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Incorporating a Gender Lens into Challenge Project Design

This brief presents initial lessons learned about gender challenges in Payment for Results (PfR) challenge projects. It describes how underlying inequalities often disadvantage women in agricultural market systems, and how market-oriented projects can perpetuate those disadvantages. We illustrate these issues drawing on our evaluation of AgResults' Kenya On-Farm Storage project, and identify offsetting factors that led to unique benefits to women. Based on our AgResults evaluation experience, we suggest gender considerations for project designers embarking on PfR initiatives, identify analyses, decision points, and potential pathways at those decision points to support design of a gender-sensitive project.

Gender challenges in a Payment for Results context

AgResults uses PfR prize competitions to catalyze private sector investment in the development of sustainable and inclusive markets for promising agricultural technologies. An important question is whether men and women have different experiences and outcomes with PfR approaches.

Women experience significant disadvantages in agricultural market systems (World Bank et al., 2009). Market-oriented interventions can further disadvantage women because, compared to men, they tend to be less integrated in agricultural input and output markets, have less access to finance, less access to media, lower levels of literacy and education, less land and other productive resources, more limited mobility, and less decision-making power within households. Women are more often involved in informal markets, which can be passed over or undermined by the development of more formal market systems. They also have less capacity to absorb risk due to greater poverty and more limited resources. Market-oriented interventions can also undermine women's preferences. For example, women are more likely than men to prioritize consumption over selling products at market, with consequently different preferences for crop mixes, varieties, and post-harvest management. Women also often bear the burden of additional labor requirements imposed by new crop, technology, or market opportunities. Finally, as traditionally female activities become more profitable, men sometimes take over those activities causing women to lose the benefits that they had previously enjoyed.

Key Observations and Lessons Learned

1 Women are often disadvantaged in agricultural market systems and face initial disadvantages in market-oriented development initiatives.

There are opportunities to plan for and improve gender outcomes throughout the project design process. These include:

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- The choice of technology to promote
 - Identification of potential PfR competitors
 - The selection of results to reward

3 Nonetheless, PfR projects have limitations, given that they succeed by motivating private sector actors to advance their profit motives, which may undermine gender equity. Complementary resources beyond the prize incentive may increase women's participation and benefits.

Gender findings from AgResults' Kenya On-Farm Storage Project

Despite these challenges, our evaluation of the AgResults' Kenya On-Farm Storage Project identified some unique benefits to women. We present a snapshot of our evaluation results from this project to set the scene for our broader suggestions on how to create a pathway to help women benefit from market development-oriented PfR projects like AgResults.

The Kenya On-Farm Storage project sought to catalyze the development of a sustainable and smallholder farmer inclusive market for improved on-farm storage (OFS) devices in Kenya's Eastern and Rift Valley regions. The project sought to improve smallholder farmers' food security by reducing post-harvest storage losses of grains and legumes, their key food staples. Over four years, six project competitors sold more than 413,000 metric tonnes of improved OFS to more than 330,000 smallholder farmers (Tanager, 2018, AgResults, 2020).

Evaluation results illustrated the inherent challenges in benefitting women through a market-oriented intervention. Our baseline assessment revealed, for example, that female heads of household tended to be older and less literate, have fewer household members and working members, receive fewer resources from a household member living and working in another city, own less land, and have lower farm and total household incomes (Table 1) (Abt Associates, 2015). Consequently, we hypothesized that female-headed households might have lower uptake of, and consequently benefit less from, improved OFS.

Table 1. Baseline characteristics of female and male/dual-headed households

	Female-headed as percent of male/dual-headed households	
	Eastern	Rift Valley
No. of household members	90%	89%
No. of working household members	83%	86%
Household head age	110%	106%
Household head literacy	74%	72%
At least one household member lives and works in another city	78%	81%
Total area of all owned and rented-in plots (ha)	86%	75%
Total household income (KES)	69%	49%

Our baseline assessment also showed markedly different behaviors in maize production, post-harvest management, sale, and consumption (Table 2). Female-headed households had lower total maize production and ran out of maize stocks sooner than male/dual-headed households¹. For example, in Rift Valley, female-headed households that sold maize retained about two-thirds of their maize harvests on average for their own consumption, while male-headed households that sold maize retained less than half.

Our baseline data showed that, across the two regions, female-headed households reported losing only one third the amount of maize lost by male/dual-headed households. This implied that they might have found more effective strategies to mitigate storage losses than male-headed households, or pursued similar strategies with

Adoption of on-farm storage devices in Kenya

Despite underlying disadvantages, women-headed households adopted improved OFS devices at higher rates than male-headed households.

