



global agriculture & food security program



IMPACT EVALUATION NOTE

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This brief provides an update on findings and experiences from impact evaluations carried out by the Development Impact Evaluation (DIME) unit and other technical partners for projects in the GAFSP portfolio. Draft reports described here may be shared upon request to the GAFSP Deputy Program Manager, Natasha Hayward. For DIME-led evaluations, the related original papers and reports may still be in the process of discussion, review, and final analysis, and so not yet ready for wider publication. Where possible, this brief indicates the status of results where analysis or discussion of results are still ongoing.

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Acronyms and Abbreviations

AFSP	Agriculture and Food Security Project (Nepal)
DIME	Development Impact Evaluation
FIES	Food Insecurity Experience Scale
GAFSP	Global Agriculture and Food Security Program
IAPP	Integrated Agricultural Productivity Project (Bangladesh)
IE	Impact evaluation
LWH	Land Husbandry, Water Harvesting and Hillside Irrigation Project (Rwanda)
M&E	Monitoring and evaluation
PTTA	Technology Transfer to Small Farmers Program (Haiti)
RCT	Randomized control trial
SAPEC (Liberia)	Smallholder Agricultural Productivity Enhancement and Commercialization
TP	Technological package
VDC	Village Development Committee

Introduction

The Global Agriculture and Food Security Program (GAFSP) is designed to make smart investments in sustainable and resilient food and agriculture systems to improve the lives of poor farmers in countries across the globe. The GAFSP Monitoring and Evaluation (M&E) Framework sets forth a policy that every GAFSP investment project shall undergo a form of impact assessment. With a focus on both results and learning, GAFSP supports several rigorous impact evaluations (IEs) across its investment portfolio.

The essence of IE is to focus on causality and attribution, where addressing causality determines the methods that can be used. It is widely established that rigorous causal evidence has been scarce for agriculture and food security interventions. For GAFSP, the rationale for using IEs, therefore, has multiple dimensions. First, the Program intends to use the systematic evidence coming out of these to inform recipient governments about policy and project design, and, subject to timing, guide project and Program mid-course corrections. In addition, lessons learned from evaluations are intended to inform broader adoption in and across countries and actors, as well as the potential scale-up of proven good practices. Further, extrapolating for a subset of projects statistically robust data on higher-level indicators, such as income and food security, allows the Program to derive potential aggregated Program-wide impacts of interest to multiple stakeholders, including donors. Finally, M&E using new indicators (e.g., the Food Insecurity Experience Scale (FIES)¹) will help generate operational evidence of broader public interest, testing the value of such new tools. The authors of this paper also see great value in the lessons learned on both process and substance through mixed methods approaches, including the ability to hear directly from the Program's primary beneficiaries.

Through a partnership with the Development Impact Evaluation (DIME) group at the World Bank, GAFSP has supported randomized evaluations of several projects in its portfolio (see Annex 1 for a list and related progress of the GAFSP/DIME evaluations). DIME is currently conducting, or has conducted, IEs for GAFSP-financed operations using experimental designs and counterfactuals in Bangladesh, Rwanda, Haiti, Nepal, and Liberia. The IEs typically span the lifecycle of the projects, with "endline" evaluation rounds conducted in the final year of project implementation. IE specialists engage with operational teams and government counterparts at the beginning of the project to ensure that the evaluation study provides answers to relevant operational and policy questions. Evaluation results are available for four countries in the subset carried out by DIME: Bangladesh, Rwanda, Haiti, and Nepal. The evaluation for Haiti was successfully disseminated in July 2017.

GAFSP has also undertaken impact assessments in collaboration with other technical partners in Cambodia, Ethiopia, Uganda, and Mongolia. This cohort can be further broken down into two groups: (i) those for which GAFSP is providing additional resources, following the DIME model (Uganda and Mongolia); and (ii) those that are paid for within the project or government budget (Ethiopia and Cambodia). Except for Cambodia and Uganda, these evaluations are ongoing.

¹ The FIES is a measure of food access at the individual or household level. It is a member of the family of experience-based food security measurement scales and measures the severity of the food insecurity condition of a household or an individual respondent (i.e., the constraints on the ability to access food).

DIME-Supported Impact Evaluations

The DIME-led evaluations rely on prospective rigorous designs using randomized control trials (RCTs) as the primary tool to identify causality. For the first cohort of countries, Bangladesh and Rwanda, all survey rounds (baseline, midline, and endline) are now complete. The results of these evaluations are under discussion and consultation with respective governments and supervising entities, with key results shared here. For Nepal and Liberia, the IEs are at an early stage, so this brief indicates the proposed designs and questions of interest being addressed. The IE in Haiti followed a mixed approach, combining experimental, nonexperimental, and qualitative assessment.

