Impact Evaluation of the IAPP Project: Preliminary Results Brief

Summary

The Development Impact Evaluation (DIME) team of the World Bank is working with the Integrated Agricultural Productivity Project (IAPP) to conduct an impact evaluation (IE) of the IAPP. This brief outlines preliminary results of the IE, based primarily on a follow-up household survey conducted from July-September 2013. The brief focuses only on the crops component of Component 2 (Technology Adoption) of IAPP, as fisheries and livestock activities had just started in the IE villages at the time of the follow-up survey.

The primary intervention in Component 2 is the formation of Farmer Field Schools (FFS). The FFS in the IE sample were formed in September and October 2012, and this report covers the impact of the demonstration phase of the first agricultural season of IAPP (Boro season 2012/2013). A second follow-up survey will take place from June-August 2014, to assess the adoption phase of IAPP.

In addition to measuring the overall impact of IAPP, the IE tests two alternative approaches to a standard demonstration plot model in order to understand what is the most effective way to promote new crop varieties. The standard demonstration plot model is for one farmer to cultivate one demonstration plot per crop variety for a FFS. In the Shared Demonstration Plot model, 2-4 farmers share cultivation of each demonstration plot. In the Incentives for Self-Demonstration Treatment, all farmers in the group are encouraged to demonstrate the new variety by cultivating it in a small trial plot on their own farm, and guaranteed a small compensation if yields were worse than their usual variety.

The early results from the IE are mixed. As expected, farmers in the treatment groups received more visits from extension officers. Demonstration farmers in treatment villages had higher rates of adoption of promoted varieties, and paddy yields on demo plots increased by around 14.5%. However, the total value of farm production is lower in treatment groups than in control groups, with this effect being driven by adoption (non-demonstration) farmers. This decrease is driven primarily by farmers in treatment groups altering their crop mix to one that has lower total value based on current yields and prices. This may not necessarily be bad, as current total market value is only one dimension upon which farmers hope to optimize. However, it does provide a reason for the project to confirm that the crop mixes it is promoting will lead to improved farmer welfare.

IE Overview

Evaluation Questions

The impact evaluation of IAPP is a randomized controlled trial, designed to answer the following questions:

1. What is the impact on farmer livelihood of the standard FFS approach of IAPP?
2. Are decentralized approaches to demonstration plots more effective in promoting technology adoption, compared to the standard approach of a single demonstration farmer per village?

In IAPP's **Standard Demonstration Model**, each FFS has a single demonstration farmer for each crop variety that is being demonstrated. This farmer receives a package of inputs (seed, fertilizer, etc) to use on his demonstration plot. The IE tests two alternative approaches:

- **Shared Demonstration Model**: 2-4 farmers share the provided inputs, giving more farmers a chance to demonstrate and to share risks. Farmers with contiguous plots were encouraged to become shared demo farmers, so that there would still be one geographical demonstration plot.
- **Incentives for Self-Demonstration Model:** the provided inputs were shared among as many farmers in the group who were interested in trying the new variety. This creates small demonstration plots on each farmers' land. As farmers tend to be risk averse about trying new varieties, they received the additional guarantee that if their yields on their trial plot were low, compared to a reference plot on a nearby farm, they would be compensated for their losses.

The motivation for testing these alternative approaches is that decentralizing the standard demonstration model may increase rates of adoption of the demonstrated technology by increasing exposure. Farmers may be more likely to adopt technologies in future years if they view more successful demonstrations, or if they conduct a successful trial themselves.

Evaluation Design

The evaluation takes place in in 316 villages, across all 8 districts included in IAPP. 6 of the districts[1] are included only in the evaluation of the Overall Impact (OI) of IAPP. In the OI districts, half of the IE villages have the standard IAPP FFS, while the other half are control (they will receive IAPP interventions after the IE has finished.) The remaining 2 districts, Barisal and Rangpur, are where the alternative approaches to demonstration plots were tested. We will refer to these districts as the DPE (Demonstration Plot Evaluation) districts. In the DPE districts, there are control villages plus three treatments: Regular IAPP Demonstration (the same treatment as in OI districts), Shared Demonstration, and Incentives for Self-Demonstration.

During the first year of FFS, certain farmers were selected to demonstrate promoted crops and cultivation techniques, and were provided inputs to make the demonstrations successful. These farmers are referred to as "Demonstration Farmers". During the second year, the rest of the farmers will be

[1] Pataukhali, Jhalokati, Boroguna, Kurigram, Nilphamari, Lalmonirhat

encouraged to adopt the demonstrated techniques. These farmers are referred to as "Adoption Farmers".

Table 1 shows the breakdown of treatment arms and sample size in the OI and DPE districts. All treatment assignments were randomly allocated.

	OI Districts		DPE Districts (Barisal and Rangpur)			
	Control	Regular IAPP	Control	Regular IAPP	Shared Demo Treatment	Incentives Treatment
Number of Villages	46	46	55	54	56	54
Households Included in Analysis	59	70	487	517	548	530
Average Number of Demonstration Farmers per Group Included in Analysis	0	1.7	0	1.3	3.4	7.8
Average demo plot size (ha)	N/A	0.20	N/A	0.23	0.16	0.09

Table 1: Villages in Treatment Arms

Two rounds of data collection have taken place. Baseline data was collected in 2012 for a sample of 5,617 households. A first round of follow-up data was collected in 2013 for a smaller sample of 3081 households. The follow-up survey sampled all demonstration farmers, and a subset of adoption farmers in each group. Although all districts were included in the midline survey, the sample was heavily biased towards farmers from Rangpur and Barisal. For the analysis in this report we concentrate a subset of 2,211 for which sampling was done consistently for both treatment and control.[2]

Analysis

In each of the graphs that follow, we show the treatment effect compared to the control mean. The column labeled "Control" presents the actual control mean of the sample. The column corresponding to treatment shows the control mean plus the estimated effect size.[3] The error bars show the 95% confidence estimate of the treatment effect. When the control mean lies outside of the 95% confidence interval, the treatment effect is significant at the 95% level. One star denotes significance of the treatment effect at the 10% level, two stars 5%, and three stars 1%. Estimates are taken from an ANCOVA regression model. (Further details of the model can be found in the appendix.)

