



Feed the Future Learning Agenda Annotated Bibliography (Gender)

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Alkire, S., Meinzen-Dick, R., Peterman, A., Quisumbing, A., Seymour, G., & Vaz, A. (2012). *The Women's Empowerment in Agriculture Index*. Washington, DC: IFPRI.

The authors present the newly-developed Women's Empowerment in Agriculture Index (WEAI) that measures women's empowerment in agriculture using two subindexes. The first measures the percentages of women who are empowered in five domains of empowerment (5DE): "(1) decisions about agricultural production, (2) access to and decisionmaking power about productive resources, (3) control of use of income, (4) leadership in the community, and (5) time allocation." The second is a Gender Parity Index (GPI) that, "reflects the percentage of women who are empowered or whose achievements are at least as high as the men in their households." In addition to describing the WEAI and its formation, the authors reported the results of three pilot projects to demonstrate use of the WEAI in regions of Uganda, Guatemala, and Bangladesh where USAID's Feed the Future initiative has been active. Household surveys were conducted in 350 households in Uganda and Guatemala and 450 households in Bangladesh. Also, 14 women and 6 men were interviewed from each region in order to formulate complementary case studies. The authors find that the WEAI score for Uganda is 0.800, for Bangladesh it is 0.762, and for Guatemala it is 0.702, and the specifics for each country regarding the subindexes and comparisons between men and women are reported. While the paper does not specifically address the Feed the Future Learning Agenda question regarding agriculture and nutrition programs and women's empowerment, this tool will be ideal for answering the question in the future.

Bhagowalia, P., Menon, P., Quisumbing, A. R., & Soundararajan, V. (2012). *What Dimensions of Women's Empowerment Matter Most for Child Nutrition?* Washington, DC: IFPRI.

The authors examine the links between women's empowerment and children's nutrition status in Bangladesh. They utilize cross-sectional data from the Demographic and Health Survey of Bangladesh conducted in 2007, including observations of over 5,000 children. In their model, they look at the relationships between indicators of empowerment (women's decision-making power, mobility, and attitudes towards domestic violence) and maternal endowments (mother's health status and education levels) on the one hand, and children's prevalence of stunting and dietary diversity scores on the other hand. The results from the authors' logistic regressions show statistically significant correlations between child stunting and attitudes toward domestic violence, maternal education, child age, women's age at first marriage, maternal education, and household wealth. For children's dietary diversity, they find significant correlations with women's participation in decision-making, age difference between spouses (a negative

relationship), mother's age at first marriage, mother's education level, and household wealth. When the authors simultaneously include all three indicators of empowerment (decision-making, attitudes towards domestic violence, and mobility) in the model along with the other explanatory variables, they find that attitudes towards domestic violence are significantly correlated with stunting, but none of the indicators of empowerment are significantly correlated with dietary diversity. Maternal height and education show strong correlations with both stunting and dietary diversity. The authors conclude that women's empowerment and endowments matter to children's long-term nutritional status.

Bolwig, S. (2012). Poverty and Gender Effects of Smallholder Organic Contract Farming in Uganda. IFPRI Uganda Strategy Support Program Working Paper, (8). Washington, DC: IFPRI.

Bolwig evaluates the impact of smallholder organic contract farming on household food security in Uganda and examines how men and women are affected by organic contract farming. The author provides two case studies from Uganda – the Biofresh pineapple scheme and the Kawacom coffee scheme – both of which are organic smallholder contract arrangements promoted by the Swedish International Development Agency via its program Export Promotion of Organic Products from Africa (EPOPA). Evaluation is primarily based on qualitative focus group interviews conducted in 2006 of male and female participants in each scheme, as well as more quantitative household surveys of scheme and non-scheme households also conducted in 2006. Conversion to organic pineapple production for the export market required more labor for tasks such as weeding and higher production costs. The author found that women provided a relatively minor proportion of the labor, in part because the men used cash income from pineapples sales to hire non-family labor. Women were still responsible for production of food crops and domestic work, which the author cites as a reason why women's did not participate more actively in the organic contract scheme. Men predominantly controlled the income from the pineapple scheme. A decrease in food production was not reported. Participants in the coffee scheme reported that in order to meet the quality standards in the organic contract coffee arrangement, time spent weeding and processing coffee increased. Based on male and female focus groups, the author finds that women contribute the majority of the labor in the coffee scheme, whereas men control management decisions and revenue. The author finds that although women in the scheme increased labor, they experienced an overall loss of personal income. A reduction in food production was reported, although women do not report a reduction in time spent on food crops but rather a reduction in domestic work and/or leisure. Overall food security for the coffee-farming households was not reduced due to increased incomes and expenditures on food.

Gillespie, S., Harris, J., & Kadiyala, S. (2012). *The Agriculture-Nutrition Disconnect in India: What Do We Know?* (No. 1187). Washington, DC: IFPRI.

The authors consider explanations for the disconnect in India between GDP and agricultural growth on the one hand and lack of substantial progress in fighting malnutrition on the other hand. The authors develop a framework that identifies seven key pathways from agriculture to nutrition: agriculture as a source of food; agriculture as a source of income; the link between agricultural policy and food prices; how agricultural income is actually spent; women's socioeconomic status and their ability to influence household decisionmaking and intrahousehold allocations of food, health, and care; women's ability to manage the care, feeding, and health of young children; and women's own nutritional status. For each pathway, the authors conducted a systematic review of the literature and described existing evidence generally and specifically within India. For the pathways that focused on women in agriculture, the results of the studies that the authors identified were quite mixed. In some studies commercialization increases women's work in agriculture and is accompanied by a reduction in caring practices for children. In others, commercialization decreases women's employment in agriculture, which can have positive effects on caring time but negative effects on women's control of income. They find that women's income in general increases expenditures directed towards children, but can at times be insufficient to overcome the lack of time women have for caring. The authors conclude by emphasizing the need for further research to understand the links between agriculture and nutrition along these seven pathways in India.

KIT, Agri-ProFocus and IIRR. (2012). *Challenging chains to change: Gender equity in agricultural value chain development*. KIT Publishers, Royal Tropical Institute, Amsterdam.

The authors present a summary of the literature regarding value chains and gender, and develop an “engendered value chain empowerment matrix” as a framework with which to analyze 25 case studies of women in agricultural value chains. The matrix includes the following four dimensions: chain activities, chain governance, agency (women's capabilities), and structure (contextual and institutional opportunities for change). The case studies are largely qualitative and describe examples of projects or business activities within value chains where women's involvement and equity were emphasized. From the case studies, there are several examples of women who took on increased leadership positions as part of their productive activities and subsequently engaged in leadership activities within their communities. Also, the case studies include examples of women living in poverty who gained income through value chain activities, helping to alleviate poverty and improve food security. Most case studies include examples of women who have increased their paid employment, which can likely be attributed at least in part to the fact that the projects emphasized women's

involvement in value chains. Also, in some examples, men increased their contributions to domestic work, easing women's responsibilities within the home.

Meinzen-Dick, R., Behrman, J., Menon, P., & Quisumbing, A. (2012). Gender: A Key Dimension Linking Agricultural Programs to Improved Nutrition and Health. In S. Fan and R. Pandya-Lorch (Eds.), *Reshaping agriculture for nutrition and health: An IFPRI 2020 book* (135-144). Washington, DC: IFPRI.

The authors provide an overview of the literature linking agriculture and nutrition to gender and argue that gender roles and gender equity are key factors that determine whether agricultural interventions are successful in achieving positive nutrition outcomes. They discuss three types of agricultural interventions to illustrate this point: programs that link smallholders to markets, large-scale agriculture, and homestead food production. Regarding programs that link smallholders to markets, the authors point to examples where women have lost control of income or production to the detriment of women and children's nutrition. They emphasize the importance of ensuring that women are included in contracts, small-holder groups, and training opportunities, and that economic opportunities for men are also taken into account in order to minimize the likelihood that they will take over women's profitable activities. Regarding large-scale agricultural operations, the authors suggest that employment in these arrangements can have beneficial impacts on nutrition by increasing household income and increasing the amount of income controlled by women. They cite several potential hazards for women working in large-scale agriculture, including insecure labor contracts, domestic work passed on to daughters at the expense of their education, and excessive exposure to agro-chemicals. Again, the authors suggest the importance of instituting protections from women to mitigate against these negative effects. Finally, regarding homestead food production (HFP), the authors point out that women have successfully been integrated into the HFP model, but suggest an increased focus on women's income generation in order to further improve health and nutrition.

