

# **Amplifying Outcomes by Addressing Inequality: The Role of Gender-transformative Approaches in Agricultural Research for Development**

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**Paula Kantor<sup>1</sup>**  
**Miranda Morgan<sup>2</sup>**  
**Afrina Choudhury<sup>3</sup>**

## **Abstract**

Increasing agreement on the relevance of gender and social equalities to agricultural development outcomes has not come with the same consensus within the development community regarding ways to intervene

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<sup>1</sup> Senior Scientist, International Maize and Wheat Improvement Center (CIMMYT), Mexico.

<sup>2</sup> WorldFish, Dhaka, Bangladesh.

<sup>3</sup> WorldFish, Headquarters, Penang, Malaysia.

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\* Paula Kantor's death as a result of a tragic terrorist attack on May 13, 2015 has left a painful void as is felt with the loss of a mentor, a friend, a teacher, an ardent supporter. This article is one of her final works she submitted before succumbing to her tragic fate. We co-authors would like to dedicate this piece in loving memory and honor of Paula whose selfless dedication will subsist through all the lives she touched with her warmth and passion. We hope to keep her passion alive by striving to achieve what she believed in. She joined Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) as a senior scientist (gender and development specialist) in February 2015 to lead an ambitious

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## **Corresponding author:**

Afrina Choudhury, WorldFish, House 22B, Road 7, Block F, Banani, Dhaka 1213, Bangladesh.  
E-mail: [a.choudhury@cgiar.org](mailto:a.choudhury@cgiar.org)

in the sector to foster equality. The guiding principles of agriculture research for development (AR4D) and its focus on capacity development can contribute to this debate and to advancing gender integration in the sector if the “social threads” within its principles are developed more thoroughly. The aim of the article is to articulate how the social dimension of AR4D could be further developed through the conceptualization and operationalization of gender-transformative approaches (GTAs). The article provides a case study from the aquaculture sector of Bangladesh to illustrate why this is needed, and it describes some ways forward to move GTAs into agricultural practice and test their contributions to development outcomes. Such an action research agenda will generate learning that can be used to make the most out of synergies between enhanced social equality and capacities to innovate.

### **Keywords**

Gender, AR4D, transformation, capacity to innovate, Bangladesh

### **Introduction**

Since Boserup’s seminal work on women’s roles in African agriculture (1970), researchers have produced a considerable body of evidence documenting how gender and wider social inequalities affect access to productive resources, technologies, markets, networks, and business services in the agriculture sector. For example, often-cited empirical works by Udry (1996), Saito, Mekonnen, and Spurling (1994), and Jones (1986) quantify the “gender gaps” in agricultural inputs and in some cases estimate the productivity gains from their reversal. Recent additions to this literature include compilations, such as, the FAO’s

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new project aimed at empowering and improving the livelihoods of women, men, and youth in important wheat-growing areas of Afghanistan, Ethiopia, and Pakistan. Before joining CIMMYT, Paula served as a senior gender scientist with Consultative Group for International Agricultural Research (CGIAR) sister organization WorldFish for three years from 2012. At WorldFish, working in Bangladesh, Malaysia, and Egypt, Paula contributed significantly to the design and development of gender-transformative approaches for the CGIAR Research Programs (CRP) on Aquatic Agricultural Systems (AAS) and Livestock and Fish.

2010–2011 State of Food and Agriculture (2010), the Gender in Agriculture Sourcebook (2010), and multiple studies on gender and asset rights, testing new methods for collecting intra-household asset data and documenting gender gaps.<sup>1</sup>

Such evidence continues to be generated and used to advocate increased investment in gender-responsive programming, often using efficiency arguments to advance the case. These arguments relate the documented gender differences in access to resources to shortfalls in development and food security achievements, and cite the widely applied assumption of women's relative altruism and concomitant allocation of larger shares of their earnings to the family (Meinzen-Dick, Behrman, Menon, & Quisumbing, 2012; Quisumbing, 2003; World Bank, 2001). For example, the 2010–2011 State of Food and Agriculture estimates that if gender differences in the access to agricultural resources were reversed, agricultural output in developing countries would increase between 2.5 and 4 percent, which itself could reduce the number of malnourished people by 12–17 percent, assuming, of course, that the increased production is available and affordable to those currently malnourished.

While there is increasing agreement that gender and social inequalities matter to agricultural development outcomes, there is less consensus around how to intervene in the sector to address these inequalities. Some support efforts to increase women's access to resources, generally working within the existing social norms and structures, while others seek what they expect to be more lasting changes by acting both on and within the existing social structures to create an environment in which both women and men have more and better livelihood options.

This article argues for an approach to gender integration that recognizes and responds to the constraints imposed by the social context on poor and marginalized people's opportunities and outcomes, in order to unlock their potential to participate in and benefit from agricultural development. It articulates how the guiding principles of agriculture research for development (AR4D)<sup>2</sup> and their focus on capacity development can contribute to this debate and to advancing more conceptually robust approaches to gender integration in the sector, if the "social threads" within its principles are developed more thoroughly. The next section articulates how AR4D provides openings for integrating critical social and gender analysis within its processes. The third section uses a case study from the aquaculture sector in southwest Bangladesh to illustrate why such social and gender integration is relevant to technology adoption and its outcomes, while the final section provides further

guidance on how to address inequality and foster social change that can enable poor and marginalized rural populations to better contribute to and make the most of technological advances.