The treatment effect is captured for three subsets of farmers: demonstration farmers, adoption farmers, and all farmers combined. In order to provide accurate comparisons of demo farmers in the control group, the IE team worked with local agricultural officials to determine "shadow" demonstration

[2] One goal of the follow-up survey was to understand the experiences of demonstration farmers. Many demonstration farmers were not part of groups as formation, so they weren't surveyed at baseline. They are excluded from the analysis as there is no valid counterfactual. There were some villages where the farmers surveyed at baseline were incorrect, in that they were members of an older IAPP group. These farmers were replaced at midline, and are included in the analysis of this report.
[3] This is approximately equal to the treatment mean, but can vary slightly due to the presence of additional controls in the regression.

farmers in the control groups. These are people that officials have identified as likely demo farmers if IAPP were to be active in their village. In control villages in the DPE districts, “shadow” demonstration farmers have been identified for regular, shared, and incentives demonstration farmers. In the analysis, demo farmers are compared to their appropriate shadow.

Demonstration farmers are identified based on surveys of local agricultural officials (SAAO) and additional monitoring of demonstration farmers selection by the research team. For the analysis, we define the demonstration farmers as those farmers who were originally selected to demonstrate. In the field, it is certain that some of those chosen to demo initially did not actually carry through with the demonstration. Therefore, the results for demonstration farmers should be viewed as an approximation of the experience of actual demonstration farmers.

Impact Results

This section gives the main results of the impact evaluation. Detailed regression tables can be found in the Appendix. This section will cover the following topics:

- Access to Agricultural Extension Services
- Rates of adoption of promoted paddy varieties
- Agricultural production and yield on primary plots
- Agricultural production and yield on entire farm

Access to Agricultural Extension services

In treatment groups, farmers were visited far more frequently by extension workers. In control villages, farmers were visited by extension worker an average of .5 times over the season. In treatment villages, farmers experienced an increase of 1.5 visits over the season. This effect is largest for demo farmers. Figure 1 shows the increase in extension visits for the Regular IAPP Treatment villages. The effect is similar for shared demo plot and incentive villages.

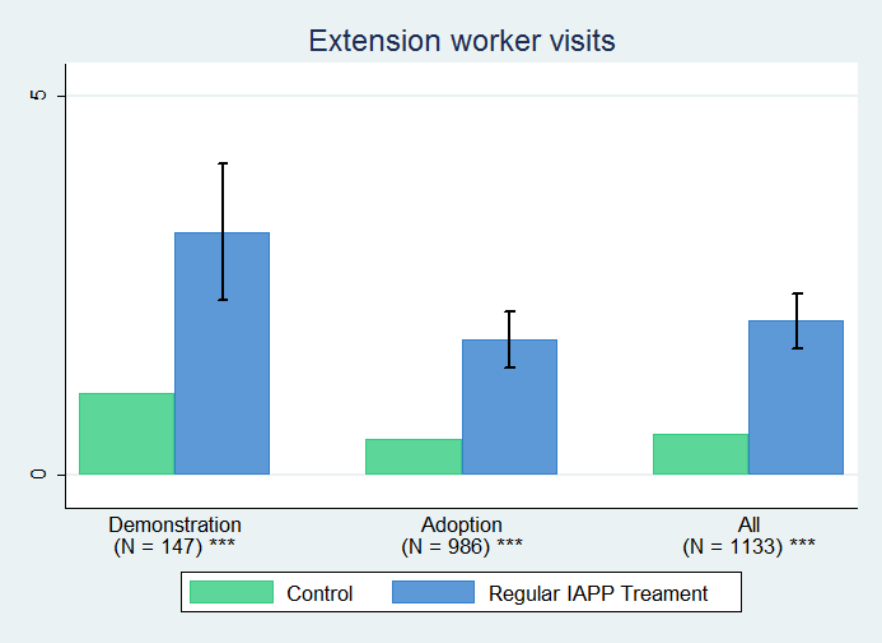

Figure 1: Extension Worker Visits, Regular IAPP Treatment

Adoption

In this section, we focus on paddy, as it was the most commonly-demonstrated crop and therefore has a large enough sample size for analysis.[4] IAPP resulted in substantially higher rates of adoption of the promoted varieties of paddy for demo farmers. The left pane of Figure 3 shows adoption levels of any variety of paddy promoted by IAPP. In control groups, usage of IAPP-promoted paddy varieties is already high at 66%. While usage in treatment groups increases, this increase is not statistically significant. However, as the right pane of Figure 3 shows, farmers in treatment groups do increase cultivation of the specific variety of paddy being promoted by IAPP in their village. Demo farmers are 30% more likely to grow the promoted variety of paddy than the shadow demo farmers in control villages. While Figure 2 shows the results for the Regular IAPP Treatment, the results are similar for the Shared Demo and Incentives treatments.

[4] Other crops show similar patterns, but are not shown due to low sample sizes.

