Standing Panel on Impact Assessment

CGIAR

SPIA Feedback for One CGIAR Draft Research Strategy
August 27, 2020

The One CGIAR research strategy for 2030 covers a lot of ground and clearly is a challenging and ambitious undertaking. Within SPIAs responsibility for providing rigorous, evidence-based and independent strategic advice to the CGIAR System, SPIA appreciates the focus of managing research for impact. Given SPIAs mandate to provide advice on (i) efficient and effective impact assessment methods and practices, and (ii) on innovative ways to improve knowledge and capacity on how research contributes to development outcomes, this note shares SPIAs comments and suggestions that specifically focus on part 3 of the research strategy on managing research for impact. We purposely aimed at keeping the set of comments relatively short to convey the main points. We hence refrain from providing sentence-by-sentence comments, but instead propose to directly engage in the next steps of the process to help flesh out the more specific implications for the plans and modalities to implement the research strategy.

Main points

1) The research strategy signals a strong focus on impacts at scale. But the current strategy mis-characterizes and underestimates the role impact assessment research can play to achieve impacts at scale in the various areas.

   To maximize the possibilities to achieve impacts, impact assessment research cannot be seen as an afterthought, to be conducted at the end of a linear process as Figure 4 (as well Figure 2), seem to suggest. Instead, managing research for impact can better be represented by a circular process, with impact assessment research needed for rigorous learning and for testing of assumptions underlying Theories of Change (ToCs), throughout all the steps following the foundational research.

- When innovations are ready to be tested with users, impact assessment studies with rigorous counterfactuals are needed to test the assumptions underlying the ToC and to estimate whether and to what extent the anticipated impacts materialize in the real world. Pathways to impact are likely affected by many internal and external constraints and there often can be unanticipated factors and behavioral responses that increase or decrease impacts. Such real-world impacts cannot be easily predicted from on-farm research (Laajaj et al, 2020), but require rigorous construction of counterfactuals through Randomized Control Trials (RCTs) or related methods, as part of the stage gated process illustrated in Figure 4. For similar reasons, other initiatives that invest in development innovations rely on rigorous real-world tests before scaling (Kremer et al, 2019)

- When innovations are deemed ready for scaling, there are many potential delivery mechanisms and/or pathways and mechanisms that could be considered to achieve this. Impact assessment research can help inform the strategy to follow by testing different mechanisms for scaling, accounting in particular for the nature and expected impacts of the innovations. Innovations implying large externalities or spinoffs, for instance, may need an approach that explicitly accounts for such externalities (e.g. by compensating farmers for social benefits generated from the innovations they adopt), while innovations with large private benefits may be more straightforwardly scaled through the private sector. Impact assessment research then directly contributes by testing and comparing alternative "strategies for scaling" (~ Figure 4).
- When innovations are believed to have scaled, tracking carefully adoption at scale (both in terms of overall adoption rates, but also who and where adoption occurs) is needed to compare reality with assumptions made in the ToC (See e.g. SPIAs forthcoming Ethiopia synthesis report). Adoption cannot be simply assumed (the research strategy largely seems to ignore that), and causal evidence on the possible constraints to adoption will be required to help target new research efforts as well as complementary public policies. Such hard evidence on adoption is needed to complement ex-ante demand analysis/assessment, product profiles, and diagnostics of partners' needs referenced in the document.
- When evidence exists of adoption at scale, rigorous impact evidence is needed to test whether it delivers the anticipated impacts across the different impact areas, as well as to trace dynamics on the long term (including possible dis-adoption). While Figure 4 envisages a declining role for CGIAR as innovations scale, mechanisms to generate impact evidence will still need to be invested in, and put in place, if such impacts are to be even plausibly attributed to CGIAR.

As such, impact assessment research should become an integral part of the stage gating process, with feedback mechanism looping back into the previous steps, so that results can help guide future research efforts. Importantly this includes a) results from adoption and/or impact among intended users; b) results on the lack of adoption or impacts; as well as c) evidence related to possible unexpected (positive or negative) impacts.[1] In such a framework, rigorous impact assessment research showing zero or negative results becomes a positive indicator of an innovation system that works, avoiding conscious or unconscious biases in the impact assessment research. This implies

[1] See related discussion and examples of such approaches in Stevenson et al (2019) on farm-level NRM; and discussions on the contribution of early-stage impact assessments in the scaling of bio-fortified crops, or livestock insurance policy research.

integration of impact assessment research in the key implementation elements highlighted for the 10 strategic directions on page 36 and 37.

