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Gender Outcomes Harvesting in Climate Change, Agriculture and Food Security

A meta-analysis

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Abstract

Within the context of the promotion and adoption of climate-smart agriculture (CSA) options or practices, this paper is a meta-analysis that focuses on gender outcomes resulting from women's adaptation strategies, in response to constraints brought on by their normative and cultural environment, expectations emanating from their reproductive and productive roles, and gender disparities that contribute to gender inequality and women's economic disempowerment.

The women's adaptation strategies were examined among climate-smart villages in five countries in Southeast Asia -- Myanmar, Cambodia, Vietnam, Lao PDR, and the Philippines. The gender outcomes were harvested from available gender-related literature and empirical studies under the CCAFS and researches implemented by IIRR on CSA practices, technologies, innovations consisting of a portfolio or a basket of options that address food security, climate change adaptation and mitigation and support services provided in climate-smart villages. Outcome is defined in this study as a change in the behaviour, relationships, actions, activities, policies, or practices of an individual, group, community, organization, or institution. Gender outcome harvesting shifts the focus on the changes that impact on women and men from the use of CSA technologies, practices, and social learning practices.

The report presents gender outcomes and insights from 69 reports conducted in these five countries with findings validated by studies done in other CSVs elsewhere, covering a range of women's concerns that include an analysis of their gender roles as determinants or barriers to empowerment, gendered impacts of climate change, male migration, literacy, and the COVID-19 pandemic. Gender outcomes were also harvested from studies on the adoption not only of CSA practices (including homestead gardens and livestock production), but also of agricultural innovations, labour-saving technologies and seed systems.

The report includes gender outcomes that spring from integrating gender approaches into CSA and food systems, examining pathways around gender norms surrounding patriarchy, and assessment of the use of gender transformative approaches, gender guidance and tools used in measuring women's empowerment. In support of the findings and recommendations, a final section is presented on a future research agenda.

Keywords

Gender outcome harvesting, women empowerment, gender, climate-smart agriculture, climate-smart villages

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Gender Outcome Harvesting in Climate Change, Agriculture and Food Security: A Meta-analysis

“In many instances, it is probably fair to say that women at work in agriculture are “physically visible,” but “conceptually or culturally invisible” even to those who actually see them. Fortunately, the visibility is improving and therefore the research that we do must go beyond being “sensitizing.” Research must be operationally significant, i.e., it must indicate to someone who is responsible for policy, program development and implementation a more precise definition of the problem so that it will lend itself to feasible solutions.”

Castillo, Gelia T. 1988. Filipino Women in Rice Farming Systems

I. Introduction

Women represent a crucial resource in agriculture which remains one of the most important areas of women’s work. Yet, in many developing countries, women’s economic contributions in agriculture have remained largely invisible, even as women comprise 43 percent of agricultural labor force globally. The countries covered by this study provide evidence of the huge proportion of women employed in the agricultural sector -- more than 70 percent in Cambodia (World Bank, 2015), 63 percent women in Vietnam (Minh, 2016), 50 percent in Lao PDR (FAO, 2018), 43 percent in Myanmar (Lambrecht, 2021), and 25 percent in the Philippines (PSA 2016). In the Philippine case, official data may not accurately capture women’s work in agriculture as it is normally considered to be extensions of their household tasks and therefore not reported as “work.” Agriculture is, relative to manufacturing and services, the most important source of employment for women (FAO, 2011).

Women’s participation in the rural economy varies considerably across regions, but invariably women are overrepresented in unpaid, seasonal, and part-time work. Women’s activities typically include producing agricultural crops, livestock-raising, food provisioning, care work for family members, wage work in agricultural or other rural enterprises, collecting water and fuel, marketing and trading, and other home-based work. Many of these activities are not defined as “economically active employment” in national accounts but they are essential to the wellbeing of rural households.

Available empirical evidence suggest that women are often paid less than men, for the same work. Overall, the labor burden of women in agriculture exceeds that of men and includes a higher proportion of reproductive household responsibilities related to food provisioning and care work for family member. (Verzosa, 2020). Social norms also play a role in exacerbating gender inequality that reinforce the low status and lack of agency¹ of women, and the dominance of men in the various dimensions of women’s empowerment, including decision-making, access to resources, ownership of assets, control over income and division of labor and workload. The gender-divide of reproductive and productive roles contribute to the traditional notion that farmers are males and that farming is commonly considered as a male function. For this reason, despite recognition in policies, women continue to be unaccounted in agriculture work when in fact, they continue to participate in unpaid family work in agriculture in larger numbers as compared to men.

These factors often explain gender gaps in agricultural production related to the access and control of key resources and inputs (such as land, labor, credit, information, and technology) that also define the

¹ Agency is the ability to make decisions in one's life, exercise leadership, and engage in collective action.

differences in vulnerabilities and adaptive capacities of men and women to cope with climate risks. Women also tend to have greater workloads as a result of their domestic and care work that are intensified by climate impacts. (Huyer and Chanana, 2021). Reducing this gap has the potential to improve both agricultural productivity as well as development outcomes including poverty and inequality.

The current gender debate in agriculture that has received much attention in the literature is that the agricultural sector in many developing countries is underperforming, in part because women through their roles as farmers, laborers and entrepreneurs, almost everywhere face more severe constraints than men in access to productive resources. And that efforts by national governments and the international community to achieve their goals for agricultural development, economic growth and food security will be strengthened and accelerated if they build on the contributions that women make and take steps to alleviate these constraints. (FAO, 2011).

Within the context of the promotion and adoption of climate-smart agriculture (CSA) practices or option, the purpose of this paper is to contribute to the current gender debate by focusing on **gender outcomes** that result from women's adaptation strategies to face the constraints brought on by their normative and cultural environment, social expectations of their reproductive and productive gender roles, and gender stereotypes, issues, gaps and constraints that contribute to gender inequality and women's economic disempowerment. Women's empowerment represents an awareness both individually and collectively that they have the ability to be respected and be confident in their communities. It is about the process by which those who have been denied the ability to make strategic life choices acquire such ability. (Kabeer, 2002) It is a dynamic process: resources enable women to have agency, or the ability to make decisions, through which women can achieve outcomes. Women's economic empowerment (WEE) on the other hand, is the capacity to generate income for themselves and their families, to make and act on decisions that involve control over economic and financial resources. WEE is important because of gender inequalities in the division of labor between paid and unpaid work, and in access to valued resources and opportunities.

The women's adaptation strategies were examined among climate-smart villages in five countries in Southeast Asia -- Myanmar, Cambodia, Vietnam, Lao PDR, and the Philippines. The gender outcomes were harvested from available gender-related literature and empirical studies under the CCFAS and researches implemented by IIRR, with focus on CSA practices, technologies, innovations consisting of a portfolio or a basket of options that address food security, adaptation and mitigation and support services that are tailored to the unique contexts of the participating communities. These include technological options, such as promoting stress-tolerant varieties of primary crops; new platforms for agriculture production, such as integrating and improving small livestock production and vegetable production in homesteads (the patch of land around the household dwelling, which, in Southeast Asia, can sometimes comprise up to 200–400 square meters of land; use of green manure to reduce the footprint of fertilizer use, improving soil health; integrating trees into the existing farming system to generate new sources of income; small grant facility for trials of identified options; and creating micro-climates around the farm to protect farms against strong winds during storms. (Hanley, et al., 2021)

A CSA option is considered a "gender-responsive" if its impact on women's workload. If it does not reduce a woman's workload, then it might not be a good option and may not be widely adopted. The following CSA practices were popular among women farmers: vegetable, cowpea, goats/sheep and non-timber forest product value chain participation; improved postharvest handling, processing and storage

practices; agroforestry; use of improved varieties; home gardening; intercropping; and climate information service. (Castellanos, 2021).

II. Methodology

The harvesting of gender outcomes is guided by the Gender and Social Inclusion Strategy (GSI) of the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCFAS), and implemented in collaboration with the IIRR. The main goal of the GSI is to promote gender equality in supporting CCAFS' work towards CSA, food systems and landscapes, and equitable access to resources, information and power in the agri-food system for men and women in order to close the gender gap by 2030 (CGIAR, 2015). The GSI Strategy focuses on women as central to agriculture in developing countries with gender equality as a key leverage point for change given women's important roles in agricultural production, food security, nutrition and livelihoods. Addressing gender equality opens spaces for addressing gender and intersectionality.

This study adopted the Outcome Harvesting Framework (Figure 1)² from Ferrer and Bernardo (2020), which is based on the outcome harvesting framework of Wilson – Grau and Britt (2012). Outcome Harvesting is an evaluation innovation method that enables evaluators, grant makers, and managers to identify, formulate, verify, and make sense of outcomes from things that already exist, similar to the harvesting of findings, conclusions, recommendations, lessons learned and good practices from existing studies and available literature in the CCAFS and IIRR report databases on gender outcomes in CSVs. Outcome is defined here as a change in the behavior, relationships, actions, activities, policies, or practices of an individual, group, community, organization, or institution. Instead of focusing on the activities, perspective is shifted in identifying, analyzing, and interpreting outcomes from the use of CSA technologies, practices, and social learning practices.