## Enhancing the Social and Gender Focus on AR4D

AR4D provides an opening for innovative and critical gender integration approaches through its focus on innovation, learning, and action processes, and on the need to create a favorable environment for AR4D practices. It does so by fostering change in personal attitudes and mindsets, in organizational practices and cultures, and in how organizations interact in wider innovation systems (Hawkins et al., 2009). Systems are defined by these interactions, which in turn allow innovations in products or processes to be brought into social use. While social and gender equalities do not feature consistently or strongly in many articulations of AR4D principles and approaches (Manyire & Apekey, 2013 are a strong exception), the AR4D approach of bringing together perspectives and knowledge of varied stakeholders, and to learning from and about each other through working together, can create shifts in mindsets that raise awareness of the relevance of gender equality to agricultural development. However, to realize this, the operationalization of these principles must be inclusive and should purposefully enable women and other marginalized groups to have voice within them.

AR4D seeks to bring together analysis, action, and change across multiple levels of spatial, economic, and social organization, in recognition of the need to foster change across the innovation system (Hawkins et al., 2009). This multilevel and systemic orientation, along with the interest in models of inclusive action and learning, has clear synergy with analyses of and action to address the multiscale drivers of gender and social inequalities like sociocultural norms and how they prevail and interact across the micro- and macro-level social, economic, and political contexts. Gender and social inequalities are conceived of as social constructs, embedded in the way societies define the roles of and relations between women and men, which in turn govern the distribution of resources (Martin, 2004; Risman, 2004). Gender infuses all aspects of the daily lives of women and men through the way it shapes what is acceptable and appropriate for them to be and do. This means that gender affects the following: how women and men conceive of themselves and their capabilities; how women and men interact and relate within the

framework of social expectations in different spheres, such as, the home and the community; and how opportunities are structured and resources are distributed within institutions, such as, the market and the state. Therefore, as in the case of fostering the uptake of AR4D principles and practices, shifts in mindsets and attitudes are needed at the individual, organizational, and institutional levels if attention to social and gender equalities is to become embedded in the agricultural sector both within agricultural research and development organizations, and in their work in communities (De Soysa & Jutting, 2007; Jutting & Morrison, 2005). Achieving these mindset shifts in relation to both AR4D principles and gender equality can realize the synergies between enhanced equality and innovation capacities, unlocking social barriers to innovation and creating the conditions for enduring and equitable improvements in the livelihoods of the poor and marginalized. For example, AR4D's efforts to enable farmers to take up and benefit from existing innovations can be better realized if the underlying and differing constraints behind the uptake for women and men are differentially understood and addressed.

Enhancing the social content of AR4D, and the critical nature of debate on how to address gender and social differences in the access to and control over agricultural resources and opportunities, relies on deepening understandings of the concepts of poverty and inequality, particularly of their underlying drivers. The foundation of this analysis is an understanding that poverty and inequality are caused in part by unequal power relations that shape how society operates and the range and quality of opportunities available to different social groups determined by gender, class, race, ethnicity, or caste (Kabeer, 2000; Mosse, 2007). Therefore, interventions must address more than the symptoms of poverty and social inequality (i.e., lack of access to resources, markets, etc.); they also need to catalyze critical questioning of and action in response to the norms, attitudes, and institutionalized rules and relationships creating and maintaining poverty and inequality.

This understanding of poverty and inequality is informed by social-ecological models that understand human action and behavior to both affect and be affected by the social environment across various levels of influence from the micro to the macro (McLeroy, Bibeau, Stechler, & Glanz, 1988). Thus, attention to changes in mindsets, rules, practices, or resources at any one level alone (e.g., the community) will be insufficient to foster enduring change, as will attention only to structures of constraint (e.g., property rights) or only to individual agency (e.g., women's

access to resources). Change processes are complex and must cross actors and scales and include efforts to enhance the voice and agency of the poor and marginalized in innovation and empowerment<sup>3</sup> processes, as well as enable their own efforts to challenge the structures of constraint (Kabeer, 2012).

While an increasing number of agricultural research programs are beginning to acknowledge the influence of the social context on innovation and the capacity to adapt to changing social and ecological systems, few seek to foster change in the elements of society that stop the poor and marginalized people from articulating and achieving their goals. This consequently limits the ability of these programs to achieve impact at scale because existing social inequalities may keep significant portions of the population, such as, ethnic minorities, poor men, and women, from participating in or benefiting fully from development efforts (Hickey & du Toit, 2007; Kabeer, 2000; Mosse, 2007; Wood, 2004). Not addressing the barriers created by existing norms and attitudes also limits the enduring nature of development outcomes. By not addressing the underlying causes of poverty and gender inequality, for example, projects may produce superficial changes in the participation of women or other marginalized groups in an economic activity that return to “normal” after the project. Alternatively, projects may produce unintended and potentially harmful outcomes because the interests and incentives of the poor or women were not understood and addressed. For example, a study showed that a rise in the productivity and income from fish ponds in Bangladesh did not result in the expected nutritional improvements for women and girls in the household in part because there was no effort to address the sources of gender inequality (Kumar & Quisumbing, 2010). More positive and sustained outcomes for women resulted in a project where women were assisted in claiming long-term rights over public water bodies through forms of collective action (Nathan & Apu, 1998).

Lack of funds, time, and capacities to conduct gender and social analysis and to utilize the results for program design hinder attempts to reorient programs to a more transformative approach to gender integration, which seeks to address the underlying causes of gender inequality rather than just reducing the various gender gaps between men and women. Another constraint is the political realities of development agencies and the need to “sell” gender in efficiency terms in order to gain a foothold (Cornwall, Harrison, & Whitehead, 2007; Eyben & Napier-Moore, 2009). The frequent orientation of agriculture research and programs to understanding and addressing the symptoms of gender inequality

provides a key rationale for a new approach to gender and social analysis in AR4D that engages with the causes of inequality. The case study in the following section provides further justification for this need as well as guidance for ways forward to enhance the critical social content of AR4D processes.

