.4.4	Is Respondent the HH Head?	1 = Yes 2 = No		|__|	If 1 --> **A.4.8**
A.4.5	**Respondent Name** Write name used on official documents, with nickname in parentheses				
A.4.6	Respondent's Father/Husband's Name				
A.4.7	Relationship of Respondent to HH Head	2 = Spouse 3 = Son/Daughter 4 = Son/Daugher-in-law	5 = Parent 6 = Brother/Sister 11 = Other relative (Please specify) 12 = No relation	|__|	
A.4.8	Mobile Numbers of HH Members (for follow-up) Include a REQUEST number if applicable. Please write "REQ" in the margin next to the number.	Mobile Owners		Numbers	
		a.		|__|__|__|__|__|__|__|__|__|__|__|	
		b.		|__|__|__|__|__|__|__|__|__|__|__|	
		c.		|__|__|__|__|__|__|__|__|__|__|__|	

SECTION B: INDIVIDUAL IDENTIFICATION

Part 1: HH Member Identification

HH Member ID	B.1.1 NAME FIRST, List HEAD OF HH FOLLWED BY SPOUSE AND CHILDREN. If several wives, record in order of marriage. SECOND: List other HH members related to the head of household or his spouse(s). THIRD: List other HH members NOT related to the head of household or his spouse. The HH Roster should include all people that "eat out of the same pot". Be sure to include the following people: someone temporarily gone for less than six months, students studying away from home, and someone that lives away from home but is VERY involved in HH economic decision-making	B.1.2 In the last two weeks, have you shared a meal in the household with this person? *1 = Yes* *2 = No*	B.1.3 Age *Only completed years. No fractions.*	B.1.4 Sex *1 = Male* *2 = Female*	B.1.5 Relationship to HH Head *1 = HH Head* *2 = Spouse* *3 = Son/Daughter* *4 = Son/Daughter-in-law* *5 = Parent* *6 = Brother/Sister* *7 = Grandparent* *8 = Grandchild* *9 = Brother/sister in law* *10 = Niece/nephew* *11 = Other relative* *12 = No relation*	B.1.6 Maritial Status *1 = Married* *2 = Single* *3 = Divorced* *4 = Separated* *5 = Widower*	B.1.7 What is the highest level of education that he/she has achieved? *1 = None* *2 = Some Primary* *3 = Completed Primary* *4 = Some Secondary* *5 = SSC Passed* *6 = Some Higher Secondary* *7 = HSC Passed* *8 =Vocational Institute* *9 = Some University* *10 = Completed University* *11 = Madrassa*	B.1.8 Can he/ she read a letter or a simple note? *1 = Yes* *2 = No*	B.1.9 In which language can he/she read? *A = Bangla* *B = English* *C =Urdu* *D = Arabic* *E = Hindi* *F = Tribal* *G = other (specify)* *Multiple responses possible*
								If "2" --> Part 2	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									

SECTION B: INDIVIDUAL IDENTIFICATION

Part 2: HH Labor

HH Member ID	B.2.1	B.2.2	B.2.3	B.2.4	B.2.5	B.2.6	B.2.7	B.2.8	HH Member ID
	ENUMERATOR CHECKPOINT: IS THIS HH MEMBER 6 or more years old? (WILL RESPOND TO THIS SECTION) 1 = Yes 2 = No	During the last completed month did [NAME] work in agriculture or land husbandry? *[EITHER IN HH FARM OR SOMEONE ELSE'S FARM]* *1 month = 1 month from the date of the interview* *1 = Yes* *2 = No*	During the last completed month did [NAME] work for a salary or any other form of payment? *1 month = 1 month from the date of the interview* *1 = Yes* *2 = No*	During the last completed month, did [NAME] work or provide help in a business without receiving a salary? *[EITHER IN HH BUSINESS OR SOMEONE ELSE'S BUSINESS]* *1 month = 1 month from the date of the interview* *1 = Yes* *2 = No*	ENUMERATOR CHECKPOINT: IS THERE A "YES" RESPONSE IN B.2.2, B.2.3 or B.2.4? *1 = Yes* *2 = No*	Was [NAME] available for work during the last completed week? *1 week = 1 week from date of interview* *1 = Yes* *2 = No*	Why was [NAME] not available for work during the last completed week? *1=Too old* *2 = Too young* *3=Too sick* *4=Disabled* *5 = Student* *6=Other (Specify)*	When was the last year [NAME] did any work either paid or unpaid (if ever)? *Year*	
	if 2 --> Next HH Member				If 1►B.2.9	If 1 ►B.2.8		Go to the NEXT HH MEMBER ID	
1									1
2									2
3									3
4									4
5									5
6									6
7									7
8									8
9									9
10									10
11									11
12									12

:TION B: INDIVIDUAL IDENTIFICATION

2: HH Labor, Continued

B.2.9	B.2.10	B.2.11	B.2.12	B.2.13	B.2.14	B.2.15
What was [NAME]'s main occupation in the last completed month? 1 month = 1 month from date of interview	During the last completed week, how many hours did [NAME] work in this occupation?	During the last 12 months how many months did [NAME] work in this occupation?	During these months, on average, how many days did [NAME] work in this occupation?	Has [NAME] received wages, salary or other payments either in cash or in other forms from this occupation?	How much was [NAME]'s last cash payment?	What period of time did this payment cover?
1=Own Farm/Sharecropper *2=Agricultural Day Labor* *3 = Own business* *4 = Salaried Job* *5=Domestic Work (Non-HH)* *6=Petty/Retail Trade* *7= Construction labor* *8=Transportation Sector* *9 = Carpentry* *10=Other Non-Ag Day Labor* *11 = Other (Specify)*	*1 week = 1 week from date of interview* *Hours*	*Last 12 months = from date of interview* *Months*	*Days*	*1=Yes* *2=No*	*If in-kind payment, ask respondent to estimate value* *Taka*	*1=Hour* *2=Day* *3=Week* *4=Month* *5=3 Months* *6=Year* *7=Other (Specify)*
				If 2 ►Next HH Member ID		

SECTION C: ACCESS TO EXTENSION AND OTHER TRAININGS

C.1.1	Did a government extension worker visit your HH farm between September 1 2011 to August 31, 2012, to provide advice about farming ?	1 = Yes 2 = No		if 2 ►C.1.5
C.1.2	How many times did the government extension worker visit to provide advice about farming?	Number of Visits		
C.1.3	Who met with this extension worker? Multiple responses possible	A = a female HH member B = a male HH member C= a non-HH member		
C.1.4	What topics were discussed during these visits? Multiple Responses Possible	A = seeds B = fertilizer C = pests and diseases D = pesticide use E = cropping practices F = soil type G = compost H = irrigation I = previous year crop on your land J = other (specify)		
C.1.5	Have you or anyone else in your household attended a Department of Agriculture Extension training in the last six months **(six months from the day of the interview)**?	1 = Yes 2 = No		If 2 ► C.1.8
C.1.6	In what month was the most recent training you attended?	Use Code 2: Month code on Code Sheet		
C.1.7	What topics were discussed in this most recent training? Multiple Responses Possible	A = seeds B = fertilizer C = pests and diseases D = pesticide use E = cropping practices F = soil type G = compost H = irrigation I = previous year crop on your land J = other (specify)		
C.1.8	Did anyone from an NGO visit your HH farm between September 1 2011 to August 31, 2012, to provide advice about farming ?	1 = Yes 2 = No		if 2 ►C.1.12
C.1.9	How many times times did the person from the NGO visit to provide advice about farming?	Number of Visits		
C.1.10	Who met with this person?	A = a female HH member B = a male HH member C= a non-HH member		
C.1.11	What topics were discussed during these visits? Multiple Responses Possible	A = seeds B = fertilizer C = pests and diseases D = pesticide use E = cropping practices F = soil type G = compost H = irrigation I = previous year crop on your land J = other (specify)		
C.1.12	Have you ever accessed information about agricultural markets or agricultural prices using your mobile phone?	1 = Yes 2 = No		

HH ID |__|__|__|__|__|__|

CROP ID		
Write Plot IDs	Crop Code	Month Planted
	Copy from previous page	*Copy from previous page*

SECTION D: AGRICULTURE

Part 1: Plot ID

D.1.1	How many plots did this household cultivate seasonal OR fixed crops on from September 1, 2011 to August 31, 2012?	|__|__|	if "0" --> **Section E**

ENUMERATOR: LIST ALL AGRICULTURAL LAND CULTIVATED ON (regardless of ownership) from September 1, 2011 to August 31, 2012 . DO NOT INCLUDE LEASED-OUT/RENTED-OUT PLOTS. INCLUDE PLOTS WHERE FIXED AND SEASONAL CROPS ARE CULTIVATED. LIST ALL PLOTS THAT APPLY.