Added into this framework is the dedicated focus on how the changes have moved the needle towards the empowerment of women. In capturing the gender outcomes, the changes targeted in this study go beyond the easily discernible outputs such as increased income or agricultural produce or new CSA knowledge or increased use of technology, but how the changes contributed to greater empowerment. Hence, the questions are not only about who changed or what changed or what level of change, but how these changes impacted both women, men, and not only men, with particular focus on gender outcomes that resulted from the CSA interventions or innovations.

The analysis of the gender outcome or changes is guided by the Grounded Theory, a systematic methodology for qualitative research using an inductive approach. This involves building a compilation of findings from gender-related reports to draw-out insights, new knowledge and themes that emerge from the review of these reports. The ideas that emerge are summarized and grouped into categories that link the concepts together. Categories may include the dimensions of women's empowerment in agriculture, or other frameworks or dimensions that may come out from the reviews. The categories become the basis for building a body of knowledge on women's empowerment in CCAFS sectors. Grounded theory is quite different from the traditional scientific model of research, where the researcher chooses an existing theoretical framework, develops one or more hypotheses derived from that framework, and only then collects data for the purpose of assessing the validity of the hypotheses.

² Adopted from Limsuan AA, Ferrer AJG, 2021. Outcome Harvesting In A Climate-Smart Village: The Case of Guinayangan, Quezon, Philippines (2014-2020) <https://hdl.handle.net/10568/116444>

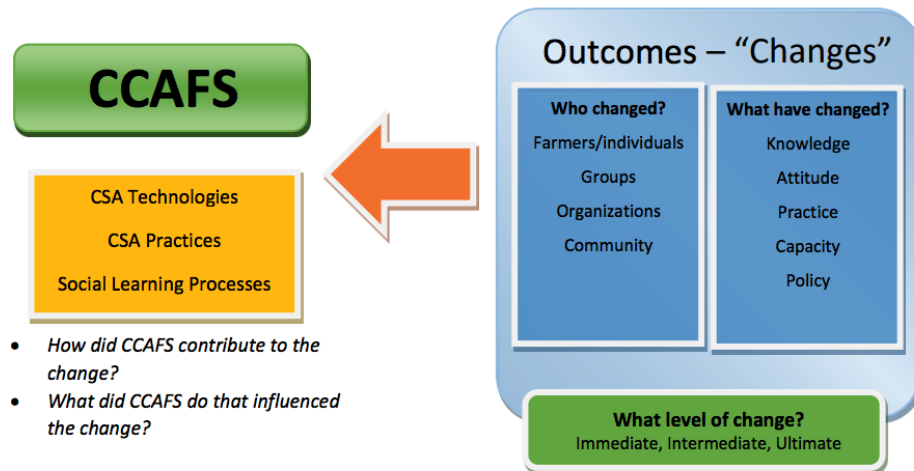


Figure 1. The framework of the study (Adopted from Ferrer and Bernardo, 2020)

As part of the analytical framework, the gender outcomes are examined using two women’s empowerment tools – the Women Empowerment in Agriculture Index or WEAI (IFRI, 2012) and the Women Empowerment in Livestock Index or WELI (World Bank, 2015). WEAI is a survey-based tool designed to measure the empowerment, agency, and inclusion of women in the agricultural sector, and to identify key areas in which empowerment needs to be strengthened, and to track progress over time. It is made up of two indices – the five domains (top 5 below) that directly measure women’s empowerment and the Gender Parity Index that measures gender equality relative to the primary male in the household. The WEAI was initially developed as a tool to reflect women’s empowerment that may result from the US government’s Feed the Future Initiative, which commissioned the development of WEAI by the International Food and Policy Research Institute in 2012. WELI builds on the WEAI and seeks to overcome the limitations of WEAI in assessing women’s empowerment in areas where livestock is the dominant practice for livelihood. The WELI focuses specifically on key areas of livestock production, such as animal health, breeding and feeding; and on use of livestock products, such as animal-source-food processing and marketing. The International Livestock Research Institute, in collaboration with Emory University, developed WELI in 2015.

WELI is an important measure of women’s empowerment because women already represent the majority of livestock keepers and helps underpin women’s traditional role in securing household nutrition. Their empowerment is crucial for the development of the livestock sector. Different strategies to empower women already exist, but they are difficult to assess or prioritize without a reliable and accepted means of measuring empowerment. WELI provides an option to do this and positive gender outcomes have been identified in this meta-analysis.

Below is a comparison of the dimensions of women’s empowerment in WEAI and WELI. An important component of empowerment is that individuals are their own agents of change. A woman who exercises her choice with the internalized assumption that she is subordinate to others is not empowered, even if she has all the resources she needs to make decisions over her life. In terms of women’s empowerment, the empowerment process includes becoming aware of all the possibilities and the ability to exercise one’s own choices within an enabling environment. Because individual empowerment is partially an internal process, it is difficult to measure. However, what can more easily be measured are the conditions that allow for the empowerment process to happen. These include having a role or ability to

participate in agricultural production decisions, having access to and control over resources and benefits from engaging in agricultural activities, and having the necessary knowledge and skills. (IFRI, 2012).

WE Dimensions	WEAI (5 key domains)	WELI (6 key domains)
1. Decision-making	Decisions about agricultural production and refers to sole or joint decision-making about food and cash crop farming, livestock and fisheries, and autonomy in agricultural production.	Decisions about livestock production
2. Resources	Ownership of, access to and control over productive resources such as land, livestock, agricultural equipment, consumer durables, and credit.	Access to control over resources (capital, financial services)
3. Income	Sole or joint control over the use of income and expenditures.	Control and use of income
4. Leadership	Leadership: leadership in the community, here measured by membership in economic or social groups and comfort speaking in public.	
5. Time	Allocation of time to productive and domestic tasks, including unpaid reproductive work and satisfaction with the time available for leisure activities.	Workload and control over own time
6. Human Capital	Adequate skill and knowledge to productively use resources, new technologies and information to improve the household's economic situation	Access to and control of opportunities
7. Technology	Access to beneficial technologies	
8. Other dimensions	Gender Parity Index	Decisions on household nutrition

In addition to the dimensions under WEAI and WELI, the harvesting of gender outcomes will also examine other factors that impact on women's empowerment outside of these frameworks, including climate change, social norms and gender roles, migration, collective action, extension services, labor saving technologies, COVID-19 adaptation strategies, the absence or lack of gender consideration in projects, and other important insights with reference to CSA practices and options. The analysis will be guided by the following key research questions:

1. What are the gender outcomes from the work of climate-smart villages (CSVs) in Southeast Asia (SEA)?
2. What are key lessons and insights on facilitating gender responsive/sensitive climate resilient agriculture in (SEA)?
3. What are the emerging good practices and tools in facilitating gender responsive/sensitive climate-smart agriculture in SEA?

In response to these questions, a meta-analysis of 69 gender-related studies, reports, working papers and journal articles published under the CGIAR Research Program on Climate Change, Agriculture and

Food Security (CCFAS) was conducted to gather gender outcomes, changes and insights that result from CSA options and practices in CSVs across the five countries, and contribute to women's empowerment. Other gender-related data sources were also reviewed where relevant.

III. Findings

Outcome harvesting has been done from CSVs studies by IIRR, notably in Guinayangan CSV in the Philippines (Limsuan, 2021) and in Ma CSV in Vietnam (Nguyen et al., 2021). These studies provided the focus from where gender outcomes could be gathered. In the Guinayangan CSV, CSA practices included agriculture diversification (e.g., diversification of crop production - intercropping, multiple cropping, crop rotation, and agroforestry, diversification of farming activities), livestock production using native species, saving of seeds for next cropping, use of alternative fertilizers (animal manure and green leaf manure). Identified outcomes included improved awareness of climate change and knowledge/adoption of CSA, increased capacities and resilience to mitigate climate risks, and increased farm productivity and livelihood opportunities. Significantly, the CSV became a learning platform to farmers, with spread effect to other farmers, community organizations, and local executives in the municipality. The CSV achievements and contributions reached a higher scale – it influenced the implementation of the national Adaptation and Mitigation Initiative for Agriculture (AMIA) Program, a flagship program by the Philippine Department of Agriculture. The CSVs established by the IIRR served as an advanced CSV in the initial years of the AMIA Program. IIRR also supported the DA and FAO efforts to develop policy briefs based on experiences from the DA AMIA Program. (Limsuan, 2021).

In the Ma CSV, similar outcomes were noted from the practice of CSA. Overall changes in the village included improved crop productivity and household income; better access to information (weather forecasts, tolerant varieties); increased knowledge from technical training and knowledge sharing; access to resources (loans); better coordination and cooperation among villagers in CSA and CSV actions; and the improved perceptions of climate risks and their impacts helped farmers to proactively respond to risks.

For the landless, especially in Myanmar delta, the homesteads provide significant off-season income sources through the sale of backyard vegetable crops and coconuts, among others. The further improvement of homesteads through intensification and diversification, including livestock provide pathways for improving the income, food and nutritional security of the poor, the landless or near landless, and female-headed households, who were deliberately targeted in order to enhance social inclusiveness and equity outcomes from CSA work. The homestead practice can still be seen in most areas (unlike in parts of Southeast Asia where it is vanishing fast) and their role in the overall household food system can be further endorsed via CSA support programs. (Barbon, 2017).