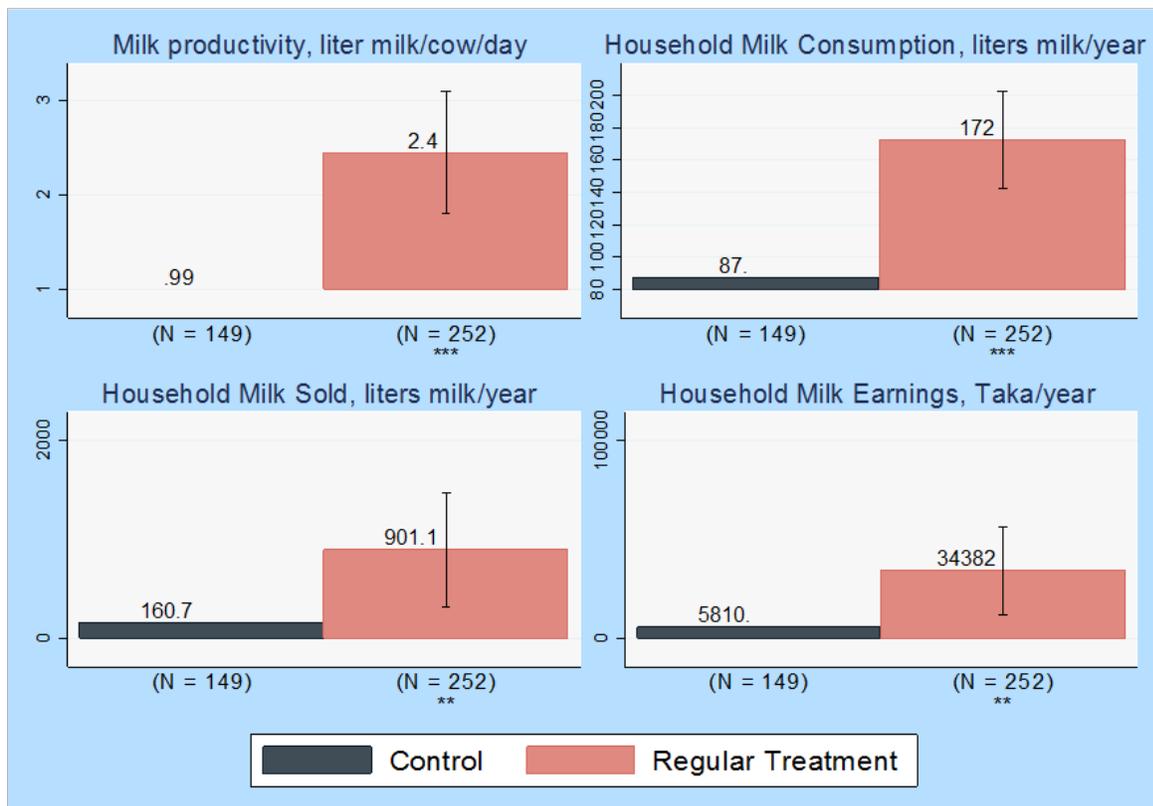
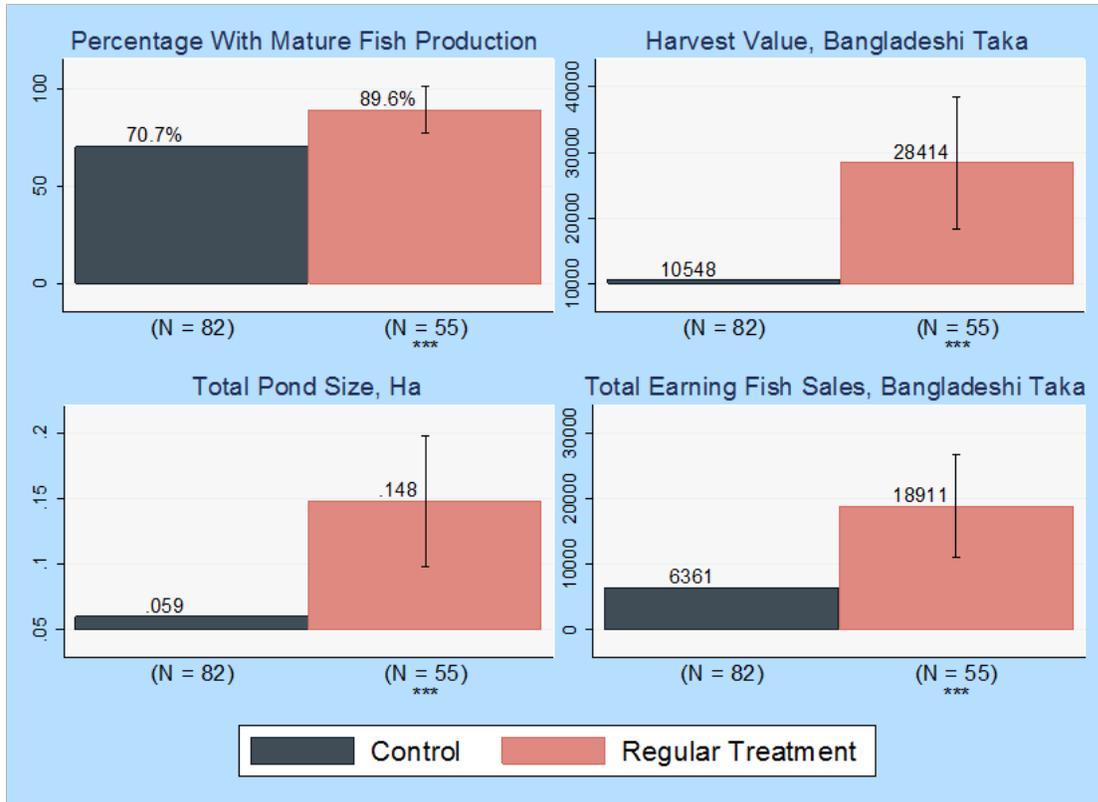
Bangladesh

In Bangladesh, the Integrated Agricultural Productivity Project (IAPP) – now closed – aimed to increase the productivity of selected crops, livestock, and fisheries using sustainable, climate-resilient methods and new technologies supported by a grant of \$50 million. The IE followed a two-pronged approach in its experimental design to measure: (i) the relative effectiveness of IAPP’s different strategies to demonstrate new technologies on different farmers’ take-up rates; and (ii) the overall impact of IAPP’s technology adoption on productivity. The IE assessed the impact of technology demonstrations in farmer field schools on adoption and resulting productivity.

Results

Productivity: Results show that IAPP positively influenced productivity for smallholders involved in fish farming and livestock production. Figure 1 illustrates the outcomes for farmers in IAPP groups in treatment villages (referred to as “regular” treatment, as they follow the standard IAPP approach rather than the experimental demonstration strategies) compared to those of farmers in control villages. Farmers in IAPP fishery groups increased the pond area cultivated, fish production levels, fish harvest value, and income from fisheries. Farmers in IAPP livestock groups experienced large increases in milk production (up 147 percent) and consumption (up 96 percent), and a fivefold increase in milk sales. Results for crop farmers are more mixed: there was increased adoption of promoted varieties of paddy, and diversification into crops such as mung beans, but limited evidence of gains in crop productivity or income.