Female adopters of improved OFS described benefits such as labor savings, reduced crop losses, avoiding using pesticides on their food, and more peace of mind knowing that their food stores were safe from pests.

¹ We use the terms 'male-headed' and 'dual-headed' households to refer to households with at least one male over the age of 18, whether or not there is a female over the age of 18. A female-headed household is one in which a female over the age of 18 is present, but no male over the age of 18.

more diligence. While they were also less aware of improved OFS devices, regional variation in purchases of OFS devices suggested strong latent demand for improved OFS among female-headed households (Table 2).

Table 1. Household maize activity; awareness and purchase of improved OFS

	Female-headed as percent of male/dual-headed households	
	Eastern	Rift Valley
Household-level production, storage, and sale of maize		
Maize grain produced	93%	67%
Maize kept for household consumption	92%	94%
Maize yield	16%	89%
Maize revenue	91%	47%
Household ran out of maize before next season's harvest	107%	107%
Household purchased maize for consumption	108%	103%
Household-level awareness and purchase of improved OFS devices		
Aware of any improved OFS technology	80%	78%
Purchased any improved OFS	25%	146%

Despite the anticipated challenges to exposing women to the potential benefits of improved OFS and enabling them to acquire and use improved OFS, our endline research showed 3.7 percentage points higher uptake of improved OFS among female-headed households (Ness-Edelstein et al., 2019). Our qualitative inquiries also revealed a notable lack of friction within households regarding decisions to purchase OFS and roles, responsibilities, and rights around the OFS once it was purchased. This may be due to low costs of storage solutions—usually less than US\$2—and general recognition that the technology had the potential to improve household food security. In addition to perceiving less post-harvest loss from using improved OFS, women also perceived benefits from reduced pesticide exposure, labor savings from not having to periodically clean and treat their maize with chemicals or wash chemicals from their maize before consuming it, and reduced anxiety about threats from weevils and other insects. Based on these results, we argue that Kenya On-Farm Storage project benefitted women despite the inherent difficulty in doing so through a market-oriented PfR initiative.

Reflections on benefits of improved OFS from female farm-household interviewees

'It is faster as there is no cleaning of the maize from the chemicals that we previously applied to all of our maize.'

'Before, it was time consuming, as you had to keep on checking whether the grains have been attacked by weevils. Now I can relax knowing that they are safe.'

Incorporating a gender lens into PfR project scoping and design

In this section, we suggest ways market development oriented PfR projects can be developed to improve gender equity. We first provide suggestions on how identifying gender issues can be integrated into project scoping assessments and offer specific questions that can guide the gender portions of these analyses. We then outline how gender issues can be accommodated in key project design decisions and offer recommendations and questions that can be used to guide development of a gender-sensitive design.

Incorporating gender into project scoping

Project scoping activities offer extensive opportunities to integrate gender concerns, particularly in the context of market systems and household-level research that inform project design.

Market systems analysis. To integrate gender concerns, project scoping activities should investigate current gender patterns of market participation and form hypotheses about how alternative PfR project designs might

affect those patterns. For example, men often dominate wholesale markets for agricultural products, whereas women are often predominant in retail and informal markets. AgResults PfR competitors are often drawn from value chain levels that are dominated by men, such as aggregators and large-scale processors², which means that the project may unintentionally engage more men than women. Lines of inquiry that can help project designers to better understand gender-differentiated market roles include:

Considering gender from the start

Research at the project scoping stage can incorporate gender dimensions into its market systems and household-level analyses, thus facilitating early identification of gender issues to consider in project design.

- What roles do men and women play along the value chain, and how do these roles differ across different segments of society (such as across different religions, socio-economic strata, or cultures)?
- What costs and benefits—both financial and non-financial—do women and men experience in undertaking their traditional roles, and what factors—such as technology or resource availability—influence these costs and benefits?
- How rigid are traditional roles for men and women? Under what circumstances do men sometimes take on traditionally female roles, and vice versa? How are any such shifts in roles perceived?
- Are there any examples in this or similar value chains where significant and sustained changes to the traditional gender roles have been achieved with consequent improvements in gender equity? What changes were made and how were they negotiated to ensure acceptance?