Ragasa, C., Berhane, G., Tadesse, F., & Seyoum, A. (2012). Gender Differences in Access to Extension Services and Agricultural Productivity. Washington, DC: IFPRI.

Ragasa et al. examine the relationship between gender and extension services in Ethiopia, which has invested heavily in agricultural extension in recent years but still faces "major institutional challenges." The paper addresses the following questions: "(1) Are there systematic patterns of differences in access to various types of extension services by women and men farmers? (2) What typology of female and male farmers get which information and through which channels? (3) Are there differences in productivity and technology adoption between female and male farmers and if so, are these differences attributed to their access to varying

channels and quality of extension services?” The data utilized in the study is from a regionally representative survey undertaken by the Central Statistical Agency of Ethiopia in June-July of 2011 covering 7,530 households and 31,450 plots. The authors use an instrumental-variable regression model, as well as other models to test for robustness. The authors found that women had less access to agricultural extension than men, and that even after controlling for other variables, gender was a significant determinant of extension access. Women also were shown to have a lower rate of technology adoption and input usage for almost all the indicators tested, but after controlling for other variables such as land size, plot fertility, and access to extension services, gender was not a significant determinant of technology adoption and input usage. Value of production was also significantly lower for women than for men, but after controlling for household, plot, and village characteristics, gender was not shown to be a significant determinant of value of production. Also, the frequency of development agent (DA) visits was not significant in terms of value of production, but the perceived quality of the DAs advice and access to radio were significant variables explaining value of production. The authors conclude that improving women’s access to extension services and information via radio are important for closing the gender gap in input usage, technology adoption, and agricultural productivity.

2011

- Duflo, E. (2011). Women’s empowerment and economic development (No. w17702). Cambridge, MA: National Bureau of Economic Research.

Duflo considers the question of whether economic development is sufficient to drive women’s empowerment or if programs specifically focused on improving the empowerment of women are necessary. The author reviews the literature for both arguments and concludes that there is no “magic bullet,” meaning that economic development alone will not be sufficient to achieve gender equality. The author also finds that women’s empowerment programs can have ambiguous results, and therefore are also not a simple solution to achieving women’s empowerment. The complex and bi-directional relationships between poverty and women’s empowerment are discussed. Duflo considers the ways in which women’s empowerment can lead to economic development. She finds that while a correlation between women’s education and children’s well-being has been shown, the evidence for a causal relationship is not strong. In reviewing the literature on how women’s income affects the ability of women to influence decisions on household expenditures, the author states that women’s income has “clear implications” for women’s bargaining power within the household. Indeed, Duflo cites several studies which show that even temporary increases in women’s income lead to increased spending directed towards children. In agriculture, Duflo cites examples of the ways in which women’s inequality leads to the inefficient allocation of resources and therefore worsens the well-being of

families. Politically, Duflo describes examples of how women in political office have different policy agendas than men and shows that women's political empowerment can lead to investment choices that reflect women's preferences.

World Bank Group (Ed.). (2011). *World Development Report 2012: Gender Equality and Development*. Washington, DC: World Bank Publications.

In the report, the authors frame the discussion of the importance of addressing gender inequality around two pillars: gender equality as an important issue *intrinsically* because of the inherent rights of women, and *instrumentally* because of the contributions of gender equality to development and economic efficiency. The instrumental argument includes three primary components: gender inequality leads to a misallocation of resources and lost productivity; the equality or lack thereof of women affects the well-being of children; and women's agency leads to "better outcomes, institutions, and policy choices." The report describes what is known about gender equality and its consequences, and provides evidence and recommendations for its remedies. The report draws upon evidence from the existing literature, as well as qualitative data collected for the report from 500 focus groups covering 4,000 men and women in 19 developing countries. The report states that there has been significant progress in recent years in increasing the education levels of women and girls, labor market participation of women, and fertility rates. Areas that have not seen significant improvements include excess relative mortality of girls and women, segregation in economic activity, gender gaps in earnings, male-female differences in responsibility for house and care work, gaps in asset ownership, and constraints to women's agency in both the private and public spheres. In agriculture, women's lack of access to inputs such as land, credit, fertilizers, and seed is discussed as an area of persistent inequality.

2010

FAO. IFAD. ILO. (2010). *Agricultural value chain development: Threat or opportunity for women's employment?*. *Gender and Rural Employment Policy Brief # 4*. Rome, Italy: FAO.

The policy brief provides a brief description of the "gendered structure of employment" in modern agricultural value chains based on previous research. The report states that, "In modern value chains, men are concentrated in higher status, more remunerative contract farming since they generally control household land and labour, while women predominate as wage labourers in agro-industries." Several other distinctions are highlighted in how the development of modern value chains has affected women differently than men, such as the different commodities women tend to work with, the types of employment arrangements women face compared to men, and the barriers to entry that women face in value

chains because of disproportionately low access to resources. Although women face many disadvantages, some positive effects are considered such as the possibility that women's ability to earn income can increase bargaining power and lead to a more equal sharing of household duties. The brief concludes with policy recommendations to improve the outcomes for women as they participate in modern agricultural value chains.

Hill, R. V., & Vigneri, M. (2010). Mainstreaming gender sensitivity in cash crop market supply chains. Background paper prepared for The State of Food and Agriculture, 11. Rome, Italy: FAO.

The authors study the constraints to women's participation in cash cropping by conducting a literature review and providing two case studies. The literature review can be summarized with the following statement from the authors: "Inequalities in resources result in different levels of participation, methods of production and modes of marketing for men and women." The first case study examines the role of women in cocoa farming in Ghana, which has allowed women to acquire land through inheritance since the mid-1980s. The authors use data from the Ghana Cocoa Farmers Survey, which was conducted in 2002 and 2004. They find that productivity on plots managed by women was as high as on plots managed by men once controlling for levels of inputs. They also find that women increased their cocoa production between 2002 and 2004 by increasing their use of annual and communal labor, which are the types of labor least subject to cash constraints. The second case study examines the role of women in coffee farming in Uganda. Data are from the 1999 national household survey and follow-up of 300 coffee-farmers. Approximately one quarter of the households were female headed, which on average had smaller plots and fewer coffee trees than male headed farms. Regression analysis showed that there are no differences between men and women in the choice of selling coffee at the market or the farm-gate after controlling for distance to market, quantity of coffee, and wealth. Further analysis revealed that bike ownership is the primary factor that determines whether women can sell coffee in the market, which is in turn the primary determinant in the price received for coffee. The authors conclude with recommendations for interventions to improve women's ability to engage in production of cash crops.

Peterman, A., Behrman, J., & Quisumbing, A. (2010). A review of empirical evidence on gender differences in nonland agricultural inputs, technology, and services in developing countries. Washington, DC: IFPRI.

The authors perform a systematic review of the evidence from previous literature regarding the extent to which gender affects small-scale farmers' access, use, and adoption of technological resources including inorganic fertilizer, insecticides, improved seed varieties, and mechanical power; natural resources including those related to water and soil fertility; human resources including agricultural labor, extension services, and life-cycle challenges; and social and political capital

including group membership, information exchange through networks, and political representation. They find that 19 of the 24 studies on gender and technological resources showed that men had greater access to technological resources, but that once other factors were controlled for, 59% of studies showed that gender did not affect outcome measures. They also find that 8 of the 11 studies on gender and natural resources input usage showed that men had higher mean values, but that after controlling for other factors 64% showed that gender did not affect outcomes. Regarding the categories of human resources explored by the authors, they find a significant body of research that has focused on gender and extension services. The authors find that men were shown to have greater access to human resource inputs than women in 15 of 28 measures, whereas women had greater access than men in the remaining 13 of 28 measures. After controlling for other variables, 57% of studies showed that gender was not significant with respect to human resource outcomes, 35% showed that men had higher outcome measures, and 7% showed women to have higher outcomes. Regarding access to social and political capital, the number of studies was limited, but the trend observed by the authors was that gender did affect group membership, and that while women were active in community groups, men tended to belong to agricultural groups more so than women. The authors conclude with recommendations for further research.