Figure 1: Outcomes of Bangladeshi farmers in IAPP groups in treatment and control villages



Demonstration models: Traditional agricultural extension models assume that farmers learn primarily by observing others, and thus technologies are often promoted through demonstration plots at a community or sectoral level. IAPP offered a good opportunity to test this assumption. DIME worked with the project team to design an RCT to test experimental learning – a demonstration package was divided among up to 12 farmers within a village, so that farmers could experiment directly with the new technologies on their own farms. Initial analysis shows that both the traditional and experimental demonstration strategies were effective at disseminating the seed varieties promoted by IAPP. In a forthcoming working paper, a deeper dive into the data shows that self-demonstration has a social contagion effect *three to five times greater* than that of a standard demonstration plot. Two years after the onset of the trial, farmers who were invited to experiment on their own plots increased their adoption of new crop varieties and the size of cultivated area using this new technology by about 25 percent, and on-farm profits by 41 percent.

Nutrition: No significant impact was observed for any of the nutrition indicators, including dietary diversity, household hunger scale, and months of adequate household food provisioning.

Lessons learned

The experimental component of the IAPP IE showed the important role of learning-by-doing in agricultural extension. Encouraging farmers to experiment and innovate on their own farms, rather than focusing on a central demonstration plot, may be the most cost-effective use of demonstration resources in Bangladesh. As an illustration of the knowledge exchange taking place within and across the IE portfolio, these strategies are being further tested by the Rwanda IE to translate lessons from one project to another and test generalizability across contexts.

Rwanda

In Rwanda, the Land Husbandry, Water Harvesting and Hillside Irrigation Project (LWH), supported in part with a \$50 million grant from GAFSP, aimed to increase the productivity and commercial potential of hillside agriculture in key watersheds. GAFSP, in partnership with DIME and the Government of Rwanda (GoR), worked closely in designing an IE aimed at answering questions related to the delivery, sustainable maintenance, use, and overall impact of this flagship program. Specifically, the IE is evaluating four components: (i) the overall impact of the LWH approach; (ii) the effectiveness of farmers' feedback tools for extension service uptake; (iii) the impact of savings schemes on input usage; and (iv) the impacts and sustainability of irrigation (ongoing).

Results:

Technology adoption and production: Results from a follow-up survey in 2016 show that treated households were significantly more likely to adopt a variety of adaptation and productivity-enhancing technologies, including soil fertility management, erosion control, and productivity enhancement. This was especially salient given that 2016 was a historically poor rainfall year for the catchment areas. One of the important aspects of the GoR's rural transformation priorities – irrigation usage – was found to have a large and statistically significant correlation with harvest values. While irrigation was relatively low in the catchment areas, access to and usage of irrigation infrastructure was found to be correlated with increased harvest values of roughly 120 percent and increased sales value of about 50 percent in the main agricultural season, known as season A for the purposes of the evaluation. ²

Farmers' feedback tools: Experimental evidence shows that providing farmers with access to feedback tools increased usage of extension services, with satisfaction and demand for the service increasing among client farmers. The study randomized two types of treatment groups for the intervention, based on scorecards (supply-driven, topic-based) and logbooks (demand-driven, open-ended). The intervention led to a substantial rise in the number of trainings attended by farmers under both scorecard (67 percent rise for men, 66 percent for women) and logbook (36 percent rise for men, 59 percent for women) approaches. Operationally, this indicates demand improvements are above and beyond simple supply-side effects, to influence and have a positive impact particularly on the participation of women in training – an important lesson for interventions targeting and working with female farmers.

Savings for inputs: An experiment was designed to test two new savings products: (i) a targeted savings account that asked farmers to budget for two seasons, and (ii) a commitment savings account that additionally locked away the money they budgeted until set periods that corresponded to planting times. The products had typical take-up rates: 25–30 percent of households registered for one of the new types of accounts. The offer of the commitment savings accounts increased investments in agricultural inputs for the main rainy season (referred to as Season A), which translated into remarkable yield gains (123–150 percent). Access to both savings products increased the likelihood of cultivating any crop in the shorter rainy season (Season B) and of using improved

² The main agricultural (rainy) season (or Season A) for a given year lasts from September of that year to February of the next calendar year; the secondary agricultural season (or Season B) lasts from March to end-June of the same year.

agricultural inputs. Unfortunately, rainfall in Season B was not sufficient to sustain yield increases seen in Season A. Impacts of the simple targeted account were comparable to those for the commitment savings account. This suggests that results were likely driven by changes in mental accounting³ that came about due to the exposure to both products.

Farmers' incentive to cultivate high-value crops: Incentivizing farmers to experiment with high-value crops is essential to ensuring high impact and sustainability of irrigation investments. A field experiment is ongoing in the irrigated LWH sites to learn what combination of demonstration activities and irrigation subsidies leads to optimal levels of high-value crop adoption. Learning from the results in Bangladesh, a field experiment was conducted in which farmers were offered “mini-kits” (small packages of seeds and complementary inputs) to experiment with horticultural crops, instead of attending centralized demonstrations. This was overlaid with a randomized subsidy for the irrigation fees introduced in the same season. Results from the first follow-up survey show promising changes in the irrigated area: uptake of higher-value horticultural crops increases substantially, especially in the dry season, with corresponding increases in income from sales. However, there are still gains to be made in increasing rates of cultivation in the dry season, which the IE is tracking in follow-up survey rounds. Early results show a strong positive impact of irrigation on high-value crops in the dry season (Season C), with increases in farmers' access to markets and value of sales of 52 percent and 142 percent, respectively. These increases are explained by a switch to horticultural crops, leading to an annual increase in profits equivalent to 16 percent of annual income per median landholding. Land markets play a key role: significant amounts of land rentals and sales occur within the irrigated areas, and these transactions account for approximately 25 percent of the impact of irrigation on total revenue. In other words, increased irrigation has driven a more active land market with those smallholder farmers better integrated into the value chain, and as early adopters of irrigation and high-value crops, seeking to increase the area they can cultivate in the command area⁴ to further increase profits. This result provides the government with a direction for future work, including a deeper investigation into how land and labor markets might help optimize the return on irrigation investments.