2) Much more precision is needed regarding which metrics will be tracked systematically (and how) and which ones will require targeted investments in impact assessment research with rigorous counterfactuals. To do so, it will be important to:

- Be realistic about which impacts can be rigorously measured in the relevant time frames and at what level.
  - On a related point, it is unclear how the quantitative 2030 targets were calculated and how the system is planning to account for them. More precision on methods and metrics would seem important before committing to specific targets.
- Not leave reporting on "impact" in the realm of the M&E community, since M&E systems are designed to establish the facts, and hence automatically do not account for the counterfactuals. M&E tools are, however, very well suited to report on outputs. Reporting on large scale impacts will requires investment in rigorous IA combined with careful tracking of adoption, see SPIA 2020). That said, more is needed to assure that the M&E systems are set up so they can provide the necessary information regarding where, when and how scaling efforts occurred, key information to feed into the design of large scale impact studies.
- Have a careful plan for rigorously measuring impact with state-of-the-art methods as a key feature of CGIAR projects that goes beyond the foundational research stage (bullet points on page 39).

The strategy document fails to distinguish between outputs that can be systematically tracked, and impacts, which require careful research that permits an assessment of attributable impacts. In doing so, the document risks the system promising more than it can deliver, as it will lead to a list of "impact" targets that cannot be shown credibly afterwards. Measuring impact is not a "counting beans" exercise, and indeed it is impossible to infer anything about impacts from a systematic tracking of users reached (or attempted to be reached), which we assume is what is meant on page 40. Impacts in the real-world depend on the interactions of the innovations with many external factors as well as behavioral adjustments by farmers, which cannot be simply assumed away or approximated by models, but can be understood through rigorous impact research. Such impact evidence has become the benchmark in the development policy world, and is the standard many of the funders of CGIAR rightly expect (Stevenson et al, 2018). It is important for the CGIAR to signal through this document that as a science organization, it embraces the most scientifically-validated and rigorous methods, and expects to contribute to developing state-of-the-art research in *all* aspects of its work, *including* impact assessment.

Such an approach will require strengthening capacity and use of Impact Assessment research as an integral part of the OneCGIAR research strategy (and the related decisions on the optimal institutional set up, HR and funding allocations to enable such work).

3) SPIA generally agrees that the CGIAR has a strong track record on impacts in certain domains, but at the same time wants to highlight that credible evidence of impact in a number of the impact areas is limited to date. We highlight here that the lack of rigorous evidence on some of the impact areas does not necessarily mean that such impacts don't exist at large scale, but rather that more rigorous impact research is needed to credibly document those impacts. Moreover, we recommend that the OneCGIAR strategy only uses rigorous impact evidence based on credible counterfactuals (defensible assumptions) to support claims about the track record on impacts (such as the evidence summarized in SPIA 2019 or SPIA SC 9 presentation). We have shared the most recent summary of such evidence-to-date with the co-stewards of TAG 2 (see annex for easy reference).

Standing Panel on Impact Assessment
CGIAR

Annex: SPIA suggestions for box on CGIAR track record – in reply to request of co-stewards TAG2.

Evidence of CGIAR outcomes & impacts compiled by the Standing Panel on Impact Assessment (SPIA)

A recent set of rigorous impact assessment studies implemented under the Strengthening the Impact Assessment Capacity of CGIAR (SIAC) program provided evidence of CGIAR outcomes and impacts at scale. It documented adoption at scale of cassava, potato, lentil, beans, fish and tropical forages technologies, and agroforestry and natural resource management innovations in the context of long-term development programs (SPIA, 2019). Rigorous quasi-experimental impact studies furthermore show that worldwide the adoption of modern varieties between 1960 and 2010, associated with CGIAR contributions, increased aggregate yield growth resulting in a contribution to GDP per capita growth of 50 percentage points (in part through structural transformation, Gollin et al, 2018), and a substantial reduction of long-term infant mortality (3-5 million infant deaths averted per year) (Fishman et al. 2017). Rigorous impact results on infant mortality declines resulting from HYV in India further show that impacts were concentrated on rural and low-caste children (Bharadwaj et al, 2020).