### **Homestead Aquaculture Technology: The Relevance of Gender Relations to Technology Adoption and Sustained Use**

A recent study in Southwest Bangladesh, supported by two CGIAR Research Programs (Climate Change, Agriculture, and Food Security and Aquatic Agricultural Systems), examined how gender relations shape if and how women and men adopt and use agricultural innovations, specifically cage aquaculture and homestead pond polyculture and how benefits and consequences of technology adoption are distributed among individuals, households, and communities. The study was conducted in four communities of southwest Bangladesh where two United States Agency for International Development (USAID)-funded projects—Cereal Systems Initiative for South Asia in Bangladesh (CSISA-BD) and Aquaculture for Income and Nutrition (AIN)—with a focus on disseminating aquaculture technologies were operational. The communities chosen were from the agro-ecologically similar Khulna and Barisal districts, which face climatic risks, particularly floods, waterlogged soils, and increasing salinity of both land and water. All four villages have a mixture of Hindu and Muslim population with agriculture as their main source of income. The villages were chosen based on the operating areas of CSISA-BD and AIN where these two women-targeted technologies were disseminated.

Qualitative research methods were used in order to understand the full range of factors shaping how women and men adopt and use innovations, including less tangible and thus less easily measurable gender power relations and dynamics. The intention was to point out to project designers, researchers, and implementers that targeting women for a technology that seems befitting and convenient for women<sup>4</sup> may not necessarily translate into their using the technology or even benefiting from it. The study emphasizes the various effects such technology targeting may have on women and their families and what project designers need to be aware of in the AR4D process.

The methods included focus group discussions with villagers and innovation adopters, and in-depth interviews with both women and men in innovation adopting households and other key informants. In total, the field teams conducted 121 focus group discussions (FGDs) and interviews, which were recorded and transcribed in Bangla. The transcripts were then translated to English for analysis. An initial data coding structure was agreed upon by two lead researchers following the fieldwork after which a large number of transcripts were coded and analyzed (using a collaborative qualitative data analysis software, Dedoose). However, due to the significant amount of data collected in the field, it was not feasible to analyze all the transcripts. The results summarized here focus primarily on the qualitative data analysis of a sample of interview transcripts with “innovation adopters” ( $n = 67$ ; 42 women and 25 men). This sample includes all research sites, innovation types (cage and pond polyculture) and the two major religious backgrounds of communities.

Fish cage aquaculture<sup>5</sup> was initiated as an adaptive research study to test the technical feasibility (including stocking density, feed conversion ratio, productivity, and profitability) of the cage aquaculture technology in different agro-ecological zones of Bangladesh. Its viability lies in the fact that one does not need to own the water body to undertake cage aquaculture but can utilize the common open-access water bodies that run beside many households in Bangladesh. With the decline in capture fisheries, many are opting for aquaculture in *ghers* (converted rice fields used for farming shrimps and prawns) and ponds, but the poor landless farmers mostly cannot avail of that option. Thus, poor landless women were a key target for introducing this innovation, and the project sought to involve women living close to common water bodies, and without any substantial productive water resources of their own. As an adaptive trial, the cages and other inputs were provided free of cost to the women farmers who were expected to reinvest from the profits after the first production cycle (see Table 1).

The household system interventions initiated under CSISA-BD and AIN include polyculture of carp and/or tilapia with small indigenous fish (*Amblypharyngodon mola* with high-nutrient qualities, hereafter referred to as *mola*). They also encouraged the intensive utilization of space by producing high-value vegetables in homestead areas and pond dykes, based on the seasonal crop calendar. Many household-based fish ponds targeted by CSISA-BD for improvement were used previously for traditional fish culture resulting in low productivity. Introducing small indigenous fish, such as, *mola* in efficient, low-risk, polyculture

**Table 1.** Dissemination Mode According to Research Site and Innovation Type

| Trial     | Innovation Type | Receive Inputs | Receive Training      |                  |
|-----------|-----------------|----------------|-----------------------|------------------|
|           |                 |                | Men                   | Women            |
| Village 1 | Cage            | Yes            | No                    | Yes              |
| Village 2 | Cage            | Yes            | Yes (outside village) | Yes (in village) |
| Village 3 | Cage            | Yes            | Yes                   | Yes              |
|           | Pond—Typical    | No             | Rarely                | Yes              |
|           | Pond—Demo       | Yes            | Rarely                | Yes              |
| Village 4 | Pond—Typical    | No             | Rarely                | Yes              |
|           | Pond—Demo       | Yes            | Rarely                | Yes              |

**Source:** Morgan et al. (2015).

systems of high-value fish like carp and tilapia was promoted as a means to generate additional income for the family besides improving their nutritional intake.

CSISA-BD and AIN both use training, participatory farmer trials/demonstrations, and linkage events<sup>6</sup> as the principal means to promote aquaculture technologies. The demonstration farmer is one who is selected to demonstrate a given technology and a group (consisting of an average of 25 “typical” farmers) is provided with opportunities to observe the methods applied, and results achieved, by this farmer, thereby enabling them to replicate similar results for themselves. The demonstration farmer approach is used with homestead ponds. CSISA-BD targets only women for its homestead pond polyculture dissemination, while AIN targets a majority of women but with a mix of men as well. Participants received inputs, training or both, depending on the type of innovation (see Table 1).

In-depth analysis of the sample of innovation adopters reveals how social differences, including gender-specific differences, shape the process of disseminating smallholder aquaculture innovations as well as their adoption, and the division of benefits among participants. The study observed how different households function differently when it comes to responsibilities and decision making around the technology. The cage and pond polyculture technologies were both delivered in a similar manner to the target women by both the projects. The study observed the way in which these women adopted and interacted with the technology that was given to them. These interactions were found to depend on the relations among the women themselves and with other

members of their household and members of the community, including project staff.

