

# innovATE

Innovation for Agricultural Training and Education



---

## Preliminary Study: Gender, Higher Education and AET

Laura Zselezcky, Emily Van Houweling, Maria Elisa Christie,

Virginia Tech

September 17, 2013

---

PENNSSTATE



## **1. Introduction**

Agriculture education and training (AET) is important to increase human capital in agriculture, promote knowledge, raise agricultural productivity, and realize the potential of women in agriculture. This paper focuses on gender in higher education agricultural training programs. Female farmers play a vital role in agriculture around the world, yet they are poorly represented in agricultural programs in higher education. The objectives of the paper are to review global and regional gender data on AET in higher education, outline the major gender issues in AET, and initiate a discussion of good practices for addressing gender disparities in AET higher education programs.

Following this introduction, Section 2 presents the background material and summarizes some of the global issues related to gender, higher education, and AET. Section 3 takes a regional look at these issues. Section 4 presents a case study of AET in three universities in Bangladesh and Cambodia to bring to life the experiences of women in AET programs. The paper concludes with a summary of good practices.

## **2. Background and global issues**

In order to strengthen the institutions that train and educate agricultural professionals, gender disparities in education must be addressed. Institutions need to work together to ensure that men and women have equal opportunities to pursue their goals. This requires going beyond parity, or merely numerical balance among men and women students and professionals, to a more complex concept of equality in which young men and women have equal access to schooling and opportunities, and curricula and approaches to teaching are not gender-biased (Aikman, Halai & Rubagiza, 2011; UNESCO, 2004).

According to the United Nations Educational, Scientific and Cultural Organization's (UNESCO) Education For All program, the share of women in tertiary education increased from 46 percent to 46.8 percent globally from 1990 to 1997 (UNESCO, 2004). In developing countries, women's enrollment at this level increased by 6.2 million. Despite this increase, the majority of developing countries have gross enrollment ratios (GER)<sup>1</sup> at the tertiary level below 30 percent and nearly two-thirds of these countries have GERs below 15 percent.

In more than half of the countries, female tertiary students outnumber male students (UNESCO, 2004). However these rates vary by region, with much fewer women enrolled in tertiary education in Sub-Saharan Africa and Asia, a wide variation among Arab States, and higher rates of female enrollment in Latin America and the Caribbean, North America, and Europe. In terms of increasing the percentage of female students, the priority countries are nearly all in Africa and South and West Asia. Within advanced research programs, women represent a clear minority of students in most countries, with the exception of about half of the countries in Latin America, the Caribbean and Central Asia.

---

<sup>1</sup> Gross enrollment ration is a statistical measure used by the UN in the education sector. It is calculated by dividing the number of individuals who are actually enrolled in schools by the number of children who are of the corresponding school enrollment age.

When examining the distribution of female students by field of study, the majority are enrolled in education, health and welfare, and humanities and arts. Female participation is lowest in the fields of engineering, manufacturing, and construction as well as science and agriculture. On average, women make up less than 40% of students enrolled in tertiary agricultural science programs, and in many countries in Asia and Africa this percentage below 25 (UNESCO, 2004; UNESCO 2012). Since the 1980s women's participation in all fields has increased with the exception of education and agriculture in Africa.

Although there have been major international policy developments promoting gender equity<sup>2</sup> and gender is explicitly addressed in the national policies of many countries, women continue to experience a range of discriminatory practices. As Morley (2006) found in five countries (Nigeria, South Africa, Sri Lanka, Tanzania, and Uganda) these discriminatory practices feature “the exclusion of women from career development opportunities, gender-insensitive pedagogical processes, prejudice about women's academic abilities and intellectual authority, poor equality policy implementation and backlash and stigmatization in relation to affirmative action programs” (p.543) Many of these practices are not visible and unrecognized due to the covert and intangible nature of much of this discrimination (Morley, 2006). Another issue in programs that train agricultural extension workers is the lack of attention to the roles women play in agricultural production and rural development (Van Crowder, 1997).

A review of gender issues in agricultural education and extension conducted by the Food and Agriculture Organization of the United Nations (FAO) found that major constraints to women participating in AET programs include: lack of time due to household responsibilities, cultural norms that value education for boys over girls, and cycles of poverty in which families keep their daughters home to work or marry them early, leading to future generations plagued by early marriages and illiteracy (Van Crowder, 1997). This study also found that those countries with high literacy rates and enrollment in primary and secondary education also had the highest levels of female enrollment in higher education in agriculture. For example, in the Philippines, 46 percent of young women complete secondary school and 52 percent of students in tertiary agriculture programs are women. Conversely, only 25 percent of students enrolled in secondary school in Nigeria are female and less than 25 percent in agricultural programs are women (Van Crowder, 1997).