Women identified specific CSA options that they know very well, ranking them at 8-10 level of proficiency in adopting the options. Cited in the coastal agricultural system were planting of vegetables and native pig production; proper spacing in rice transplanting and green leaf manuring in the rainfed lowland rice system; native pig production, green leaf manuring and proper spacing in rice transplanting in the irrigated lowland rice system; intercropping corn with legumes in the upland corn system; and planting of vegetables, agroforestry, native pig production and goat production in the coconut-based farming system. (Bayot, 2021).

From the harvesting of outcomes in CSVs, a gender lens was used to examine how these changes contributed to women's empowerment. A more in-depth research study was done using the

Abbreviated WEAI (Verzosa, 2021) on how and to what extent the promotion and practice of CSA options lead to women economic empowerment in six CSVs in Myanmar, Cambodia and the Philippines. The study examined the challenges and constraints that women and men faced in relation to the impact of climate change, and their CSA adaptation strategies; the social and cultural norms that impacted on the dimensions of women's empowerment; and the comparison of women and men's positive and negative experiences in the CSVs. The AWEAI findings are summarized below. What differentiates it from most CSA/CSV studies is that it provides a women-only perspective along the AWEAI dimensions of women's empowerment, with validations provided by their male partners and key informants in the CSVs.

1. Gender roles as determinants or barriers to women's empowerment

- Agricultural production and livelihood opportunities for men and women are strongly linked to gendered norms, with clearly defined gender-based roles in the division of labor. Across the CSVs in these countries, the heavier tasks of land preparation, building fencing, making bunds, irrigation, purchasing and applying pesticides are done by men, such as in rice and coconut farming. The lighter or less physically demanding work are done by women, such as weeding, post-harvesting, processing, storage and drying, and selling. Joint activities are done frequently when planting and transplanting, harvesting and post-harvesting, purchasing seeds, among others. (Verzosa, 2021; Bayot, 2021; and Rosimo, 2021).
- The dichotomy of heavier or lighter farm work for men and women farmers have gendered implications that impact negatively on wage equality. Men and women farmers are not paid equally, averaging 30 percent less, even for similar work. Across the six CSVs in Cambodia, the Philippines and Myanmar (where the daily wages of men are almost double of the wages for women), the reasons for the disparity of wages are the same – the men do heavier farm work that requires physical strength and the women do the lighter work, such as weeding, harvesting, post-harvesting, processing, and selling; men use more energy compared to women; and men are faster and can do multiple work. Women are said to have little capacity or physical endurance for farm work; and that women's labor is only used if they can handle the work (such as picking tomatoes). In the Htee Pu (Myanmar), the female FGD cited that “some men don't want to work if wages are paid the same as the women.” (Verzosa, 2021).
- The gender-based division of labor also have negative gendered implications for agricultural extension services. Findings from a Myanmar study showed that women's limited access to extension services is due primarily to the social norms and cultural belief relating to gender roles and division of labor. Most service providers are likely to overlook women as farmers in their own right and target products and services to the assumed male farmer, their target client. Women were invisible as recipients of extension services, because extension workers assumed that they will not understand since they do not have access to farm lands. When conducting extension services training that require participants to travel significant distances, women are also disproportionately affected due to their mobility constraints, hence they are seldom invited to training. (Verzosa, 2020).

2. Gendered impacts of climate change and climate variability

- The biggest constraints that men and women farmers face are caused by climate change impacts. Climate variability impacts on the low yield of agricultural production due to the

prevalence of diseases and pests, and weeds exacerbated by weather changes. The increase in temperature leads to pest and disease outbreaks. In Myanmar CSVs, the disease outbreaks have caused chicken deaths (H1N1) which have become seasonal due to climate changes. The irregular rainfall and climate variability (late or early onset and withdrawal of monsoon) were also cited as shifting the sowing season and poor germination of seeds.

- Women’s knowledge of climate-resilient practices increases their empowerment, as evidenced by the women in Vietnam who participated in training sessions on pest management and livestock rearing experienced significant levels of increased confidence, increased status in the household, and increased contributions to household income (Chi et al., 2015). In Ma CSV, women’s participation in communal activities positively reinforced women’s roles to prepare for and respond to gender-related risks of climate change and related crises where they envisage themselves as leaders and instructors of CC/disaster risk reduction adaptation for their communities. (Nguyen, 2021).
- The impact of climate variability on agriculture are perceived differently by men and women farmers. More husbands than wives perceived that climate change reduce crop yields. In contrast, more wives than husbands said that climate change caused more livestock deaths. These differences are based on gender roles and direct benefits in managing crops and livestock. While husbands are mainly responsible for crop management, the women are mainly responsible for animal management. Floods can cause disease, loss of livestock, and consequently, reduction in livestock population. Drought also affected livestock production and management due to lack of water for maintaining the health, nutrition, and sanitation practices for livestock. In the flood/submergence areas, rice seedlings die or are swept away by floods. The job of transplanting again or do gap-filling is relegated to women. Thus, women are more exposed to health risks such as skin diseases and other water-borne diseases. They have observed that flooding of areas do not only destroy the crops or increase the incidence of pests on plants, but also increase occurrence of animal diseases and loss of livestock. The women’s time/labor in the farm and household chores also increased. In salt-affected areas, men and women farmers estimated that rice income decreased by about 35%, while income from other sources decreased by 30% during the year due to severe salinity, shortage of freshwater, and less rain. (Paris, 2018).
- Rural women are at high risk of being negatively affected by climate change, particularly in relation to household responsibilities, agricultural activities, and male out-migration for employment—with resulting consequences on family nutrition and children’s care and education (Kakota, et al. 2011, Rao, et al. 2017, Ylipaa, et al. 2019). Women’s nutrition levels are also affected, for example, when climate shocks affect food access, women tend to eat less to reserve food for the family (Nguyen, et al. 2013). Natural disasters and their after-effects kill more women than men on average, for physiological reasons (such as pregnancy) or socio-cultural reasons (in the case of flooding, the clothes women wear or their responsibilities in caring for small children may restrict their ability to run or climb to avoid danger). Women are also at higher risk of physical, sexual, and domestic violence in times of climate shock and natural disaster (Correia, 2001, Neumayer and Plumper, 2007).³

³ Cited from Pyburn, Rhiannon and Eerdewijk, Anouka, 2021. [Advancing Gender Equality through Agricultural and Environmental Research](#). International Food Policy Research Institute.

3. Gender Outcomes from the Adoption of CSA options

- Top among the gender outcomes were evidences that the adoption of CSA options contributed to women farmers' economic empowerment, as the adoption has resulted in the increase of women's incomes from higher yields with the application of their new CSA knowledge and experiences, and resource inputs (quality seeds and livestock) from IIRR. This finding is corroborated by Bayot (2021) citing CSA options as increasing productivity and income, and Paris (2018), citing income security from the sale of livestock (native pigs), and the native chicken as a climate-resilient income generation CSA option that empowers women. (Barbon, 2021).
- With income as an important measure of women's economic empowerment, the impact of women's increased income and contribution to the household has resulted in their increased participation in joint intra-household decision-making on production and major household expenditures. (Bayot 2021). It also bolstered stronger husband and wife and family relationships, and contributed to more shared decisions and problem-solving in the household compared to before CSA adoption (Verzosa 2021), and improved communication between wives and husbands (Nguyen, 2021). A similar study (Colfer 2013) found that increased power for women in intra-household dynamics when women gained increased income has resulted in positive gender outcomes in Vietnam where men began helping with household chores (Sen and An, 2006); and in India, where men took on some gardening and other duties locally defined as domestic (Nakro, 2006).
- In terms of impact on community participation, together with more knowledge about the CSA practices, having more income contributed to women's active participation and involvement in training, meetings, and social and religious activities in the community and becoming more vocal during meetings (Verzosa, 2021), which serves as another important dimension of women's empowerment.
- Perceived income levels measured in a 10-point scale before and during the CSVs, showed that the CSA portfolio or basket of options approaches in the CSVs have been instrumental in increasing incomes by 32-135 percent doubling incomes among the six CSVs, and in providing income sources where there was previously minimal or none. (Verzosa, 2021). This conclusion is congruent with the results of two other studies conducted by IIRR in the Philippines and Cambodia which showed that the adoption of a CSA option (native pigs) has similarly generated positive net incomes. (Rosimo, 2021 and Manilay, 2021).
- Decision-making on agricultural production: The pattern of decision-making is task-based, depending on who is performing the task. Across the six CSVs, women have higher participation and predominate in decisions relating to food crop farming for household consumption, small-scale livestock production, selling of surplus of homestead gardens to the market, and minor household expenditures (food and basic needs). Men make most of the production decisions relating to getting inputs for production, types of crops to grow, taking cash crops to the market, use of new techniques and practices and major household expenditure. In the Guinayangan CSV (Philippines), husbands and wives make decisions together concerning production and income generation. However, the husband has the final say in most of the decisions (Bayot, 2021). With women's increased knowledge and adoption of CSA options, together with increased income, a positive picture emerges in more joint decision-making by women and men farmers. This is

supported by positive gender outcomes in Northern Vietnam (Nguyen, 2021) citing increased confidence of women to influence decision-making.