This finding demonstrates the need for technology-focused projects to engage more explicitly with underlying social barriers if they are to achieve their desired results.

## **Factors Affecting Innovation Dissemination and Uptake**

A combination of physical, natural, human, and/or social capital is required for the initial uptake of the aquaculture technologies (i.e., secure water access or investment capital for inputs and previous knowledge or experience with aquaculture). It helps to improve the likelihood of the technology's success. Poor households are less likely to have sufficient capital; even in the households that do have capital, women are less likely to have sufficient control over it. This makes it challenging for the target group of poor women to take up and sustain their use of novel aquaculture innovations.

How inputs are disseminated (via training and/or asset transfer) and to whom also has implications for the program's success. In one village, men and women within households were trained on separate tasks required for cages (men on marketing and women on feeding and cleaning), which may lead to or reinforce gender-differentiated roles affecting workload and the distribution of benefits.

Women who attended training on pond polyculture agreed that their workload had increased since the training, in part because their husbands were not included in it. Both men and women adopters expressed the opinion that men should also attend the training. Rokeya, an 18-year-old Muslim woman who participated in the training in Village 3, said that even though the household receives inputs, it was only she who received training: "In a family, it isn't enough if one person is aware. If [training] is given to everyone in the family, then all the members will be aware. Benefits can come."

Although the women adopting new technologies in this study did attend training for the most part, some faced significant obstacles in doing so. Parvin, a 25-year-old Muslim woman, also in Village 3, details the opposition she faced from her husband, as well as her mother-in-law, father-in-law, and brother-in-law, for attending the training. Despite this opposition, she initially went to the training sessions because she liked

them and could learn new things. However, she explains how dominant gender norms related to mobility and gender roles eventually led her to stop attending training and farming fish:

My husband also doesn't like all this. He also doesn't like that I went to the meeting. The woman should stay at home. Fish farming is done by the men...I stopped farming fish. It was difficult for me to go the training. I have a small child, I have household work...Again there are outside men at the training. They see us...I didn't go any more after those 3–4 days. I didn't go anymore because I have hassles here.

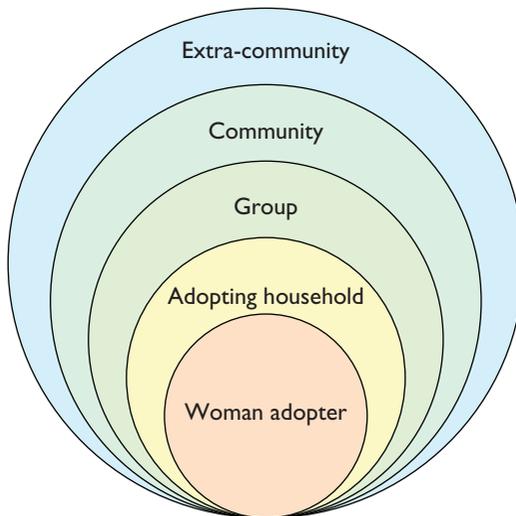
Use of the demonstration farmer model for dissemination (wherein one farmer receives assets to model the innovation to a larger group who receives training but not assets) created confusion, jealousy, and tension, affecting the potential for intra-community or intragroup knowledge sharing. Of the 22 typical pond adopters in total who receiving pond training, at least 13 revealed feeling some kind of negative emotions at not receiving similar inputs as the demonstration farmer. These feelings seemed to affect these women's motivation to take up what they learned at training, with many blaming the lack of inputs (in combination with their lack of financial capital) for not taking up the new farming techniques. For example, a 30-year-old Muslim woman Anwara (Village 4) said, "I don't give [the training book] much importance, you know why sister, because we worked hard all month and they didn't give us fish, that's why."

The confusion caused by the limited distribution of assets even led to tension among couples. Ayesha, a 30-year-old Muslim woman in Village 4, compared not receiving inputs to failing an exam: "If anyone fails in any paper in an exam then how does the heart feel? And this fish that [the demonstration farmer] got, how does her heart feel and we who didn't get the fish, how do our hearts feel?" Her feelings appeared to be reinforced by her husband, as revealed by Ayesha: "My husband also says, you go swaying to the meeting and come back swaying, only [that] fisherman's wife got the fish." Similarly, at least three other women in the same village mentioned that their husbands blamed them for not receiving inputs when another woman did. A 45-year-old Muslim woman Sadeka said: "When we go home, the husband says you go for no reason<sup>7</sup> clicking your shoes to get training, what benefit do you get, they didn't give you fish." This reaction has implications for women's continued or future involvement with training opportunities, as evidenced by Ayesha's husband's decision to prohibit her from meetings: "My husband prohibited me from going to the meeting. You have been

going to the meeting for so many days but they don't give you anything. That is why the husband says it's bad or forbids me."

## Factors Affecting Current and Future Innovation Use

Though the innovations are targeted at women, the women adopters said they rarely felt capable of independently doing the work required or making financial and/or technical decisions related to the innovation. For many of the women adopters, the men in their household or groups of men made the key decisions and did most of the work, while the women either supported or were mere bystanders. Despite efforts to transfer innovations to women and even set up bank accounts in their name, women's link to the innovations is often only on paper. This was particularly true for the cage aquaculture. The type of innovation, combined with context-specific extra-village, inter-household and intra-household relations, shape the levels of self-efficacy that women have vis-à-vis the innovation (see Figure 1 and Table 2).