Household analysis. This analysis examines household level roles, responsibilities, and dynamics to identify major patterns of participation in agricultural production and markets and the distribution of costs and benefits of these activities across and within households. Gender-differentiated patterns of participation and outcomes can vary across culture, religion, income level, and household structure, all of which should be taken into account in the analysis. By identifying gendered household roles, responsibilities, and privileges early on, they can be better addressed in project design and tracked during project implementation.

When conducting project scoping analyses, consider potential gender implications of:

- The choice of technology
- How potential competitors are identified
- Market channels favored by the project
- Results to be awarded
- Qualifying criteria for results

Qualitative analysis can also help project designers explore intra-household roles and responsibilities and decision-making dynamics, focusing on how they affect production and sales in the targeted market system and how that participation affects the wellbeing of different members of the household. Considerations include how decision-making dynamics reflect differential control over productive inputs such as land and livestock and their products. Labor allocations are also a key factor behind potential gender-differentiated outcomes, particularly as household labor is rarely remunerated and women are often responsible for a 'double workday' of both 'productive' and 'reproductive' labor. Identifying these issues during project scoping allows for potential non-financial impacts of a project intervention to be addressed during design. Themes to explore include:

- What are men's and women's roles in the production, processing, and disposition of the targeted crop?
- How are women likely to be involved in the use of the new technology?

² The reasons behind PfR projects drawing from relatively more concentrated industry levels are discussed in Mainville and Narayan (2017).

- What factors might increase or decrease women’s opportunity to learn about and adopt the technology?
- What factors might affect women’s opportunities to benefit from the technology? For example, who has rights to and/or controls key resources used in production and other activities involving the product?
- What are dynamics around important decisions such as what inputs to use and how whether to consume or sell the product?
- Who retains and makes decisions about what to do with revenue when the product is sold, and how is that revenue used?

Finally, men may take over activities if a new technology raises the profitability of a traditionally female enterprise, thus changing household-level dynamics with implications for gender equity (World Bank et al. 2009). There are ways to protect women’s control in the face of these pressures. For example, the AgResults Zambia Biofortified Maize Project introduced biofortified maize to women’s groups. By cultivating biofortified maize on group-managed land, women were better able to maintain control over the crop and its proceeds than if they had cultivated it on their household plots. To protect women in the face of such potential dynamic changes, questions to explore include:

- Are there examples of women losing control over traditionally female enterprises or activities when they became more profitable?
- Are there examples of women overcoming pressure to cede control over traditionally female enterprises or activities when they become more profitable?
- If the project will increase the profitability or attractiveness of a task or crop that traditionally falls to women, what can be done to protect against men asserting control over it and capturing those benefits?

Incorporating gender into project design

Project designers can use the findings from market and household analyses to assess the potential effects of different project designs on gender outcomes. The scoping assessments can inform the choice of innovation or technology to promote, the types of potential project competitors to recruit, the market channels that the project will favor, and the specific results and qualifying criteria for those results that the project will reward. Below, we present gender considerations underlying these decisions, recommended approaches, and key questions.

Choice of technology. Technologies that provide benefits to households that don’t market their product, and technologies with low cost, can offer improved outcomes for women, as illustrated in Kenya. AgResults has focused on technologies—such as biofortified maize, on-farm storage products for grains, and aflatoxin-reducing inputs—that could directly increase food security and nutrition at the farm-household level. Focusing on food security-relevant technologies (which tend to be well aligned with development objectives being targeted by AgResults’ PfR projects) can benefit household food consumption even if market development for the product is central to the theory of change. Low-cost technologies requiring small or incremental expenditures and minimal risk can also increase uptake and utilization among diverse market actors. In Kenya, most of the improved OFS technologies cost low-cost, and were incorporated into households on an experimental basis, with little friction around the decision to buy them. Considerations about the attractiveness and accessibility of technologies to women should be weighed among other project priorities. Sample questions to ask about technologies under consideration include:

- Can the technology help produce food for consumption, rather than just for sale?
- Is the technology likely to lead to a reduction in other food security products or activities?

- Who will control the product of the technology? How secure is that control, or how can it be fortified?
- Does selection of a potentially gender-inclusive technology entail tradeoffs with other project priorities?