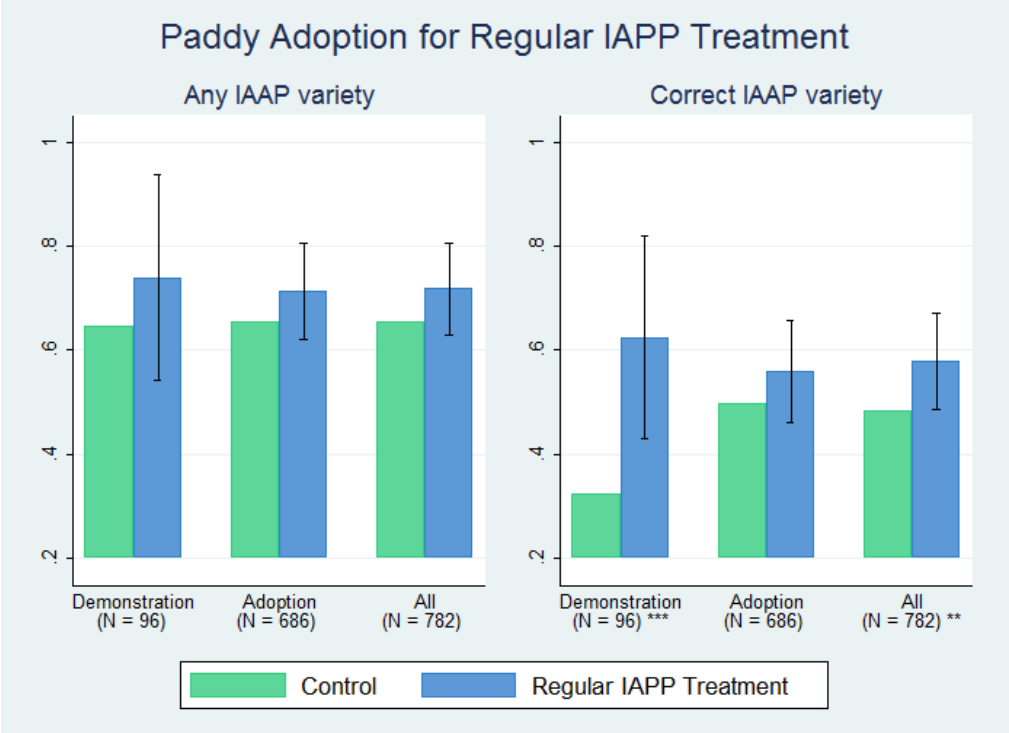

Figure 2: Adoption of Paddy in Villages with Paddy Demonstrations

Agricultural production and yield on Primary Plots

In this section we look yields and output for the 'primary' two plots of a household. Households were asked to give detailed cultivation and harvest data for two plots. If farmers had demo plots or cultivated IAPP crops on some plots, these plots were included in the two primary plots. Apart from this, farmers were asked to give information on their largest plots. This strategy is designed such that for demo farmers any demo plot a farmer cultivates is included, and these are compared to similar plots for non-demo farmers in the control groups.

Paddy Yields

The detailed information taken from the two primary plots allows a calculation of crop-specific yield in kg/ha. Although the survey collected data on six IAPP crops, the majority of our sample were in groups were paddy demonstrations took place. Paddy is the only crop with enough sample size to conduct crop-specific analysis, so we focus on paddy in this section.

Under the standard IAPP model, paddy demonstration farmers saw a statistically significant increase in yields. As shown in Figure 3, treatment demo farmers saw an increase in paddy yields of 14.5% (increase of 722 kg/ha, over the mean of 4968 kg/ha in the control group)[5]. Note that this is for all paddy grown on their primary two plots, not only on the demo plot.

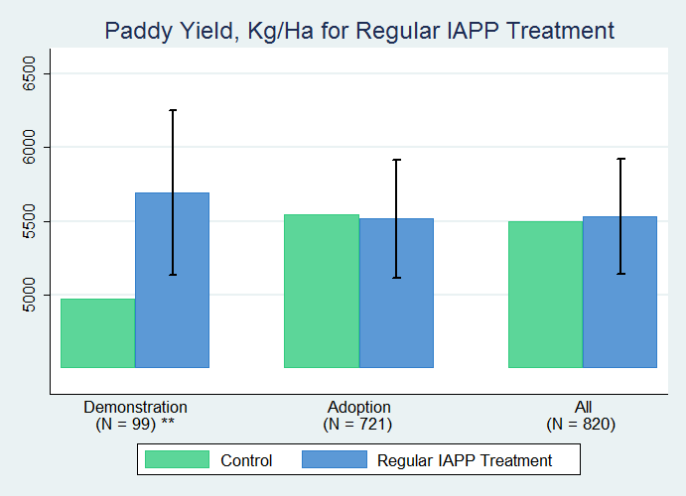

Figure 3: Paddy Yields in Kg/Ha for Standard IAPP

This increase in yield does not hold for farmers in the Shared Demo and Incentives villages. As shown in Figure 4, in these villages there was no significant difference in paddy yields compared to control villages. This is likely because demo farmers in these villages received far fewer inputs per person, due to the input packages being split among many people. For the Incentives treatment, farmer yields on demo plots were closely monitored, since farmers received compensation if their demo yields were

[5] Note that these yields are calculated for raw paddy. Rice yields are around 1/3 lower as they reflect the lower weight of rice post-processing.

below those of local reference points. In over 50% of the cases, yields were indeed lower and the farmers received compensation.