At the professional level, women only comprise about 20 percent of agricultural researchers in developing countries<sup>3</sup> (Beintema, 2006). These female researchers consistently hold lower degree qualifications than male researchers. While the numbers are nearly equal at the Masters level, 23 percent of women scientists hold PhD degrees compared to 35 percent of men. Women face a range of constraints in their professional environments. These include: exclusionary networks that make it difficult for women to access research teams or grants and funding; male-dominated review and promotion committees with bias that may prevent women from winning funding or receiving objective reviews; lack of networks of female peers and role models; and difficulties maintaining a work-life balance when prevailing norms

---

<sup>2</sup> CEDAW (the Convention on the Elimination of All Forms of Discrimination against Women, 1979) (UN DAW, 2006), and the Beijing Platform for Action (1995).

<sup>3</sup> Based on a dataset of 67 countries. See Beintema (2006) for a complete explanation of the sample.

burden women with double responsibilities for work and caring for the family (Meinzen-Dick et al. 2011).

Increasing the number of women in tertiary agricultural programs as students, faculty, and high level administrators will improve the representation of women in important policy debates and decision-making processes (Meinzen-Dick et al., 2011), and will increase the number of role models to encourage future generations of girls to pursue AET (Van Crowder et al., 1998). Gender-sensitive policies are also necessary to go beyond increasing the number of women in AET programs and professions to create supportive environments that account for different needs and time constraints of women (Meinzen-Dick et al., 2011; Van Crowder et al., 1998). If women are not engaging in agriculture research at the same level as their male peers, there will likely be less attention paid to the issues that women farmers face in agriculture.

Although these issues relate specifically to women, men play a key role in reducing gender disparities and changing the culture of institutions. Programs like African Women in Agricultural Research and Development (AWARD) have found that involving senior male AET professionals as mentors for women who received fellowships increased men's appreciation for the constraints that women face in AET institutions (Meinzen-Dick et al., 2011).

### **3. Region-specific gender issues in AET and higher education**

Gender issues in AET and higher education vary significantly across countries. The next section discusses some of the broad regional trends. There is little data specifically focused on AET in most regions, except for sub-Saharan Africa. When data on AET is not available a general picture of the gender issues in higher education is presented for the region. In general, female students outnumber male students in tertiary education in all regions except South and West Asia and Sub-Saharan Africa (UNESCO, 2012).

#### *Latin America and the Caribbean*

In Latin America and the Caribbean, overall enrollment rates in tertiary education increased by about five million students from 1999 to 2005 (UNESCO, 2008d). However, gender disparities become more pronounced at higher levels of education; while approximately 90 percent of countries achieved gender parity at the primary level, only 46 percent had done so for secondary education and only Mexico and Peru had reached gender parity at the tertiary level by 2005 (UNESCO, 2008d). Unlike regions such as Sub-Saharan Africa or South Asia, gender disparities in Latin America and the Caribbean at the tertiary level are actually the result of higher numbers of female students enrolled than male students. However, women are still consistently enrolled in fields traditionally considered "feminine", such as the humanities, social sciences, and health, while less than a third of female students are enrolled in the sciences (UNESCO, 2008d). Another trend is that female students are poorly represented in advanced degree programs. For example, in the Faculty of Agriculture Department at the University of the West Indies, female undergraduates outnumber male undergraduates, but females make up only a quarter of PhD students (Karl, 1998).

## *Sub-Saharan Africa*

While data on gender and AET is lacking for many regions of the world, a significant number of studies and reviews have been conducted on this topic in Sub-Saharan Africa. As of 2008, there were approximately 200 public universities in Africa and nearly one hundred programs in agriculture and natural resources management (Johanson, Saint, Ragasa & Pehu, 2008). A review of AET institutions in Africa by the World Bank revealed: curricula often fail to address topics such as nutrition or hygiene that are particularly important to women farmers; there are few gender-specific career tracks for women students; and many of these institutions lack adequate facilities for women to live and to ensure their safety (Johanson, et al., 2008).