Plot ID	D.1.2	D.1.3		D.1.4		D.1.5	D.1.6	D.1.7	D.1.8	D.1.9	D.1.10	D.1.11	D.1.12	D.1.13
	PLOT DESCRIPTION _____ *Write description that will not change in the next five years. For example, landmarks, depth, plot name.*	Plot Size *Number*	*Unit* *1 = decimals* *2 = square feet* *3 = acres*	Distance from Home *If next to home write "0"* *Number*	*Unit* *1 = feet* *2 = meters* *3 = miles* *4 = kms*	Current Operational Status *1 = Own* *2 = Rent* *3 = Mortgage* *4 = Joint Ownership* *5 = sharecropping* *6 = other (speicfy)*	Was this plot used as a demonstration plot in this time period? *1 = Yes* *2 = No*	Who was primarily responsible for making decisions and field management about this [PLOT] in this time period? *Use HH Member ID* *If non-HH member, write "0"*	Who spent the most time working on this plot in this time period? *Use HH Member ID* *If non-HH member, write "0"*	List all Crops planted on this plot in this time period *Use CODE 1 and a separate line for each crop.*	Month Planted *Use CODE 2* *If fixed/permanent crop, write "0"*	If Paddy Report Variety *Use CODE 3* *If not paddy, write 0*	Crop Type *1 = Local Variety* *2 = HYV* *3 = Hybrid* *88 = Unknown*	What was the source of this seed? *1 = Community seed bed* *2 =NGO* *3 = Seed multiplier* *4 = Own production* *5 = purchased from private company* *6 = Govt/BADC provided* *7 = Local Market/Shop* *8 = other (specify)*
1														
2														
3														

Plot ID	D.1.2	D.1.3		D.1.4		D.1.5	D.1.6	D.1.7	D.1.8	D.1.9	D.1.10	D.1.11	D.1.12	D.1.13
	PLOT DESCRIPTION _____ *Write description that will not change in the next five years. For example, landmarks, depth, plot name.*	Plot Size *Number*	<u>Unit</u> *1 = decimals* *2 = square feet* *3 = acres*	Distance from Home *If next to home write "0"* *Number*	<u>Unit</u> *1 = feet* *2 = meters* *3 = miles* *4 = kms*	Current Operational Status *1 = Own* *2 = Rent* *3 = Mortgage* *4 = Joint Ownership* *5 = sharecropping* *6 = other (speicfy)*	Was this plot used as a demonstration plot in this time period? *1 = Yes* *2 = No*	Who was primarily responsible for making decisions and field management about this [PLOT] in this *Use HH Member ID* *If non-HH member, write "0"*	Who spent the most time working on this plot in this time period? *Use HH Member ID* *If non-HH member, write "0"*	List all Crops planted on this plot in this time period *Use CODE 1 and a separate line for each crop.*	Month Planted *Use CODE 2* *If fixed/permanent crop, write "0"*	If Paddy Report Variety *Use CODE 3* *If not paddy, write 0*	Crop Type *1 = Local Variety* *2 = HYV* *3 = Hybrid* *88 = Unknown*	What was the source of this seed? *1 = Community seed bed* *2 =NGO* *3 = Seed multiplier* *4 = Own production* *5 = purchased from private company* *6 = Govt/BADC provided* *7 = Local Market/Shop* *8 = other (specify)*
4														
5														
6														

Plot ID	D.1.2	D.1.3		D.1.4		D.1.5	D.1.6	D.1.7	D.1.8	D.1.9	D.1.10	D.1.11	D.1.12	D.1.13
	PLOT DESCRIPTION _____ *Write description that will not change in the next five years. For example, landmarks, depth, plot name.*	Plot Size *Number*	<u>Unit</u> *1 = decimals* *2 = square feet* *3 = acres*	Distance from Home *If next to home write "0"* *Number*	<u>Unit</u> *1 = feet* *2 = meters* *3 = miles* *4 = kms*	Current Operational Status *1 = Own* *2 = Rent* *3 = Mortgage* *4 = Joint Ownership* *5 = sharecropping* *6 = other (speicfy)*	Was this plot used as a demonstration plot in this time period? *1 = Yes* *2 = No*	Who was primarily responsible for making decisions and field management about this [PLOT] in this *Use HH Member ID* *If non-HH member, write "0"*	Who spent the most time working on this plot in this time period? *Use HH Member ID* *If non-HH member, write "0"*	List all Crops planted on this plot in this time period *Use CODE 1 and a separate line for each crop.*	Month Planted *Use CODE 2* *If fixed/permanent crop, write "0"*	If Paddy Report Variety *Use CODE 3* *If not paddy, write 0*	Crop Type *1 = Local Variety* *2 = HYV* *3 = Hybrid* *88 = Unknown*	What was the source of this seed? *1 = Community seed bed* *2 =NGO* *3 = Seed multiplier* *4 = Own production* *5 = purchased from private company* *6 = Govt/BADC provided* *7 = Local Market/Shop* *8 = other (specify)*
7														
8														
9														

Plot ID	D.1.2	D.1.3		D.1.4		D.1.5	D.1.6	D.1.7	D.1.8	D.1.9	D.1.10	D.1.11	D.1.12	D.1.13
	PLOT DESCRIPTION *Write description that will not change in the next five years. For example, landmarks, depth, plot name.*	Plot Size		Distance from Home *If next to home write "0"*		Current Operational Status	Was this plot used as a demonstration plot in this time period?	Who was primarily responsible for making decisions and field management about this [PLOT] in this time period?	Who spent the most time working on this plot in this time period?	List all Crops planted on this plot in this time period	Month Planted	If Paddy Report Variety	Crop Type	What was the source of this seed?
		Number	*Unit* *1 = decimals* *2 = square feet* *3 = acres*	*Number*	*Unit* *1 = feet* *2 = meters* *3 = miles* *4 = kms*	*1 = Own* *2 = Rent* *3 = Mortgage* *4 = Joint Ownership* *5 = sharecropping* *6 = other (speicfy)*	*1 = Yes* *2 = No*	*Use HH Member ID* *If non-HH member, write "0"*	*Use HH Member ID* *If non-HH member, write "0"*	*Use CODE 1 and a separate line for each crop.*	*Use CODE 2* *If fixed/permanent crop, write "0"*	*Use CODE 3* *If not paddy, write 0*	*1 = Local Variety* *2 = HYV* *3 = Hybrid* *88 = Unknown*	*1 = Community seed bed* *2 =NGO* *3 = Seed multiplier* *4 = Own production* *5 = purchased from private company* *6 = Govt/BADC provided*
10														
11														
12														

SECTION D: AGRICULTURE

Part 1: Plot ID

D.1.13a	D.1.14	D.1.15	D.1.16	D.1.17		D.1.18	D.1.19	D.1.20	D.1.21	D.1.22	D.1.23		D.1.24
On how much of this plot did you cultivate this [CROP ID]?	Did you irrigate this [CROP ID]?	How much did you spend on irrigation for this [CROP ID]?	Did you apply any inputs to this [CROP ID]?	Which inputs did you apply to this [CROP ID]? Multiple Responses Possible Please ask about each input listed.		How much in total did you spend on inputs for this [CROP ID]?	How primarily did you till the land for this [CROP ID]?	Did you hire labor to work on this [CROP ID]?	How much in total did you spend on hired labor for this [CROP ID]?	Month Harvesting Began *Write "0" if not harvested yet*	How much of this [CROP ID] have you harvested up to now?		How much in total did you earn from sales of this [CROP ID]?
Write in Decimals	*1 = Yes 2 = No*	*Record Taka. Estimate value of crop given.*	*1 = Yes 2 = No*	*A = Compost B = Animal Manure C = Farm Yard Manure D = Urea E = Calcium/Lime F = NPKS/mixed fertilizer G = Pesticdes/Insecticides H = Pheremone Traps*	*I = DAP J = Potash/MOP K = TSP/SPP L = Zinc M = Ammonia N = Gypsum O = Potassium P = Vitamins Q = Other (specify)*	*If gave crop, estimate value Taka*	*1 = by hand 2 = with animal power 3 = with machine 4 = did not till*	*1 = Yes 2 = No*	*Taka*	*Use Code 2: Month on Code Page. 66 = continuously harvested*	*Number*	*Unit*	*Taka*
	If "2" --> D.1.16		If "2" --> D.1.19					If "2" --> **D.1.22**		If "0" --> next row			

D.1.13a	D.1.14	D.1.15	D.1.16	D.1.17		D.1.18	D.1.19	D.1.20	D.1.21	D.1.22	D.1.23		D.1.24
On how much of this plot did you cultivate this [CROP ID]?	Did you irrigate this [CROP ID]?	How much did you spend on irrigation for this [CROP ID]?	Did you apply any inputs to this [CROP ID]?	Which inputs did you apply to this [CROP ID]? Multiple Responses Possible Please ask about each input listed.		How much in total did you spend on inputs for this [CROP ID]?	How primarily did you till the land for this [CROP ID]?	Did you hire labor to work on this [CROP ID]?	How much in total did you spend on hired labor for this [CROP ID]?	Month Harvesting Began *Write "0" if not harvested yet*	How much of this [CROP ID] have you harvested up to now?		How much in total did you earn from sales of this [CROP ID]?
Write in Decimals	*1 = Yes* *2 = No*	*Record Taka. Estimate value of crop given.*	*1 = Yes* *2 = No*	*A = Compost* *B = Animal Manure* *C = Farm Yard Manure* *D = Urea* *E = Calcium/Lime* *F = NPKS/mixed fertilizer* *G = Pesticdes/Insecticides* *H = Pheremone Traps*	*I = DAP* *J = Potash/MOP* *K = TSP/SPP* *L = Zinc* *M = Ammonia* *N = Gypsum* *O = Potassium* *P = Vitamins* *Q = Other (specify)*	*If gave crop, estimate value* *Taka*	*1 = by hand* *2 = with animal power* *3 = with machine* *4 = did not till*	*1 = Yes* *2 = No*	*Taka*	*Use Code 2: Month on Code Page.* *66 = continuously harvested*	*Number*	*Unit*	*Taka*
	If "2" --> D.1.16		If "2" --> D.1.19					If "2" --> **D.1.22**		If "0" --> next row			