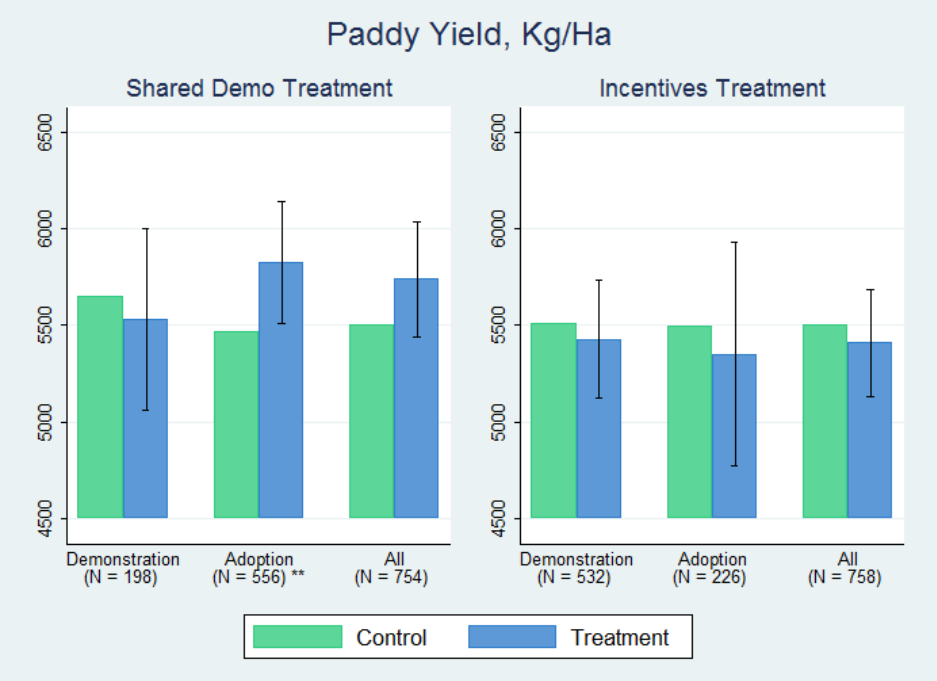

Figure 4: Paddy Yields, Kg/Ha for Shared Demo and Incentive Treatments

All Crops

We now turn to the total yield on primary plots. Total production value is calculated by multiplying output of each crop by its unit price[6], and summing up the value of all crops on the primary plots.

As shown in Figure 5, on primary plots production value and gross yield are not statistically different between treatment and control, even for demonstration farmers. However, demonstration farmers in the treatment group report lower input spending, leading to higher net yield. It appears that IAPP provision of inputs is replacing input spending that would have happened in the absence of the project, leading to higher net yields without higher gross yields.

The graphs in Figures 5 are from regular IAPP demonstrations. For the Shared Demo Plot and Incentive treatments, the patterns are largely the same but the magnitudes of changes are smaller and not statistically significant.

[6] Unit prices are estimated based on prices reported from farmers who sold the crop in question. We calculated unit prices for northern districts (Rangpur, Kurigram, Nilphamari and Lalmonirhat) and southern districts (Baraisal Pataukhali, Jhalokati and Boroguna) separately.

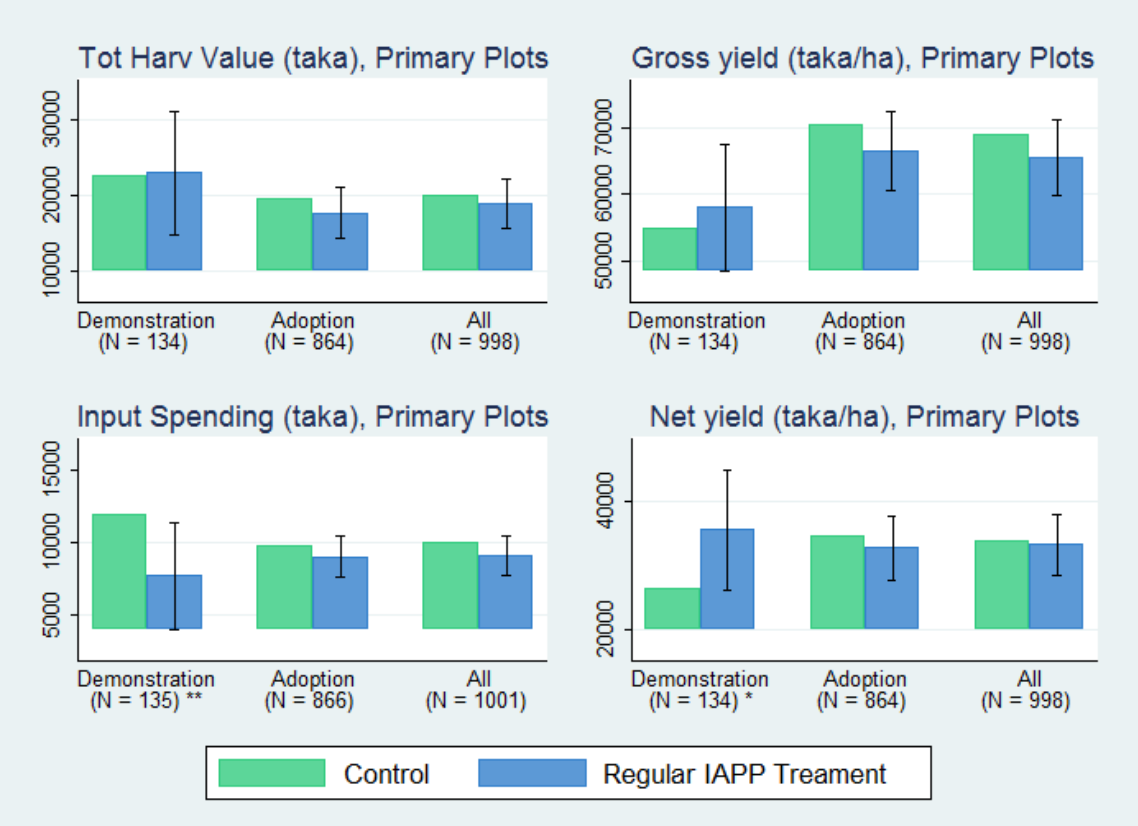

Figure 5: Farm Output on Primary Plots, Standard IAPP

Agricultural Production and Yields for the Household Farm

In this section we consider output on participants' entire farms.[7] As shown in Figure 6, farmers in standard IAPP treatment groups had markedly lower value of output compared to control groups, with this effect being driven by adoption farmers. Compared to farmers in control groups, those in treatment groups saw their total value of harvest decrease by 15.0%, gross yields[8] decrease by 13.7%, and net yields decrease by 20.9%. These decreases are all statistically significant.

[7] Data was gathered on a maximum of 10 plots, which is the entire farm for the majority of respondents. For farmers with more than 10 plots, we ask about the 10 largest.

[8] Yield is approximated as the total value of up to 10 crops produced divided by land area of up to 10 plots cultivated. 59% of the households in the sample have fewer than 10 plots and fewer than 10 crops, and for these household the yield calculations are valid. For others, the yield calculation is an approximation.