Lessons learned

Testing complementary interventions and implementation modalities during project implementation can reorient large agricultural investments to make them more effective. By investing early and often in experimentation and learning about all components, the collaborators in Rwanda demonstrated the potential for projects to use IE to improve their operations in real time. One example is the savings for inputs study, based on the positive results of the pilot in Karongi; the LWH team decided to test a range of financial products at scale and worked with DIME to implement an evaluation with five agricultural cooperatives in Rwamagana district in 2013–2014. First-order impacts of the introduction of the program were promising – 80 percent of farmers who attended a training registered for one of the new accounts. However, apart from the support to farmers' organizations and local savings and credits cooperatives (SACCOs) that was provided through the

³ Mental accounting is a behavioral concept referring to the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities (Thaler 1999).

⁴ A command area is the land area covered by the canal system (or dam, river, etc.) that can reasonably be irrigated with the available water and typically is fit for cultivation of crops.

LWH project in the pilot site, there were multiple implementation failures and no statistically distinguishable impacts. As a result, the GoR prioritized building the capacity of the SACCOs and strengthening cooperatives. Within the LWH sites, the project team extended planning and budgeting training to farmers to maximize the mental accounting benefits shown through the Karongi pilot.

Haiti

Smart subsidies were introduced in Haiti in 2009, as the Ministry of Agriculture, Natural Resources, and Rural Development (MARNDR) partially reversed its earlier supply-side approach and commenced input distribution. Between 2011 and 2017, the MARNDR implemented and evaluated the Technology Transfer to Small Farmers Program (PTTA) at a cost of US\$25 million received in grant financing from GAFSP. The program aimed to achieve three objectives: (i) increasing agricultural production; (ii) increasing farmers' revenues; and (iii) preserving natural resources. It was designed to accomplish the above through two components: (a) promoting improved and sustainable agricultural technology adoption through non-reimbursable financial support for eligible farmers in the form of vouchers for agricultural goods and services; and (b) strengthening the National Seeds Service by assisting the MARNDR to build capacity to control and regulate seeds.

As part of project evaluation, independent IEs and mixed-method evaluations were performed to investigate different policy aspects and implications of PTTA⁵. The IEs were: (i) two RCTs in 2014–2015 testing the effectiveness of smart subsidies for rice and horticulture in Northeast Department and in Saint Raphaël (North Department); and (ii) two Propensity Score Matching studies (2016) testing the effectiveness of smart subsidies on peanut production and agroforestry in Northeast Department and Limbé (North Department). The qualitative evaluation included: (i) an agroeconomic diagnostic study (2014–2015) focusing on a small-scale, in-depth case study of farmers dwelling in the Saint Raphaël irrigated area; and (ii) a qualitative evaluation (2014–2015) investigating the sustainability of PTTA's effects on supply chain actors.

Results

Smart subsidies for rice: The RCT on rice was placed in two communes (Ouanaminthe and Ferrier) in Northeast Department, where the rice technological package (TP) was delivered. The IE methodology deployed was a stratified randomized phase-in at the “habitation” level. The RCT reported a decline in treatment farmers' rice yields and production value vis-à-vis control groups in the year in which the vouchers were distributed (2014), but also in the following year (2015). The negative productivity effects were likely due to the significant decline in input use (about one-third), particularly urea and sulfate. As a direct result of the lower production values, treatment farmers sold less rice in 2015. Interestingly, however, there was no negative impact on agricultural profits for rice. Farmers who received subsidized fertilizer did not have to purchase this input and therefore their profits after accounting for input costs were no lower than those of the control farmers who did pay for fertilizer, despite lower production. Decreased input use in 2014 may be due to a few

⁵ Paris School of Economics (PSE); Inter-American Development Bank (IDB); Development Impact Evaluation (DIME): TTA Haiti: Technology Transfer to Small Farmers Program - See more at: <https://publications.iadb.org/handle/11319/8462#sthash.UxHEMHcf.dpuf>

factors, such as farmers in the treatment areas already being regular users of many of the subsidized inputs prior to the intervention. An investigation of their spending suggests that farmers used the vouchers as substitutes rather than as complements to their own spending. Finally, lower input use may also be attributed to the late delivery of seed vouchers, affecting farmers' chances to sow at the right time. On the other hand, decreased input usage in 2015 may be due to a combination of the following factors. First, vouchers may have caused households to take fewer loans, perhaps because they expected new vouchers, and in that expectation decided to invest less in the following season. Indeed, a complementary RCT tested outcomes of reminding or not reminding farmers that vouchers were a one-time event and thus would not be delivered in the following season. The experiment showed that farmers in the voucher treatment who did not receive the reminder had lower input use in the following season. This would suggest that uninformed farmers expected to receive vouchers again and therefore withheld part of their investment.

Smart subsidies for horticulture: This RCT focused on the provision of smart subsidies for horticulture in the commune of Saint Raphaël (North Department). Two habitations, Merlene and Buenabite, were chosen for the IE due to their good water access. The IE methodology was a randomized phase-in at the individual level. The treatment farmers were to receive vouchers in the fall of 2014, while the control farmers would only receive the vouchers in June 2015. The RCT found while the intervention led to some reallocation of crops, it did not induce farmers to expand their horticulture cultivation. While the probability of using fertilizer was high for all farmers, treatment farmers were more likely to use fertilizer (increasing from 79 percent to 90 percent). The quantity of fertilizer per hectare planted also significantly increased by 55 percent (to 45 kg per ha) in Buenabite. The total reflects increases in both urea and NPK fertilizer. However, the increases were only significant in Buenabite, while treatment and control farmers in Merlene appeared to use similar amounts of fertilizer. Nevertheless, no significant positive effect on yield or production was found in either area. The lack of production response to the increase in fertilizer appears to be explained by the fact that the increased fertilizer use was offset by reductions in pesticide use relative to nontreated farmers. Because hot pepper is particularly sensitive to pests and diseases, farmers in Buenabite, where PTTA shifted cultivations to hot pepper, experienced a significant decrease in output in the absence of an adequate pesticide supply.