- In a case study in Vietnam, Paris (2018) cited that disposing agricultural assets are jointly decided by the husband and wife, however, the wife has full control of small livestock. Thus, during times of floods and disaster, women can decide alone as to when to sell and determine the selling price of small livestock. Wives also have a decision-making authority in the allocation of remittances from other family members, especially from their husbands. Among other items related to investment, men are more empowered than women in decision-making related to allocation of funds to purchase farm inputs, spend on capital investments (land, machinery, water pumps, etc.), and for house construction.
- The higher participation in agricultural production of upland women farmers provides more equal opportunities in decision-making and ownership of assets. Women farmers in Taungkhamauk in Shan State (Myanmar), an upland CSV, predominate in farm activities (including land preparation which is a dominant male activity), and non-farm activities, and have shown a consistently high level of decision-making in activities pertaining to types of crops to grow (food and cash crop farming) and taking crops to the market; use of income, deciding on one's own wage or salary from outside employment, going to training and the use of new techniques/practices. Culturally, the women in the Shan State are known to be hard-working farmers who are actively involved in all phases of upland rice farming, the main crop in the CSV. Other factors that contribute to this finding is the nature of the agroecology of the upland villages, the more labor-intensive systems that need more family labor where women tend to be more involved in farm work. Men were also observed to have more wage/salary employment which puts more pressure on women to be engaged in production.
- Income use:
 - In all the six CSVs, men generally have control on decisions over production income and spending for major farm and household expenditure; and women have control over minor expenditures such as daily household needs, even if they manage the income of the households (as budget planners and keepers of income). However, with women's increased knowledge and experience in CSA adoption, a different pattern emerges with more joint decision-making as a norm.
 - In another study, women in climate-smart villages (CSVs) in two regions of India (Bihar and Haryana) experienced empowerment as a result of CSA adoption, in the form of increased participation in decision-making over income from increased agricultural production as well as on farming practices and children's education, among other issues. (Pyburn, 2021).
- Access to resources and ownership of assets:
 - Across the six CSVs, land ownership by men remains the norm, aside from ownership of farm equipment and vehicles. Equalizing land ownership is a critical issue for women. Ownership of this asset is a form of economic power, which can be transformed into bargaining power of women within the household. Social norms on inheritance, land registration under the name of household head, lack of knowledge of land rights impact on land ownership for women across CSVs. All other assets, including the house, large and small livestock, large

consumable and cell phone are owned jointly by the women with their husbands or other family members. Women farmers in Taungkhamauk have higher ownership of assets -- houses, farm equipment, large consumables, and livestock. Access to resource inputs from CSV served as impetus for women farmers' livelihood.

- To help catalyze the implementation and adoption of CSA options by households in the four CSVs in Myanmar, IIRR established the CSV Adaptation Fund. In Htee Pu, women are the main recipients of support for the purchase of small livestock, including chickens and goat. IIRR also provided capacity building and nutrition education. The Fund, when used strategically and in a targeted manner can serve to incubate ideas, catalyze action, and help spread adaptation options (Barbon, 2021).
- In Vietnam's CCAFS project, women farmers were provided seeds of stress-tolerant varieties and hands-on training on how to produce quality rice using climate-smart farming practices. Their participation empowered them in making sound and informed farm-related decisions, particularly when men are engaged in nonfarm employment away from their villages. Their direct access to improved stress-tolerant seeds changed the cultural perception that "they are just housewives and that they do not know anything about rice farming." (Paris, 2018).
- Access to credit:
 - Women are the main borrowers in agricultural households as they have greater access to microcredit and are under strong pressure to bridge resource gaps. Borrowing, mostly from friends, relatives and savings associations, is part of women's normative responsibility to provide for the needs of the family.
 - In Cambodia, the Village Development Fund and Savings Groups (VDFSG), with a high percentage of women among its borrowers, provided financial protection against the impacts of climate-related shocks and helped rural communities to better safeguard income and productive assets without resorting to costly coping strategies (such as selling assets) which compromise long-term resilience. Membership in the VDFSG also allowed access to agricultural training and extension services. Most members receive training in native chicken raising, home vegetable gardening, fruit tree growing, and sustainable harvest of non-timber forest products. They benefit from knowledge and experiences on successful farming practices and challenges shared by other members when coming to monthly meetings. The presence of the VDFSG makes it easier to mobilize community members to attend such training courses. During the COVID-19 pandemic, members applied for loans or tapped their savings deposits to buy food supplies or to start microbusinesses to replace their lost jobs. When face-to-face classes were cancelled due to the COVID-19 pandemic, some families used the loans to buy smart phones so that their children could attend online classes. (Manilay, 2021).
- Leadership and group membership:
 - Group membership may increase CSA adoption and investment decisions by women. Majority of women farmers are active members of an agricultural cooperative, producers group, savings group and non-government organizations. Farmer Learning Groups (FLGs) provide both female and male members with a platform for knowledge exchange while

- creating a sense of belonging to a community, giving them an opportunity to help one another. Women participation in the pig production learning group has resulted in 84 person of the women as CSA adopters, and of the 34 members in the Arbismen, Guinayangan FLG, 20 are women. The women in the FLGs self-declared their increased confidence and feelings of self-worth. Women have started to take on leadership role in community activities. Of the 13 swine FLGs, nine are led by women. (Rosimo, 2021).
- Fostering women’s participation and leadership in farmer and producer organizations have been shown to promote and encourage women’s empowerment. In Vietnam, women’s engagement in the CSV project, extension training or community meeting has increased women’s self-confidence to participate in collective action, including engaging in community activities and planning. Women who took part in exchange visits with other provinces and abroad feel more confident and empowered to work as leader (from training group lead to wooden workshop manager). One woman attended the study tour in Philippines said that being invited to international events elevated women status and respect in the community. The participation of women in exchange visit abroad positively reinforced women’s roles as representative in their own community. (Castellanos, 2021).
 - One important finding is that capacity building and support of the husbands are the key enabling factors to increase women’s participation. An unintended negative consequence to increase women’s participation outside the home is the reduction of time for the family that could lead to conflicts between the husband and wife. (Verzosa, 2021).
 - Time use:
 - Time poverty contributes to women’s lack of capacity to participate and improve their productive skills. In the six CSVs, women experience a greater degree of time poverty than men, working 15.2 hours per day for housework, farm work and wage employment. The highest work hours is in Taungkhamauk at 18.8 per day. Men’s involvement is critical in balancing the workload of women farmers. Men are willing to help only if their wives are not available to do housework. In the Myanmar and Cambodia CSVs, women farmers work more hours doing farm work (5-7 hours), compared to women farmers in the Philippine CSVs, who spend the most number of hours doing housework (6-7 hours), as most of the women have no wage work.
 - Gendered time issues involve more than the simple quantity of tasks, as women’s traditional domestic tasks tend to be unpredictable and ongoing throughout the day (and night, in the case of child- and eldercare), whereas men’s tasks may well involve short bursts of intense energy and/or strength. There may be seasonality to time demands that differ by gender; there may be differences in the gestation of crops (women may grow, use and sell quick annuals; men may grow long-lived timber species). Time use may also vary among women in any given community, considering issue relating to ethnicity, age, marital status, caste, class, religion, and others. (Colfer, 2013).
 - While there are many benefits derived from the CSA options, women are at the same time burdened with increased workload doing household chores, homestead gardening and raising livestock (feeds and caring for native pigs, chickens, goats and ducks); time use conflicts in attending meetings, training, housework and productive work; less time for family

which sometimes leads to family conflicts; more unpaid debts from savings groups; and challenges in dealing with disease problems of chickens, causing decrease in incomes. While the challenges are the daily reality of women farmers, majority remain positive as the benefits from CSA adoption outweigh the costs.

4. Gender Outcomes of Livestock Production

- Livestock production emerged as a relatively resilient form of agriculture. Livestock production not only provides households with a reliable food source but it enables an easy and productive source of income. Livestock have particular benefits for women, providing them with a low labor and easily manageable economic asset. (IIRR 2019). Small livestock activities can help promote women’s empowerment, particularly women from landless and near-landless households. In an economy dominated by crops that are vulnerable to climate change, small livestock production presents a less risk-prone livelihood venture. Production of small livestock is relevant to all ecosystems—coastal, lowland, and upland— in meeting food security, nutrition, livelihood, and asset-building objectives. Small livestock systems lend themselves to community-based dispersal mechanisms, reducing the need for reliance on cash inputs. Women pay back in kind, usually to other members of the local community. Pig production lends itself to community-managed out-scaling. (Paris, 2018).
- Swine raising is now considered as women’s livelihood where in the past, commercial pigs were managed mostly by men. Growing native pigs has proven to be reliable due to their tolerance to changing climate. They have higher survival compared to commercial breeds. In the cost-benefit analysis of native pigs production, findings showed that majority of the households surveyed generated positive net income in raising native pigs. (Manilay, 2021). Women are more involved in the management of native pigs, devoting 70% of total time in animal management. Consequently, they have a say on how to spend the income from this livelihood, which mainly go to food and better nutrition for the household, children’s education, and medical expenses. The income being produced is sustainable since the pigs are able to continue production even in the face of extreme conditions, thus increasing their food security. In addition, women now proudly claim that they can afford to serve “lechon” or roasted pork during special occasions (usually associated only with wealthy households), thus enhancing their social status.
- Native chicken production is of special relevance to women in the CSVs. It is a useful climate resilient enterprise to supplement the household income while growing cash crops and homestead gardens. In the assessment of households where livestock is the primary agricultural activity, women’s empowerment was measured using WELI, applied to local chicken production led by women. Following its six empowerment domains, the study (IIRR, 2021) found substantial evidence that:
 - Decisions about agricultural production: Women are responsible for decision-making in regards to household chicken production, even if the household is male-headed. Increasing chicken flocks and sales of hens and roosters allow women to buy goats of their own – diversifying their livestock (and diets), and demonstrates changes in access and control of assets typically associated with men in rural settings.
 - Decisions related to nutrition: Women’s decisions relating to nutrition in the household are a reliable indicator of women’s empowerment. Proper control of poultry diseases, along

with upskilling women in poultry farming, may translate into the permanent availability of chickens and eggs, contributing to more nutritious, high quality meals. Moreover, even if women sell the chickens and eggs they produce, part of the revenue is usually invested in increasing the quantity and variety of food available in their households – once again enabling families to access better quality diets.