D.1.13a	D.1.14	D.1.15	D.1.16	D.1.17		D.1.18	D.1.19	D.1.20	D.1.21	D.1.22	D.1.23		D.1.24
On how much of this plot did you cultivate this [CROP ID]?	Did you irrigate this [CROP ID]?	How much did you spend on irrigation for this [CROP ID]?	Did you apply any inputs to this [CROP ID]?	Which inputs did you apply to this [CROP ID]? Multiple Responses Possible Please ask about each input listed.		How much in total did you spend on inputs for this [CROP ID]?	How primarily did you till the land for this [CROP ID]?	Did you hire labor to work on this [CROP ID]?	How much in total did you spend on hired labor for this [CROP ID]?	Month Harvesting Began *Write "0" if not harvested yet*	How much of this [CROP ID] have you harvested up to now?		How much in total did you earn from sales of this [CROP ID]?
Write in Decimals	*1 = Yes* *2 = No*	*Record Taka. Estimate value of crop given.*	*1 = Yes* *2 = No*	*A = Compost* *B = Animal Manure* *C = Farm Yard Manure* *D = Urea* *E = Calcium/Lime* *F = NPKS/mixed fertilizer* *G = Pesticdes/Insecticides* *H = Pheremone Traps*	*I = DAP* *J = Potash/MOP* *K = TSP/SPP* *L = Zinc* *M = Ammonia* *N = Gypsum* *O = Potassium* *P = Vitamins* *Q = Other (specify)*	*If gave crop, estimate value* *Taka*	*1 = by hand* *2 = with animal power* *3 = with machine* *4 = did not till*	*1 = Yes* *2 = No*	*Taka*	*Use Code 2: Month on Code Page.* *66 = continuously harvested*	*Number*	*Unit*	*Taka*
	If "2" --> D.1.16		If "2" --> D.1.19					If "2" --> **D.1.22**		If "0" --> next row			

D.1.13a	D.1.14	D.1.15	D.1.16	D.1.17		D.1.18	D.1.19	D.1.20	D.1.21	D.1.22	D.1.23		D.1.24
On how much of this plot did you cultivate this [CROP ID]?	Did you irrigate this [CROP ID]?	How much did you spend on irrigation for this [CROP ID]?	Did you apply any inputs to this [CROP ID]?	Which inputs did you apply to this [CROP ID]? Multiple Responses Possible Please ask about each input listed.		How much in total did you spend on inputs for this [CROP ID]?	How primarily did you till the land for this [CROP ID]?	Did you hire labor to work on this [CROP ID]?	How much in total did you spend on hired labor for this [CROP ID]?	Month Harvesting Began *Write "0" if not harvested yet*	How much of this [CROP ID] have you harvested up to now?		How much in total did you earn from sales of this [CROP ID]?
Write in Decimals	*1 = Yes* *2 = No*	*Record Taka. Estimate value of crop given.*	*1 = Yes* *2 = No*	*A = Compost* *B = Animal Manure* *C = Farm Yard Manure* *D = Urea* *E = Calcium/Lime* *F = NPKS/mixed fertilizer*	*I = DAP* *J = Potash/MOP* *K = TSP/SPP* *L = Zinc* *M = Ammonia* *N = Gypsum*	*If gave crop, estimate value* *Taka*	*1 = by hand* *2 = with animal power* *3 = with machine* *4 = did not till*	*1 = Yes* *2 = No*	*Taka*	*Use Code 2: Month on Code Page.* *66 = continuously harvested*	*Number*	*Unit*	*Taka*
	If "2" --> D.1.16		If "2" --> D.1.19					If "2" --> **D.1.22**		If "0" --> next row			

SECTION D: AGRICULTURE

Part 2: Plot-Level Production

ENUMERATOR: Please answer the following questions for the time period from September 1, 2011 to August 31, 2012.

CHOOSE TWO PLOTS USING THE FOLLOWING CRITERIA, IN ORDER OF IMPORTANCE: 1) DEMONSTRATION PLOTS; 2) HYBRID OR HYV Seeds; 3) LARGEST SIZE

D.2.1		D.2.2		D.2.3	D.2.4	D.2.5		D.2.6		D.2.7		D.2.8		D.2.9		D.2.10		D.2.11		D.2.12		D.2.13	
How much [CROP ID] seed did you plant?		How much of the [CROP ID] seed was provided for free/subsidized by government?		How much in total did you spend on the [CROP ID] seed that you bought? Do not include seed not planted/used	ENUMERATOR CHECKPOINT: Has the HH harvested ANY of the [CROP ID] yet?	How much [CROP ID] have you sold?		How much [CROP ID] do you intend to sell?		How much [CROP ID] has the HH already eaten?		How much [CROP ID] do you have stored to eat later?		How much [CROP ID] have you given away? (gifts to neighbors, weddings, church)?		How much [CROP ID] did you use for any payment in-kind? For example, sharecropping, labor, irrigation, etc.		How much [CROP ID] did you use for animal feed?		How much[CROP ID] did you store to use as seed?		How much [CROP ID] did you lose due to spoilage or post-harvest losses?	
Number	*Unit*	*Number*	*Unit*	*Taka*	*1 = Yes 2 = No*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*	*Number*	*Unit*
					If "2" --> Next CROP ID																		

SECTION D: AGRICULTURE

Part 3: Labor for Basic Agricultural Activities ENUMERATOR: Report for each CROP ID from September 1 2011 to August 31, 2012.

NOTE: 1) A CHILD IS SOMEONE LESS THAN 15 YEARS OLD, AS REPORTED IN QUESTION B.1.3.
2) WHEN REPORTING PERSON-DAYS, 4 HOURS OR LESS IS 0.5 DAYS.

D.3.1			D.3.2	D.3.3	D.3.4	D.3.5	D.3.6	D.3.7			D.3.8	D.3.9	D.3.10	D.3.11	D.3.12
LAND PREPARATION (Includes ploughing, harrowing, leveling, green manure, etc)								**PLANTING**							
For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in land preparation for this [CROP ID]? If HH members not involved, write "0"			Did any unpaid labor assist with land preparation?	For how many days in total did the unpaid labor assist in land preparation?	Did you hire any paid labor for preparing land?	For how many days in total did paid labor do land preparation on this [CROP ID]?	How much in total did you pay hired labor for land preparation for this [CROP ID]?	For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in planting for this [CROP ID]? If HH members not involved, write "0"			Did any unpaid labor assist with planting for this [CROP ID]?	For how many days in total did the unpaid labor assist in planting for this [CROP ID]?	Did you hire any paid labor for planting on this [CROP ID]?	For how many days in total did the paid labor do planting on this [CROP ID]?	How much in total did you pay hired labor for planting for this [CROP ID]?
Person-Days							*I f payment in-kind, estimate value*	*Person-Days*							*If payment in-kind, estimate value*
Male	*Female*	*Child*	*1 = Yes 2 = No*	*Person-Days*	*1 = Yes 2 = No*	*Person-Days*	*Taka*	*Male*	*Female*	*Child*	*1 = Yes 2 = No*	*Person-Days*	*1 = Yes 2 = No*	*Person-Days*	*Taka*
			If "2"--> D.3.4		If "2"--> D.3.7						If "2"--> D.3.10		If "2"--> D.3.13		

Part 3: Labor for Basic Agricultural Activities

D.3.13	D.3.14			D.3.15	D.3.16	D.3.17	D.3.18	D.3.19	D.3.20	D.3.21			D.3.22	D.3.23	D.3.24	D.3.25	D.3.26
CHECK-POINT	**WEEDING**								**CHECK-POINT**	**INPUTS (**compost, urea, farm yard manure, calcium, NPKS, etc.)							
Did you Weed this [CROP ID]?	For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in weeding for this [CROP ID]? If HH members not involved, write "0"			Did any unpaid labor assist with weeding for this [CROP ID]?	For how many days in total did the unpaid labor assist in weeding for this [CROP ID]?	Did you hire any paid labor for weeding for this [CROP ID]?	For how many days in total did the paid labor do weeding on this [CROP ID]?	How much in total did you pay hired labor for weeding for this [CROP ID]?	Did you apply inputs on this [CROP ID]?	For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in applying inputs for this [CROP ID]? If HH members not involved, write "0"			Did any unpaid labor assist with applying inputs for this [CROP ID]?	For how many days in total did the unpaid labor assist in applying inputs for this [CROP ID]?	Did you hire any paid labor for applying the inputs for this [CROP ID]?	For how many days in total did the paid labor apply inputs on this [CROP ID]?	How much in total did you pay hired labor for applying inputs for this [CROP ID]?
	Person-Days							*If payment in-kind, estimate value*		*Person-Days*							*If payment in-kind, estimate value*
1 = Yes 2 = No	*Male*	*Female*	*Child*	*1 = Yes 2 = No*	*Person-Days*	*1 = Yes 2 = No*	*Person-Days*	*Taka*	*1 = Yes 2 = No*	*Male*	*Female*	*Child*	*1 = Yes 2 = No*	*Person-Days*	*1 = Yes 2 = No*	*Person-Days*	*Taka*
If "2" --> D.3.20				If "2"--> D.3.17		If "2"--> D.3.20			If "2" --> D.3.27				If "2"--> D.3.24		If "2"--> D.3.27		

Part 3: Labor for Basic Agricultural Activities

D.3.27	D.3.28			D.3.29	D.3.30	D.3.31	D.3.32	D.3.33	D.3.34		D.3.35			D.3.36	D.3.37
CHECK-POINT	**HARVESTING**								**PROCESSING**						
Have you harvested this [CROP ID]?	For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in harvesting for this [CROP ID]?			Did any unpaid labor assist with harvesting for this [CROP ID]?	For how many days in total did the unpaid labor assist in harvesting for this [CROP ID]?	Did you hire any paid labor for harvesting for this [CROP ID]?	For how many days in total did the paid labor harvest on this [CROP ID]?	How much in total did you pay hired labor for harvesting for this [CROP ID]?	What processing methods were used on this [CROP ID]? *Multiple Responses Allowed*		In total, how many days did HOUSEHOLD ROSTER MEMBERS spend processing this [CROP ID] after the harvest?			Did any unpaid labor assist with processing the [CROP ID]?	For how many days in total did the unpaid labor assist in processing for this [CROP ID]?
	Person-Days										Person Days				
1 = Yes 2 = No	*Male*	*Female*	*Child*	*1 = Yes 2 = No*	*Person-Days*	*1 = Yes 2 = No*	*Person-Days*	*If payment in-kind, estimate value Taka*	A = Drying B = Husking C = Parboiling D = Milling	E = Grinding F = Preservation G = Other (Specify) H = None	*Men*	*Women*	*Children*	*1 = Yes 2 = No*	*Person-Days*
If "2" --> next CROP ID				If "2"--> D.3.31		If "2"--> D.3.34			If "H" -->D.3.41					If 2 --> D.3.38	

D.3.38	D.3.39	D.3.40	D.3.41	D.3.42	D.3.43	D.3.44
			SALES			
Did you hire any paid labor to assist with processing this [CROP ID]?	For how many days in total did the paid labor process for this [CROP ID]?	How much in total did you pay hired labor for processing for this [CROP ID]?	Did you sell any of this [CROP ID]?	How much did you earn in total from selling this [CROP ID]?	What was the main location of sale for this [CROP ID]?	How many minutes did it take you to reach the main location?
1 = Yes *2 = No*	*Person-Days*	*If payment in-kind, estimate value* *Taka*	*1 = Yes* *2 = No*	*Taka*	1 = Village market 2 = Union market 3 = Farm gate (khamar bari) 4 = Wholesale mkt 5 = Commercial company 6 = Cooperative 7 = Other (Specify)	*Number of minutes* *If sold at own house, write "0"*
If 2 --> D.3.41			If 2 --> **next**			

SECTION D: AGRICULTURE

Part 4: Irrigation

D.4.1	Did you irrigate any of your plots from September 1, 2011 to August 31, 2012?	*1 = Yes 2 = No*		If "2" --> Part 5

NOTE: Please ask the following questions about the time period from September 1, 2011 to August 31, 2012.