Smart subsidies for peanut: This IE evaluated the effectiveness of the peanut TP distributed as part of PTTA in Northeast Department between March and April 2016. The peanut TP provided new varieties of peanut seeds as well as technical assistance for soil preparation and harvesting. A quasi-experimental method was used for this segment of the evaluation. The results found no significant effects of the intervention on the area planted by households, the number of plots planted, total production, production per hectare, or total agricultural profits, but the intervention increased the annual crops sold by 12 percent. The results also showed that PTTA decreased the probability of selling crops in the local market by about 15 percent. This is mainly driven by the fact that the treatment farmers had an alternative sales outlet facilitated by a private firm's program, which committed to buy farmers' peanut production at a fixed price as part of their program.

Smart subsidies for agroforestry: This IE evaluated the impact of PTTA agroforestry TPs delivered between January and June 2015 in Limbé commune, a mountainous and humid area located in North Department. The TPs consisted of banana and pineapple seedlings, fruit trees, forest trees, cocoa trees, yam seeds, and beans, as well as services such as pruning and grafting. Results indicate that

program beneficiaries planted a higher number of plots, especially those farmed with annual crops. There was no clear impact on the diversification of annual crops, the use of intercropping systems, or the proportion of harvest sold. When factoring in the expected revenue from sales of PTTA crops once mature, PTTA's impact on the value of production is considerable (around 38 percent). The impact of PTTA on agricultural income and profits from crops (counting in sales from expected harvest) was positive and significant, amounting to increases of 58 percent and 63 percent, respectively.

Lessons learned

Clearly, input subsidies can yield positive outcomes, as with the positive income gains seen in agroforestry. But the design of the intervention should be in line with the socioeconomic situation on the ground and should be adjusted as that evolves, as the negligible/negative findings in other areas highlight. As for designing input subsidy programs, further attention is needed on implementation issues, targeting strategies, research-based technology transfer, and risk management interventions. Broadly, the lessons learned cover both policy and operational grounds. On the policy front, relatively more promising results for agroforestry investments than for fertilizer subsidies in rice, horticulture, and peanuts allowed the government to retarget resources toward their most productive uses. The IE findings showed that farmers cultivating annual crops used the subsidies as cash substitutes and did not reinvest in ways that increased productivity. The PTTA evaluation also proved that a one-size-fits-all TP does not adequately address the diversity of cropping and production systems in the target areas. TPs should acknowledge this diversity and support it. Even farmers who are geographically close experience highly diverse sets of challenges. The new GAFSP-financed project in Haiti, therefore, acknowledges the plethora of different agroeconomic needs and situations stemming from farmers' location and land and capital endowments. The effectiveness of (i) using an iterative design to scale up or target technical assistance in response to emerging lessons and (ii) improving risk mitigation systems are key lessons learned during the PTTA intervention. On the operational front, a key lesson learned is to improve implementation protocol, with the design, implementation, and monitoring thereof all ensuring that the value of vouchers is not eroded by delays, inflation, or supply chain distortions.

Nepal

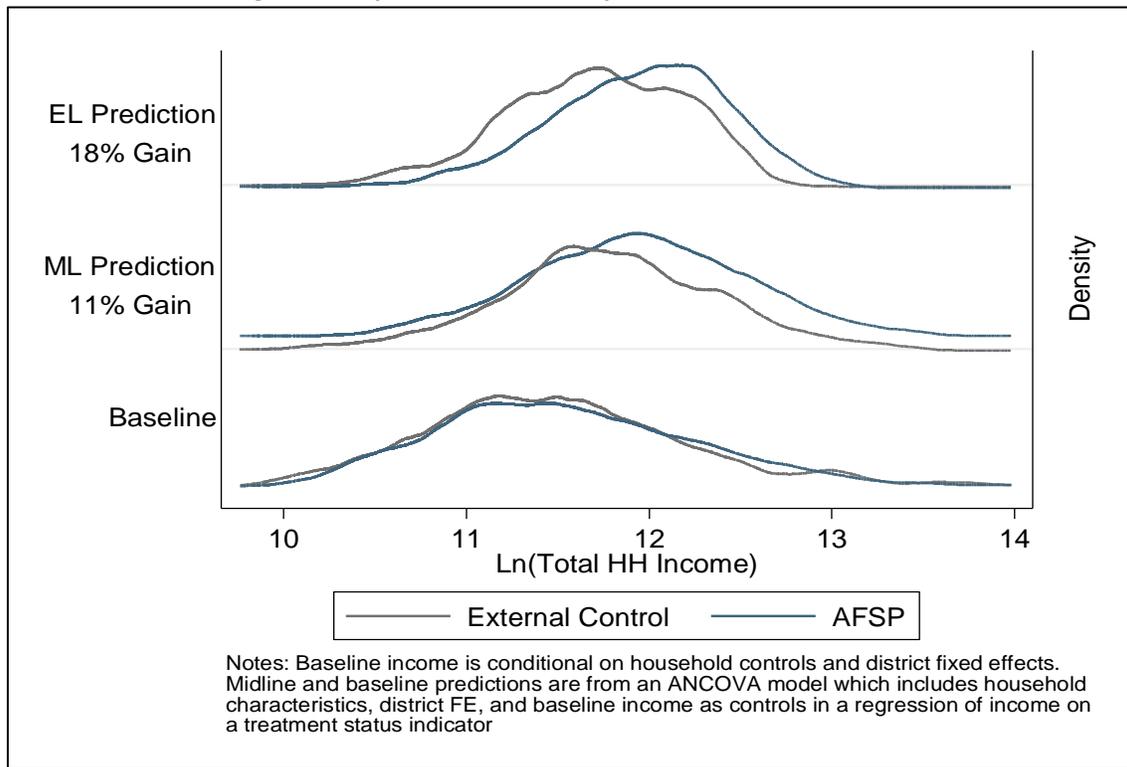
The Agriculture and Food Security Project (AFSP), supported by a GAFSP grant of \$46.5 million, aims to enhance the food and nutrition security of vulnerable communities in specific areas of Nepal by increasing food availability and increasing the productivity of crops and livestock. The project also works to improve nutrition security through improved feeding practices – promoting diversified diets and improving feeding and caring practices for pregnant and nursing women and children up to two years of age – and by supporting nutrition-sensitive agricultural activities, including the generation and adaptation of technology to increase yields and production intensities of nutritious crops and fish.