Quisumbing, A. R., & Pandolfelli, L. (2010). Promising approaches to address the needs of poor female farmers: Resources, constraints, and interventions. *World Development*, 38(4), 581-592.

Quisumbing and Pandolfelli consider the gender-specific constraints facing poor female farmers in the developing world and address the following questions: “(1) What are the key strategies to address constraints to accessing productive resources? (2) What are some of the promising approaches that have been tried in the field? (3) Have these approaches been rigorously evaluated, and what are the implications for scaling up?” They conduct a systematic review of published and unpublished literature from 1998 through 2008 of studies that address the following: “interventions or policy changes in the areas of land, water, and soil fertility; new varieties and technologies; extension; human capital and technologies to enhance labor productivity; access to markets; credit and financial services; and social capital and infrastructure support services.” The authors identify several projects that have addressed these issues, only some of which were successful. Several examples point to situations where cultural norms dictate that certain activities were inappropriate for women and therefore hindered the success of interventions, which points to the essential need to take these issues into account when designing interventions intended to benefit women. Furthermore, the authors point out that programs that challenge cultural norms regarding the role of women too aggressively can lead to backlash and program failure. Finally, the authors point to the need for more rigorous evaluation of programs in the future.

2009

- Iannotti, L., Cunningham, K., & Ruel, M. (2009). Improving diet quality and micronutrient nutrition: Homestead food production in Bangladesh. Washington, DC: IFPRI.

The authors describe a home gardening program, the Homestead Food Production (HFP) program, begun by Helen Keller International (HKI) in Bangladesh in 1988. According to the authors, the program, “promotes an integrated package of home gardening, small livestock production and nutrition education with the aim of increasing household production, availability, and consumption of micronutrient-rich foods and improving the health and nutritional status of women and children.” To analyze the impacts of the HFP program, the authors rely on results from nine previous studies of the program, only two of which used control groups for comparison. The authors’ analysis reveals that the program has been successful on many fronts, including the increased consumption of micronutrient-rich foods amongst participants and the empowerment of women. The authors show the percentages of women with final decision-making power on a range of issues, either independently or in consultation with their husbands. The categories of decisions considered are household land use, group meeting participation, making purchases of small and large household goods, daily workload, and vegetable consumption. For each category, decision-making grew more for women in the HFP program than for women in the control group when comparing results from before and after the intervention.

(Note that this paper is also included in the FTF Learning Agenda Annotated Bibliography on Nutrition, with added emphasis on gender here.)

2008

- Beaman, L. A., Chattopadhyay, R., Duflo, E., Pande, R., & Topalova, P. (2008). Powerful women: does exposure reduce bias? (No. w14198). Cambridge, MA: National Bureau of Economic Research.

Beaman et al. examine the question of whether voters’ exposure or lack thereof to female politicians affects their stereotypes of women’s abilities to serve as effective politicians and therefore their willingness to vote for female candidates. The authors use data from West Bengal, India where an affirmative action program required that one third of village council seats be reserved for women. The authors collected quantitative and qualitative data regarding the provision of public goods from 495 villages, conducted household and individual surveys, and applied the Implicit Association Test (IAT) in 15 randomly selected households from each of these villages. They found that the exposure to female political leaders led to improved attitudes regarding women’s effectiveness in political

positions. This is despite the results that showed that voters still stated a general feeling of preference for male politicians, suggesting that preferences for male leaders are deep-rooted. They also report that, “*In the recently concluded village council elections in May 2008, almost twice as many women stood for election and won unreserved councillor positions in councils where the chief councillor position had been reserved for women in the previous two elections, compared to villages which had either never been reserved or reserved only once.*” Overall, this suggests that increased leadership opportunities for women can lead to increased leadership roles for women in the community.

Goldstein, M., & Udry, C. (2008). The profits of power: Land rights and agricultural investment in Ghana. *Journal of Political Economy*, 116(6), 981-1022.

The authors consider the connection between the security of land tenure and investments in and productivity of land in Ghana. They state that the most important investment in the productivity of land in West Africa is land fallowing; claims to land are complex and contentious; and extended fallowing can weaken one’s claim to land. Thus, they explore the extent to which an individual’s position of power affects their claim to the land and hence their decision to fallow. Data are from surveys of married couples in Akwapin South District of the Eastern Region of Ghana. From each of four village clusters, 60 couples were selected and interviews were conducted with each spouse on 15 occasions over a 2-year period. This was supplemented by GPS data, data on soil fertility, and a one-time in-depth questionnaire. The authors’ econometric analysis shows that, “insecure land tenure in Ghana is associated with greatly reduced investment in land fertility. Individuals who are not central to the networks of social and political power that permeate these villages are much more likely to have their land expropriated while it is fallow.” Furthermore they find that women have less secure land tenure than men, and correspondingly fallow land for less time, and have lower productivity.

Kaaria, S., Njuki, J., Abenakyo, A., Delve, R., Sanginga, P. (2008) Assessment of the enabling rural innovation (ERI) approach: Case studies from Malawi and Uganda. *Natural Resources Forum*, 32 (1) (2008), pp. 53–63.

The authors seek to understand the effects of the Enabling Rural Innovation (ERI) project in Uganda and Malawi, led by the International Centre for Tropical Agriculture (CIAT). One of the research questions investigated by the authors is how the program affects women’s empowerment, decision-making, and control of income. The authors state that the ERI “integrates specific strategies to encourage and promote participation by the poor and women in markets, and builds their capacity to effectively engage in markets in a more sustainable manner.” In Uganda, a group of potato farmers participated in a value chain analysis and through the ERI project developed a business relationship with the fast food

restaurant Nandos located in Kampala. In the Katundulu Village in Malawi, a group of 35 farming households identified bean production and pig-raising as the most marketable activities. Finally, a project involving 75 households in Chinseu Village, Malawi, selected beans and groundnuts as the focus crops and developed marketing and farming techniques to improve the productivity and profitability of farmers. Surveys were conducted in at least 50% of households in each project village, and the sample was stratified normal. In the survey, respondents were asked about the current situation and to recall the circumstances three years prior. The authors found that in the village where pig farming was emphasized, men retained 100% of the income. In the other two villages, the authors found that an increased percentage of household decisions were made jointly by men and women, compared to three years prior when a higher percentage of decisions were made by men alone. The authors also find that women's increase in farming capabilities was not as substantial as men's increase in capabilities and that women were not able to negotiate for favorable prices of potatoes as well as men.

Lastarria-Cornhiel, S. (2008). *Feminization of Agriculture: Trends and Driving Forces. Rimisp-Latin American Center for Rural Development Working Paper Series.*

Lastarria-Cornhiel provides a review of the literature regarding the increasing labor contribution of women to agriculture in recent decades, which has been termed the 'feminization' of agriculture. The author states that the objective of the paper is to: "describe how women have increased their labor in two types of agricultural production—smallholder production and agro-export agriculture—and the economic and socio-cultural forces that are driving this trend." The author focuses on Latin America and Africa and finds evidence in the literature that women have increased their labor contributions to both agricultural wage labor and smallholder production in both regions. The growth of non-traditional agricultural exports including flowers, fruits, and vegetables, has been an important trend in the wage labor market, and the author reports that numerous studies show that women tend to dominate these markets, which mainly feature temporary positions. The type of work varies for men and women, whereby women tend to work in the fields and do low-skilled, labor-intensive work and men tend to do work that requires strength and involves heavier machinery. The author finds some evidence in the literature that women have taken on an increasing share of smallholder agriculture, both for food crops and cash crops, because men are leaving agricultural work to migrate or seek other employment, however the author points out that the data are insufficient to draw broad conclusions on this point. The author also cites evidence regarding unpaid domestic work that suggests that men do not take over unpaid domestic work even as women increase their agricultural employment.