- Access to and control over resources: Women’s access to resources, particularly land and credit, is limited in rural settings, severely undermining their access to large livestock and other agricultural activities. Women can easily access the low-input nature of extensive and semi-intensive systems of village chicken production which is of vital importance because women, along with children and elders, are usually at higher risk of food insecurity. Chickens, therefore, represent an effective turn-around that overcomes, in part, the inequitable access of women to loans and property compared to men.
- Control and use of income: When women have complete control of their income, they invest up to 90% in their households or communities. Men, in contrast, spend less than 50% of their income in these ways. Providing women with chickens, husbandry and health training may empower them to profit from the activity, investing not only in food diversity, but also in greater access to health, hygiene and access to education for children, which are vital to breaking vicious circles of poverty and under-development.
- Access to and control of opportunities: Women engage in village chicken production to secure household nutrition, and provide them with a profitable business opportunity. Local native chickens are usually preferred by local consumers as these are considered ‘natural’ products of better quality in comparison to commercial breeds of poultry. The high demand for village chickens translates to high market prices and the willingness of traders to travel long distances to collect and sell these birds.
- Workload and control over time: Village chickens place little demand on women’s time as these birds scavenge their food, and sustain a natural turnover of the flock. The autonomy of these chicken systems allows women to have adequate time for other women’s responsibilities in the household.

5. Gender Outcomes of Adaption of Technologies and Agricultural Innovations

- Studies suggest that more female, as well as male farmers, adopt climate smart technologies and practices in agriculture when women’s awareness, knowledge, and access to information about such practices increases (Kristjanson, et al., 2015); and that the resilience of households, communities, and food systems are increased as a result (World Bank, FAO, IFAD, 2015). On the other hand, if women are not able to use and benefit from CSA, the gender gap in agriculture is likely to increase, both as a result of inability to manage changes in farming systems that are likely to occur in the face of climate change, and in terms of increased exposure to disasters, shocks and reduced incomes and assets. (Huyer, 2016).
- In Cambodia, the Rohal Suong CSV emphasizes the inclusion of women farmers in its activities, such as the Plant Clinic. (Eam, 2017). Operating since June 2016, it is a meeting place where plant advisors and assistants help farmers who are faced with issues of plant pests and diseases. One woman farmer, Ms Savet, was recruited to join the Plant Clinic as a plant assistant. Through her

involvement in the project, she learned plant disease identification, plant treatment methods, and plant management techniques and applied them on her own farm. She was able to share her learnings and deliver better agricultural services to local farmers, particularly other women. (CAAFS, 2017).

6. Gender Outcomes of Labor-Saving Technologies

- Vemireddy (2021) showed that labor-saving technologies (LSTs) can relieve women from the time constraints and drudgery involved in working in agriculture and managing household chores. Agricultural work is time-consuming and physically challenging. This is particularly relevant given women's heavy involvement and time spent in agriculture across all seasons. However, the rate of women adopting LSTs is low. LSTs are usually designed based on factors important to men, but gendered design considerations can increase their use by women.
- Information about LSTs is critical for uptake by women or men, but information, extension and social communication about LSTs needs to be tailored for women. Research is needed to expand beyond tractors, and give more attention to women-oriented activities (such as weeding and transplanting), and options for renting LSTs and accessing credit to do so.
- Some CSA technologies benefit both sexes directly. In a case study in Maharashtra, India, both women and men considered the rice drum seeder useful: men appreciated the increased production levels and farming income and women benefited from a reduced workload when seeding rice (Joshi, et al., 2019).
- Most agricultural equipment and tools are designed based on men's ergonomic factors, without considering women's ergonomics. The design of LSTs needs to consider gendered perceptions such as weight, ease of use by women, complexity and labor-saving benefits for men and women. This can contribute to long-term adoption and ensure sustainable use. Crucial factors influencing adoption of LSTs, including technologies were found to be: the effectiveness of field demonstrations, hands-on training, extension agents' availability, and preference for women extension agents.
- Adopting LSTs is associated with a decline in costs for land preparation and costs associated with labor for sowing and weeding. Time savings, cost reductions and increased labor productivity have been evident across gender after adoption of LSTs. While there are positive impacts of LST adoption, negative impacts such as women's labor displacement are likely, particularly with the mechanization of various phases of work in agriculture.

7. Gender Outcomes of Seed Systems

- Seed systems are the formal or informal networks that ensure availability of and farmers' access to high-quality seeds of a wide range of crops. Access to seeds, essentially shaping farm productivity, is largely segregated by gender roles. Women and men experience different levels of success in getting the seeds they need—from formal markets, from government sources or from other farmers. In contrast to formal systems, women play a relatively bigger role in farmer-managed and community-based (informal) seed systems. These tend to provide locally preferred seeds that better respond to women's needs and preferences. However, even in these systems,

challenges related to participating in decision-making, ensuring seed quality and accessing novel varieties and information persist. (Puskur, 2021).

- Community seed banks are repositories of local genetic diversity that can withstand climate stress, and are a useful resilience strategy. Women’s role in informal seed networks and the related conservation of genetic resources is connected to dietary diversity and local knowledge. In addition, women often retain ties in their home village while creating new connections in their marriage community, suggesting they can be important avenues of seed distribution (Otieno, et al., 2018).⁴
- Evidence on gender in seed systems points toward two primary roles that shape the potential outcomes for women: their roles as seed users and as seed producers. As seed user, seeds need to be within the reach of women. Seed systems tend to prioritize higher-value cash crops dominated by men. Women often lack information and knowledge about seeds, and limitations to their mobility and social networks often shut them out of information channels, such as extension services. These limitations restrict women’s abilities to use new seed technologies effectively, and when combined with barriers to have and control cash, women must often settle for lower quality seed as it is all they can afford. (Puskur, 2021).
- There is evidence that women’s roles as seed producers can be empowering. Although they have to overcome financial and other barriers, women are increasingly taking on stronger and leading roles in community seed systems and small seed enterprises. Research in India and Bangladesh showed that women who had access to improved seed and were trained in seed production claimed that their social status had improved. They perceived themselves as farmers and not just housewives. They also gained confidence in decision-making, enhanced their knowledge, had marketable surplus and experienced better status within households and the community. In Laos CSV, the community-based seed system for rice was noted as the most inclusive and responsive CSA technology during land preparation, harvest, post-harvest and the overall value chain. (Castellanos, 2021).

8. Gendered Impacts of male migration on women’s empowerment

- The “feminization” of agricultural production which is closely associated with male migration shifts the burden of most of the farming work to women. Accordingly, women undertake not only traditionally-considered women’s jobs like sowing and weeding but also take on the so-called men’s jobs like ploughing, fertilizing, and pesticide spraying. This creates pressure on women to take on more farming responsibility without providing additional time to do so.
- Women in migrant households play very active roles in agricultural production. In Myanmar, the proportion of women participating in rice and orchard farming in the Red River Delta and Central Region dry areas is higher than that of the Mekong River Delta because of respective high rates of male migration in the first two regions. (Nguyen, 2016).
- Feminization of farming by women can have benefits. It can provide an opening for the renegotiation of gender roles, and a potential source of positive change. (Colfer, 2013). It can

⁴ Cited from Pyburn, Rhiannon and Eerdewijk, Anouka, 2021. [Advancing Gender Equality through Agricultural and Environmental Research](#). International Food Policy Research Institute.

support women's empowerment and provide women with more autonomy, as more women become primary decision-makers and have greater access to income accrued from the farms. Women may benefit from extra flexibility in their schedules; the ability to combine family and economic work; taking part in more social, economic and political events; and having a better chance that land is registered in their name. (Najjar, 2021).

- Migration of men have also been found to have drawbacks -- even if migration decisions are made as a family, outcomes favor men. Women must take up the missing labor, even if men work in the same community but off-farm. Women end up with less time for leisure and socializing, and face more socioeconomic, physical health, mental health and cultural challenges. Women who take up traditional male roles to sustain the family after men migrate are often frowned on in communities because they have transgressed sociocultural norms. When men return to work on-farm, there may be significant conflict or stress in households and communities as roles are renegotiated or returned to.
- The increased feminization of farming has been associated with low agricultural productivity, low earnings, poor job security and growing food insecurity, and more often involves women from poorer households who own little or no land. Women generally perform manual, time-intensive, lower paying work such as fruit and vegetable harvesting, drying produce and transplanting rice. Women are more likely to focus on adaptations that feed their families rather than cash cropping. They also often have less job security. There are fewer opportunities for women off-farm than for men, and women are more likely to accept very low-paying off-farm jobs. (Najjar, 2021).