The GAFSP-financed project partnered with DIME to conduct an evaluation comparing the relative contribution of farmer group-based interventions and maternal health messaging on nutrition and household welfare. Formation of farmers' groups was strategically phased in throughout a sample of eligible communities to create an RCT measuring how farmers' productivity improves over the time that they spend as a member of a farmers' group. Matched control communities were selected to measure the effect of not being exposed to AFSP programs. The IE is nearing its closing stage: the second of three planned surveys was completed at the end of 2016, and an endline survey was done at the end of 2017.

Results

Across three rounds of data collection that tracked households across 228 villages in the 19 project districts, AFSP had strong income effects. From baseline to midline, AFSP communities – pooling together those exposed to the project for more than three years (“long exposure”) and those that had participated for less than two years (“short exposure”) – experienced an 11 percent increase in total income relative to control communities; and an 18 percent increase over the length of AFSP interventions.

Figure 2: Impact of AFSP on Nepali beneficiaries' income



Within AFSP areas, the timing of when AFSP started was randomized, allowing the IE to assess whether communities that experienced the project for more than three years were significantly better off than communities that participated for two years or less. At endline, long-exposure households, those who had three to five years of experience in the project, had incomes that were 16 percent higher than at baseline. The short-exposure households, those with one to two years of project participation, had incomes that were 21 percent higher than at baseline. These results suggest that the income gains are highest immediately after joining the project when inputs are first delivered. But encouragingly, the income gains are sustained and – at 16 percent – are nearly as high after three to five years as they are after one to two years. The overall improvements seem to be driven largely by gains in income earned from livestock rearing, with households in both long- and short-exposure communities experiencing income increases of 18–19 percent. In addition to income, the evaluation looked at nutrition patterns and mothers' knowledge of best practices. Overall, reported experiences of food insecurity decreased between baseline and endline, but this trend was common to both AFSP and non-AFSP communities. Looking at households with pregnant and nursing women, mothers' membership in health groups doubled in control communities and quadrupled in AFSP communities between baseline and endline. Dietary diversity and average maternal knowledge scores for pregnant and nursing mothers increased across both AFSP and control communities.

Across the board, AFSP brought about improvements in productivity and income for farmers across several key indicators. The increase in incomes by 16–21 percent represents a significant achievement for the project, and initial evidence does point to these effects persisting over the

medium run. On the other hand, the evaluation does not provide enough evidence to attribute overall improvements in nutrition and nutrition-related practices to the activities of AFSP.

Lessons learned

In March 2018, DIME presented the endline results in Nepal. The IE improved the Government of Nepal's ability to measure the impacts of program interventions and raised questions about how the results will feed into future work and upcoming programs. With respect to community level impacts shown, the clearest gains were seen in average household income, which grew by 18 percent more in communities where AFSP was active than in comparable communities where it was not. These gains were largest among households who earned income from rearing livestock. The dynamics of the gains show that the increase in income is largest immediately after households join the project activities. Encouragingly, most of the gains are sustained 3-5 years after households were introduced to the program.

One of the core questions of the IE as originally designed was to investigate whether nutrition-sensitive behavioral change leverages the impacts of livelihood programs on nutrition, and vice versa. The most intriguing finding from the report is that, while the AFSP communities had much bigger increases in income than the non-AFSP communities, the increases in food security were no bigger. In a sense, this finding presents an opportunity. Conventional wisdom might suggest that food security and nutrition cannot be improved until the worst effects of poverty are eliminated and that income growth is a necessary prior condition for nutrition to improve. The results of this evaluation hint that this conjecture might not be true. The non-AFSP communities experienced nutrition and food security improvements, even without the income gains experienced by AFSP households⁶.

⁶ Part of the explanation likely lies in the timing and focus of the attention on activities devoted to agricultural income relative to behavior change messaging for nutrition. The agriculture interventions started earlier and were intensively focused, while nutrition programming began only relatively late in the project's timeline. The lack of difference between AFSP and non-AFSP areas could also arise because of spillovers in knowledge and practices. If the AFSP improved nutrition practices in AFSP Village Development Committees (VDCs) that were observed and copied by households in non-AFSP VDCs the non-AFSP VDCs could see improvements as well.

Liberia

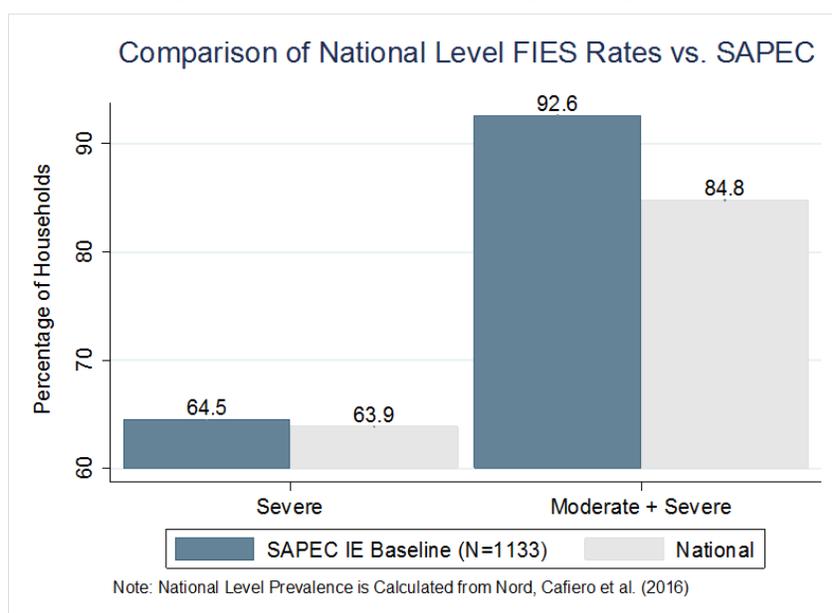
The Smallholder Agricultural Productivity Enhancement and Commercialization (SAPEC) project, supported by a \$46.5 million GAFSP grant, aims to transform Liberia's agriculture sector. The sector is dominated by traditional subsistence farming systems, characterized by labor-intensive shifting cultivation and low technologies that result in low productivity. The project's main target population is smallholder farmers and rural entrepreneurs, particularly women and youth. It supports: the improvement of technologies for rice, cassava, and vegetables; the development of new irrigation and drainage systems; and the rehabilitation of feeder roads, storage facilities, and agro-processing equipment.