**Figure 1.** The Web of Relationships Influencing Women's Adoption Use and Benefits from Technology

**Source:** Morgan et al. (2015).

**Table 2.** Multi-Level Factors Influencing Technology Adoption, Use and Benefits

| Scale                                                                                                         | Factors Influencing Adoption, use, and/or Distribution of Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Intra-household relations:</b><br>Relations between and among women adopters and others in their household | <ul style="list-style-type: none"> <li>• Different households function differently when it comes to responsibilities and decision making around a technology. In some cage-adopting households, the men are primarily responsible for using the fish cages while women support or stand by; women hold the title to the innovation in little more than their name. In other households, women do the majority of the work and make key technical and financial decisions with the support of their husbands. In still other households, couples report making decisions jointly and sharing the labor and responsibility in a complementary way.</li> <li>• Of the sites adopting cage aquaculture, Village I stands out as the exception with the maximum number of individuals saying they either jointly share responsibility for the innovation or that women make more of the key decisions. Village I is different from the other villages in a number of ways: It is the only village classified as “other urban” (the others are rural), the only one with a majority Hindu population, and has the highest literacy rate.</li> <li>• Gender-specific expectations and roles condition what men and women are perceived to be able to do—and thus do or do not do—relative to the cage aquaculture. In general, women may spend much of their time or even more of their time than men in taking care of the cage, but in the end, men are considered indispensable in completing the work required. This renders the women’s efforts in maintaining the cage as more of a supportive role and it is perceived that they cannot manage this technology without men. There is a strong perception that women cannot do many of the tasks that men are typically responsible for due to limitations of knowledge or physical strength (to lift or move the cage) and because of social norms limiting entry into the water (to care for the cage) and women’s mobility (limiting them from any tasks outside the home, especially the market). In this way, cage aquaculture highlights or serves to reinforce existing gender roles and norms.</li> </ul> |

*(Table 2 Continued)*

(Table 2 Continued)

| Scale                                                                                       | Factors Influencing Adoption, use, and/or Distribution of Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| <b>Inter-household relations</b><br>Relations between women adopters and groups of adopters | <ul style="list-style-type: none"> <li data-bbox="334 326 904 1190"> <p>• In contrast, in pond-adopting households, men and women are more likely to say that women are primarily responsible for adopting and using the innovation, with men supporting them when they are available. Pond adopters mention fewer constraints to women's labor activities and women are perceived to be able to use and benefit from the innovation largely independently. Even in the face of more entrenched constraints (such as, gender norms on mobility), both men and women identify ways by which women can subvert the constraints, for instance, by hiring day labor or using a middleman to access markets. Targeting women as recipients of pond polyculture training may be seen as providing spaces for bending or negotiating with dominant gender norms and roles, which projects can potentially do more to enable. The new capacities of women, realized by themselves and recognized by others, open up other livelihood options for them, and may free up time for others in the household to pursue alternative work. That said, where women are seen to be capable of doing more, they end up doing a lot more. Some find this additional work a hassle, especially if their husbands leave it all to them; while others feel it is worthwhile to sacrifice their leisure time for this new livelihood opportunity. Therefore, positive changes triggered by innovations in the type of work that men and women actually do, and are perceived to be capable of doing, must be balanced against the additional workload required.</p> </li> <li data-bbox="334 1203 904 1487"> <p>• In all cage-adopting sites, the innovations are used collaboratively to some extent. Pooling labor, knowledge, skills, and financial resources as a group can enable those who cannot manage to provide any of these sufficiently on their own. As input costs are high and the cage physically large to move, a group mechanism helps to facilitate the uptake and use of the innovation, especially for women; in many cases, reducing reliance on men and enabling working more effectively and economically.</p> </li> </ul> |

(Table 2 Continued)

(Table 2 Continued)

| Scale                                                                                                                        | Factors Influencing Adoption, use, and/or Distribution of Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>External village relations:</b><br/>Relations between women adopters and external support (e.g., project officers)</p> | <ul style="list-style-type: none"> <li>• Unequal power relations within the group affect the ability of individual adopters to make decisions that suit their preferences (i.e., around investments) or to reap benefits in line with their labor contributions. This is particularly difficult for individual women, as the group level can provide an extra layer of power relations that reinforce inequitable gender roles.</li> <li>• Individual adopters may find it more difficult to influence how the technology is being used when the control is taken over by other powerful members of the family. For example, in one village the “group” of adopters controlling the innovation was actually five male members of a family, rather than the women at whom the innovation was meant to be targeted. Therefore, groups are not inherently transparent and equitable; they need to be managed well and members’ capacities built to encourage cohesion and the wider social benefits that can result from collective action.</li> <li>• As the cage assets were disseminated as part of an adaptive research trial, the project officers had very strong roles in technical support and financial decision-making with the intention of giving full control to adopters after four years. This led to heavy dependency on the project officers and lack of a feeling of ownership. Thus, the level of support and involvement of the project officers can lead to more or less external dependency, with implications for perceived ownership and sustained independent use.</li> <li>• Pond polyculture adopters, meanwhile, mention being encouraged to be self-sufficient.</li> </ul> |

Source: Morgan et al. (2015).

## Lessons Learned and Ways Forward

The nature of the innovation (cage aquaculture versus pond polyculture) combined with the local context, social norms around intra-household decision making, and a variety of interpersonal relationships contribute to the configurations shaping who uses, decides on and benefits from

the innovations in each research site. Even though the innovations are targeted at women, in reality, power relations, specifically gender power relations, at every level affect the extent to which women actually use these innovations. This has implications for if and how these innovations will continue to be used in future, among the target group and beyond, and thus their capacity to deliver more equitable and resilient livelihood options at scale. Key issues to be considered for improving how existing and future technological interventions engage with social relations include the following:

1. Use adaptive research trials to test not only the technical merits of a technology but also its fit with the social realities of a range of users—women and men, and across poverty levels. Purposefully diversify trial adopters and trace the development outcomes of different socio-economic groups to understand their capacities, limitations, and preferences when actually adopting and using innovations. Testing how technical solutions merge with social realities provides a more realistic trial and helps inform scaling strategies. Bringing together a multidisciplinary team from the start to design and monitor such interventions is recommended to achieve this.
2. Targeting individual women in households requires engagement with men in those households as well in order to achieve more sustained outcomes. This involves including men in training and/or working with men and women together when disseminating innovations to encourage men's support for uptake, and to improve opportunities for intra-household sharing and communication. Care needs to be taken to understand how to do this in ways that are win-win for women, men, and households.
3. Revisit the mechanisms used to disseminate innovations (groups, demonstration farmer models) to ensure that they foster intra-community learning and sharing required to scale-out horizontally, and they do not add conflict to intra-household relationships.