Positive impacts on health and nutrition outcomes have also been demonstrated for more recent bio-fortification innovations by integrating the impact research throughout the different steps program cycle – discovery, pilot, scale. A set of efficacy and effectiveness studies has documented impacts of sweetpotato vine distribution on vitamin A intake and increased immunity, with impacts persisting after several years (Hotz et al, 2012a,b; Jones and de Brauw, 2015, de Brauw et al, 2018, de Brauw et al, 2019). Evidence on large-scale adoption is accumulating for iron beans in Rwanda and Zimbabwe, yellow cassava in Nigeria and orange flesh sweetpotato in various African countries, and delivery at scale of biofortified crops is being tracked through M&E systems (Asare-Marfo et al, 2016, HarvestPlus M&E team, 2018; HarvestPlus M&E team, 2019). The existing evidence is being complemented by studies designed to document impacts at scale and learning studies aiming to test assumptions along the impact pathways of biofortification.

Although many CGIAR natural resource and environmental impacts remain undocumented, SPIA studies point to some evidence of environmental gains (SPIA, 2019). Two large development projects informed by CGIAR research showed an increase in tree coverage in Kenya (Hughes et al, 2020) and a reduction in the rate of loss of natural forest in Guinea (Mills et al, 2017) A number of rigorous impact studies also documented impacts of CGIAR innovations in helping farmers adapt to climate change. Index-Based Livestock Insurance, now covering more than 300,000 cattle equivalents in northern Kenya and Ethiopia, has showed positive impacts on preserving productive assets and improving farmers' wellbeing after severe drought, and the scheme has a largely positive benefit:cost ratio (Janzen and Carter, 2013, Chantarat et al. 2018, Jensen et al. 2017, Bageant and Barret, 2017). In Zimbabwe, conservation agriculture was found to mitigate yield losses under abnormally high or low rainfall, even if it held no advantage during periods of average rainfall when compared to conventional agriculture (Michler et al, 2018). In contrast, flood tolerant rice in India reduced downside risk and increased yields including during non-flood years, as farmers crowded in other inputs (Emerick et al, 2016). Alternate wetting and drying (AWD) rice technologies did not show an impact on yields, income and water use in The Philippines and Bangladesh without an accompanying policy change (Rejesus et al. 2017, Chakraworty et al. 2019). However, once the price for water was accounted for, AWD adoption increased in areas with higher water cost (Chakraworty et al. 2019).

Most of the rigorous evidence of impact on these climate adaptation strategies was obtained prior to their scale up, allowing not only to make the case for scale-up, but also for the scale-up strategies to incorporate lessons learned regarding targeting and complementary policies. Indeed, evidence suggests that smallholders are often reluctant to adopt NRM practices (Stevenson et al, 2019). Further early-stage impact assessments can help adapt strategies for successfully scaling up of these innovations and are key to track farmers' behavioral responses and remaining constraints in real-world settings that can both amplify or limit anticipated impacts.

References cited

Asare-Marfo D; Herrington C; Alwang J; Birachi E; Birol E; Diressie M; Dusenge L; Funes J; Katungi E; Labarta R; Larochelle C; Katsvairo L; Lividini K; Lubowa A; Moursi M; Mulambu J; Murekezi A; Musoni A; Nkundimana J; Oparinde A; Vaiknoras K; Zeller M (2016) Assessing the Adoption of High Iron Bean Varieties and Their Impact on Iron Intakes and Other Livelihood Outcomes in Rwanda, HarvestPlus Listing Exercise Report

Bageant, E. R., and Barrett, C. B. (2017). Are there gender differences in demand for index-based livestock insurance? Journal of Development Studies, 53, 932–952. https://doi.org/10.1080/00220388.2016.1214717

Bharadwaj P, Fenske J, Kala N, Mirza RA (2020) The Green revolution and infant mortality in India. Journal of Health Economics: 71:102314. DOI: 10.1016/j.jhealeco.2020.102314

Chakravorty, U., Dar, M. H. and Emerick, K. (2019) Inefficienct water pricing and incentives for conservation, CESifo Working Paper Series. CESifo Group Munich

Chantarat, S., A. Mude, C. Barrett, C. Turvey (2017) 'Welfare Impacts of Index Insurance in the Presence of a Poverty Trap', World Development. Elsevier Ltd, 94, pp. 119–138. doi: 10.1016/j.worlddev.2016.12.044.