Identification of potential competitors. AgResults projects to date have tended to draw competitors from value chain levels that have fewer and larger firms, such as wholesale intermediaries or medium and large-scale processors. This focus on relatively more concentrated industry levels reflects the need to achieve scale and verify competitors' sales. However, it implicitly favors the male-owned or controlled businesses which tend to dominate those industry levels. Low representation of women-owned and controlled firms among project competitors could be offset by rewarding the inclusion of women-owned or controlled firms or organizations in competitor consortiums. Projects could also define requirements for participating competitors to increase participation of diverse firm types and sizes. Sample questions to ask about competitors include:

- Are there any potential competitor groups that are particularly diverse, whether in terms of gender representation or in other ways such as the size, business focus, and/or clientele of different firms?
- Are there any viable potential competitor groups that are particularly inclusive of women in their leadership or ownership?
- Can requirements for firms to qualify as competitors be adjusted, while still remaining meaningful, to increase the possibility of women-owned or controlled firms participating?

Market channels favored by the project. Market-oriented PfR projects typically try to scale up underserved markets or create them where they are 'missing'. Often, the target technology (or its derivative product) has quality characteristics or other traits that make it unsuitable for trade in mainstream commodity markets. AgResults PfR projects, for example, have often sought to help create markets for quality-differentiated products such as biofortified maize or Aflasafe-treated/aflatoxin-complaint maize. Markets for quality-differentiated products often require tighter coordination among buyers and sellers to ensure that the identity of the quality differentiated product is preserved and protected (through product segregation) or communicated (through product certification) as it moves along the value chain and to help offset investment risk. This tighter coordination often implies intensified relationships between buyers and sellers—for example, the use of contracts or advance purchase agreements—and implies that formal markets are favored. Intensified relationships and tighter coordination may also favor market actors that have greater capacity to bear risk, better access to finance, and more commercial orientation, all of which may disadvantage women. In circumstances where the target product favors more formal market channels at the potential expense of women's participation, there may be room for complementary activities that can strengthen supportive market infrastructure through funding and/or technical assistance to help increase opportunities for more diverse, and women-led, firms. Sample questions to ask about diverse firms' participation include:

Challenges and opportunities at the design stage

Designing a PfR project to be more gender-inclusive may entail tradeoffs with other project priorities or undermine private sector investment. Creative designers, however, may be able to craft win-win solutions, for example:

- **Choice of technology.** Food-security relevant and low-cost technologies may increase uptake among, and benefits to, women.
- **Identification of potential competitors.** Recruitment of competitors can promote inclusion of woman-owned and managed firms.
- **Prize design.** Creative designers can craft criteria that will 'nudge' competitors to be more inclusive of women, without undermining their business case for participating in the PfR project. For example, rewards could be based on production, rather than sales, of a product.

- What arrangements or facilities—such as contracts or certification—will be required to trade in the technology or its derivative product(s)?
- Are there publicly available actions, such as definition and enforcement of product standards or certification bodies, that can make the market more accessible to diverse firms including those owned or managed by women?

Results to be rewarded. A major benefit of PfR challenge projects is that, by inducing competition among private sector firms that pursue PfR rewards, they motivate competitors to leverage their own management, financial, and creative resources. The results that AgResults projects have rewarded, to date, typically focus on volumes procured or sold of the technology or its derivative product. While these results have helped promote market development for the technologies or their product, they also create incentives for households to sell, rather than consume, the product, potentially dampening benefits of the technology at the household level. In Nigeria, for example, where farmers tended to use Aflasafe (a field-level biocontrol that vastly reduces the proliferation of aflatoxins on maize fields) on only a portion of the maize crop, they were motivated to sell the Aflasafe-treated maize and consumed little at the household level (Narayan et al. 2020). In contrast, the Tanzania Dairy Productivity project focused on sales of dairy productivity-enhancing inputs, rather than production, farm sales of milk, or processor procurement of milk. Sales and purchases of milk were eschewed as results because of their potential to shift milk away from home consumption or informal markets, and the potential gender-inequitable benefits that either of those results implied. (Farm-level production of milk was eschewed because it is difficult and costly to measure.)

To define gender-inclusive results to be rewarded, project designers can ask themselves:

- What results can be rewarded that will enhance participation of, and benefits to, both men and women?

Qualifying criteria for results. Qualifying criteria for PfR target results help ensure that the project achieves its intended development impact. For example, in Kenya, sales were counted only in the Eastern and Rift Valley regions due to the importance of staple crops there. By counting sales only in those two locations, the project helped ensure that OFS that qualified for prizes would be used to store food staples rather than cash crops. The project also limited the qualifying size of OFS devices to the average amount of maize estimated to be consumed by a household in a year, helping ensure that the OFS technologies were directed to smallholder farmers rather than larger scale farmers also producing maize and other staples in the target regions. Similarly, in the Nigeria Aflasafe Project, aggregators were required to source their Aflasafe-treated maize from smallholder farmers in order to promote development of a smallholder-inclusive market.