Leroy, J. L., M. Ruel, E. Verhofstadt, and D. Olney. (2008). *The Micronutrient Impact of Multisectoral Programmes Focusing on Nutrition.* Washington, DC: National

Institute of Public Health (INSP) and International Food Policy Research Institute.

Leroy et al. examine the evidence of the impact that conditional cash transfers (CCT), microcredit with education (MCE) programs, and agricultural interventions have on micronutrient status. They use a program theory framework, and consider how these programs affect the immediate determinants of micronutrient status (food and nutrient intake and child's health) as well as the underlying determinants (access to food, women's empowerment and maternal and childcare practices, and water sanitation and health services). Regarding agricultural interventions, the authors focus on home gardening projects (18 projects were identified) and animal production projects (10 projects identified). Also, the authors identified 9 projects that promoted a combination of home gardening and animal production. The authors identified four home gardening studies, three animal production studies, and two combined studies that reported on the pathway of women's income and/or control over income, some of which showed positive effects of the intervention on women's (control over) income. They also found a small number of studies that reported on how the interventions affected women's time. The following summarizes their conclusions from the limited evidence on women's time: "It could be that if there were any negative effects of increasing women's time demands for income-generating activities, they were offset by the increased income, and the income may even have been more beneficial than the time if adequate alternative childcare was available."

World Bank, Food and Agriculture Organization and International Fund for Agricultural Development (2008). *Gender and Agricultural Markets (Module 5)*. In *Gender in Agriculture Sourcebook*. Agriculture and Rural Development Series. Washington, DC: World Bank.

The report describes the challenges facing female farmers who move along the value chain from subsistence farming to commercialized cash crops. Specifically, the report states that, "Men may take over production and marketing—even of traditional 'women's crops'—when it becomes financially lucrative to do so." The steps for conducting a value chain analysis are described, along with an explanation of how to include gender-specific concerns throughout the process. Several examples are provided of value chain development projects that successfully integrated women into the chain and resulted in increased income for women. Also, the report summarizes examples of and important considerations for capacity development programs for women entrepreneurs.

2007

Allendorf, K. (2007). Do Women's Land Rights Promote Empowerment and Child Health in Nepal?. *World Development*, 35(11), 1975-1988.

The author considers the questions of whether giving land rights to women contributes to women's empowerment and whether women's land rights contribute to improvements in children's nutrition and health. The author considers the possibility that land rights can lead to improved children's health via an empowerment pathway. The author describes the context in Nepal where women play an active and growing role in agriculture but have limited land rights. The author utilizes data from the 2001 Nepal Demographic and Health Survey, which according to the author is a nationally representative, cross-sectional household survey. Other measures included in the study are empowerment, measured by women's survey responses as to whether they make four types of decisions alone or jointly, which is then translated into a score on an empowerment scale. There is also a dummy variable capturing whether women make at least one of the four types of decisions alone without input from her husband or other family members. The author uses a logistic regression and ordered logistic regression models to analyze the data. The author finds that after controlling for other socio-economic variables, land ownership is a significant predictor of empowerment, as are women's secondary education, women's cash employment, and women's place in the family structure. The author also finds that the children of women who own land are less likely to be underweight. To determine whether land ownership affects children's nutrition status via the pathway of women's empowerment, the author controls for women's empowerment and finds that this does not significantly change the effect of land ownership on the prevalence of underweight children. Thus the author concludes that land ownership affects children's nutrition through a more direct pathway, not via the empowerment pathway. A weakness of the study design, acknowledged by the author, is that the data only capture one point in time, therefore it is not possible to know whether land rights led to empowerment or if empowered women were more likely to own land.

Fonjong, L. N., & Athanasia, M. F. (2007). The fortunes and misfortunes of women rice producers in Ndop, Cameroon and the implications for gender roles. *Journal of International Women's Studies*, 8(4), 133-147.

The authors examine the effects of rice-growing on gender roles in Ndop, Cameroon, which is an area where rice cultivation has been promoted by a government-run parastatal organization since the 1960s. Women have played an increasing role in rice production since the early 1990s, when a national economic crisis forced them to seek additional income. In December 2003, cross-sectional data were collected from surveys of 100 randomly selected women from three villages in Ndop. Interviews were also conducted of a small number of women to supplement survey data. The authors report on the women's motivations for farming rice: "Apart from the need to earn wages and become financially independent as indicated by 58% of those surveyed, the women see rice production as a means of employment, given that 84% of them are not adequately educated for white-collar jobs, which in any case are not readily available." The authors also

report that as of 2003, women in Ndop provide 70% of the labor for rice farming, including wage labor for which they are hired outside of family-managed plots. Women are reported to manage plots (leased by the local governmental authority to women as well as men) but they have limited access to inputs, which increases the demand on their labor and decreases their productivity. Rice is both a cash crop and a food crop in Cameroon, and women report using the income from rice sales for various household needs including education, food, and healthcare for the family. The authors report that women's employment in rice production represents a major shift in women's traditional roles, which were limited to the home. Regarding women's childcare, household, and community responsibilities, the authors report qualitatively that women continue to shoulder these responsibilities alongside their work in rice production, creating an enormous burden for women. Overall, this study presents an important glimpse into the impact of commercialization on women's paid and unpaid work, however very limited quantitative results are provided by the authors.

Morrison, A., Raju, D., Sinha, N. (2007). *Gender Equality, Poverty and Economic Growth*. Washington, DC: World Bank.

The authors provide an extensive review of the literature on the relationship between women's empowerment and increased productivity and poverty reduction. In terms of microeconomic studies, the authors summarize studies that have looked at the effects of increased equality of women on children's well-being. They also review the literature on women's participation in land, labor, credit, and agricultural technology markets and the corresponding effects on women's productivity. They identify the available evidence regarding interventions to improve gender equality in land, labor, credit and agricultural technology markets and review whether these have been successful in increasing women's productivity. The authors conclude that, *"Ample evidence suggests that greater gender equality in resources such as education and access to employment can reduce the likelihood of a household being poor. Female labor force participation, in particular, has been shown to play a key role in cushioning households from the impact of macroeconomic shocks and keeping households from falling into poverty."* In terms of the macroeconomic relationship between women's equality and poverty, the authors find evidence that "developing countries with higher gender equality tend to have lower poverty rates," but point out that this does not establish causality. They also find that, "economic growth appears to be positively correlated with gender equality," although the statistical significance of the relationship depends on which indicators are used and the relationship is only a correlation. The authors conclude with recommendations for further microeconomic and macroeconomic research on women's equality, poverty, and growth.

Gentle, P. (2006). Improving the effectiveness of collective action: Sharing experiences from community forestry in Nepal. CAPRI Working Paper No. 54. CGIAR.

Gentle describes the importance of Community Forest User Groups (CFUGs) in Nepal for managing the nation's forests, the importance of forest resources to women, and the relatively low levels of participation and leadership of women in the CFUGs. The author examines the effectiveness of the SAMARPAN program (Strengthening the Role of Women and Civil Society in Democracy and Governance) in Nepal, which was funded by USAID and implemented by CARE between 2002 and 2005. The goals of the program were the following: "To contribute to strengthening governance at the local level through increased women's participation and increased advocacy capacity of civil society groups." The program included the training of facilitators, 47% of whom were women, who then provided training to individuals and groups at the community level. CFUGs were targeted by the SAMARPAN program, as well as other types of community groups. The program is driven by a Rights Based Approach (RBA) to development. The author presents a case study of six CFUGs that participated in the SAMARPAN program, selected based on criteria that included having at least one woman in a leadership role. The author's evaluation is based on focus groups and individual interviews, as well as review of program documentation. The author shows that the numbers of women in committee and leadership positions increased between 2002 and 2005, and provides details regarding the policies supported by women in positions of power in the six CFUGs described. The author finds that the participation of women in male-female CFUGs is more effective than when they are in female-only CFUGs. Finally, because of the experiences of some women who left their leadership positions and challenges faced by women who remained in these roles, the author concludes that the program was successful in enabling women to attain community leadership roles, but more capacity-building and empowerment would be necessary for their success in these positions. While the findings of this study are informative, a more rigorous, quantitative analysis of the program would help to more thoroughly evaluate its impact.