According to UNESCO (2008g), 3.5 million students were enrolled in tertiary education in Africa in 2005, an increase of 66 percent since 1999. Despite this increase, only five percent of the eligible age group are enrolled and less than one percent of eligible students are enrolled in countries such as Angola, Mali, and Niger. Only three percent of countries with available data had reached gender parity in tertiary education by 2005 and the average ratio of female to male enrollment at this level decreased from 0.68 in 1999 to 0.62 in 2006. These ratios worsened significantly in the Congo, the Gambia, Lesotho, and Nigeria, though they improved in Burkina Faso, Ethiopia, Malawi, and Tanzania.

Gender disparities are particularly marked in the agricultural sciences, where about a third of the students enrolled are female. In the Eastern, Central, and Southern Africa regions, the disparity is even more pronounced at the postgraduate level where only about 16 percent of the graduate students are women (Mangheni et al., 2010 p.7). Female students are concentrated in the humanities, social sciences, and health, with less than one third enrolled in science fields. Agriculture is perceived to be a masculine discipline, and women are not believed to have the physical, mental and social capabilities to succeed (Mangheni et al., 2010 p.14). Women in Sub Saharan Africa are especially affected by negative perceptions of agriculture and social criticisms about why they would want to choose a career track that takes them out of their reproductive roles. Additionally, negative bias was found in teacher attitudes toward female students as well as in textbooks in curricula (UNESCO 2008g, Mangheni et al., 2010). Another factor that limits women's participation in higher education, and AET in particular, is sexual harassment, and a fear of traveling far from home to take part in extension projects (Mangheni et al., 2010).

The Agriculture Science and Technology Indicators (ASTI) initiative produced one of the most extensive studies of gender-disaggregated capacity indicators in AET institutions in Sub-Saharan Africa (Beintema & Di Marcantonio, 2010). Data was collected from 125 agricultural research and higher education institutions in 15 countries. A synthesis of this data revealed that the gender gap among professionals in agricultural research and higher education is closing, with women accounting for nearly half of the capacity increase in agencies and institutions from 2000/01 to 2007/08. In 2007/08, however, 10 percent more of the men sampled held Ph.D. degrees than women. In general, more than 60 percent of the increase in staff in agricultural research and higher education institutions has been limited to staff, both men and women, with Bachelor's degrees rather than advanced degrees. Women's participation in these institutions varied by country, with the lowest rates in Ethiopia (6 percent), Togo (9 percent), Niger (10 percent), and Burkina Faso (12 percent) and the highest rates in South Africa (32 percent), Mozambique

(35 percent), and Botswana (41 percent). The proportion of female students pursuing higher education in agriculture is higher than that of female professionals in these institutions, though the vast majority of these students (83 percent) are only enrolled in Bachelor's-level programs. Perhaps one of the greatest disparities identified through this study is that only 14 percent of individuals in management positions are women, and are thus inadequately represented in high-level decision-making positions. Other trends include the lower average age of female staff compared to men, and the concentration of women in fields that are related to life and social sciences rather than more technical, "hard science" fields.

#### *Middle East and North Africa*

According to UNESCO (2008a), enrollment in tertiary education in the Arab States increased 31 percent from 1999 to 2005, though only 21 percent of the eligible age group is enrolled at this level. Rates vary by country, with more than half the population enrolled in higher education in Lebanon and Libya but fewer than one in 10 enrolled in Djibouti, Mauritania, and Yemen. There are significant gender disparities at the tertiary education level and no countries had achieved gender parity by 2005. However, like Latin America and the Caribbean, 12 out of 17 countries have gender disparities due to higher numbers of women than men enrolled in tertiary education. Mauritania and Yemen represent the opposite extreme, with a ration of female to male students at 0.40. Women are poorly represented at the professional level in tertiary education, and only one third of teachers at this level are female.

#### *Central and Eastern Europe and Central Asia*

On average, enrollment in tertiary education in Central and Eastern Europe and Central Asia has increased tremendously from 1999 to 2005 (UNESCO, 2008b). The number of students enrolled in higher education in Central and Eastern Europe grew by 50 percent during this time period and by 61 percent in Central Asia. However, enrollment rates vary significantly by country in these two regions, with rates above 70 percent in Latvia, Lithuania, Russia, and Slovenia, and rates less than 20 percent in Albania, Azerbaijan, Tajikistan, and Uzbekistan. As with most regions, gender disparities are more pronounced at the higher levels of education and, like Latin America and the Caribbean and the Arab States, these two regions generally have more women enrolled in tertiary education than men. A few countries do have marked disparities in the opposite direction; in Tajikistan the ratio of female to male enrollment is only 0.35, and Turkey and Uzbekistan have ratios of 0.74 and 0.80, respectively.