The baseline survey for the SAPEC IE was conducted between June and August 2017. It covered 97 primary sampling units, in this case, electoral areas, surveyed across all 10 counties where SAPEC operates. The baseline survey covered electoral areas that were randomly assigned as control communities for the evaluation, in which SAPEC did not distribute subsidized agricultural inputs in 2017, as well as areas randomly assigned for treatment status during the evaluation, where SAPEC did so.

The SAPEC evaluation is the first GAFSP evaluation to incorporate the Food Insecurity Experience Scale (FIES), GAFSP's newly adopted standard for measuring self-reported food insecurity.

Figure 3 shows the proportion of households categorized as moderately or severely food insecure by using FIES raw scores.

Figure 3: Proportion of Liberian households categorized as moderately or severely food insecure using the FIES instrument versus national-level data



Based on the findings from the baseline survey of 1,133 households, the prevalence of food insecurity is estimated to be very high in this population: 64.5 percent (+/-2.32 percent) of households are categorized as severely food insecure, and 92.6 percent (+/- 1.53 percent) are categorized as either moderately or severely food insecure, based on a raw FIES score.

The baseline data using the FIES showed higher prevalence rates of food insecurity than the rates found using a scale based on nationally representative data. For example, in other national data for Liberia, 84.8 percent of households are categorized as moderately or severely food insecure, and 63.9 percent are categorized as severely insecure (Cafiero et al., 2016)⁷. There are two reasons for the differences arising between the sample in the IE and a nationally representative sample. First, the IE sample is composed only of farmers, meaning that these rates are for a rural sample, excluding urban populations. Second, two counties in Liberia are not covered by SAPEC, and are therefore not represented in this sample. The preliminary results also revealed that gender of the household head may influence the food security status of the woman responsible for answering the FIES module. Preliminary results showed that the prevalence of severe food insecurity is estimated to be higher for women than men, while the prevalence of moderate to severe food insecurity is estimated to be marginally higher for men than for women.

The endline evaluation is planned for late 2018, when the SAPEC project and DIME engagement were originally scheduled to end. However, the timing of the start of input distribution at the scale envisaged by the evaluation will imply a follow-up period of one year after input distribution. Therefore, DIME is exploring possibilities to extend the IE within the constraints of available resources and scheduled plans.

Lessons learned

DIME has helped SAPEC to develop a robust monitoring system to track beneficiaries and finalize an IE design that is testing strategies for disseminating new inputs. The process of collecting the baseline data revealed that locating farmers who have registered to receive benefits is a time-intensive and difficult activity for field staff, suggesting a need for strong systems to follow eligible farmers over time.

⁷ Cafiero, C., Nord, M., Viviani, S., Grossi, E., Ballard, T., Kepple, A., Miller, M., Nwosu, C. (2016). *Methods for estimating comparable prevalence rates of food insecurity experienced by adults throughout the world*, Food and Agriculture Organization of the United Nations. Rome.

Impact Evaluations with Other Technical Partners

An additional cohort of GAFSP-funded projects is using or has used quasi-experimental IE designs that can also provide helpful insights on project outcomes and test key hypotheses. Within this cohort, Cambodia has completed its final evaluation, while the others are at early stages.

Cambodia

The Emergency Food Assistance Project (EFAP) – now closed – aimed to reduce the vulnerability of food insecure households in target provinces by diversifying the production and consumption base and supporting disaster preparedness, supported by a grant of \$39.1 million from GAFSP. This included short-term transitional support measures such as cash-for-work, nutrition-related activities, and subsidized distribution and sales of quality inputs. To measure the impact of the project accurately, the project financed a quasi-experimental IE that was carried out by a local consulting firm, SBK Research and Development. The IE was bundled together with other qualitative assessments to present a general assessment of the project’s performance on criteria such as relevance, efficiency, and sustainability. While the evaluation methodology has some technical weaknesses⁸ as compared to a “gold standard” RCT, it has been welcomed by the Government of Cambodia as contributing clear evidence of the project’s impacts.

Results

Beneficiaries: The results of the endline survey show that the percentage of households that have little or no food insecurity because of EFAP activities increased from 31 percent to 63 percent – a change of 32 percent, well above the target.

Food security: A comparison with nontarget households shows that while food insecurity was reduced, the contribution from EFAP in its target villages was about 10 percent over other influencing factors.

Income: The endline survey shows that average monthly income among target households increased by 85 percent. In contrast, the average income for nontarget households increased by only 38 percent during this same period.

Rice yield: The project increased average rice yields among target households by 33 percent and 69 percent for wet and dry season rice, respectively, well above the project target of a 20 percent increase. Considering the natural calamities faced by many farmers during project implementation, this achievement is quite impressive. To put the above figures in perspective, the yields for nontarget households increased by 21 percent and 43 percent for wet and dry season rice, respectively. Overall, EFAP had a significant and positive impact on beneficiaries.

⁸ While the propensity score matching approach used in the IE is a sophisticated and popular method used in quasi-experimental design, in this case, the regression results reveal limited overlap between the treated and nontreated groups. This limited overlap can introduce some bias in estimates. Reference: <http://pubdocs.worldbank.org/en/707711440083712705/12-c-Matching-Joost-de-Laat.pdf>

Lessons learned

Results indicate that subsidized sale of inputs can be more sustainable than free distribution, when subsidized sales are able to both ensure quality inputs to support agricultural production and promote awareness of the related quality benefits. Working closely with seed producers to ensure that they supply at the quality required by the project helped ensure sustainable production of such quality seeds for the future.