Talukder, A., Sapkota, G., Shrestha, S., de Pee, S., & Bloem, M. W. (2006). Homestead Food Production Program in Central and Far-western Nepal Increases Food and Nutrition Security: An Overview of Program Achievements. In Home Gardens in Nepal: Proceeding of a workshop on "Enhancing the contribution of home garden to on-farm management of plant genetic resources and to improve the livelihoods of Nepalese farmers: Lessons learned and policy implications", 6-7 August 2004, Pokhara, Nepal. LI-BIRD, Bioversity International and SDC. Local Initiatives for Biodiversity.

The authors describe and evaluate a homestead gardening program in Nepal operated by Helen Keller International. The objectives of the program were to, *"increase the production of and access to micronutrient-rich animal and plant*

foods for daily meals to meet the nutritional needs of the people; increase family income through the sale of products from both animal and plant sources; ensure better utilization of local resources through community channels; and empower women through an active participation at all levels of homestead food production and other income generating activities.” Evaluation is based on data from questionnaires administered in two rounds (March-June 2003 and July-October 2003) to 10% (n=300) of participating households that were randomly selected. The authors found that between the first and second rounds of monitoring, production of fruits and vegetables increased, as well as the income generated from the sales of these products. Furthermore, the authors found that the percentage of women responsible for keeping the money earned from the garden increased from 67% in the first round to 88% in the second round. Children’s consumption of fruits, vegetables, and eggs also increased between rounds one and two. A weakness of the study is that it does not include a control group for comparison. Also, while data on income from the garden is provided, overall household income is not evaluated and thus it is not possible to determine whether increased garden income came at the expense of income from other sources.

Tesoriero, F. (2006). Strengthening communities through women's self help groups in South India. *Community Development Journal*, 41(3), 321-333.

Tesoriero describes and evaluates women’s self-help groups (SHGs) and the civil society organizations (CSOs) that support them in South India, where oppression of women is often severe. The SHGs implement micro-credit schemes and provide a foundation of empowerment and capacity-building for their (female) participants. The author provides the following description: “*The general objectives of the SHG programme in India relate to social empowerment (equal status, participation in decision-making), economic empowerment (access to and control over resources, reduced vulnerability, and increase in income), and capacity building (increased skills, knowledge, self- and mutual help, and leadership roles) (TNCDW, 2000).*” The author focuses on the SHGs in KV Kuppam Block, or administrative area, where 362 SHGs operate and include 7,238 members. The evaluation is based on 18 SHGs, whereby one SHG was randomly selected from each of 18 sub-areas of the Block. Data were obtained from project documentation, interviews, questionnaires, and a focus group, and were mainly qualitative. The author reports that aside from the direct impacts of the microcredit scheme, the women who participate in the SHGs became active in their communities, successfully advocated for change when necessary, interacted with their local governing bodies, and even on some occasions successfully ran for office in the local governing body. By focusing on women’s empowerment rather than economic outcomes per se, the author views the program in terms of its ability to alleviate *capability poverty* as described by Amartya Sen, rather than *income poverty*. Also, while the author does not focus on whether the SHGs have led women to take on traditional leadership roles, the point is made that together the women are leading their communities in collective action.

2005

Agricultural Management, Marketing, and Finance Service (AGSF). 2005. "Gender Impacts of Small-Farm Commercialization on Household Resource Management and Livelihoods." AGSF Working Document. Rome, Italy: FAO.

The paper seeks to understand the effects of Small-Farm Commercialization (SFC) in Ghana on "gender roles and relationships, as well as on intrahousehold incomes and other livelihood indicators." The paper presents qualitative case studies from six villages that, according to the paper, provide nationally-representative examples of SFC in Ghana. The most commonly commercialized crops in the six villages were vegetables. There was also some degree of processing of crops that occurred but the extent of this was minimal. The paper reports that commercialization led to increased incomes for both men and women, and that for women this increased their status in the household and community. It is also reported that commercialization changed the intra-household division of labor, whereby profitable commercialization reduced women's time spent working on the farm because cash could be used to hire farm labor, whereas unprofitable SFC transitions forced women to work on the farms more. Because the paper does not provide rigorous, quantitative data or results, the findings must be interpreted with caution.

Bushamuka, V. N., de Pee, S., Talukder, A., Kiess, L., Panagides, D., Taher, A., & Bloem, M. (2005). Impact of a homestead gardening program on household food security and empowerment of women in Bangladesh. *Food & Nutrition Bulletin*, 26(1), 17-25.

The authors report on the Homestead Gardening Program begun in Bangladesh in 1993 by Helen Keller International to increase production and consumption of fruits and vegetables with the goal of improving the vitamin A status of participants. The aim of the study is to evaluate the success of the program in meeting its primary objectives, as well as in terms of its effects on household food security, the status of women, and women's income. The authors provide context on the status of women in Bangladesh, reporting that women are treated as and often consider themselves to be inferior to men and live largely secluded lives. Data were collected in Feb. and March of 2002, and were from household surveys of 720 active-participant households, 720 former-participant households (out of program for at least three years), and 720 control households. The authors found that a higher percentage of active and former participant households gardened compared to the control group; they also consumed more vegetables and fruits from homestead gardens than control households. Regarding women's empowerment, the authors evaluated women's responses to questions regarding whether they had full power, some power, or no power over decision-making in

the household in the following areas: participating in group meetings; deciding how to use household land; making small and large household purchases; deciding on type and quantity of vegetables to be consumed in the household; visiting stores or large markets; determining woman's daily workload; and visiting woman's parental home. The authors find that women in the active and former participant households increased their decision-making power in each of the categories more so than women in the control group. Women participants were also shown to generate income from gardening, which led to an increased perception on the part of the women that they were contributing to the economic well-being of the household.

Clisby, S. (2005). Gender mainstreaming or just more male-streaming?. *Gender & Development*, 13(2), 23-35.

Clisby describes the LPP – the People's Participation Law – implemented in Bolivia in 1994. The overarching goal of the LPP was to democratize municipal government in Bolivia in order to improve the quality of life of men and women. According to the author, the LPP “was written with an explicit intent to integrate gender awareness and gender equality into the political process.” Specifically, the law establishes that men and women are considered “eligible and equal participants” in community committees. The author identifies ways in which implementation of the LPP has benefited women, such as a program in 24 (out of 300) municipalities to “promote gender awareness in the planning processes.” Also, in the city of Cochabamba women occupy a significant portion of leadership positions, primarily as “Gender Secretaries.” However, the author also identifies structural barriers to women's ability to take full advantage of the law's potential. Women often lack the time to participate in the local governmental groups because of their triple roles – their productive income-generating roles; their reproductive roles caring for children and the household; and their roles in community organizations, which are largely unappreciated relative to men's political roles. Furthermore, the author points out that because of the way the law was written, women's pre-existing community organizations were *de facto* precluded from receiving official status, whereas the largely male-dominated community organizations were eligible for recognition under the law and thus further elevated in status. Although this has technically created opportunities for women to take on leadership roles, the author argues that the factors that affect women's participation in the political process must be more carefully considered in order for laws such as this to be effective.

Opare, S. (2005). Engaging women in community decision-making processes in rural Ghana: Problems and prospects. *Development in Practice*, 15(1), 90-99.