D.4.2	D.4.3		D.4.4	D.4.5			D.4.6	D.4.7	D.4.8	D.4.9	D.4.10	D.4.11	D.4.12
Did you irrigate this [CROP ID]?	What was the method of irrigation on this [CROP ID]? Multiple Responses Allowed		Why did you need to irrigate this [CROP ID]? Multiple Responses Possible.	For how many days in total were HOUSEHOLD ROSTER MEMBERS involved in irrigation for this [CROP ID]? *Person-Days*			Did any unpaid labor assist in irrigation for this [CROP ID]?	For how many days in total, was unpaid labor involved in irrigation for this [CROP ID]?	Did you hire any paid labor for irrigation for this [CROP ID]?	For how many days in total, was paid labor hired for irrigation of this [CROP ID]?	How much in total did you pay hired labor for irrigation for this [CROP ID]?	Who is responsible for management and maintenance of the irrigation structure for this [CROP ID]?	Other than labor costs, how much did you spend in total for irrigation on this [CROP ID]?
1 = Yes *2 = No*	A = Rainfed B = Swing Basket C = Dona D = Dugwell E = Hand Tubewell F = Treadle Pump G = Rower Pump H = Shallow Tubewell I = Deep Tubewell	J = Low Lift Pump K = Canal/Irrigation L =water harvesting through mini-ponds M = water harvesting through thread pipe N = rain water harvesting (RWS) O = surface water use P = Other (specify)	A = Lack of rainfall B = Lack of water in river C = Lack of water in dam D = Fall in groundwater level E = Water too saline F = Required for crop growth G = Other (specify)	*Men*	*Women*	*Children*	*1 = Yes* *2 = No*	*Total Person Days Worked*	*1 = Yes* *2 = No*	*Total Person-Days Worked*	*If payment in-kind, estimate value* *Taka*	1 = Cooperative 2 = Water User Association 3 = Self Help Group 4 = Self-Managed 5 = private supplier 6 = Other (Specify)	*Do NOT include labor costs.* *Taka*
If "2" --> Next [CROP ID]	If only "A" --> next [CROP ID]						If "2" --> D.4.8		If "2" --> D.4.11				

SECTION D: AGRICULTURE

Part 5: Inputs ***Report from September 1 2011 to August 31, 2012.***

Enumerator Checkpoint: Only selected two plots.

D.5.1	D.5.2		D.5.3	D.5.4	D.5.5		D.5.6	D.5.7	D.5.8		D.5.9	D.5.10	D.5.11		D.5.12
Compost				**Animal Manure**				**Double-Chambered Farm Yard Manuring (FYM)**				**Urea**			
Did you use any COMPOST on [CROP ID]?	How much COMPOST did you apply to this [CROP ID]?		How much did you spend on COMPOST for this [CROP ID]?	Did you use any ANIMAL MAURE on [CROP ID]?	How much ANIMAL MAURE did you apply to this [CROP ID]?		How much did you spend on ANIMAL MAURE for this [CROP ID]?	Did you use any FARM YARD MAURE on [CROP ID]?	How much FARM YARD MAURE did you apply to this [CROP ID]?		How much did you spend on FARM YARD MAURE for this [CROP ID]?	Did you use any UREA on [CROP ID]?	How much UREA did you apply to this [CROP ID]?		How much did you spend on UREA for this [CROP ID]?
1 = Yes *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*
If "2" -->D.5.4				If "2" --> D.5.7				If "2" -->D.5.10				If "2" -->D.5.13			

D.5.13	D.5.14		D.5.15	D.5.16	D.5.17		D.5.18	D.5.19	D.5.20		D.5.21	D.5.22	D.5.23		D.5.24
Calcium / Lime				**NPKS (mixed fertilizer)**				**Pesticides / Insecticides**				**Pheremone Traps**			
Did you use any CALCIUM/LIME on [CROP ID]?	How much CALCIUM/LIME did you apply to this [CROP ID]?		How much did you spend on CALCIUM/LIME for this [CROP ID]?	Did you use any NPKS/MIXED FERTILIZER on [CROP ID]?	How much NPKS/MIXED FERTILIZER did you apply to this [CROP ID]?		How much did you spend on NPKS/MIXED FERTILIZER for this [CROP ID]?	Did you use any PESTICIDES/INSECTICIDES on [CROP ID]?	How much PESTICIDES/INSECTICIDES did you apply to this [CROP ID]?		How much did you spend on PESTICIDES/INSECTICIDES for this [CROP ID]?	Did you use any PHEROMONE TRAPS on [CROP ID]?	How much PHEROMONE TRAPS did you apply to this [CROP ID]?		How much did you spend on PHEROMONE TRAPS for this [CROP ID]?
1 = Yes *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*
If "2" -->D.5.16				If "2" --> D.5.19				If "2" --> D.5.22				If "2" -->D.5.25			

D.5.25	D.5.26		D.5.27	D.5.28	D.5.29		D.5.30	D.5.31	D.5.32		D.5.33	D.5.34	D.5.35		D.5.36
DAP				**Potash (MOP)**				**TSP / SPP**				**Zinc**			
Did you use any DAP on [CROP ID]?	How much DAP did you apply to this [CROP ID]?		How much did you spend on DAP for this [CROP ID]?	Did you use any POTASH on [CROP ID]?	How much POTASH did you apply to this [CROP ID]?		How much did you spend on POTASH for this [CROP ID]?	Did you use any TSP/SPP on [CROP ID]?	How much TSP/SPP did you apply to this [CROP ID]?		How much did you spend on TSP/SPP for this [CROP ID]?	Did you use any ZINC on [CROP ID]?	How much ZINC did you apply to this [CROP ID]?		How much did you spend on ZINC for this [CROP ID]?
1 = Yes *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*
If "2" -->D.5.28				If "2" -->D.5.31				If "2" -->D.5.34				If "2" --> D.5.37			

D.5.37	D.5.38		D.5.39	D.5.40	D.5.41		D.5.42	D.5.43	D.5.44		D.5.45	D.5.46	D.5.47		D.5.48
	Ammonia				**Gypsum**				**Vitamins**			**Other 1: _____**			
Did you use any AMMONIA on [CROP ID]?	How much AMMONIA did you apply to this [CROP ID]?		How much did you spend on AMMONIA for this [CROP ID]?	Did you use any GYPSUM on [CROP ID]?	How much GYPSUM did you apply to this [CROP ID]?		How much did you spend on GYPSUM for this [CROP ID]?	Did you use any VITAMINS on [CROP ID]?	How much VITAMINS did you apply to this [CROP ID]?		How much did you spend on VITAMINS for this [CROP ID]?	Did you use any [INPUT] on [CROP ID]?	How much [INPUT] did you apply to this [CROP ID]?		How much did you spend on [INPUT] for this [CROP ID]?
1 = Yes *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*	*1 = Yes* *2 = No*	*Number*	*Unit*	*Taka*
If "2" -->D.5.40				If "2" --> D.5.43				If "2" --> D.5.46				If "2" --> Next CROP ID			

SECTION D: AGRICULTURE

Part 6: Technologies ***Report for ALL PLOTS, from September 1 2011 to August 31, 2012.***

Enumerator Checkpoint: Please write the number of plots listed in Section D Part 1.					|__|__|
PLEASE NOTE THAT THIS SECTION YOU MUST ANSWER FOR ALL PLOTS LISTED IN PART 1					
	D.6.1	**D.6.2**			**D.6.3**
Name of Technology	Did you use this technology on any crop on any plot, from Sept 1, 2011, to August 31, 2012?	List [CROP ID] where used			Was this implemented as part of a government or NGO project?
	1 = Yes *2 = No*	*Plot ID*	*Crop Code 1*	*Month Planted*	*1 = Yes, Government* *2 = Yes, NGO* *3 = No* *4 = Both* *88 = Don't know*
	If "2" --> Next Technology				
Green Manure: This is a crop grown to be plowed into the soil for fertilizing. The local name of this crop is "Dhoincha".					
Mulching					
Seedbed method for rice					
Alternate wet/dry method for rice: Saving water by occasionally drying the paddy fields instead of keeping them constantly wet.					