Thoughtful definition of results and qualifying criteria can help increase gender equity; strategies that initially appear to promote gender equity may entail tradeoffs with other project objectives. For example, requiring that a certain percentage of buyers or suppliers be women can potentially help increase gender equity but may also undermine private sector participation and investment. This is because qualifying criteria have been shown to be effective in nudging broad outcomes that can still be achieved at scale—for example, smallholders make up the vast majority of maize farmers in Nigeria, so requiring that competitors source from smallholders did not significantly constrain them. Similarly, in Kenya, there was a large potential market for OFS in the two regions where OFS sales would be rewarded. No AgResults project has rewarded results that target a small or marginalized market segment. Our evaluations show that competitors typically go after ‘low hanging fruit’—such as relatively well-endowed or progressive smallholder farmers—when they invest. Thus, using gender criteria to qualify results should consider how the specific criteria might incur additional costs, limit opportunities, or reduce participation and scale. Furthermore, some parameters may also motivate competitors to ‘game’ the system, creating unintended effects. An alternative to restrictive qualifying criteria is to use

complementary activities, for example awareness-generating activities that increase information access, empower women as decision-makers, or promote a technology's health benefits.

In consideration of these points, the use of qualifying criteria for target results to increase gender inclusion (or other social objectives) is likely to be most effective and least disruptive if they 'nudge' rather than 'force' competitors toward the desired targets. For example, project designers can offer a modest but meaningful bonus on the incentive for reaching pre-determined targets around gender inclusion, rather than an outright requirement stipulating specific targets to qualify for any reward. To balance tradeoffs between investment attractiveness and social objectives in defining qualifying criteria for results, designers can ask themselves:

- Are there criteria that will 'nudge' competitors to be more inclusive of women, without undermining competitors' business case for participating in the PfR project?

Conclusion

PfR projects such as AgResults offer an innovative approach to leverage private investment and ingenuity for the development of sustainable, private-sector driven markets for promising technologies. Nonetheless, their focus on markets implicitly disadvantages women given that women are often less integrated into agricultural input and output markets. Integrating gender considerations into project scoping and design activities offer opportunities to make the projects more gender-inclusive and beneficial to both men and women.

Key Takeaways for Challenge Prize Sponsors

Despite implicitly disadvantaging women, market-oriented PfR project design can enhance gender equity.

- Incorporating gender inquiries and household-level analysis during project scoping can help identify gendered patterns of behavior to consider during project design.
- PfR approaches that promote food-security relevant and low-cost technologies may ease uptake among and benefits to women.
- Recruitment of competitors can promote inclusion of woman-owned and managed firms.
- PfR approaches that favor development of more formal market channels that may implicitly exclude women can use complementary activities to increase their inclusion.
- Results on which PfR rewards will be based can be defined to be inclusive of diverse farmers; for example, rewards could be based on production rather than sales of a product.
- Qualifying criteria for results which will be rewarded can nudge more inclusion of women, but the possible negative effects of such criteria—such as reducing private-sector firms' incentives to participate as competitors or encouraging 'gaming' of the system should be considered and balanced with the potential benefits of greater gender inclusion.
- Overall, the fact that PfR projects depend on catalyzing private-sector investment and ingenuity implies the need to balance gender-equity and other social and development goals of the project with the motivations and interest of the project's private-sector competitors.

The Kenya On-Farm Storage project exemplifies a project which, by promoting a low-cost, food-security relevant technology, resulted in unexpected benefits for women including reduced crop losses in storage, reduced labor to maintain crops in storage, and better peace of mind knowing their crops were safe from pests.

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AgResults is a \$152 million multilateral initiative incentivizing and rewarding high-impact agricultural innovations that promote global food security, health, and nutrition through the design and implementation of Challenge Projects, which provide payments for results intended to foster the creation of sustainable markets benefiting smallholder farmers. The AgResults initiative is a partnership between the Australian Government, the Bill & Melinda Gates Foundation, the Government of Canada, the United Kingdom's Foreign, Commonwealth and Development Office, the United States Agency for International Development, and the World Bank.

Abt Associates, in partnership with Denise Mainville Consulting, is an external impact evaluator of AgResults. Abt Associates uses rigorous evaluation methods to answer critical questions about the impact of PfR projects and to identify best practices in their design and implementation. These briefs summarize our lessons learned on individual projects and cross-cutting topics.

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