9. Gendered Impacts of Literacy on Women's Empowerment

- Literacy is one of the barriers to CSA adoption and cuts across multiple dimensions of women's empowerment, including decision-making, access to resources, reproductive and basic health, food insecurity and economic disenfranchisement (Huyer, 2021 and Vivona, 2021). Illiteracy levels also tend to be higher and educational achievements lower among indigenous groups—often located in forested regions—with indigenous women routinely representing the extremes. (Colfer, 2013).
- Higher education contributes to women's leadership in community organizations, and literacy is key to leadership in the CSVs. Findings from the women's empowerment study of six CSVs showed low education levels in Myanmar's Taungkhamauk CSV where 35% of the women farmers had no schooling and 60% were in primary level and in Htee CSV with 80% in primary level of education. In Cambodia CSVs, 35% had no schooling, and 52% were in primary. Compared with these CSVs, the Philippine CSVs have tertiary and secondary education in the majority, which is reflective of the basic adult literacy rate at the national level— 96 percent for women and 95 percent for men. (World Bank, 2019). Those with tertiary education are mostly college graduates, such as former teachers and government employees who have taken farming as their occupation. Most of them also served as leaders of organizations in their communities. (Verzosa, 2021).
- In the same six CSVs, the correlation analysis showed that the present perceived income levels are positively correlated with level of education (with high statistical significance). This means that as the level of education increases, the perceived level of income also increases. This finding is supported in the Philippines among the women farmers of Malocloc Sur CSV with a big majority

(70 percent) at the primary level, who only had “few inputs” on decisions relating to the use of incomes from farm production and wage employment, compared to the women farmers in the Agmalobo CSV with 70 percent having a combined secondary and tertiary education, who had “some/most or all” inputs on decisions on the use of incomes.

- One of the innovative approaches for scaling gender equality and women’s empowerment of the International Fund for Agricultural Development is reinforcing rural women’s self-confidence, knowledge, and skills— including technical, leadership, and managerial—through functional literacy vocational training, and adoption of appropriate learning approaches (e.g., peer learning, exchange visits, learning routes), in addition to gender-sensitive extension and business advisory services. (Huyer, 2021)

10. Gender Outcomes of Managing Pathways Around Gender Norms Surrounding Patriarchy

- Colfer 2013 cited that a fair amount of recent scholarship on men in gender studies has emphasized the geographically broad-based notion of ‘hegemonic masculinity’, which is seen as creating and/or reinforcing gender hierarchies. This gendered, masculine ideal mandates a male role as protector, provider and rightful dominator within families (Moore, 2009). This is manifested in all the countries under this study.
 - Social attitudes in Cambodia favor men in every aspect of life, and are deeply rooted in Cambodian society. Traditional stereotypes assign women less power than men in decision-making processes.
 - In Myanmar, patriarchal cultural values related to women’s roles and responsibilities influence family relationships, limiting women’s participation in decision-making. Male superiority is assumed to be a natural and abstract quality that gives higher authority and status to men. The expectation that males are leaders, combined with the social expectation that women play supportive roles, is entrenched in daily Myanmar life.
 - In the Philippines, despite the veneer of equality among women and men, women’s actual contribution to food and agricultural production remains undervalued. Access to land, technology, extension services, capital, and infrastructure support tend to favor rural men. Even with laws supporting gender equality, only a third of women own certificates of land ownership.
 - In Vietnam, the economic reform, *đôì mới*, opened up opportunities for women in farming, but Confucian beliefs and practices still persisted, with expectations that women play a care-giving role, be obedient to all men, and be self-sacrificing for the family to maintain its harmony (Schuler, et al., 2006).
 - In Lao PDR, deeply-rooted patriarchal structures and gender norms assign women to mostly household tasks and reproductive roles. Gendered divisions of land, labor, decision-making and resources leave women susceptible to extreme poverty, homelessness, poor health, unemployment, exploitation, trafficking, early and forced marriage, adolescent pregnancy, and gender-based violence. Marginalizing factors are exacerbated across intersectional groups, especially for ethnic minority women and girls, LGBTQ+ persons, and persons with disabilities. (Vivona, 2021).

- Women's agency is shaped by their social positions within the household and community. In the rural patriarchal contexts, women's agency is often orientated toward cautiously negotiating, instead of directly challenging patriarchy ([Kabeer, 2000](#); [Schut et al., 2015](#); [Stark, 2016](#)) because directly challenging patriarchy is contrary to how society expects women to act ([Whitehead, 1981](#)). Rather than challenging gender norms, women cautiously try new practices at a very small-scale and gradually develop it so that their husbands and in-laws can accept and support it. This negotiation process is critical for their success, shaping their choices of innovation and entrepreneurship. In addition, these women know what approaches work best for the subordinated situations in which they find themselves ([Schut, et al., 2015](#)).
- Experiences of gender outcomes were more commonly reported at both the household level and community level, which were mostly self-identified by women participating in CSA/CSV projects. Through these projects, women's increased incomes have been found to result in improved communication between wives and husbands, and increased women's influence over the household decision-making process. These are critical elements that contribute to gender transformative outcomes which are also demonstrated in women's increased trust in their abilities to step beyond the existing cultural norms where men are the primary decision makers and income generators. In households where women earn more money than men, the power relations become more equal and women perceived themselves to have become more self-confident than men perceived them to be. (Nguyen, 2021).
- Intersectionality in terms of gender, age and ethnicity matters in the adoption of agricultural innovations. Young ethnic women have little autonomy and power because of restrictive gender norms and ideas about age hierarchies, even if, they do eventually gain more power in later life as their relationships change over time (Kawarazuka 2019). In the study of six CSVs in the Philippines, Myanmar and Cambodia, the correlation analysis showed that the present perceived income levels are positively correlated with age. This means that as the age increases, the perceived level of income also increases (Verzosa, 2021).

11. Gender Outcomes of Integrating Gender Approaches into CSA and Food Systems

- Castellanos (2021) reported that there was lack of gender integration right from the planning and design stage. For most of the programs, gender considerations were taken into account as the activities progressed and it served as a learning process. In some cases, the lack of female involvement was realized after a couple years of project implementation, and then designed interventions to address the disparity. The regions in this study comprising South/Southeast Asia, West/East Africa and Latin America felt unsure of how to best integrate gender into the project design, with limited guidance at the program onset and lack of gender expertise within the project team.
- Across regions, there were CSA option characteristics which were found to be gender-responsive/popular among women farmers, including practices that required a low investment and/or had a high economic benefit, reduces labor and improve food security to encourage adoption. (Castellanos, 2021). Gender-responsive practices found to be beneficial in gender integration included sex- disaggregated focus group discussions to have a more conducive environment for women's participation; and increased involvement of local administrative leaders in addition to the village leaders in gender equality discussions. Most research for development

work need to refrain from continuously treating “gender” as being mostly about women. This explains why exclusion and inequality are often invisible or reduced to simplistic issues of engaging women. (Deepa, 2021).

- CGIAR recently undertook a literature review that identifies and synthesizes two main critiques about current common approaches to gender in order to help the research and development community in addressing gender inequality in food systems. First, current gender approaches have failed to deliver gender outcomes as intended. While projects may “reach” women (such as by involving women in trainings), they do not necessarily lead to substantive or lasting empowerment. Second, common gender accommodative approaches only engage superficially with how social change occurs. Current strategies tend to address visible gaps, yet do not take into account that inequalities persist because of underlying structural factors, in particular gender norms. Gender norms are the unwritten rules of any given society about the expected behavior of women and men. These include what paid or unpaid work and roles are considered “appropriate” for different genders in the farm and household, which assets should be controlled by whom, and overall, how women and men should act and interact, including which gender is “the decision maker” versus which is the “caregiver”. (McDougall, 2021).
- In response to the above critiques, CGIAR and partner teams innovated with gender transformative approaches (GTAs) for food systems as a way forward. GTAs aim to transform gender relations and seek to change existing power dynamics, structures, and social norms that are the root causes of gender-based inequality. GTAs strives to examine, question, and change gender norms and imbalances of power, encouraging critical awareness among men and women and challenging the distribution of resources and gendered division of labor. (Poulsen, 2018). In contrast, gender “accommodating” approaches adjust for gender norms and inequalities but do not seek to change them. For example, engaging women within the homestead and initiatives that seek to generate income for women accommodate for the norm of women earning less than men, but they do not seek to affect the underlying causes of this income gap. Most development projects adjust for gender accommodating approaches.
- An important lesson learned despite investments in women’s empowerment is that the lack of progress in reducing inequalities in the agriculture and natural resource management sectors underscores the need to rethink current gender accommodating approaches, which focus on working around – rather than directly addressing – structural barriers, in particular constraining gender norms that underpin gender inequality. In this way, they go deeper than common gender integration and mainstreaming and tackle the root causes of gender inequalities instead of addressing its symptoms. With less than a decade left to meet the Sustainable Development Goals, the sobering current global trajectory is one in which it will take roughly 170 years to achieve gender equality (WEF, 2016). The current global pandemic has both made gender inequalities more visible and worsened them, including in food systems. (McDougall, 2021).
- Operationally, GTAs aim to engage men in a more careful and purposeful way that acknowledges their nuanced relationships with women, aiming to position them as agents of change on the same path to gender equality, while strengthening the interdependent and mutually supportive relationships that exist between men and women. In order to address gender inequality in agriculture, it is essential to begin with a rigorous participatory social and gender analysis that examines how social norms, values, and power relationships shape and are shaped by women’s

and men’s understandings of their roles and capacities; societal expectations of what is appropriate for women and men to be and do within the agricultural sector; and how these expectations and differences are institutionalized in the way the market, family, and community work.