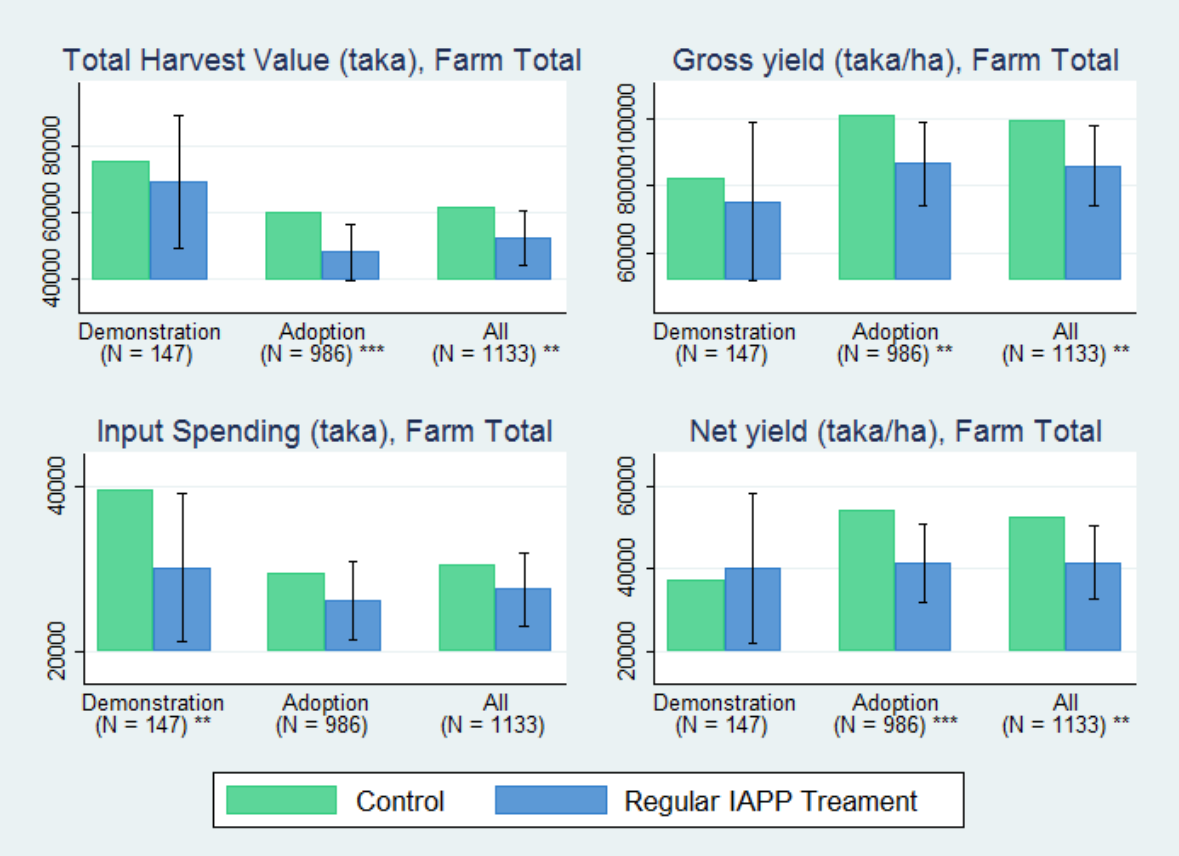

Figure 6: Total Farm Outputs for Regular IAPP Treatment

As shown in Figure 7, the same general pattern holds for the Incentives Treatment. However, as shown in Figure 8, in the Shared Demo Plot Treatment villages, farm production is not statistically different from control villages.