Opare reviews evidence from previous studies regarding the role of women in leadership positions in community-based organizations (CBOs) in rural Ghana,

and finds that women are disadvantaged relative to men both in the number of positions they hold and the level of power they have in the positions they do hold. The author argues that “this lack of an effective voice in community affairs constitutes a serious obstacle to women's socio-economic advancement.” The author describes several examples of efforts that have been made to rectify this situation by requiring that women occupy a minimum number of committee positions in CBOs, but finds that despite the fact that these quotas are typically met, women are often not given influential positions nor are they able to exercise meaningful power. One important explanation provided by the author is that women have less formal schooling than men, and thus are less likely to be literate, particularly in English. Other obstacles to women’s participation in CBOs include their onerous domestic responsibilities and lack of decision-making power relative to their husbands, especially in the predominant case of married women. The author concludes with recommendations to remedy the imbalance between women and men in leadership positions in the community in rural Ghana.

2004

Webb, P. and Block, S. (2004), Nutrition information and formal schooling as inputs to child nutrition, *Economic Development and Cultural Change*, 52(4).

Webb and Block examine the effects in Central Java, Indonesia of parental formal education and nutrition knowledge on children’s nutrition status. They address the following questions: “(1) *What are the child nutrition gains, in the short run and long run, of maternal schooling compared with maternal nutrition knowledge?* (2) *Are maternal schooling and paternal schooling substitutes for good child nutrition?* (3) *How do maternal education and nutrition knowledge affect the mother’s own nutritional status?*” Data are from Helen Keller International and consist of seven rounds of household surveys in Central Java, with each round covering 7,200 randomly selected household using a multi-stage cluster sampling design. In analyzing the effects on short-term nutritional status of children, the authors use a non-parametric analysis and find that nutrition status of children is significantly better for children of mothers with nutrition knowledge versus children of mothers without nutrition knowledge, even when controlling for household expenditure and mother’s formal education. On the contrary, mothers’ formal education does not have a significant effect on children’s short term nutritional status after controlling for nutrition knowledge and expenditures. However, for long-term nutrition status of children (height for age z scores), mothers’ formal schooling is a significant determinant and nutrition knowledge is not. Furthermore, for long-term nutrition status of children, father’s formal education provides an additional increase in addition to the effect of mother’s formal schooling. The parametric results confirm these findings.

2003

Datta, R. (2003). From Development to Empowerment: The Self-Employed Women's Association in India. *International Journal of Politics, Culture, and Society*, 16(3), 351-368.

Datta describes the history and components of the Self-Employed Women's Association (SEWA), which was founded in 1972 in the state of Gujarat, India. As the author describes, self-employed workers in India have few assets, are generally very poor, face little recognition for their work, and thus are unprotected by government policies such as those covering wages and working conditions. SEWA originally was founded as a trade union, and although it continues in that role, it has also taken on additional functions. SEWA helps women form cooperatives; it includes a bank where women deposit savings and can obtain loans; it includes a video technology program whereby women learn to use video for practical purposes; and it operates the SEWA Academy, which provides training and education to women in areas such as literacy. The author describes the success of the program not just in economic terms but in terms of women's empowerment and the subsequent effects on women as leaders and active participants in their communities: *"Moreover, women who are active in SEWA gain a new sense of empowerment that comes through active participation in decision-making and leadership. The skills they learn enable them to exude a sense of confidence in their families and communities as well. Men soon begin to respect them (personal interviews, July 1998). Women who assume leadership roles in SEWA prove to be more aware, compassionate, and able to meet the needs of their families and communities."*

Dolan, C. and Sorby, K. (2003). Gender and Employment in High-Value Agriculture Industries (Agriculture and Rural Development Working Paper 7). Washington DC: World Bank.

Dolan and Sorby describe the shift that has occurred in global agriculture towards high-value-added (HVA) exports, which has occurred in many developing countries and has included significant labor contributions from women. The authors seek to answer the following questions: *"First, what are the specific features of employment and labor market opportunities in high-value agricultural export industries? What patterns prevail and what conclusions can be drawn? Second, how does employment in these production chains influence the welfare of workers, both as wage earners and small-scale farmers? Third, what sort of policy instruments or programs might the World Bank develop to ensure that the employment in HVA contributes to gender equality without jeopardizing the levels of employment generated?"* They focus their analysis on the following five commodities: cut flowers, fresh fruits and vegetables, vanilla, and poultry. The authors provide case studies for each of these commodities, including overviews of the primary countries involved in the production of each crop. They also describe the nature of the workforce for HVA, including breakdowns by gender, age, marital status, education levels, assets/entitlements, and migration status.

They describe the nature of work in HVA, which largely includes “flexible” work such as contract, seasonal, or piecemeal jobs that women are more likely to accept than men. Overall, the authors conclude that while employment in high-value-added agricultural industries can benefit women by allowing them to earn income, increase their economic visibility, etc., there are costs that women bear such as the insecure working conditions, increased demands on their time, and poor workplace environments.

Duflo, Esther. (2003). Grandmothers and Granddaughters: Old Age Pension and Intra-Household Allocation in South Africa. *World Bank Economic Review* 17(1), 2003, pp. 1-25.

Duflo reviews the existing evidence regarding the effects of cash transfer programs on the well-being of children and considers in this study the questions of whether the gender of cash transfer program recipients matters and whether unconditional cash transfers can be effective. The author uses data from a national household survey conducted in South Africa in 1993 to evaluate the effect of the South African old-age pension program on children’s nutrition. Pension recipients include both men and women and are unconditional transfers, and the size of the pension represents a significant increase in recipients’ income. Because of extended household structures, more than one quarter of children under age 5 live with a recipient of the pension program. The author finds that receipt of the pension by women was associated with increases in weight-for-height and height-for-age for girls but not for boys. Also, the author finds that receipt of the pension by men did not affect weight-for-height or height-for-age for girls or boys living in the male recipient’s household. The author concludes that although the program may not be easily replicated, the finding that the transfer to women and not men improved girls’ nutrition status is important.

Hallman, K., Lewis, D., & Begum, S. (2003). An integrated economic and social analysis to assess the impact of vegetable and fishpond technologies on poverty in rural Bangladesh (No. 112). Washington, DC: IFPRI.

Hallman, Lewis and Begum analyze three projects in Bangladesh: an improved vegetable seed project targeting women, a fishpond technology project that reached men and women who have privately-owned fishponds, and another fishpond technology project that targeted women and involved group-run fishponds. The authors’ objective was to analyze the effects of the technology dissemination on both economic and social conditions of recipients. In their analysis of women’s empowerment, the authors focused on physical mobility, control over resources, domestic violence, and political knowledge and activity. Qualitative and quantitative data were from focus groups, interviews, household surveys, and census results, and allowed for comparison between villages where the technology was available (adopter and non-adopter households), as well as

similar villages that did not yet have access to the technology (including households likely to adopt the technology in the future and households unlikely to adopt). The authors found that the outcomes for women's empowerment were generally better amongst women in the adopting households than the non-adopting households, and the effects were most pronounced for the women involved in the vegetable technology project. The outcomes for dietary diversity and nutritional status also tended to be better for adopting households compared to non-adopting households, with some variation depending on the indicators and household members studied. The authors do not describe the pathways or mechanisms through which women's empowerment occurred – increased income, training, capacity building, etc.

Pitt, M., Khandker, S., Chowdhury, O., & Millimet, D. (2003). Credit programs for the poor and the health status of children in rural Bangladesh. *International Economic Review* 44:87-118.