## **Fostering Transformation to Enable People's Potential**

The case study highlights the importance of understanding and engaging with social relations as part of AR4D in order to improve the adoption of agricultural technology, its sustained use, and the equitable distribution

of its benefits. Social barriers that hinder various groups from achieving their full potential can end up limiting agricultural outcomes. If agricultural technologies are to achieve their potential poverty reduction and food security outcomes, and if their benefits are to be equitably distributed, the social enabling environment needs to provide more and better choices, opportunities and voice to those traditionally excluded, including women. A change in the social system is required that transforms the attitudes, norms, and practices of the actors and institutions engaged within these social systems, which limit the opportunities and outcomes of A4RD for marginalized groups.

## **Changing Social Systems**

Fostering such a change in social systems is at the core of gender-transformative approaches (GTAs) to integrating gender into development programs. GTAs differ from other gender integration approaches in how they define the problems underlying gender inequality and therefore the solutions put forward to foster change. They engage with the complexity of gender to support women and men to act on the norms, attitudes, and wider structural constraints that limit their opportunities and outcomes; the institutional context is seen as a key barrier to equality, justice, and the achievement of development outcomes (Chant & Sweetman, 2012; Kabear, 2012; Okali, 2012; Razavi, 2009). The case study serves to emphasize the need for integrating GTAs into the AR4D processes, without which the equitable uptake and scale out of such technologies will not be fully attained, and which could even lead to undesirable outcomes. Key characteristics that distinguish GTAs from other efforts, including the ones presented in the case study, to integrate gender in agricultural research for development interventions include (Kantor, 2013) the following:

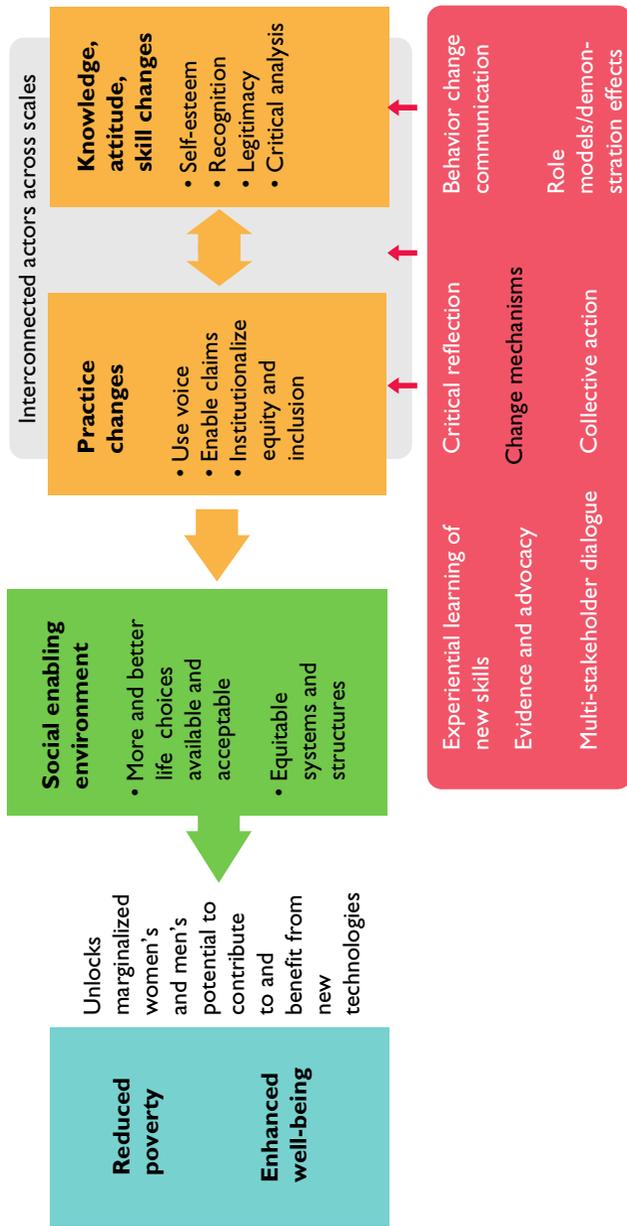
1. Development of a deep understanding of people in their context and the way social inequalities intersect to affect choices and outcomes
2. Engagement with both women and men as both have a role and stake in gender-transformative change
3. Engagement with different actors and institutions across scales in recognition of the way that social inequality is created and maintained through their attitudes and practices
4. Commitment to address unequal power relations

5. Commitment to foster iterative cycles of critical reflection and action as a means to challenge oppressive norms, behaviors, and structures.

The research presented in the case study serves to point out the need for GTAs which seek to foster change in: individual capacities (knowledge and skills), attitudes, agency, and actions; the gendered expectations embedded within relationships between people in the home, in groups, and in organizations; and institutional rules and practices. These changes are expected to lead to more and better livelihood choices for poor and marginalized women and men, more equitable norms and institutions, finally leading to an expansion in their potential to contribute to and benefit from technologies (see Figure 2).