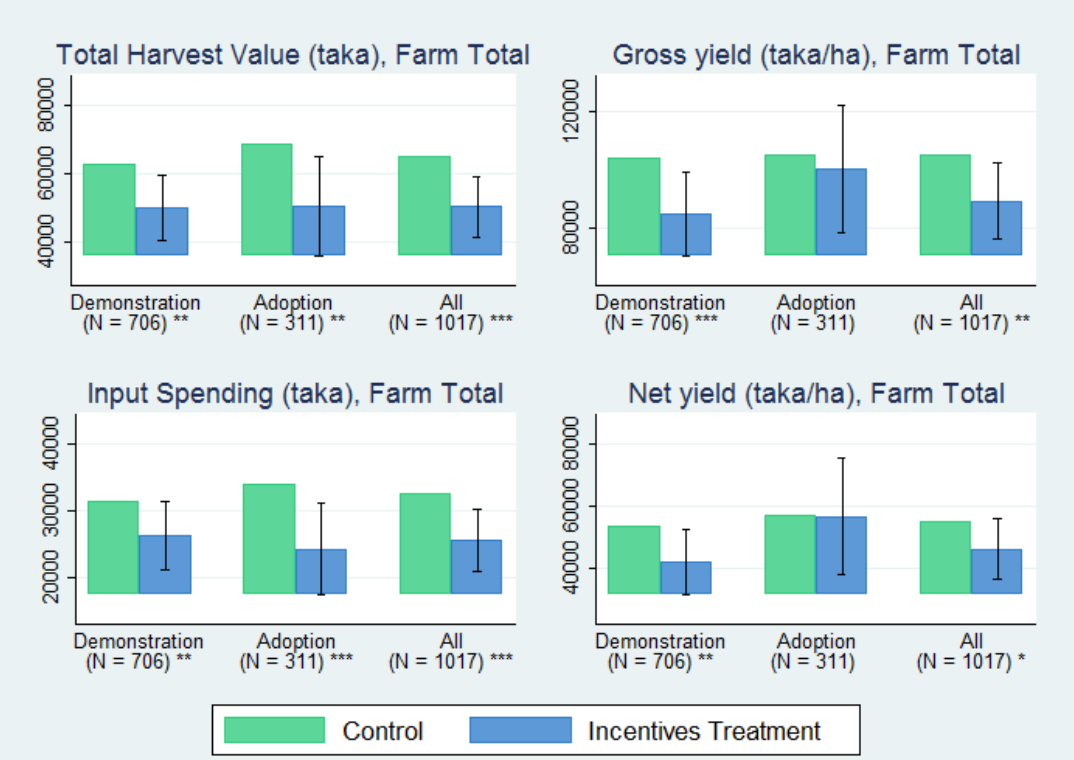

Figure 7: Total Farm Output, Incentives Treatment

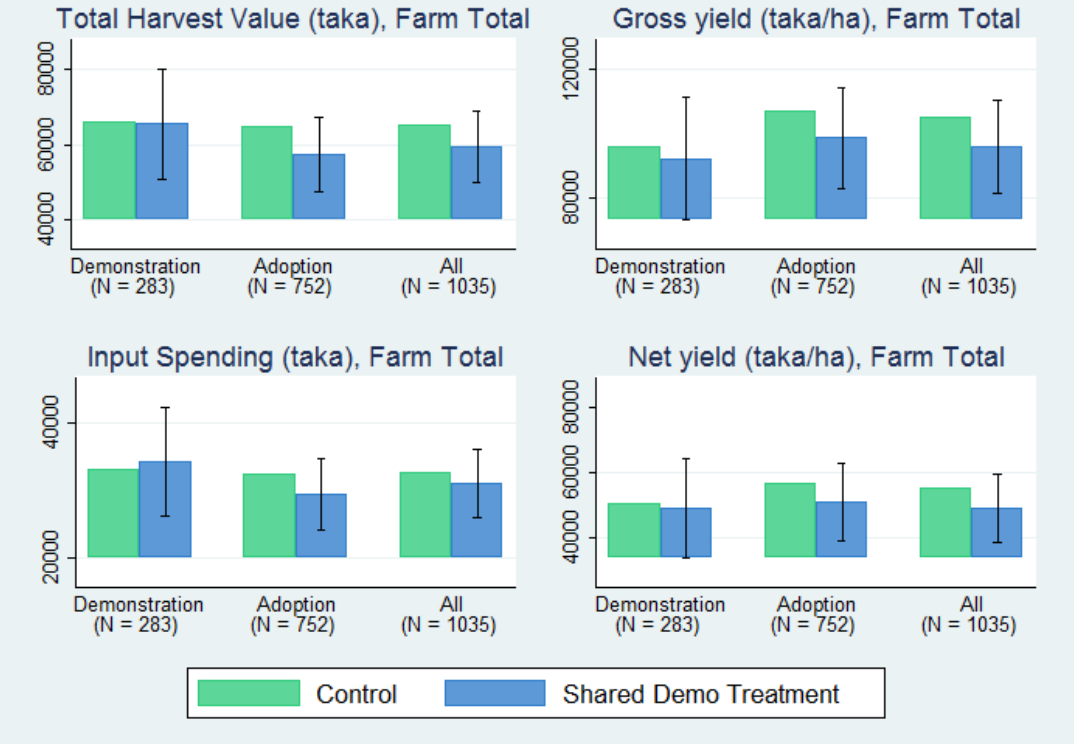

Figure 8: Total Farm Outputs, Shared Demonstration Treatment

Discussion

The finding of lower harvest value among adoption farmers in treatment villages is unexpected. While adoption farmers did not receive inputs during the first year of the program, it appears that they did shift their crop mix, adopting more IAPP crops at the expense of crops not promoted by IAPP. This mix resulted in lower total value of harvest, but possibly provided other benefits.

Although the shift in crop mix was not dominated by any particular crop, there are three trends in the data that together explain the majority of the drop in crop value. In Rangpur, farmers whose crop mix includes more potato have higher average production value, as potatoes have high value relative to other crops. But treatment farmers in Rangpur grew fewer potatoes, perhaps because it was not a crop being promoted by IAPP.[9] In Barisal, production of mung is correlated with lower total crop value, and production of beetle leaf is correlated with greater total crop value. However, treatment farmers in Barisal grow less betel leaf and more mung compared to those in the control group.[10] Mung is being directly promoted by IAPP.

Crop value is measured using a snapshot of prices (those at the same time as the survey), and therefore may not be an accurate representation of the long-term value of the crop mix due to price fluctuations. Potato provides a good example of this. Prices during the Boro 2013 season (and therefore used for value calculations) were around 10 taka/kg, making them a very profitable crop. However, a production glut in 2014 caused potato prices to collapse to nearly zero. Therefore, farmers moving out of potato production may have been justified in the long run due to price risk.

However, the shift into mung presents a cause for concern. Although mung is a high-priced cash crop (62 taka/kg in 2013), farmers in our sample saw low yields of around 450 kg/ha. At these yields, mung is less profitable than more common crops (such as paddy). The yields reported in the DIME survey contrast with much higher numbers reported by the project M+E team. (They reported “Before IAPP” yields at 915 kg/ha, and “After IAPP” yield on demo plots to be 1330 kg/ha.) If the project is going to continue to promote mung, it will need to find a way to close this yield gap.

Finally, it is important to note that the decreases in harvest value were only significant for the ‘total farm’, and the questions on total farm production were asked with less detail than in standard agricultural surveys. One drawback of the lack of detail is that survey does not allow calculation of crop-specific yields (in kg/ha) outside of the two ‘primary plots’. This is because this survey was designed to be a rapid follow-up as opposed to a full household survey. It is possible that these methods caused a lack of accuracy in the data, though it is difficult to see how the survey methods would drive differences between treatment and control.

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[9] In Rangpur, the value of potatoes as a percentage of total harvest value is 5.9% lower in treatment villages compared to control villages. However, this difference is not statistically significant at standard confidence levels (p=.16).

[10] In Barisal, the value of mung as a percentage of total harvest value is 4.0% higher in treatment villages compared to control villages. However, this difference is not statistically significant at standard confidence levels (p=.17). The value of beetel leaf as a percentage of total harvest value is 4.6% lower in treatment villages compared to control villages. This difference is also not statistically significant at standard confidence levels (p=.17).