Jones, K. M. and de Brauw, A. (2015) 'Using Agriculture to Improve Child Health: Promoting Orange Sweet Potatoes Reduces Diarrhea', *World Development*. Elsevier Ltd, 74, pp. 15–24. doi: 10.1016/j.worlddev.2015.04.007

de Brauw, A. P. Eozenou, D. Gilligan, C. Hotz, N. Kumar, J.V. Meenakshi (2018) 'Biofortification, Crop Adoption and Health Information: Impact Pathways in Mozambique and Uganda', *American Journal of Agricultural Economics*, 100(3), pp. 906–930. doi: 10.1093/ajae/aay005.

de Brauw, A., Moursi, M. and Munhaua, A. B. (2019) 'Vitamin A intakes remain higher among intervention participants 3 years after a biofortification intervention in Mozambique', *British Journal of Nutrition*, 122. doi: 10.1017/S0007114519002162

Emerick, Kyle, Alain de Janvry, Elisabeth Sadoulet, and Manzoor H. Dar. 2016. "Technological Innovations, Downside Risk, and the Modernization of Agriculture." *American Economic Review*, 106 (6): 1537-61

Fishman, R., Dar, A., Barnwal, P., Mueller, N. D., von der Goltz, J., and McCord, G. C. (2017). Crop variety improvement and infant mortality in the developing world. Unpublished report submitted to the Standing Panel on Impact Assessment (SPIA) of the Independent Science and Partnership Council (ISPC)

Gollin, D., Hansen, C. W. and Wingender, A. (2018) 'Two Blades of Grass: The Impact of the Green Revolution', *National Bureau of Economic Research*. doi: 10.3386/w24744

Hotz, C. *et al.* (2012a) A large-scale intervention to introduce orange sweet potato in rural Mozambique increases vitamin A intakes among children and women, *British Journal of Nutrition*. Cambridge University Press, 108(1), pp. 163–176. doi: 10.1017/S0007114511005174.

Hotz, C. *et al.* (2012b) Introduction of β-Carotene–Rich Orange Sweet Potato in Rural Uganda Resulted in Increased Vitamin A Intakes among Children and Women and Improved Vitamin A Status among Children, *The Journal of Nutrition*. Oxford University Press (OUP), 142(10), pp. 1871–1880. doi: 10.3945/jn.111.151829.

Hughes, K., S. Morgan, K. Baylis, E. Smith-Dumont, T-G Vagen, H. Kegode, J. Oduol (2020). Assessing the downstream socioeconomic impacts of agroforestry in Kenya. *World Development* https://doi.org/10.1016/j.worlddev.2019.104835

Janzen, S. A. and Carter, M. R. (2013) 'The Impact of Microinsurance on Consumption Smoothing and Asset Protection: Evidence from a Drought in Kenya', *NBER Working Paper Series*, (March), p. 25. doi: 10.1007/s13398-014-0173-7.2.

Jensen, N. D., Barrett, C. B. and Mude, A. G. (2017) 'Cash transfers and index insurance: A comparative impact analysis from northern Kenya', *Journal of Development Economics*. Elsevier Ltd, 129(July 2016), pp. 14–28. doi: 10.1016/j.jdeveco.2017.08.002

Michler, J.D., Baylis, K., Arends-Kuenning, M., and Mazvimavi, K. (2018). Conservation agriculture and climate resilience. *Journal of Environmental Economics and Management*, 93, 148-169. https://doi.org/10.1016/j.jeem.2018.11.008

Mills, B., Nelson, C., and Achdiawan, R., (2017). Into the forest with or without a trace? A multi-level impact analysis of forest co-management in Guinea. Unpublished report submitted to the Standing Panel on Impact Assessment (SPIA) of the Independent Science and Partnership Council (ISPC)

Rejesus, R. M., Yorobe Jr., J. M., Lampayan, R. M., Sibayan, E. B., Ole Sander, B., Mendoza, M. L., B. Flor, R. J., B. Malabayabas, A. J., Singleton, G. R., Mohanty, S., and San Valentin, M. R. (2017). Adoption and impact of alternate wetting and drying (AWD) water management for irrigated rice production in the Philippines. Unpublished report sub-mitted to the Standing Panel on Impact Assessment (SPIA) of the Independent Science and Partnership Council (ISPC)

Standing Panel on Impact Assessment (SPIA), 2019. Impact of CGIAR's Agricultural Research for Development: Findings and Lessons from the Strengthening Impact Assessment in CGIAR (SIAC) Program. Rome: SPIA.

Stevenson, J., B. Vanlauwe, K. Macours, N. Johnson, L. Krishnan, F. Place, D. Spielman, K. Hughes, P. Vlek (2019) 'Farmer adoption of plot- and farm-level natural resource management practices: Between rhetoric and reality', *Global Food Security*. Elsevier B.V., pp. 101–104. doi: 10.1016/j.gfs.2019.01.003