The interconnected and cross-scale nature of the changes underlines the complexity of the challenge involved in fostering transformative change. For example, a wife may want to work outside the house or a husband may want to take on more childcare responsibilities but the attitudes of family members may need to shift in order to facilitate such a change in their accepted roles. Community opinion leaders and local service providers can stymie or support progress through how strongly they hold on to norms and attitudes that limit women's access to opportunities, such as, by upholding mobility constraints. Community norms may influence the willingness of families and individuals to step outside of what is expected of them, due to fear of the consequences of not conforming. Both private sector and development organizations can play a role in supporting or constraining gender transformative change. As in the case study, private sector actors may be blind to women as economic agents, and bypass their needs and interests in the design and dissemination of technologies. Staff within development organizations need to understand the relevance of, and actively support, gender integration, viewing it not as an added work burden but as a core part of any activity, central to its success. Finally, donor approaches, including project timetables and pressures for scale and rapid results, can affect how development is done and the ability to invest in longer-term program approaches that address the structural inequalities underlying many development challenges.

Development actors cannot impose gender-transformative changes upon individuals, communities, or societies from the outside. Therefore, a willingness to engage in gender-transformative change processes needs to emerge from among those who will bring about and experience the changes—the families, communities, and local and national institutions composing a given society. Development actors have a role in sparking



**Figure 2.** A Theory of Gender Transformative Change

**Source:** Cole, Kantor, Sarapura and Rajaratnam (2014).

such processes by providing information, linking people to different networks, or demonstrating through role models or other means that change is possible, but not by defining what change is “good.” For development actors to play this supporting role, they themselves must buy into the argument that social and gender justice are important in their own right, as well as underlie the achievement of other development goals.

One key challenge for the uptake and application of GTAs in agriculture is to not see them as separate from more “technical” interventions and vice versa. A main hypothesis related to GTAs is that it is through implementing them hand in hand with technology-focused, livelihood-enhancing interventions that optimal results from both are achieved (CGIAR Research Program on Aquatic Agricultural Systems, 2012). Achieving this marriage of the social and technical requires rethinking how technical interventions are delivered (i.e., the process) and to whom, and planning how purely social interventions can be sequenced and layered with technical ones. Examining whether and how integrated packages of social and technical interventions foster gender-transformative change across contexts and social groups, and affect technology adoption and use, is a central research agenda for GTAs in the agricultural sector.

One potential way to foster gender-transformative change within agricultural interventions is to apply transformative learning approaches within the interventions as a means to develop critical consciousness. Transformative learning approaches support the use of agricultural interventions as vehicles to enhance the capacity and willingness of participants to critically question how the social world works and its role in creating and maintaining poverty and gender inequality (Apgar & Douthwaite, 2013; Argyris & Schon, 1978; Brookfield, 2000; Kabear, 2012). The process encourages participants to probe into problems and engage with their underlying causes. The causes emerge through deeper questioning and critical engagement that builds an understanding across actors of the underlying structures of the social system and how they work to constrain the ability of various groups to fulfill their own potential. This process provides opportunities to identify and engage in actions to redesign rules, norms, and practices so that better outcomes are achieved for all.

## **Mechanisms to Change Critical Consciousness**

A range of mechanisms might foster this critical consciousness. Participatory action research, including equity targeting farmer field school approaches, is one mechanism that has shown success in catalyzing change

in social relations through building confidence in and demonstrating the capacities of marginalized groups (Friis-Hansen, Duveskog, Taylor, 2012; Humphries et al., 2012; Phillips, Waddington, & White, 2015). Adult learning approaches focusing on social issues also can be incorporated into technology training, and delivered to families and communities, as a means of linking technology knowledge transfer to a critical analysis of the social barriers at the family and community levels that affect the effective and equitable use of technology. For example, WorldFish-Bangladesh has adapted portions of Helen Keller International's *Nurturing Connections* curriculum, a six-month behavior change program for all family members, aimed at challenging intra-household inequalities and gender discriminating practices that underlie food insecurity and under-nutrition, to be delivered alongside technical training on homestead pond aquaculture. It was pilot testing the adaptation in two Southwestern Bangladesh villages in 2014 within the formerly studied CSISA-BD project to explore how merging technology training with activities questioning social barriers influences individual confidence, self-efficacy, and gender attitudes among women targeted for technology adoption, their spouses, and homestead pond production outcomes. The results of the aforementioned case study led to the revision of the technology delivery mechanisms for women.

Apart from merging technical training with social messages, other major changes introduced included discarding the demonstration of model farmer approach, forming smaller preference-based learning subgroups, modularizing the training throughout the production cycle, inclusion of other family members in various sessions and use of community theatre groups in linkage events to create awareness about gender issues. The social consciousness raising exercises selected from HKI's (Helen Keller International) manual were meant to address the challenges women were largely found to face whilst endeavoring to apply the new technical knowledge. The smaller preference-based learning subgroups and exercises on trust and team work helped to counter some of the group-based power dynamics that the study helped to identify. Inclusion of family members enabled women to attend the training without the family members causing barriers to their attendance. Also, since input support was uniform across all trainees, as a result of discarding the demonstration farmer model, there was more harmony amongst the groups. Finally, the technical livelihood incentive made the attendance of family members and participants more permissible in the social messaging exercises, which involve games and discussions around sensitive

gender behaviors and attitudes. The results will inform revisions of the curriculum for its application at scale, accompanied by a wider investigation of the curriculum's efficacy in fostering gender-transformative change and supporting sustained technology adoption and the equitable distribution of the associated benefits.