SECTION D: AGRICULTURE

Part 6: Technologies ***Report for ALL PLOTS, from September 1 2011 to August 31, 2012.***

	D.6.1	D.6.2			D.6.3
Name of Technology	Did you use this technology on any crop on any plot, from Sept 1, 2011, to August 31, 2012?	List [CROP ID] where used			Was this implemented as part of a government or NGO project?
	1 = Yes *2 = No*	*Plot ID*	*Crop Code 1*	*Month Planted*	*1 = Yes, Government* *2 = Yes, NGO* *3 = No* *4 = Both* *88 = Don't know*
	If "2" --> Next Technology				
Line planting: Transplanting rice with the correct distance between the lines of seedlings.					
Double Transplanting of Paddy					
Dapog method of seed sowing: Sometimes practiced in the South for the Boro seedbed because no dry land available. A floating seedbed created on Kotcuri Pana (local name for Water Hyacinth)					

HH ID |__|__|__|__|__|__|

SECTION E: HOUSING

PART 1: BACKGROUND AND STATUS OF THE HOUSING OCCUPANCY				
E.1.1	How long has your household inhabited this dwelling?	1 = Less than six months 2 = 6 months - 1 year	3 = 1 - 5 years 4 = 5 - 10 years 5 = 10+ years	
E.1.2	What is your current occupancy status?	1 = Own 2 = Renting 3 = Dwelling provided for free	4 = Temporary Shelter 5 = Other (Specify)	
PART 2: PHYSICAL CHARACTERISTICS OF THE HOUSE				
E.2.1	What is the main construction material of the walls of your main dwelling?	1 = Concrete/Brick 2 = Tin/CI Sheet 3 = Wood 4 = Mud 5 = Bamboo 6 = Jute Straw	7 = Plastic/Polythene 8 = Cardboard/paper 9 = Golpaata/Palm Leaf 10 = Grass/Straw 11 = Other (specify)	
E.2.2	What is the main material used for roofing your main dwelling?	1 = Concrete/Brick 2 = Tin/CI Sheet 3 = Wood 4 = Mud 5 = Bamboo 6 = Jute Straw	7 = Plastic/Polythene 8 = Cardboard/paper 9 = Golpaata/Palm Leaf 10 = Grass/Straw 11 = Other (specify)	
PART 3: WATER & SANITATION				
E.3.1	What is the primary source of drinking water?	1 = Supply Water (piped) inside house 2 = Supply Water (piped), outside 3 = Own tube well 4 = Neighbor's tube well 5 = Community tube well 6 = Rainwater	7 = Ring Well/Indara 8 = Pond/River/Canal 9 = Bottled Water 10 = Shallow tubewell for irrigation 11 = Deep tubewell for irrigation 12 = Other (specify)	
E.3.2	How many minutes does it take you to walk there?	Number of minutes		
E.3.3	What type of toilet facility does your household use?	1 = None (open field) 2 = Kutcha 3 = Pucca 4 = Sanitary without flush (water sealed)	5 = Sanitary with flush (water sealed) 6 = Community latrine 7 = Other (specify)	
PART 4: ELECTRICITY				
E.4.1	What is the main source of lighting?	1 =PDB Electricity (government provided) 2 = palli biddut samity provided electricity (cooperative) 3 = Private Generator 4 = Solar Electricity 5 = Kerosene	6 = Candles 7 = Lantern 8 = Charger Light (torch flashlight) 9 = Others (specify)	
E.4.2	What is your primary source of energy for cooking?	1 = Electricity 2 = Supply Gas 3 = LPG 4 = Kerosene 5 = Firewood 6 = Dried cow dung	7 = Coal 8 = Rice bran/saw dust 9 = Dried leaves/straw 10= charcoal 11 = Other (specify)	

SECTION F: SOCIAL NETWORKS

Part 1: General

Number	F.1.1	F.1.2	F.1.3	F.1.4	F.1.5	F.1.6	F.1.7	F.1.8	F.1.9	F.1.10	F.1.11	F.1.12
	HH ID	List Name of HH Head	HH Head's father's name	How well do you know this family?	Who in this household do you know best?	How often do you talk to this person beyond a simple greeting?	On a scale from 1 to ten, 1 being "not at all", 10 being "yes, completely", how knowledgeable is he/she as a farmer?	In the last three months (from the date of the interview), have you discussed farming techniques with this household?	About how many times did you ask this HH for advice about farming in the last three months (from the date of the interview)?	Compared to most years, did the HH have a better, worse, or about a normal harvest this year?	Did this HH change their usual farming practices this year?	What change did the household make?
		Will be provided from Supervisor		*1 = know of them 2 = acquaintence 3 = good friend 4 = relative 5 = other 6 = don't know*	*1 = HH head 2 = spouse 3= other 4 = general*	*0 = Never 1 = Rarely 2 = once a week 3 = more than once a week*	*For example: 1 = not at all 5 = in the middle 10 = extremely knowledgeable*	*1 = Yes 2 = No*	*Number of times*	*1=better than most years 2 = Worse than most years 3 = About the Same as most years 88= Don't Know*	*1=Yes 2 = No 9 = Don't know*	*1 = Used Compost 2 = Planted Vegetables 3 = Used new kind of seed 4 = Other (specify)*
				If "6" --> next HH				If "2" --> F.1.10			If "2" or "9" --> next HH	
1												
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25												

SECTION G: ASSETS, INCOME, EXPENDITURES

PART 1: HOUSEHOLD ASSETS

		G.1.1	G.1.2	G.1.3
	List of Assets	Does your household own a [ASSET]?	How many [ASSET] does your household own?	Did your household use the [ASSET] from September 1, 2011-August 31, 2012 even though you don't own one?
		1 = Yes		*1 = Yes*
		2 = No		*2 = No*
		If 2 ►G.1.3	**►NEXT ASSET**	
1	Achra			
2	Cot			
3	Bicycle			
4	Bullock Cart/Push Cart			
5	Chair			
6	Daa			
7	Electric Fan			
8	Fishing Net			
9	Hoes and Shovels			
10	Mobile phone			
11	Mosquito net			
12	Motorcycle			
13	Pesticide Sprayer			
14	Power Tiller			
15	Radio			
16	Refrigerator			
17	Rickshaw/Rickshaw Van			
18	Sewing machine			
19	Solar energy panel			
20	Spade (Kodal)			
21	Swing Basket			
22	Table			
23	Tractor			
24	TV Set			

SECTION G: ASSETS, INCOME, EXPENDITURES

PART 2: HOUSEHOLD INCOME FROM DIFFERENT SOURCES			
ENUMERATOR: Record Income from September 1, 2011 to August 31, 2012. Write 0 if NO income from a source. Record INCOME not PROFIT.			
			TAKA
G.2.1	Non-farm own businesses (Retail, tailor, petty trade, phone charging)		
G.2.2	Income from agriculture not reported in Section D		
G.2.3	Income from trees not reported in Section D (i.e. Selling fruit or bamboo from own trees)		
G.2.4	Renting Land or House (include in-kind payments, for example value of crops paid for sharecropping)		
G.2.5	Sale of Land		
G.2.6	Remittances		
G.2.7	Interests and dividends		
G.2.8	Pension		
G.2.9	Casual/Day Labor	Men	
		Women	
		Children	
G.2.10	Salaried/Wage Labor	Men	
		Women	
		Children	
G.2.11	Gifts/Help (if not taka, estimate value)		
G.2.12	Other Sources (specify):		

PART 3: HOUSEHOLD EXPENDITURE ON DIFFERENT SOURCES					
INFREQUENT PURCHASES: Record Expenditures from September 1, 2011 to August 31, 2012. Write 0 if NO expense in category.					
		TAKA			*TAKA*
G.3.1	School Fees (for example: tuition fees, books and uniforms, etc.)		**G.3.10**	Renting land	
G.3.2	Vocational Training		**G.3.11**	Purchase of land	
G.3.3	Housing (Construction/Repairs)		**G.3.12**	Purchase of livestock	
G.3.4	Household Furnishing and Appliances		**G.3.13**	Livestock expenses (eg. Animal feed)	
G.3.5	Remittances		**G.3.14**	Agricultural Equipment (Rented or Purchased)	
G.3.6	Insurance		**G.3.15**	Financial Institutions (eg. Membership fee)	
G.3.7	Health Expenditures (eg. Medicines)		**G.3.16**	Gifts	
G.3.8	Weddings		**G.3.17**	Funerals	
G.3.9	House Rental		**G.3.18**	Electricity	
			G.3.19	Festivals	
INFREQUENT PURCHASES: List the amount of expenditure incurred on each of the following over THE LAST 1 WEEK (from the date of the interview)					
		TAKA			*TAKA*
G.3.20	Transportation		**G.3.24**	Own non-agricultural enterprise (eg. Retail, petty trade, flexiload, etc.)	
G.3.21	Communication (mobile, internet, etc.)		**G.3.25**	Water	
G.3.22	Clothing and personal belongings		**G.3.26**	Other Fuel (firewood, cow dung, kerosene, etc.)	
G.3.23	Personal Items (soap, tooth powder)		**G.3.27**	Paan/Cigarettes/Tobacco/Tea	

SECTION G: ASSETS, INCOME, EXPENDITURES

PART 4: FOOD EXPENDITURE AND CONSUMPTION

Enumerator: Please report for the last week (the seven days before the day of the interview).							
	G.4.1	**G.4.2**		**G.4.3**	**G.4.4**		**G.4.5**
Food Category	Has your HH consumed any [FOOD] from your own production over the last week?	How much [FOOD] of your own production did your HH consume over the last week?		Has your HH purchased any [FOOD] over the last week?	How much [FOOD] did you purchase?		How much in total did your HH spend on purchased [FOOD] over the last week?
	1 = Yes *2 = No*	*Quantity*	*Unit*	*1 = Yes* *2 = No*	*Quantity*	*Unit*	Taka
	if 2 ►G.4.3			if 2 ►next item			
Flour, Bread							
Rice							
Noodles							
Other cereals (maize, sorghum, millet)							
Potatoes, sweet potatoes, root vegetables							
Vegetables							
Fruits (fresh and dry)							
Beans & lentils							
Nuts & seeds							
Eggs							
Dairy products (milk, cheese, yoghurt)							
Meat (goat, beef, lamb)							
Poultry (chicken, duck, pidgeon)							
Fish (fresh and dry)							
Oil//fats (ghee, butter, veg oil)							
Sugar, Honey, other sweeteners							
Soft Drinks, tea, fruit juices							
Condiments (salt, spices, ginger, sauce, pickle, garlic, onions, ketchup, etc.)							
Meals prepared outside HH							