Pitt et al. compare the effects of loans provided to poor women and men in Bangladesh on the health status of girls and boys. The loans were group-based microcredit-type loans from the Grameen Bank, Bangladesh Rural Advancement Committee, and Bangladesh Rural Development Board's Rural Development Program. Data are from household surveys conducted in 1991/1992 of 1,798 households, some of which were from targeted villages where households were given the option of participating in the program and some of which were "control" villages without the option of participation. The authors report the following results: "*After taking into account the endogeneity of individual participation in these credit programs and the placement of these credit programs across areas, we find that women's credit has a large and statistically significant impact on two of three measures of the health of both boy and girl children. Credit provided to men has no statistically significant impact and we are able to reject the null hypothesis of equal credit effects by gender of participant.*" The measures that are shown to increase are arm circumference of both girls and boys and height-for-age of both girls and boys. Thus, the increase in women's control over resources leads to positive results for children. However, the paper does not discuss the pathways through which these results are achieved.

Smith, L. C., Ramakrishnan, U., Ndiaye, A., Haddad, L., & Martorell, R. (2003). The Importance of Women's Status for Child Nutrition in Developing Countries. Research Report 131. Washington, DC: IFPRI.

The authors examine the role of women's social status in determining children's nutrition status in South Asia, Sub-Saharan Africa, and Latin America and the Caribbean. They examine the following questions: "*First, is women's status an important determinant of child nutritional status in the three study regions? Second, if so, what are the pathways through which it operates? And finally, why*

is South Asia's child malnutrition rate so much higher than Sub-Saharan Africa's?" The authors use data collected between 1990 and 1998 from the Demographic and Health Surveys (DHS) of 36 countries in the aforementioned regions. Two measurements of women's status are included in the study: women's relative decision-making power in households and the degree of equality between women and men in their communities. The authors' analysis of the data indicates that increased women's status has a positive, statistically significant effect on children's nutritional status in each of the regions studied. The authors also identify the pathways through which women's status affects children's nutrition in each region. Finally, they find that the "Asian Enigma" (the region's relatively high rates of malnutrition despite overall growth in the economy) is mostly explained by women's status, sanitation, and urbanization, with women's status as the strongest indicator.

2002

Paolisso, M. J., Hallman, K., Haddad, L., & Regmi, S. (2002). Does Cash Crop Adoption Detract from Child Care Provision? Evidence from Rural Nepal. *Economic Development and Cultural Change*, 50(2), 313-338.

The authors examine the effects on women and men's time allocation of the Vegetables and Fruit Cash Crop (VFC) program in the Rapti Zone of Nepal in the 1980s and 1990s. Men and women participated in the program and were encouraged to commercialize vegetable and fruit crops. Data were collected from 264 randomly selected households from 3 villages in the region. Repeated random-spot time allocation observations were conducted of household members over a 12 month period, as well as survey questionnaires, ethnographic techniques, and rapid rural appraisals. When using an instrumental variables regression, the authors find that for both head females and head males, VFC participation has a positive impact on time spent in vegetable and fruit production but this effect decreases as the number of preschoolers in the household increases. Also, men increased their time allocated to fruit and vegetable production more than women as a result of VFC participation. In households with one preschooler, VFC participation is found to decrease head female time spent on time caring for the child by 77 minutes in a 12-hour period, but VFC households with more than one preschooler see an increase in head female's time spent caring for the children. For head males, VFC participation is associated with a decrease in time spent caring for children in households with one or more preschoolers. Also for head males, VFC participation has a positive effect on leisure time, which increases as the number of preschoolers in the household increases. The authors conclude by suggesting that behavior change communication could attempt to reallocate men's leisure time in VFC households with one preschooler to time spent caring for the child to offset the reduced time that the head female spent on this important activity. Also, the authors point to the potential benefits of women's participation in income-generating economic activities.

Van Koppen, B. (2002). A gender performance indicator for irrigation: Concepts, tools and applications (Vol. 59). International Water Management Institute.

Van Koppen describes the need for a generic conceptual framework to describe how irrigation schemes affect the status and success of women and men in farming, including how irrigation agencies themselves influence the situation. The author also explains the importance of understanding whether women in the targeted group are decision-makers with control over the farm or whether their role is that of a laborer on the farm. Finally, Van Koppen explains that the goal of including gender analysis in irrigation schemes is the following: “irrigation agencies need to reach women farm decision-makers, through irrigation institutions, on an equal basis as men farm decision-makers.” To apply and test these concepts, the International Water Management Institute (IWMI) established the Gender Performance Indicator for Irrigation (GPII). Gender performance is considered to be good if women farm decision-makers have access to irrigation and are included in irrigation institutions to the same extent as men. The author then summarizes the findings from application of the GPII in nine irrigation schemes in Burkina Faso, South Africa, India Nepal, and Sri Lanka. The analysis reveals that land titles do not always accurately capture whether men or women are farm decision-makers; in female and dual (joint men and women) farming systems, inclusion of women in irrigation institutions is necessary; and in male-dominated farming systems, overarching gender issues must be addressed, including to the extent possible by irrigation agencies. The author concludes that gender *must* be addressed in irrigation schemes and shows examples where this has been done successfully.

2001

Doss, C. R. (2001). Designing agricultural technology for African women farmers: Lessons from 25 years of experience. *World Development*, 29(12), 2075-2092.

The author draws from the literature to discuss how gender affects women's decisions to adopt agricultural technology, and how technology adoption affects gender relations, in Africa. Regarding labor, the author states that technology which reduces demands on women's time and increases women's control over their labor are most beneficial to women, but that the effects of technology on women's labor are complex and difficult to predict. Regarding access to land, the author reports that past research has shown that women's plots tend to be smaller, and may be less fertile and further from the home. An important issue to consider is whether women have legal title to land and if so, how secure their claim to the land is, as these factors affect the likelihood of adopting new technologies. Also, technology adoption can affect women's land tenure. The author concludes that before introducing technology that improves the productivity of their land, it is important to ensure that women have secure access to the land. Women may be at

a disadvantage when it comes to access to inputs such as fertilizer, if access to cash, credit, or political influence determine who is able to access fertilizer. A related issue presented by the author is access to information and agricultural extension, which may be another area where women are at a disadvantage. The author considers how different models of intrahousehold decision-making might affect technology adoption, and how changing economic circumstances may alter the decision-making dynamics of the household. In sum, the author concludes that, “agricultural technologies will have very different impacts depending on men’s and women’s access to land, labor, and inputs.” Finally, the author emphasizes the importance of considering the complex and dynamic nature of gender in agricultural interventions; the importance of including local men and women in the development of interventions in order to understand how gender relations will be affected by the intervention; and the importance of collecting baseline data on intrahousehold dynamics.

Doss, C. R., & Morris, M. L. (2001). How does gender affect the adoption of agricultural innovations?: The case of improved maize technology in Ghana. *Agricultural Economics*, 25(1), 27-39.

Doss and Morris describe the importance of agricultural technology adoption, and seek to evaluate in this paper whether gender of the farmer and/or gender of the household head help to explain technology adoption, and whether differences in technology adoption between men and women are due to differing access to complementary inputs. The maize production technologies of interest in the paper are modern varieties (MVs) and chemical fertilizer, both of which were developed and promoted by the Ghana Grains Development Project (GGDP). The authors use data from a survey of maize farmers conducted between November 1997 and March 1998, selected using a three-stage clustered, randomized process. Women were shown to adopt both the MVs and chemical fertilizer at lower rates than men, however results from the authors’ models show that the gender of the farmer is not a statistically significant explanatory variable once other variables are taken into account. However, when the authors included the gender of the household head in the model, they found that female farmers in male-headed households were more likely to use the MVs than female farmers in female-headed households. Yet for adoption of fertilizer, gender of the household head is shown to not have a significant effect. When evaluating the relationships between gender and other factors that affect technology adoption, the authors find that, “On the whole, these findings suggest that male and female maize farmers in Ghana do not enjoy equal access to land, education, and agricultural extension services. The data are less conclusive regarding the availability of and access to labor, especially male labor within the household.” In sum, the authors conclude that men and women adopted the technologies at different rates, but gender per se is not the important determining factor, but rather access to resources is important and should be considered in the development of interventions.

King, E., & Mason, A. D. (2001). *Engendering development: Through gender equality in rights, resources, and voice*. Policy Research Report, Washington, DC: World Bank Publications.