Conclusion

While the early results of IAPP show some promising signs, the decrease in crop value in IAPP treatment villages presents an opportunity to re-evaluate some of the crop choices being promoted by IAPP to ensure that they are suitable. However, it should be stressed that these conclusions are a result of a preliminary survey, and results might improve over time. For instance, low yields observed for mung may increase as farmers become more comfortable with the crop.

A much fuller picture of the success of IAPP will come after the second follow-up survey, which will take place from June-August 2014. This will cover a much larger sample, and will allow detailed analysis of the effects of IAPP on yield and technology adoption. This will also allow a test of the effectiveness of the alternative demonstration techniques (Shared Demonstration and Incentives for Self-Demonstration) on promoting technology adoption.

Appendix

Specification

The regression specification used for all results is an ANCOVA specification, described by the following equation:

$$Outcome_{i,t} = \alpha + \beta_1 Treat_i + \beta_2 Outcome_{i,t-1} + \beta_3 Controls + \varepsilon_{i,t}$$

The control variables consist of a dummy that indicates if the household was not surveyed at baseline, a dummy that indicates if they did not cultivate crops during boro 2012, and a set of district dummies. These two dummies provide the possible reasons why a household could not have a valid measure of the outcome at time t-1. If the observation did not have a valid measure of outcome variable at time t-1, the lagged outcome is set to zero. The error term is assumed to be correlated across villages but otherwise iid, so the specifications cluster standard errors at the village level.

Appendix Tables

	Number of extension worker visists		
	Demo	Adoption	All
Regular IAPP Treatment	2.137***	1.306***	1.495***
	[0.46]	[0.19]	[0.19]
Lag of Dependent Variable	0.0587	0.156***	0.151***
	[0.06]	[0.03]	[0.03]
Control Mean	1.071	0.477	0.537
Control Number of Obs	56	501	557
Control Standard Deviation	2.044	1.559	1.622
Total Number of Observations	147	986	1133

Note: These results correspond to Figure 1 in the main text. All regressions are ANCOVA, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Standard errors clustered at the village level.

Appendix Table 1: Extension Worker Visits

	Adopted Any IAPP Paddy Variety			Adopted Promoted Paddy Variety		
	Demo	Adoption	All	Demo	Adoption	All
Regular IAPP Treatment	0.0953	0.0577	0.0643	0.303***	0.0643	0.0971**
	[0.10]	[0.05]	[0.05]	[0.10]	[0.05]	[0.05]
Lag of Dependent Variable	0.260**	0.342***	0.331***	0.498***	0.475***	0.480***
	[0.11]	[0.05]	[0.05]	[0.09]	[0.05]	[0.05]
Control Mean	0.645	0.656	0.655	0.323	0.496	0.482
Control Number of Obs	31	363	394	31	363	394
Control Standard Deviation	0.486	0.476	0.476	0.475	0.501	0.5
Total Number of Observations	96	686	782	96	686	782

Note: These results correspond to Figure 2 in the main text. All regressions are ANCOVA, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Sample is restricted to farmers that grew paddy and were living in a village where paddy was demonstrated. Standard errors clustered at the village level.

Appendix Table 2: Paddy Adoption

	Paddy Yield (Kg/Ha)		
	Demo	Adoption	All
Regular IAPP Treatment	722.3**	-31.38	32.7
	[284.59]	[205.18]	[199.16]
Lag of Dependent Variable	0.348*	0.174*	0.214**
	[0.19]	[0.10]	[0.10]
Control Mean	4968.9	5547.8	5500.5
Control Number of Obs	33	371	404
Control Standard Deviation	1560.6	1452.6	1468.3
Total Number of Observations	99	721	820

Note: These results correspond to Figure 3 in the main text. All regressions are ANCOVA, and contain district fixed effects as well as dummies to identify households added at follow-up, those that did not cultivate at baseline and those that did not cultivate paddy during the boro season at baseline. Standard errors clustered at the village level. These yields are calculated for raw paddy. Rice yields are around 1/3 lower as they reflect the lower weight of rice post-processing

Appendix Table 3: Paddy Yield, Regular IAPP

	Paddy Yield (Kg/Ha)					
	Shared Demo Treatment			Incentives Treatment		
	Demo	Adoption	All	Demo	Adoption	All
Treatment	-119.5	354.5**	234.8	-80.12	-149.3	-96.46
	[239.91]	[160.83]	[152.63]	[157.38]	[296.18]	[143.08]
Lag of Dependent Variable	0.227	0.156	0.199*	0.257**	0.205	0.249***
	[0.27]	[0.10]	[0.12]	[0.12]	[0.13]	[0.09]
Control Mean	5649.3	5470.3	5505.5	5509.2	5499.9	5505.5
Control Number of Obs	72	294	366	218	148	366
Control Standard Deviation	1288.1	1532.4	1487.5	1493.9	1483.2	1487.5
Total Number of Observations	198	556	754	532	226	758

Note: These results correspond to Figure 4 in the main text. All regressions are ANCOVA, and contain district fixed effects as well as dummies to identify households added at follow-up, those that did not cultivate at baseline and those that did not cultivate paddy during the boro season at baseline. Standard errors clustered at the village level. These yields are calculated for raw paddy. Rice yields are around 1/3 lower as they reflect the lower weight of rice post-processing

Appendix Table 4: Paddy Yield, Shared Demo and Incentives

	Total Harvest Value (Taka)			Gross Yield (Taka/Ha)			Total Input Spending (Taka)			Net Yield (Taka/Ha)		
	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All
Regular IAPP Treatment	275.8	-1980.7	-1026.9	3097.3	-3937.9	-3324.1	-4236.8**	-710.5	-855.9	9104.1*	-1885.8	-522.6
	[4195.92]	[1708.55]	[1673.46]	[4810.42]	[3024.25]	[2907.49]	[1890.21]	[725.16]	[712.72]	[4801.87]	[2539.75]	[2432.51]
Lag of Dependent Variable	0.196***	0.103***	0.135***	0.142**	0.0582***	0.0682***	0.367***	0.153**	0.224***	0.166***	0.0299	0.0483**
	[0.07]	[0.03]	[0.03]	[0.06]	[0.02]	[0.02]	[0.13]	[0.07]	[0.08]	[0.06]	[0.02]	[0.02]
Control Mean	22622.8	19597.3	19900.5	54872.4	70504.7	68938.2	11907.7	9708.3	9932.3	26409.6	34597.4	33776.9
Control Number of Obs	48	431	479	48	431	479	49	432	481	48	431	479
Control Standard Deviation	21096.8	18232.9	18537.7	29325.6	29303.9	29650.1	11497.4	8129.7	8544.5	22713.5	24997	24877.5
Total Number of Observations	134	864	998	134	864	998	135	866	1001	134	864	998

Note: These results correspond to Figure 5 in the main text. All regressions are ANCOVA on primary plots output, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Standard errors clustered at the village level.