SECTION H: FARMER GROUPS

H.1.1	Is any member of your household a member of a Farmer Group or Cooperative?	*1 = Farmer Group* *2 = Cooperative* *3 = None*		if "3" --> Section I
H.1.2	Is the Farmer Group or Cooperative Part of the Integrated Agriculture Productivity Project, or IAPP?	*1 = Yes* *2 = No*		
H.1.3	Which year was the Farmer Group or Cooperative formed?	*Record year of group formation*		
H.1.4	How many years have you been a member of this group or Cooperative?	*Record Number of years*		
H.1.5	What is the name of your Farmer Group or Cooperative?	*Record Name*		
H.1.6	What is your position in the Farmer group or Cooperative?	*1 = Chairman* *2 = Secretary* *3 = Treasurer* *4 = Member* *5 = Other (specify)*		
H.1.7	What is the current number of male group members in the Farmer Group or Cooperative?	*Number of male members*		
H.1.8	What is the current number of female group members in the Farmer Group or Cooperative?	*Number of female members*		
H.1.9	What is the purpose/theme of your Farmer Group? Multiple Responses Possible	*A= Cereal Crops* *B = ICM (Integrated Crop Management)* *C = IPM (Integrated Pest Management)* *D = SFFP (Soil Fertility Farmers' Production)* *E = Fisheries* *F = Livestock* *G = Irrigation* *H = Other (Specify)*		
H.1.10	Does your farmer group have a savings account?	*1 = Yes* *2 = No*		if "2" --> Section I
H.1.11	Is this a formal account (in a microfinance institution or bank) or informal (savings kept by the group)?	*1 = formal* *2 = informal*		

HH ID |__|__|__|__|__|__|__|

SECTION I: LIVESTOCK, POULTRY and FISH

Part 1: Livestock and Poultry

I.1.1	Does your HH own or manage any livestock or poultry?	*1 = Yes 2 = No*		if 2 --> Section I, Part 3

							From September 1, 2011 to August 31, 2012										
	I.1.2	**I.1.3**	**I.1.4**	**I.1.5**		**I.1.6**	**I.1.7**	**I.1.8**	**I.1.9**	**I.1.10**	**I.1.11**	**I.1.12**	**I.1.13**	**I.1.14**	**I.1.15**	**I.1.16**	**I.1.17**
Animal	On Sept 1, 2011, how many did you own?	On August 31, 2012 how many did you own?	On Sept 1, 2011, how many did you manage (but not own)?	On August 31, 2012 how many did you manage (but not own)?		Do you maintain a written record of your [animal]'s production?	How many were born?	How many were purchased?	Received as a gift/ inherited?	Received from an NGO?	Given as gift?	Lost?	Became sick?	Died?	Consumed by HH?	Sold?	Total Value of Selling in whole year
	Number	*Number*	*Number*	*Number*	**CHECKPOINT:**	*1 = Yes 2 = No*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Number*	*Taka*
	If none, write 0	If none, write 0	If none, write 0	If none, write 0	If I.1.2, I.1.3, I.1.4, and I.1.5 all are 0 then skip to next animal											If 0 --> next animal	
Bullock																	
Milk Cow																	
Buffalo																	
Goat																	
Sheep																	
Chicken																	
Duck																	
Other poultry																	
Other livestock																	

PART 2: PRODUCTS

From September 1, 2011 to August 31, 2012, out of the animals that your household owns or manages, ask about the following products.		**I.2.1** How much did your HH produce?	**I.2.2** How much did your HH consume or use?	**I.2.3** How much did your HH give to others?	**I.2.4** How much did your household sell?	**I.2.5** Total Value of selling
		Quantity	*Quantity*	*Quantity*	*Quantity*	*Taka*
Animal Product	Unit	If "0", next Product			If "0", next Product	
Milk	kg					
Eggs	Number					
Manure	kg					
Cow Dung	kg					
Animal Skins	Number					
Other _____	_____					

SECTION I: LIVESTOCK, POULTRY and FISH

PART 3: FISH

ENUMERATOR: This section applies to all ponds operated in by the HH irom September 1, 2011 to August 31, 2012. Do not include ponds leased-out or rented-out to another HH If more than 3 ponds, record information for largest 3.

I.3.1	In many ponds did this household operate in from September 1, 2011 to August 31, 2012?								|__|__|	If "0" --> Section J	
	I.3.2	I.3.3		I.3.4	I.3.5		I.3.6	I.3.7	I.3.8	I.3.9	I.3.10	I.3.11
Pond ID	*Pond Description* *Write description that will not change in the next five years. For example, landmarks, depth, pond name.*	Distance from home *Number*	*1 = feet 2 = meters 3 = miles 4 = kms* *If next to home, write o in both spaces*	Current Operational Status *1 = Own 2 = Rent 3 = Joint Ownership 4 = share cropping 5 = other*	Pond Size *Number*	*1 = decimals 2 = sq. feet 3 = acres*	Was this pond used as a demonstration pond during this time period? *1 = Yes 2 = No*	INPUTS: Money spent on inputs. *Fingerlings/ Seed Fish* Taka	*Feed* Taka	*Fertilizer* Taka	*Lime* Taka	*Pesticides* Taka
1												
2												
3												

HH ID |__|__|__|__|__|__|__|

SECTION I: LIVESTOCK, POULTRY and FISH

PART 3: FISH

ENUMERATOR: This section applies to all ponds operated in by the HH from September 1, 2011 to August 31, 2012. Do not include ponds leased-out or rented-out to another HH If more than 3 ponds, record information for largest 3. Write "88" if do not know the answer.

	I.3.12	I.3.13	I.3.14		I.3.15		I.3.16		I.3.17		I.3.18	I.3.19		I.3.20
Pond ID	Fish ID	Is this fish a fingerling/seed fish? [End Product harvested]	Total Quantity Collected or Harvested by the household during this time period		Quantity Consumed by HH during this time period		Quantity given by the HH to others during this time period		Quantity Sold by the HH during this time period		Total Value for Selling	Estimated Quantity of the HH's Currently In Pond		Estimated Value of HH's Quantity Currently in Pond
	Use Code 4: Fish on code page	*1 = Yes 2 = No*	*List for each Fish Code*											
	If more than 6 fish types, list 6 most prevalent		Amount	Unit	Amount	Unit	Amount	Unit	Amount	Unit	Taka	Amount	Unit	Taka
1														
2														
3														

SECTION J: SAVINGS AND ACCESS TO FINANCE

J.1.1	Does your household currently [date of interview] have any savings (formal or informal)?	1 = Yes 2 = No		If 2 ►J.1.3
J.1.2	What is the current [date of interview] amount of savings?	Taka		
J.1.3	Does the household currently [date of interview] have any outstanding loans?	1 = Yes 2 = No		If 2 ►J.1.5
J.1.4	What is the current [date of interivew] amount of outstanding loans?	Taka		
J.1.5	Did the HH use any loans for farm inputs (crops, fish, livestock) from September 1, 2011-August 31, 2012?	1 = Yes 2 = No		If 2 ►Section K
J.1.6	What was the total amount of loans for farms inputs (crops, fish, livestock) received during this time?	Taka		

SECTION K: HOUSEHOLD GARDENS

Enumerator: Please fill in information **from September 1, 2011 to August 31, 2012**

K.1.1	Does your HH have a kitchen garden?	1 = Yes 2 = No			**If 2 ► Section L**
K.1.2	Which crops did you grow in the kitchen garden during this time period? Multiple Responses Allowed	Use Crop Code list Write ALL crops			
K.1.3	What was the main purpose of the crops grown in the kitchen garden during this time period? Multiple Responses Possible	A = Self-consumption B = Sale	C = To give as gifts to relatives/friends D = Other (specify)		
K.1.4	Which HH members were involved in planting and managing the crops in the kitchen garden during this time period?	WRITE HH MEMBER ID			
K.1.5	Did you apply any inputs to the crops grown in the kitchen garden during this time period?	1 = Yes 2 = No			**If 2 ► Section L**
K.1.6	Which inputs did you apply? Multiple Responses Possible	*A = Compost* *B = Animal Manure* *C = Farm Yard Manure* *D = Urea* *E = Calcium/Lime* *F = NPKS/mixed fertilizer* *G = Pesticdes/Insecticides* *H = Pheremone Traps*	*I = DAP* *J = Potash/MOP* *K = TSP/SPP* *L = Zinc* *M = Ammonia* *N = Gypsum* *O = Potassium* *P = Vitamins* *Q = Other (specify)*		

SECTION L: FOOD SECURITY

PART 1: DIETARY DIVERSITY

Identify respondent If main respondent is female --> No change of respondent for this section				
If main respondent is male --> Best choice is wife of HH head. If not available, replace with another other adult female HH member.				
If no adult female HH members --> indicate no appropriate respondent below.				
L.1.1	Is an appropriate respondent (adult female HH member) available?	1= Yes 2= No		**If 2 ► PART 2**
Respondent Name			**HH Member ID**	

Enumerator Instructions: Ask the respondent to describe the foods (meals and snacks) the women ate or drank yesterday during the day and night. Start with the first food or drink of the morning. Write down all foods and drinks mentioned. When composite dishes are mentioned, ask for the list of ingredients. When the respondent has finished, please probe for meals and snacks not mentioned.