12. Assessment of Gender Guidance and Tools on Women’s Empowerment

- The experience in Phase I of CCAFS gender research was that there were few clear guidelines for addressing the needs of men and women in different environments and agricultural systems. To close this gap, CCAFS worked with partners to develop guidelines and toolkits for supporting this work, keeping in mind the importance of equipping practitioners and policy makers with tools and knowledge of innovative gender-transformative practices and intervention approaches. Key resources include the gender guidance and tools that have been developed by CCAFS (Huyer, 2021) as listed below, many of which are focused on CSA. These gender tools are useful references in developing a gender tool specific for IIRR’s CSVs and would need further study regarding their applicability.
 - [2012 CCAFS and FAO Training Guide, “Gender and Climate Change Research in Agriculture and Food Security for Rural Development”](#)
 - [Gender and Inclusion Toolbox](#) (FAO-CCAFS Manual)
 - [Gender-responsive Approach to Climate-Smart Agriculture: Evidence and Guidance for Practitioners](#) (Nelson & Huyer, 2016), with FAO and the Global Alliance for CSA (GACSA)
 - [Step-by-step Process to Mainstream Gender in Climate-smart Agricultural Initiatives in Guatemala](#) (Acosta, et al., 2020)
 - [Participatory Identification of Climate-smart agriculture Priorities](#) (Duong, et al., 2016)
 - [Inclusion of Gender Equality in Monitoring and Evaluation of Climate Services](#) (Gumucio, et al., 2018).
 - [Gender-Climate-Hotspot Mapping](#) (Chanana and Agarwal, 2020; Khatri-Chhetri, et al, 2020)
 - [Gender Empowerment Index – CSVs](#) (Hariharan, et al, 2020)
- Other gender tools to assess empowerment mainly explore women’s agency -- decision-making, ability in accessing resources, control of income, time use, and other dimensions of women’s empowerment, but most neglect structural causes of disempowerment, such as social norms, cultural beliefs and traditions, and institutional policies and practices. When selecting a tool, researchers need to consider their appropriateness, scope, limitations and adaptability, as well as how data collected using the tool will be competently interpreted. Elias (2021) presented an investigation of 15 quantitative and qualitative tools used to assess women’s empowerment. The tools were analyzed based on what dimensions (resources, agency, achievements) and levels (individual, relational, environmental) of empowerment they examine; who they are meant to collect information from (local women, men and so on), whether they consider gender parity in empowerment, and whether they focus on the perspectives of those whose empowerment is being assessed. The tools roughly clustered into four groups as shown in the table below.
 - Tools that measure one dimension of empowerment at one level – mainly agency as decision-making within the household: 5 Dimensions, WEI

- Tools that focus on one dimension (agency), but at multiple levels, including attention to some structural/environmental reasons for (dis)empowerment: Ladder of Power and Freedom, WDI-GAI
- Tools that measure empowerment across more than one – but not all – dimensions and levels: A-WEAI, GEI-CSV, Pro-WEAI, WEAI, WEFI, WEI (CARE), WEI-(Oxfam), WELI, Empowerment profiles
- Tools that explore all dimensions of empowerment at all levels: GIMT, Well-being timelines

Dimensions focused on	TOOLS⁵
One dimension of empowerment at one level – mainly agency as decision-making within the household	Comparison of the Five Dimensions of Men’s and Women’s Empowerment (5 Dimensions) Women’s Empowerment Index (WEI)
One dimension (agency), but at multiple levels , including attention to some structural/environmental reasons for (dis)empowerment	Ladder of Power and Freedom Women’s Decision-Making Index and Gender Attitudes Index (WDI–GAI)
More than one – but not all – dimensions and levels	Ladder of Power and Freedom Empowerment profiles CARE’s Women’s Empowerment Index (WEI) Oxfam’s Women’s Empowerment Index (WEI) Women’s Empowerment in Agriculture Index (WEAI) Abbreviated-WEAI (A-WEAI) Project level-WEAI (pro-WEAI) Women’s Empowerment in Livestock Index (WELI) Women’s Empowerment in Fisheries Index (WEFI) Gender Empowerment Index for Climate-Smart Villages (GEI–CSV)
All dimensions of empowerment at all levels	Gender Indicator Monitoring Tool (GIMT) Life histories and well-being timelines

13. Gendered Impact of COVID-19 Pandemic on Women’s Empowerment

- The impact is all-encompassing for both male and female farmers, but may impact on women more, as they are in charge of food provisioning and health care of the household. Added to the women’s household burden were the children who are not in school and need to be tutored in online classes (specific to Philippine CSVs).

⁵ Note: Not all links may work.

- As a good practice for scaling-up, many CSA options provided the women with effective COVID-19 adaptation strategies, including consuming products from homestead gardens instead of selling; reserving food for the longer term lockdowns, stocking more seeds, fertilizers and other inputs; increasing animal raising, and maintaining good relationship with the buyers. Hence, no major household food security issues were faced by the CSVs, as the severe impact of food shortage was alleviated by vegetable gardening, and small livestock. This is congruent with the findings from another study on COVID-19 impact on local food systems in CSVs in the same countries. (Espino 2021). Results showed that rural and traditional food systems of agriculture-based villages continued to operate with minimal adjustments during the course of COVID-19 restrictions, despite significant perceived changes in the availability and prices of certain food groups. Complementary and diverse food production, together with access to informal food outlets, were vital parts of the local food systems and played critical roles in supplying food commodities to the population during the COVID-19 pandemic. (Verzosa, 2021).

IV. Recommendations

Below are some recommendations that spring from the above findings for enhancing the positive gender outcomes in the adoption of CSA option and practices that advance women’s empowerment, and ensuring their sustainability, replication and scaling up in other CSVs.

- Sustain the adoption of CSA options. Key to sustaining the continuing adoption of CSA options which are deemed as gender-responsiveness by women – those with low investment with high economic benefits, reduce women’s labor and improve food security. Right up in the list are the CSA options on homestead gardens and small-scale livestock production. In addition, there is a need to ensure the increase in incomes resulting from these practices, recognizing the empowering benefits that accrue with increased economic contribution of women in the household and in the community. For women in the CSVs, one way of optimizing the income potential of current CSA options is to intensify vegetable production, protect livestock (mainly chickens) from diseases and deaths, and optimize production to move beyond subsistence to surplus creation for income generation.
- Deepen women’s knowledge of CSA options through greater participation in Farmer Learning Groups, and initiatives similar to the Plant Clinic in Cambodia, or through the provision of gender-sensitive agricultural extension services that pay attention to the specific needs of women farmers, with special attention to the female heads of households and those left in the villages due to the outmigration of men. Increasing women’s knowledge in CSA practices in all types of agro-ecology – coastal, rainfed lowland, irrigated low land, and upland allow women farmers to effectively participate and provide useful inputs in productive decision-making and problem solving jointly with men. Women’s voice and meaningful participation are key to sustaining the CSA options. Women’s participation was cited as one of the benefits of the project and has the potential for social and transformative change in the family and community. Some women farmers cited that to ensure their participation, there is a need for proper scheduling to ensure that the timing of meetings, training, and activities will enable women to participate. A good practice cited in the literature review is that projects can set a requirement for women’s participation in all training activities where women participants are invited. (Verzosa, 2020).

- Increase women's access to financial resources and capacity development by strengthening women's associations and village groups. Majority of women farmers are members of savings associations, including Village Development Funds and Savings Groups, from where they could borrow loans for farm inputs, household maintenance, and financial protection from the impact of climate and the COVID-19 pandemic. The CSV project or other organizations in the CSVs could help strengthen these associations by providing skills training for women and men leaders in organizational development and financial management. As membership in VDFSGs also provides access to agricultural training and extension services, technical assistance and trainer's training on CSA options would be another useful initiative that could be supported by the CSVs.
- Bolster women's opportunities for leadership through exchange visits. In addition to leadership opportunities in women's associations, women's engagement in the CSV project, extension training or attending community meetings have increased women's self-confidence to participate in collective action, including engaging in community activities and planning. CSVs could provide support for more women to take part in exchange visits with other CSVs and other countries, as the exposure provides women with a bigger world view, and greater confidence to share their new knowledge and experience with their community. Women participants in exchange visits cited that their being invited to international events elevated women status and respect in the community, and positively reinforced women's roles as representative of their own community.
- Creating women leadership role models. Women taking on leadership positions can have a powerful effect in changing the participation of other women. This can be due to these women taking deliberate steps to promote the participation of other women, but also to a "role-model" effect. Data showed that as the gender equality of representation in community executive committees increases, women are more likely to speak up in meetings, and the same effect occurs when the village head is female. Women who have increased their yields and are producing volumes as high as those produced by men can encourage others to take up improved farming practices. These women also act as role models in their communities, motivating other women to attend training and improving traditional practices. Greater exposure to role models of female leaders is also likely to give more women the confidence to seek leadership positions.
- Identify possible higher-level roles for women at par with men in the agriculture value chain of small livestock production and cash crop farming, not only as farm labor or producer but also as entrepreneur – as seller, collector, retailer or wholesaler, and for the CSVs to provide the needed technical guidance and access to financial resources to serve these roles.
- Promote healthy and egalitarian forms of women's images in using masculine tools. Challenge gendered perceptions of certain tools and large equipment belonging solely to men by including images of women using 'masculine' agricultural tools and equipment and women as fertilizer applicators in all program materials, as well as on posters to stimulate group discussions. Visual materials and posters can also be used to promote healthy and egalitarian forms of masculinity such as fathers caring for children, providing their daughters with land inheritance, or being engaged in family nutrition and health.
- Include gender equality modules in all CSA training, climate change adaptation, and disaster risk reduction to increase gender awareness among men and women in CSVs and positively reinforce women's roles and adaptation strategies in responding to the risks and crises created by climate change and variability. In some CSVs (Ma in Vietnam), women participation in communal activities

have allowed them to envision themselves as leaders in climate change and DRR adaptation for their communities.