Behavior change communication (BCC) approaches, such as, community theatre, gender champions, and the use of role models or positive deviance to demonstrate that change in gender relations is possible, are approaches that can be layered on top of technical interventions to foster sustained, locally driven dialogue on the effects of gender and social inequalities on livelihood outcomes (Mahmud, Sultan, & Huq, 2012; Underwood, Brown, Sherard, Tushabe, & Abdur-Rahman, 2011). BRAC's Gender Quality Action Learning (GQAL) program is one example of BCC approaches. It was initiated in 2001 in Bangladesh for members of BRAC's village organizations with the aim of empowering women and promoting more equitable gender norms in the home and community as part of BRAC's overall poverty reduction programs. The strategies GQAL used to achieve its aims include: identifying and training women, men, and couples as gender justice educators (GJEs) who both commit to changing gender relations in their own relationships as well as being voices against gender discrimination and violence against women (VAW) in the community; courtyard meetings where women and men from the community are encouraged to discuss gender issues with GJEs, use of media campaigns and popular theatre to reinforce messages, and focus group discussions with male groups and female groups to stimulate awareness and ideas within the community about how to apply their learning (Mahmud et al., 2012). The idea behind the program is to build momentum for change by working with people to change individually and within their households, and then supporting these people to become change-makers in their villages.

A 2011 assessment of the changes among the women associated with the program found the following outcomes (Mahmud et al., 2012):

- Changing perceptions and attitudes about gender roles in the household, though less actual behavior change
- Successful community initiatives against VAW
- Income earning women in "good" performing GQAL sites who received assets under BRAC's Targeting the Ultra-Poor (TUP) program were more likely to self-report improvements in their social and economic status, self-confidence, and gender relations at home

## **Collective Action**

Factors identified as influencing these outcomes included the commitment and capacity of individual staff members; ability to mobilize elite interest and involvement in the program; capacity to engage other civil society actors like youth groups and school committees; presence of other rights based and/or women's empowerment organizations in the communities; and community characteristics, such as, few class divisions and better social cohesion. These factors point to the need to work with partners and in coalitions in order to reinforce messaging about social and cultural change, and achieve a sufficient groundswell to shift opinion.

GQAL has been implemented with BRAC's TUP program and this seems to have improved results. The evaluation notes that this relationship needs more exploration to strengthen both of the interventions and their outcomes (Mahmud et al., 2012). It also recommends mainstreaming GQAL within BRAC programming overall; this is in line with the expectation that delivering economic (or technical) and social interventions together will foster more sustainable and equitable development outcomes.

Collective action is another mechanism that builds shared experiences and interests and creates a critical mass for change (Baden, 2013; Kabeer, 1994). It is commonly thought that the engagement of women or other marginalized individuals within groups to address concerns and share experiences creates strong bonds in the process ("power with") while simultaneously building individuals' empowerment, or "power within." It also can be a way to challenge "power over" through coming together to contest inequalities (Rowlands, 1997). These experiences can expose the members to new learning besides helping to foster critical questioning of the world around them. Collective action can also build skills to speak out, advocate, and act to create change in the way systems and structures work. However, such outcomes tend to bear fruit only when they are pursued intentionally. Groups and associations that are used instrumentally as a means to enhance the efficiency of project delivery, such as, in some microcredit programs, may be less likely to experience these outcomes. For example, an Oxfam study on women's collective action in agriculture found little evidence of transformative change resulting from the existing practices it studied, mainly because the efforts to enhance women's market access through collectives focused primarily on overcoming technical constraints (Baden, 2013). There were greater empowerment outcomes when market-oriented collectives also incorporated objectives around addressing social norms or were joined with complementary efforts to

address social constraints. Further investigation of the durability and distribution of the economic outcomes of these joint social–technical initiatives is needed, to better understand the relationship between gender-transformative change and improved livelihood and food security.

## Conclusion

This article makes a case for improving the design and delivery of AR4D interventions through more purposeful inclusion of factors underlying social and gender inequality and the operationalization of GTAs. A case study on how gender relations influence the adoption of homestead aquaculture technologies demonstrated the need to marry social and technical interventions in order to avoid unintended consequences, and to help foster an enabling environment in which all people can achieve their potential. The expectation, which forms the backbone of a gender and technology research agenda, is that such integrated interventions will result in more sustained adoption of technologies and more equitable distribution of their benefits. Better articulating and delivering on the social elements of AR4D principles can support this effort, through the realization of synergies between enhanced equality and innovation capacities.

## Notes

1. See, for example, work on assets rights by the International Center for Research on Women, by IFPRI and the “*In Her Name: Measuring the Gender Asset Gap*” project.
2. AR4D is an accumulation of all attempts at merging agricultural research within a practical space where it is relevant and can be utilized to address challenges that leave an impact on communities dependent on agriculture. It is guided by the principle that generating knowledge is not enough but processes have to be in place that not only enable generation of relevant knowledge but that can be learned and utilized by communities within an environment that enables adoption and scale-up through coordination and interaction among different stakeholders and institutions.
3. Empowerment processes refer to the efforts undertaken to enable farmers to feel a sense of control over their own lives and which enable them to take action for change. These efforts can include transfer of knowledge, access to different resources, and giving them a voice which is heard.
4. In Bangladesh, many projects target women in technologies around homestead areas as it is deemed appropriate for women considering the

- mobility constraints they face and the household responsibilities they have to carry out.
5. Both fish cage aquaculture and pond polyculture technologies were studied from CSISA-BD, while only the pond polyculture technology was studied in the AIN sites.
  6. A day where farmers share with the community and value chain actors what they have learnt and produced.
  7. This is an expression meaning women leave the house all confidently and happily, their shoes making noise as they leave but come back disappointed. Expression like “clicking shoes” and “swaying hips” are used in a somewhat demeaning manner to describe their way of leaving the house which is then to no avail. Such expressions are commonly used in Bangladesh to poke one another when one’s efforts bring no gains.

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