Breakfast	*Snack*	*Lunch*	*Snack*	*Dinner*	*Snack*

SECTION L: FOOD SECURITY

PART 1: DIETARY DIVERSITY, Continued

Enumerator Instructions: When the respondent has recalled all meals, please fill in the table of food groups below. Mark "1" if any item belonging to the food group appears above. After finishing, probe: for any food groups not mentioned, ask the respondent if any food item from this food group was consumed. Be sure to use examples!

		L.1.2
Food Group	**Examples**	**Response**
		1=Yes 2=No
RICE & CEREALS	Rice, maize, sorghum, millet, barley	
WHEAT FLOUR	Roti, bread, noodles	
WHITE ROOTS AND TUBERS	Potatoes, Cassava, matoke and other roots/tubers	
YELLOW/ORANGE VEGETABLES AND TUBERS	Pumpkin, Carrot, Squash, or Sweet Potato that are orange inside + other locally available vitamin A rich vegetables	
DARK GREEN LEAFY VEGETABLES	Dark green leafy vegetables, including wild forms + locally available vitamin A rich leaves such as Spinach	
OTHER VEGETABLES	Other vegetables (e.g. Tomato, Onion, Eggplant, Green beans, Cauliflower)	
VITAMIN A RICH FRUITS	Fresh and dried. Ripe Mango, Ripe papaya, Bananas and 100% fruit juice from these + other locally available Vitamin A rich fruits	
OTHER FRUITS	Other fruits, including wild fruits and 100% fruit juice made from these	
ORGAN MEAT	Liver, Kidney, heart or other organ meats or blood-based foods	
FLESH MEAT	Goat, Beef, Lamb, Chicken, Duck	
EGGS	Eggs from Chicken, Duck, or any other bird	
FISH	Fresh or dried fish	
LEGUMES, NUTS AND SEEDS	Beans, lentis, peas, nuts (daal, peanuts)	
MILK AND MILK PRODUCTS	Milk, Cheese, Yogurt or other milk products	
OILS AND FATS	Ghee, butter, vegetable oil added to food or used for cooking	
SWEETS	Sugar, Honey, Sweetened soda or sweetened juice drinks, Sugary foods such as Chocolates, Candies, Biscuits and Cakes	
SPICES, CONDIMENTS AND BEVERAGES	Spices (Black Pepper, Salt), Condiments (SKetchup), Coffee, Tea, Alcoholic beverages	
Did you eat anything (meal or snack) OUTSIDE of the home yesterday?		

SECTION L: FOOD SECURITY

PART 2: MONTHS OF ADEQUATE HH FOOD PROVISIONING

L.2.1	Now I would like to ask you about your household's food supply during different months of the year. When responding to these questions, please think back over the last 12 months, from now to the same time last year. Were there any months, in the past 12 months, in which you did not have enough food to meet your family's needs? This includes any kind of food from any source, such as own production, purchase or exchange, food aid, or borrowing.	1=Yes 2=No		If 2 ► Section M

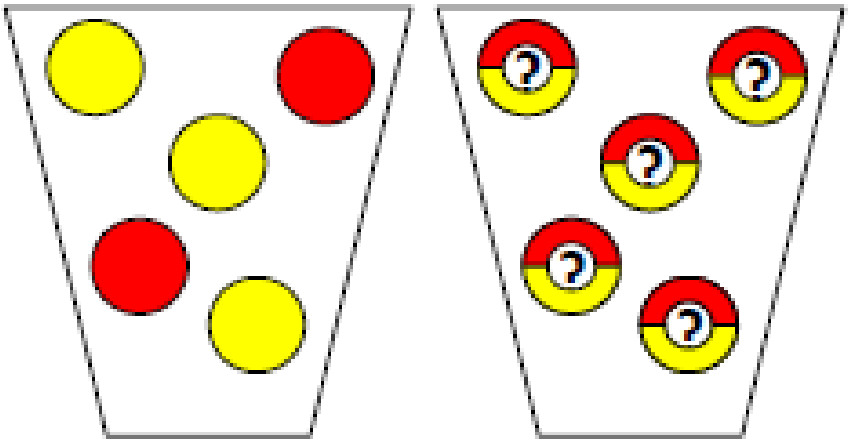
Month		**L.2.2**	**L.2.3**		
		Which were the months in the past 12 months when you did not have enough food to meet your family's needs?	Why?		
			Record only for months where you put 1 in L.2.2		
			List up to 3 reasons. If more than 3, ask respondent to choose 3 most important.		
		ENUMERATOR INSTRUCTIONS: Do not read the list of months aloud. Place a 1 in the box if the respondent identifies that month as one in which the HH did not have enough food to meet their needs. If the respondent does not identify that month, place a 2 in the box. Use a seasonal calendar if needed to help respondent remember the different months. Probe to make sure the respondent has thought about the entire past 12 months. You will not use all of the months listed below. Ask about the last 12 months.	A = Drought	F = High food prices	K = Theft of productive resources
			B = Floods	G = High cost of agricultural inputs	L = Other criminal acts
			C=Irregular rains	H = Loss or reduced employment	M = Erosion / Landslides
			D = Crop pests and disease	I= Illness/ accident of HH member	N = Other (Specify)
			E = Livestock disease	J = Death of HH member	
Bhadro 1418	(Aug 15-Sept 15, 2011)				
Ashin 1418	(Sept 15-Oct 15, 2011)				
Karthik 1418	(Oct 15-Nov 15, 2011)				
Ograhayon 1418	(Nov 15-Dec 15, 2011)				
Poush 1418	(Dec 15, 2011-Jan 15, 2012)				
Magh 1418	(Jan 15-Feb 15, 2012)				
Falgun 1418	(Feb 15-Mar 15, 2012)				
Chaitra 1418	(Mar 15-Apr 15, 2012)				
Boishakh 1419	(Apr 15-May 15, 2012)				
Joishtho 1419	(May 15-Jun 15, 2012)				
Ashar 1419	(Jun 15-Jul 15, 2012)				
Srabon 1419	(Jul 15-Aug 15, 2012)				
Bhadro 1419	(Aug 15-Sept 15, 2012)				
Ashin 1419	(Sept 15-Oct 15, 2012)				

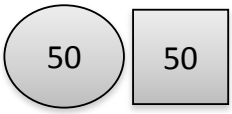
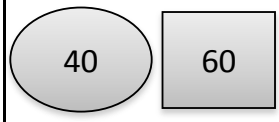
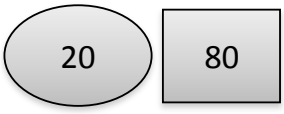
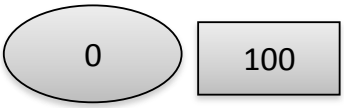
SECTION L: FOOD SECURITY

PART 3: HOUSEHOLD HUNGER SCALE

L.3.1	In the past 30 days, was there ever no food to eat of any kind in your house because of lack of resources to get food?	1=Yes 2 = No		**If 2 ►L.3.3**
L.3.2	How often did this happen in the past 30 days?	1= Rarely (1-2 times in past 30 days) 2 = Sometimes (3-10 times in past 30 days) 3= Often (more than 10 times in past 30 days)		
L.3.3	In the past 30 days, did you or any household member go to sleep at night hungry because there was not enough food?	1=Yes 2 = No		If 2 ►L.3.5
L.3.4	How often did this happen in the past 30 days?	1= Rarely (1-2 times in past 30 days) 2 = Sometimes (3-10 times in past 30 days) 3= Often (more than 10 times in past 30 days)		
L.3.5	In the past 30 days, did you or any household member go a whole day and night without eating anything at all because there was not enough food?	1=Yes 2 = No		If 2 ►Section M
L.3.6	How often did this happen in the past 30 days?	1= Rarely (1-2 times in past 30 days) 2 = Sometimes (3-10 times in past 30 days) 3= Often (more than 10 times in past 30 days)		

SECTION M: RISK AND AMBIGUITY AVERSION

M1.1	You are going to play a game where you draw a ball out of a bag without looking. If the ball you choose is the "right" color, then you win. You get to decide which bag to choose the ball from. Bag One: In Bag One there are 4 RED balls and 6 YELLOW balls. You must pick a RED ball in order to win. Bag Two: In Bag Two there are 10 balls – some are RED and some are YELLOW. You decide what color ball wins. You must then pick this color ball to win. Which bag would you like to choose from?	1 = Bag 1 2 = Bag 2 88 = Don't know	|___|
	 Bag 1 Bag 2		
M1.2	Would you prefer to receive 100 taka today, or to receive 200 taka one month from today?	1 = 100 taka today 2 = 200 taka in 1 month 88 = Doesn't know	|___|
M.1.3	You are going to play a game, I am going to flip a coin. Imagine that you would get the money shown in the circle area if it lands on heads (top of the coin) or the money shown in the square area if it lands on tails (bottom of the coin). The amount you would win depends on the bet you choose. Which bet would you choose?	Record number of picture chosen (1 - 4)	|___|

1	2	3	4
			

SECTION N: FORMAL INSURANCE & NEGATIVE SHOCKS

PART 1: Access to formal insurance

Name of Insurance Scheme/Product		N.1.1	N.1.2	N.1.3		N.1.4	N.1.5	N.1.6	
		Have you ever heard about this scheme?	Have you ever purchased this scheme?	Total premium paid		Reason for not using/ purchasing this scheme?	Would you consider purchasing this scheme in the future?	How much would you be willing to pay?	
		1 = Yes 2 = No	1 = Yes 2 = No	Taka	1 = Month 2 = Year	1 = Too expensive 2 = Unavailable 3 = No Salesman Visited 4 = Other (specify)	1 = Yes 2 = No	Taka	1 = Month 2 = Year
		If 2 --> Next Row	**N.1.4**	Now--> Next			If 2 --> next		
1	Rainfall Insurance								
2	Crop Insurance								
3	Weather-Based Crop Insurance								
4	Livestock Insurance								

Code List A
A = No one / nothing
B = Family (loans)
C = Family (gifts)
D = Family (help)
E = other villagers (loans)
F = other villagers (gifts)
G =other villagers (help)
H =money lenders
I =local government provided help
J = NGO provided help
K = central government (e.g. food for work, or food distribution)
L = insurance payouts
M = sold personal/HH property