The authors provide an extensive examination of the relationships between gender, poverty, and development by examining the existing literature and analyzing household, country-level, and cross-country statistics. While their focus is on the developing world, they also draw upon the experience of industrialized countries when relevant. They describe progress that has been made in reducing gender disparities, but show that women and girls still face “systematic disadvantages in rights, resources, and voice in almost all parts of the developing world.” They summarize the evidence regarding how gender inequality affects the well-being of men, women, and children, in terms of health, nutrition status, and children’s education, as well as other indicators. They also describe how the inequality of women decreases productivity at the microeconomic level through the misallocation of resources. They describe the evidence linking gender inequality to reduced macroeconomic growth, much of which has focused on inequality in education and the subsequent costs to growth. The authors provide explanations for what perpetuates gender disparities at the household, cultural, and national levels. Finally, they conclude with recommendations for addressing gender inequality.

2000

Mulokozi, G., Mselle, L., Mgoba, C., Mugyabuso, J. K. L., & Ndossi, G. D. (2000). *Improved solar drying of vitamin A-rich foods by women's groups in the Singida District of Tanzania (Vol. 5)*. International Center for Research on Women.

The authors describe a project implemented in Tanzania by the Tanzania Food Nutrition Centre (TFNC) from 1995-1998 to promote the use of home-based solar dryers to increase the vitamin A content of foods, increase children’s consumption of vitamin A-rich foods, and increase women’s income by promoting marketing of dried vitamin A-rich foods. The dryers are used instead of traditional sun drying, which is relatively time-consuming for women. Women are traditionally responsible for food preparation, thus the dryers fit into women’s roles. The intervention consisted of the introduction of dryers that fit women’s needs and preferences, nutrition education, and business management training. Evaluation of the project was based on data from pre- and post-intervention surveys conducted in randomly-selected participant and control villages. Intervention villages had previously participated in a horticulture project that promoted production of fruits and vegetables. The authors found that there was a slow but steady adoption of solar dryers amongst women in the intervention villages; adopters did dry more dark leafy green vegetables than they had previously with sun drying; adopters’ children did not increase their consumption of dried leafy

green vegetables, but did increase consumption of vitamin A-rich sardines, presumably because of the nutrition education component. Women did report that the dryers were time saving for them because drying was faster and they did not need to continuously monitor the produce while it dried as they did with traditional sun drying. The authors do not report further results regarding how women allocated this time or whether this was an empowering change for them. Finally, the authors report that the intervention did not have a significant effect on women's income.

Smith, L. C., & Haddad, L. J. (2000). Explaining child malnutrition in developing countries: A cross-country analysis (Vol. 111). Washington, DC: IFPRI.

The authors describe the reduction in the prevalence of child malnutrition that occurred between 1970 and 1995 in the developing world, including the variations between regions. The goal of the paper is to understand why some regions had more success than others in reducing child malnutrition during that period, and subsequently to understand what determinants are most important for reducing malnutrition. The authors use national data on children's anthropometric indicators of nutrition from 63 developing countries between 1970-1996, primarily from the 1997 *WHO Global Data base on Child Growth and Malnutrition*. The authors evaluation of the causes of children's malnutrition utilizes UNICEF's conceptual framework, which includes the immediate determinants (dietary intake and health status), the underlying determinants (food security, care for mothers and children, and the quality of the health environment), and the basic determinants (economic resources and the political environment). Women's education and women's status are explanatory variables used to represent food security as well as care. The authors' cross-country regression analysis reveals the following: *"Of the explanatory variables that represent the underlying determinants, women's education is found to have the strongest impact on child mal nutrition. It is followed closely in strength of impact by per capita food availability. As the amount of food available per person increases, however, its power to reduce child malnutrition weakens. Women's status relative to men's and the quality of a country's health environment also strongly affect child mal nutrition.... Together, improvements in women's education and status alone were responsible for more than 50 percent of the reduction in child malnutrition that took place from 1970 to 1995."*

Pre-2000

Tangka, F., Ouma, E. A., & Staal, S. J. (1999). Women and the sustainable development of market-oriented dairying: evidence from the highlands of East Africa. International Sustainable Development Research Conference; 1999 Mar 25–6; Leeds, UK. University of Leeds.

The authors examine the effects of market-oriented smallholder dairying (MOSD) in Kenya and Ethiopia. MOSD entails an intensification of small-holder dairy operations including use of cross-bred cows, and has been shown to increase household milk production and income levels. In Ethiopia, the authors collected data in 1996 from 120 households outside of Addis Ababa, including households that were given cross-bred cows to be repaid as part of the MOSD project and households with locally-bred cows that were not part of the intervention. The data from Ethiopia show that women's labor contribution to dairying was small and did not differ much between households with cross-bred and locally-bred cows. Men's and women's income increased as a result of the dairy intervention, but men's income increased more substantially. Also, men's purchases of food increased more than women's purchases of food, which the authors suggest indicates that women do not control dairy income. In Kenya, data were from a survey also conducted in 1996 of 365 households outside of Nairobi, 260 of which were engaged in dairying and had cross-bred cows, but not because of a program intervention. The data from Kenya were supplemented with data from a larger survey in Kenya conducted in 1998. The authors found that in Kenya, women supplied the majority of the labor for small-holder dairying operations; male and female-headed households did not show significant differences in income from dairying; and that women exercise significant control over dairy income, even in male-headed households. The Kenyan example suggests that by acknowledging the traditional gender allocation of labor, i.e. women's predominant role in dairying, MOSD can benefit women. The authors conclude that, "The hypothesis that market-orientation of smallholders will result in women losing control over income to men is not supported by data from MOSD in the East African Highlands." While this conclusion is promising, the authors do not account for other variables that may explain their data or provide the statistical significance of their results, which calls into question the rigor of the evaluation.

Thomas, D. (1990). Intrahousehold Resource Allocation: An Inferential Approach. *Journal of Human Resources* 25: 635-64.

Thomas challenged the model of intrahousehold resource allocation which suggested that resources were pooled within the household and maintained that the household could essentially be treated as an individual. The author states the objective of the paper: "We shall attempt to infer how resources are allocated by focusing on a series of outcomes of household resource allocations: in particular, nutrient intake, child health, survival, and fertility." The data are from surveys of nearly 55,000 nationally representative households conducted in Brazil in 1974/1975. The author finds that "the equality of parental income effects is rejected. Unearned income in the hands of a mother has a bigger effect on her family's health than income under the control of a father; for child survival probabilities the effect is almost twenty times bigger." This includes more resources directed towards household nutrition by the mother than the father. Thus, if we consider control of income/resources as a form of women's

empowerment, we can see that income in the hands of women can lead to reduction of “hidden hunger” for children.

- Von Braun, J., Puetz, D., & Webb, P. (1989). Irrigation technology and commercialization of rice in The Gambia, effects on income and nutrition (Vol. 75). Washington, DC: IFPRI.

The authors analyzed the effects of a project that promoted pump irrigation of rice fields in rural areas of The Gambia. The project included the participation of approximately 7,500 households, and data were gathered from surveys of 900 households including participants and non-participants selected by two-stage random sampling. The authors’ analysis of the data indicates that farmer households in the intervention group had higher rice production levels than did households in the control group. The authors also found that households with access to pump irrigation had a lower prevalence of calorie deficiency in the wet (hungry) season than non-participants. However, in the dry season, participant households were more likely to face calorie deficiencies than non-participants, which the authors noted was a topic for further research. The project attempted to direct more control of irrigated land to women by giving women land titles, however the authors found that women controlled land fed by rainwater and partial irrigation rather than the pump irrigated land. Analysis of the factors influencing nutrition show that the positive effects on nutrition are through the income-consumption pathway, which was shown to have substantially improved nutrition of children in the intervention group (measured with anthropometrics). Access to the irrigated rice land was also associated with reduced weight loss amongst mothers in the wet season relative to the control.

(Note that this paper is also included in the FTF Learning Agenda Annotated Bibliography on Nutrition.)