Conclusion

Overall, the results of these GAFSP IEs show some promising findings on project impacts. They also contribute multiple lessons on both the process of fielding IEs and, more substantively, on key questions of policy interest. The current portfolio demonstrates that IE results (i) are being used to inform projects at design stage (i.e., informing second-phase projects, as in Bangladesh or Nepal, or new projects in other locations), and (ii) are changing and influencing project activities during implementation, as in Rwanda.

A much fuller picture of the IE results and lessons learned will be available after finalization and dissemination of full results across the portfolio. The goal for GAFSP is to support a global platform of evidence-generation and knowledge exchange across regions and contexts. Such an effort will continue to be vital to inform and improve targeted interventions within the agriculture and food space if the Sustainable Development Goal of doubling the agricultural productivity and incomes of small-scale food producers by 2030 is to be achieved.

Annex 1: DIME Impact Evaluation Milestones

Country: Bangladesh

Project: Integrated Agricultural Productivity Project (IAPP)

Impact Evaluation Milestones	FY12	FY13	FY14	FY15	FY16	FY17
Project effective	✓					
Field Coordinator In-Country		✓	✓	✓		
Concept Note		✓				
Baseline Survey		✓				
Baseline Report			✓			
Rapid 1-year Follow-Up Data Collection			✓			
IE Brief on 1-year Outcomes			✓			
Midline Survey				✓		
IE Report on 2-year Outcomes				✓		
Endline Survey					✓	
IE Report on 3-year Outcomes						✓
Project Close						✓
Capacity-building activities		✓	✓			

In Bangladesh, three follow-up surveys were conducted after the baseline. A shorter, rapid follow-up survey was conducted in FY14 to determine with accuracy which households from the baseline ended up participating in IAPP, and to measure short-term effects for a subsample. This was requested by the project team to provide data for the midterm review. The main follow-up survey for the purposes of the IE was the midline survey in FY15, a comprehensive survey given to the entire IE sample. DIME conducted a smaller endline survey before project close in FY16 to satisfy requests from the project team to have data for the Implementation Completion Report, and to assess longer-term impacts of the project. The survey was smaller, as only 20 control villages were left by FY16 (compared to 103 in FY15).

Country: Haiti

Project: Small Farmer Agriculture Technology Transfer Project (PTTA)

Impact Evaluation Milestones	FY12	FY13	FY14	FY15	FY16	FY17
Project effective	✓					
Field Coordinator In-Country		✓	✓	✓	✓	
Concept Note		✓				
Baseline Survey			✓			
Baseline Report				✓		
Follow-Up Data Collection				✓	✓	
Follow-up IE Report(s)						✓
Project Close						✓
Capacity building activities		✓	✓			

The IE has completed all three rounds of surveys. Dissemination efforts have been conducted, including through presentations at international fora by representatives from the Ministry of Agriculture, e.g., <http://blogs.worldbank.org/developmenttalk/unraveling-dynamics-agricultural-input-subsidies>.

Country: Nepal

Project: Nepal Agriculture and Food Security Project (AFSP)

Impact Evaluation Milestones	FY12	FY13	FY14	FY15	FY16	FY17	FY18
Project effective		✓					
Field Coordinator In-Country		✓	✓		✓	✓	✓
Concept Note			✓				✓
Baseline Survey			✓				✓
Baseline Report			✓				✓
Midline Survey						✓	✓
Midline IE Report						✓	✓
Endline Survey							✓ (SAFANSI funding)
Final IE Report							✓ Planned (SAFANSI Funding)
Project Close							✓
Capacity-building activities		✓	✓				

In Nepal the activities in each VDC (village) lasted around two years. All three rounds of surveys are now completed.

Country: Liberia

Project: SAPEC

Impact Evaluation Milestones	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19
Project effective			✓					
Field Coordinator In-Country			✓		✓	✓		
Concept Note						✓		
Rapid Survey					✓			
Rapid Survey Report						✓		
Baseline Survey							✓	
Baseline Report							✓	
Endline Survey								Planned
Final IE Report								Planned
Project Close								Planned
Capacity-building activities			✓	✓	✓	✓	✓	

Following the Ebola crisis in 2014, the locally-based IE field coordinator had to be evacuated and project activities put on hold. The project relaunched in FY16 and a new field coordinator was placed. Missions were undertaken in May 2016 to re-plan the IE.

Country: Rwanda

Project: Land Husbandry, Water Harvesting and Hillside Irrigation Project (LWH)

Impact Evaluation Milestones	FY12	FY13	FY14	FY15	FY16	FY17	FY18
Project effective	✓						
Field Coordinator In Country	✓	✓	✓	✓	✓	✓	✓
Concept Note		✓					
Baseline Survey (Phase 1B)		✓					
Baseline Survey (Phase 1C)			✓				
Baseline Report (Phase 1B)		✓					
Baseline Report (Phase 1C)			✓				
Concept Note (irrigation)					✓		
Baseline Survey (Irrigation)					✓		
Baseline Report (Irrigation)						✓	
Follow-up Data Collection*			✓	✓			✓
Follow-up Report(s)			✓	✓			✓
Endline Survey (Phase 1B & 1C)						✓	
Final IE Report (Phase 1B & 1C)							✓
Project Close							
Capacity building activities	✓	✓	✓	✓	✓	✓	✓

The LWH project has multiple implementation phases. Phase 1A covered four sites in the Western and Northern provinces. Phase 1B covered three sites in the Eastern provinces. Phase 1C covers two sites in the Northern Province. DIME began to work with LWH at the beginning of Phase 1B. A baseline survey of the Phase 1B sites was conducted in 2013, and a baseline for Phase 1C in 2014. The LWH Impact Evaluation portfolio covers both the overall impact of the project and trials and effectiveness tests of specific project components, including agricultural extension and rural finance. The irrigation IE is the newest addition to the portfolio. DIME did a baseline survey specifically for the irrigation IE in Phase 1A sites, the first sites where the infrastructure was completed. This component of the IE will continue through FY19; follow-up data collection will be financed by the IGC, EU and 3IE.