Code List B
A = no one / nothing
B =Changed crop (or fish type)
C =changed seed variety
D =Changed fertilizer use
E =changed irrigation use
F =Mortgage or Sell assets
G =Use savings
H =Withdraw children from school and send them for wage employment
I =Migrate for work
J =Seek bonded labour (Dadon)
K =Reduce consumption
L =More wage employment(working extra hours)

PART 2: Negative Shocks

	Description of distress events	N.2.1	N.2.2	N.2.3	N.2.4	N.2.5		N.2.6
		How many times has your HH experienced [EVENT] in the last 12 months?	Total loss associated with event	Who helped you cope with this shock?	How much of the loss was covered by this help (%)	HH ID of any member of Farmer Group that helped (from Section F). If none write "0"		Other actions you took to cope.
		Number of times; 0 if none	*Taka*	*Use Code List A multiple responses possible*	*%*	*HHID1*	*HHID2*	*Code List B Multiple Responses Possible*
		If 0 --> Next Row		if "A" --> N.2.6				
1	Closure of a large firm affecting livelihood in your village							
2	Crop loss due to storms, flooding or other weather event							
3	Water source (wells, boreholes, public taps) dried up							
4	Drought							
5	Human health epidemic (cholera, arsenic, water borne disease)							
6	Sudden health problems / accidents (and associated costs)							
7	Loss of income due to death or illness of family members							
8	Robbery/Theft of Property or Loss/damage of valuable assets							
9	Sudden job loss							
10	Crop failure							
11	Low prices for agriculture production							

HH ID |__|__|__|__|__|__|

CODE 1: CROP CODES

Major Cereals		Oil Seeds		Green banana/plantain	164	Other fruits (lemon like)	205
Aus	101	Sesame	133	Cauliflower	165	Other fruits	206
Aman	102	Sesame BARI Til-1	134	Water Gourd	166	Boroi (Bitter Plum)	207
T.Aman	103	Sesame BARI Til-2	135	Sweet Gourd	167	Rose Apple	208
T.Aus	104	Sesame BARI Til-3	136	Tomato	168	Wood Apple	209
Boro	105	Sesame Variety Unknown	137	Radish	169	Ambada/Hoq Plum	210
Wheat	106	Linseed (Tishi)	138	Turnip	170	Pomegranate	211
Maize	107	Mustard	139	Knolkohl	171	Bilimbi	212
Dwarf Maize	108	Ground nut/peanut	140	Green Papaya	172	Chalta	213
Maize Variety Unknown	109	Soybean	141	Kakrol	173	Tamarind (pulp)	214
Barley	110	Castor (rerri)	142	Yam Stem	174	Olive (wild)	215
Job	111	Other Oilseeds (Specify)	143	Drumstick	175	Coconut/Green Coconut	216
Cheena	112			Bean/Country Bean	176	Jamon	217
Kaun (Italian millet)	113	**Spices**		Coriander Leaf	177	Lotkon	218
Joar (Great Millet)	114	Chili	144	Other Green Vegetables	178	Other Fruits (Specify)	219
Bojra (Pearl millet)	115	Onion	145				
Other Major Cereal	116	Garlic	146	**Leafy Vegetables**		**Other Crops**	
		Tumeric	147	Pui Shak	179	Latiraj	220
Fiber Crops		Ginger	148	Palang Shak (Spinach)	180	Potato	221
Dhonche	117	Dhania/Coriander	149	Lal Shak	181	Sweet Potato	222
Jute	118	Other Spices (Specify)	150	Kalmi Shak	182	Mulberry (Tunt)	223
Cotton	119			Danta Shak	183	Sugarcane	224
Bamboo	120	**Vegetables**		Kachu Shak	184	Date	225
Other Fibre	121	Pumpkin	151	Lau Shak	185	Palm	226
		Bringal (eggplant)	152	Mula Shak	186	Date Juice	227
Pulses		Patal	153	Khesari Shak	187	Tea	228
Lentil (Moshur)	122	Okra	154	Potato Leaves	188	Tobacco	229
Mung	123	Ridge Gourd	155	Cabbage	189	Bettlenut	230
Black gram (Mashkalai)	124	Bitter Gourd	156	Chinese Cabbage	190	Bettleleaf	231
Chickling Vetch (Khesari)	125	Arum	157	Other Green Leafy Vegetables	191	Other Tobacco-like Crop	232
Chick pea (Chhola)	126	Ash Gourd	158	**Fruits**		Cut Flower	233
Pigeon pea (Aarohor)	127	Cucumber	159	Banana	192	Napier Grass	234
Field pea (Motor)	128	Carrot	160	Mango	193	Para Grass	235
Soybean (Gori Kalai/Kali motor)	129	Cow Pea/Yard Long Bean	161	Pineapple	194	Fodder Crops	236
Other pulses (Specify)	130	Snake Gourd	162	Jackfruit	195	**OTHER (Specify)**	237
		Danta	163	Papaya	196		
				Watermelon	197		
				Bangi/Phuti/Musk melon	198		
				Litchis	199		
				Guava	200		
				Ataa	201		
				Orange	202		
				Lemon	203		
				Shaddock (pomelo)	204		

CODE 2: Month Codes	
1 = Boishakh	(Apr 15-May 15)
2 = Joishtho	(May 15-Jun 15)
3 = Ashar	(Jun 15-Jul 15)
4 = Srabon	(Jul 15-Aug 15)
5 = Bhadro	(Aug 15-Sept 15)
6 = Ashin	(Sept 15-Oct 15)
7 = Karthik	(Oct 15-Nov 15)
8 = Ograhayon	(Nov 15-Dec 15)
9 = Poush	(Dec 15-Jan 15)
10 = Magh	(Jan 15-Feb 15)
11 = Falgun	(Feb 15-Mar 15)
12 = Chaitra	(Mar 15-Apr 15)

UNIT CODES	
1 = kg	7 = ml
2 = 25 Kg sack	8 = liters
3 = 50 Kg sack	9 = Hali (4)
4 = 100 Kg sack	10 = Dozen
5 = grams	11 = Number
6 = tons	12 = Mon 40 kg
	leaves)
	14 = Other (Specify)

HH ID |__|__|__|__|__|__|

CODE 3: PADDY VARIETY CODES					
Chandina BR-!	101		BRRI Dhan-44	143	
Mala BR-2	102		BRRI Dhan-45	144	
Biplob BR-3	103		BRRI Dhan-46	145	
Brishail BR-4*	104		BRRI Dhan-47	146	
Dulavhoge BR-5*	105		BRRI Dhan-48	147	
BR-6	106		BRRI Dhan-49	148	
Bribalam BR-7	107		BRRI Dhan-50 Banglamoti	149	
Asa BR-8	108		BRRI Dhan-51	150	
Sufoza BR-9	109		BRRI Dhan-51 sub-1	151	
Progoti BR-10	110		BRRI Dhan-51 sub-2	152	
Mukta BR-11	111		BRRI Dhan-51 unknown	153	
Moyna BR-12	112		BRRI Dhan-52	154	
Gazi BR-14	113		BRRI Dhan-53	155	
Mohini BR-15	114		BRRI Dhan-54	156	
Shahi Balam BR-16	115		BRRI Dhan-55	157	
Hasi BR-17	116		BRRI Dhan-56	158	
Shahjalal BR-18	117		BRRI Dhan-57	159	
Mongal BR-19	118		BINA 1	160	
Nizami BR-20	119		BINA 2	161	
Niamat BR-21	120		BINA 3	162	
Kiron BR-22*	121		BINA 4	163	
Dyshary BR-23	122		BINA 5	164	
Rahmat BR-24	123		BINA 6	165	
Noya Pajam BR-25	124		BINA 7	166	
Sraboni BR-26	125		BINA 8	167	
BRRI Dhan-27	126		BRRI Hybrid-1	168	
BRRI Dhan-28	127		BRRI Hybrid-2	169	
BRRI Dhan-29	128		BRRI Hybrid-3	170	
BRRI Dhan-30	129		BRRI Hybrid-4	171	
BRRI Dhan-31	130		Other (Specify)	172	
BRRI Dhan-32	131				
BRRI Dhan-33	132		*HYBRID*		
BRRI Dhan-34	133		Alok	173	
BRRI Dhan-35	134		Sonar bangla	174	
BRRI Dhan-36	135		Jagoron	175	
BRRI Dhan-37	136		Shakti 1	176	
BRRI Dhan-38	137		Shaki 2	177	
BRRI Dhan-39	138		Aloron 1	178	
BRRI Dhan-40	139		Aloron 2	179	
BRRI Dhan-41	140		Hira	180	
BRRI Dhan-42	141		ACL 5	181	
BRRI Dhan-43	142		Lal Teer	182	

CODE 4: FISH		
1 = Silver Carp	18 = Magur	35 = Pabda
2 = Grass Carp	19 = Shingi	36 = Other Large Fish
3 = Mirror Carp	20 = Khalse	37 = Other Small Fish
4 = Common Carp	21 = Shol/Gajar/Taki	38 = Piranha
5 = Karfu	22 = Puti/Swarputi	
6 = Rui/Ruhit	23 = Prawn (Golda Chingri)	
7 = Katla	24 = Tengra/Baim	
8 = Mrigel	25 = Mola/Dhela/ Kachki	
9 = Kalibaus	26 = Ilish/hilsha	
10 = Tilapia GIFT	27 = Bata Fish	
11 = Tilapia Mono-sex	28 = Big Head	
12 = Tilapia	29 = Sea Fish	
13 = Tilapia type unknown	30 = Pangash	
14 = Pona	31 = Silver barb	
15 = Koi	32 = Chitol	
16 = Thai Koi	33 = Fholi	
17 = Koi type unknown	34 = Aair	