Appendix Table 5: Total Harvest Value, Primary Plots

	Total Harvest Value (Taka)			Gross Yield (Taka/Ha)			Total Input Spending (Taka)			Net Yield (Taka/Ha)		
	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All
Regular IAPP Treatment	-5946.5	-11854.2***	-9212.2**	-6788	-14727.7**	-13656.7**	-9479.8**	-3273.9	-2917.6	3156.9	-12708.5***	-11004.2**
	[10231.95]	[4238.99]	[4097.23]	[11886.53]	[6313.67]	[6019.18]	[4560.80]	[2397.47]	[2259.45]	[9230.97]	[4833.98]	[4577.30]
Lag of Dependent Variable	0.634***	0.618***	0.636***	0.263**	0.310***	0.306***	1.698***	0.897***	1.029***	0.276***	0.242***	0.249***
	[0.13]	[0.13]	[0.11]	[0.12]	[0.07]	[0.07]	[0.44]	[0.20]	[0.23]	[0.09]	[0.06]	[0.06]
Control Mean	74962.7	59813.8	61336.8	82145.9	101424.3	99486.1	39626.7	29398.1	30426.5	37047.9	54187.5	52464.3
Control Number of Obs	56	501	557	56	501	557	56	501	557	56	501	557
Control Standard Deviation	69935.8	57227	58734.1	81809.4	77281.3	77888.3	33677.9	27659.6	28454.7	50229.2	64217.5	63124.6
Total Number of Observations	147	986	1133	147	986	1133	147	986	1133	147	986	1133

Note: These results correspond to Figure 6 in the main text. All regressions are ANCOVA on total farm output, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Standard errors clustered at the village level.

Appendix Table 6: Total Farm Output, Regular IAPP Treatment

	Total Harvest Value (Taka)			Gross Yield (Taka/Ha)			Total Input Spending (Taka)			Net Yield (Taka/Ha)		
	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All
Incentives Treatment	-12512.6**	-18050.1**	-14794.1***	-19695.0***	-4402.5	-15434.3**	-5258.8**	-9684.8***	-6825.6***	-11603.7**	-456.2	-9006.1*
	[4904.97]	[7375.97]	[4531.24]	[7209.75]	[11211.83]	[6486.62]	[2577.03]	[3453.89]	[2367.17]	[5281.34]	[9495.79]	[4981.77]
Lag of Dependent Variable	0.576***	0.621***	0.595***	0.353***	0.395***	0.372***	0.991***	1.064**	1.015***	0.228***	0.331**	0.271***
	[0.09]	[0.22]	[0.11]	[0.07]	[0.15]	[0.08]	[0.16]	[0.51]	[0.21]	[0.06]	[0.14]	[0.07]
Control Mean	62571.2	68733.2	65129.3	104446.1	104691.2	104547.8	31500.9	34004	32540.1	53750.5	57242.4	55200.1
Control Number of Obs	224	159	383	224	159	383	224	159	383	224	159	383
Control Standard Deviation	55644.1	65182.5	59783.7	78009	81596.6	79412.3	29191.2	32397.9	30546.8	58927.7	69700.5	63557
Total Number of Observations	706	311	1017	706	311	1017	706	311	1017	706	311	1017

Note: These results correspond to Figure 7 in the main text. All regressions are ANCOVA on total farm output, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Standard errors clustered at the village level.

Appendix Table 7: Total Farm Output, Incentives Treatment

	Total Harvest Value (Taka)			Gross Yield (Taka/Ha)			Total Input Spending (Taka)			Net Yield (Taka/Ha)		
	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All	Demo	Adoption	All
Shared Demo Treatment	-595.9	-7570.8	-5834.9	-3864.1	-7911.1	-8937.1	1148.4	-3008.1	-1516	-1254.9	-5633.1	-6137.9
	[7562.21]	[5078.40]	[4904.38]	[9528.94]	[8005.75]	[7236.47]	[4125.18]	[2700.46]	[2647.97]	[7707.65]	[6040.25]	[5359.16]
Lag of Dependent Variable	0.556***	0.842***	0.774***	0.360***	0.419***	0.406***	1.083**	1.229***	1.212***	0.205**	0.281***	0.262***
	[0.11]	[0.09]	[0.08]	[0.11]	[0.10]	[0.08]	[0.45]	[0.21]	[0.20]	[0.09]	[0.07]	[0.06]
Control Mean	66071.6	64918.6	65129.3	95771.9	106510.5	104547.8	33131.9	32407.7	32540.1	50150.5	56329.4	55200.1
Control Number of Obs	70	313	383	70	313	383	70	313	383	70	313	383
Control Standard Deviation	57425.3	60385.7	59783.7	76468.1	80043	79412.3	30670	30566.9	30546.8	64476	63398.8	63557
Total Number of Observations	283	752	1035	283	752	1035	283	752	1035	283	752	1035

Note: These results correspond to Figure 8 in the main text. All regressions are ANCOVA on total farm output, and contain district fixed effects as well as dummies to identify households added at follow-up and those that did not cultivate at baseline. Standard errors clustered at the village level.

Appendix Table 8: Total Farm Output, Shared Demo Treatment