- Provide gender training for CSA/CSV project staff. The lack of knowledge on gender integration in project design and planning, and the lack of expertise in project teams were identified in this study. This calls for the conduct of gender training for the CSA/CSV project staff. The gender training should include not only an orientation on gender sensitivity and awareness, but more importantly on how to do gender analysis, including the collection of sex-disaggregated data and how to identify gender issues/gaps and the root causes of inequality; gender action planning in response to these gaps; inclusion of gender analysis in participatory vulnerability assessments; and gender transformative approaches that seek to change social norms, attitudes, beliefs and behavior that contribute to gender inequality.
- Develop and implement practical gender policy guidance and easy-to-use tools for gender integration that are tailor-fitted to CSA/CSVs. In addition to capacitating project staff on gender, a gender guidance and tools for project identification, design, implementation, monitoring and evaluation are important to ensure gender mainstreaming or integration. The finding in CCAFS gender research was that there were few clear guidelines for addressing the needs of men and women in different environments and agricultural systems. To close this gap, many gender guidelines and toolkits have been developed which could serve as a resource reference in developing gender guidance and tools that are appropriate to the local environment where IIRR works.
- Engage men in changing social norms. There has been growing recognition within organizations working on women's rights and gender equality issues of the need to engage more men in changing social norms. Engaging men is important, because male attitudes crucially shape household attitudes towards women's participation, gendered division of labor in productive and reproductive work, and determine how men respond to women when they do participate. Support from husbands was identified as key enabling conditions to support the ability of women farmers to make their own personal decisions on both farm and non-farm activities. Data highlighted engaging with men is important to women's economic empowerment, ability to participate in decision-making, reduced workload and time poverty of women. By demonstrating the value of women's participation to men, men are more likely to support women to explore different roles.
- Develop male community leaders to serve as gender champions. Include gender awareness and sensitivity training as part of agricultural training and identify gender champions among the male leaders to promote positive masculinities – recognizing women as joint partners in household and productive decision making, reducing women's workload, sharing in household and engaging in fatherhood (care work). The KIIs with the male gender champions in Agmalobo and Malocloc Sur (Philippines) cited that “as men of the house, we must be responsible and be considerate of our wives,” “help them in doing chores, like feeding the pigs,” “we need to entrust them with leadership roles with no discrimination, as women are capable leaders,” “because of the project, my wife became an active farmer and now helping me to make decisions related to farming,” and “the support of every man is necessary.” One of the suggested methodologies for awareness raising in the Philippines is through radio programs as most men are averse to attending meetings.

- Encourage community leaders to seek gender parity in agricultural committees and producer groups. Work with community leaders to ensure women actively participate in community meetings and are not merely observers, ensuring that female voices are heard. In some cases, this means encouraging women to sit at the front of training sessions, engaging women during practical exercises, calling on women during meetings, not interrupting women when they speak, making sure women are not made to sit in the back of the room or on the floor, verbally encouraging women to put themselves forward for leadership positions, and providing political support for women seeking leadership positions.
- Improve the adult literacy of women farmers. Data showed that in Taungkhamauk, 35% of the women farmers had no schooling, 60% were in primary level; 35% in Cambodia CSVs had no schooling, 52% were in primary, and 80% in Htee had primary level of education. Adult literacy -- reading, writing and numeracy are crucial to empowering women. The positive correlation of perceived income level and education showed that the higher the level of education, the higher is the perceived income before and during the CSVs. Experience in southern Philippines on adult literacy programs in remote island provinces showed that three months of training adult women will enable them to learn basic skills, using practical pedagogical approaches, such as teaching numeracy by doing household budgeting.
- Ensure that CSV community activities consider women time use and workload, so that projects do not add on to women's work hours and work load burden, even if women cited that they do not mind the added work hours if they contribute to increase in incomes. To advance women's empowerment, gender equality and broader social inclusion in agriculture and food systems, there is a need for agriculture programs and interventions to address the constraints, gaps and barriers to women's empowerment, develop and implement a gender action plan or strategies on how they can be addressed, including what specific dimensions of women empowerment, including time use, need to be targeted to foster greater inclusivity within the agricultural sector.
- Continue to promote CSA options as household adaptation strategy to cushion the impacts of COVID-19 pandemic. Data from FGDs cited that during the pandemic, the households of women farmers survived from the impact of COVID (food shortage, high cost of food, loss of income) because of the two CSA options -- homestead gardens and small livestock that provided them with food for the household, enabled them to share or sell vegetables to their neighbors, and reserved food for extended lockdowns as a critical COVID adaptation strategy. In the absence of these food provisioning strategies, the impact of the pandemic could have severely impacted the CSVs.

V. Future Research Agenda

The above recommendations opened up genders concerns that need to be addressed in future research studies. This could include the following gender research agenda:

- CSA and gender equality. More recently, analysis of whether CSA can contribute to gender equality has started to emerge, indicating that: (1) CSA can exacerbate existing inequalities if implemented in a "gender-neutral" manner, and that CSA technologies or practices may intensify inequality, and the prevailing power and gender relations within a community can be entrenched or solidified if questions are not asked about who is controlling the technology and who benefits; (2) gender equality is in some cases a factor in the adoption of CSA (Huyer and Partey, 2020); and

(3) CSA can support gender equality if it integrates one or more of the four gender in/equality dimensions of climate-resilient agriculture – a) increased participation in decision-making, b) reducing women’s work burden, c) access to resources, including information and income, and d) participation in collective action. Most analysis to date has focused on (3) how CSA can support gender equality. More research is needed to identify the enabling gender equality conditions for adoption of climate-resilient agriculture as well as potential for increased inequality as a result of CSA implementation. (Pyburn, 2021).

- Women’s role as seed producers in community seed systems. The potential of seed systems to catalyze transformative change and bring about women’s empowerment is under-researched. The key recommendations for future research include the need to build evidence on gender dynamics in seed systems by understanding gender roles, norms and power relations that determine access and use of seed systems. With little evidence on the gendered aspects of seed systems, research to bridge knowledge and evidence gaps is urgently needed to inform seed systems interventions. The goal is to make quality seed affordable and within the reach of women, involving women and men equally in decisions on seed systems and extending opportunities equally.
- Studies exploring labor saving technologies (LSTs) that cover the breadth of labor-intensive agricultural activities such as weeding or transplanting—where women’s participation is high—were limited. LSTs beyond tractors also need to be researched, such as cono-weeder for weeding, solar pumps for water management, harvesting machine, rice drum seeder for planting—including factors such as rental services, credit availability, land ownership and market linkages. Subsidies and rental markets make LSTs more affordable for smallholder farmers and increase adoption by reducing the cost of capital. However, such arrangements need interventions that enable women to access these technologies. More research is needed on the variation in adoption due to intra-household dynamics, risk attitudes, decision-making ability and control of resources by women.
- How to effectively engage with intersectionality in terms of gender, age, ethnicity, sexual orientation, physical disability matters in the adoption of agricultural innovations and transforming social norms. This field of study is emerging and needs to be carefully considered in the promotion and adoption of CSA technologies. This should also be factored into in the conduct of inclusive and gender-responsive participatory vulnerability assessments in CSVs.
- More research is needed on the gendered impacts of climate change on men, their experiences of and responses to climate change, as well as integration of men into climate adaptation programs targeted to women. Related to this is the need to understand existing socio-cultural norms as underlying factors affecting men and women’s vulnerability (access to and control of resources, CSA adoption barriers (literacy, limited agency, limited technical resources) and factors affecting differences in adoption by men and women (access to extension, institutions, asset ownership and access). Addressing these is essential for ensuring more gender-equitable outcomes of adaptation.
- Use of Social and Behavior Change Communication (SBCC) as a road map for changing behaviors and social norms that impact on women. SBCC is a set of interventions to encourage and reinforce positive behaviors, such as the continuing adoption and practice of CSA options. A good SBCC strategy also ensures that the households and communities work together to give women farmers

more space and normative environment to apply their new knowledge and continue to sustain their gains and benefits from the CSVs.

- Applying gender transformative approaches to accelerate progress in gender equality. Research is needed on factors that could shift the transition from gender accommodating to gender transformative approaches and outcomes. The study could explore the most promising strategies and entry points to catalyze gender transformative change at the household and community level, and in markets and in the enabling environment of laws and policies. Important questions would include how men and women could be effective agents of changing social norms, what interventions work and how men could take on the role of enablers of gender equality and women's empowerment.

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