#### *Asia and the Pacific*

Enrollment rates for tertiary education in East Asia nearly doubled between 1999 and 2005, though much of this increase can be attributed to China, and only 23 percent of the eligible age group is enrolled (up from 13 percent in 1999) (UNESCO, 2008c). Less than one in ten eligible young people are enrolled in tertiary education in Cambodia and the Lao People's Democratic Republic, as compared to 61 percent in China and 91 percent in the Republic of Korea. In most of the region's countries more men are enrolled in tertiary education than women. In Cambodia, for example, the ratio of female to male enrollment is 0.46. However, gender disparities in the opposite direction, with more women enrolled than men, exist in Brunei Darussalam, Malaysia, and the Philippines. Women are concentrated in traditionally 'feminine'

fields, and account for less than one-third of science students in most countries. In the University of the Philippines although more than half of the research projects were conducted by women, they carried out research in fields considered appropriate for women, such as socio-economics and arts (Karl, 1998). Additionally, UNESCO found evidence of consistent gender bias in textbooks at all education levels.

In Pacific countries, an increase of 24 percent in total enrollment in tertiary education from 1999 to 2005 is primarily attributable to increases in Australia and New Zealand (UNESCO, 2008e). In contrast, Fiji, the Marshall Islands, Tonga, and Vanuatu still have enrollment rates less than 20 percent of the eligible age group. None of the countries in this region had achieved gender parity in tertiary education by 2005, with consistently more women enrolled than men at this level.

In South and West Asia, enrollment rates in tertiary education have increased by 62 percent from 1999 to 2005, but remain low with only 11 percent of the eligible age group enrolled (UNESCO, 2008f). Similarly, the average number of women participating in tertiary education has increased, but gender disparities persist. Afghanistan, Bangladesh, India, and Nepal all have ratios of female to male tertiary enrollment less than 0.70. On average, only one third of the teaching staff at the tertiary level in this region is female, and less than one third of female students are enrolled in the sciences. The same gender bias in textbooks, curricula, and teacher attitudes found by UNESCO in East Asia was also uncovered in South and West Asia.

#### **4. AET and gender in Universities in Cambodia and Bangladesh**

In June of 2013 Maria Elisa Christie conducted a preliminary study of gender issues in AET institutions in Cambodia and Bangladesh. This study involved interviews with 51 students, instructors, faculty, and administrators in AET institutions in Cambodia (Preah Leap National School of Agriculture, the University of Battambang, and the Royal University of Agriculture) and interviews with six administrators, faculty, and students at the Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU) in Bangladesh. Where available, sex-disaggregated data for enrollment rates, graduation rates, and faculty and professional staff was also collected. This study confirmed many of the same issues mentioned above.

The data collected show that, in general, the number of female students and instructors is increasing, though almost none are in high-level positions as full faculty or administrators. Challenges include concerns about women's safety, heavy domestic workloads, and cultural perceptions about the role of women in the family. Teaching and research are seen as the most appropriate roles for women in AET, although many female students expressed interest in working in the field.

##### *Cambodia*

In Cambodia, gender-based constraints in AET include safety concerns, household and family responsibilities, and a lack of awareness about the challenges women face. Women's safety was cited by men and women as the primary concern and reason why women cannot work in the field or rural, isolated places in Cambodia. Work in these areas is often necessary for agricultural professions or for fieldwork in AET programs. As one female student in a focus group at the Royal University of Agriculture reported,

“A big problem that my parents worry about for me is about security for the girl. They worry for men too, but men can take care of themselves. Men rape girls, girls do not rape men. If a girl is raped, she feels so ashamed, and if people know, they don’t pity her but look down on her. Also family honor would be destroyed too. Authorities don’t worry either; they say the solution is to marry with that man, finish the case. A lot of cases are solved by this solution.” (Female student, Royal University of Agriculture, Cambodia, June 12, 2013)

In addition to families’ perceptions of safety issues, female students reported that their families also perceived them to be less able than men to study agriculture. These perceptions combined with cultural expectations that girls and women are responsible for domestic tasks and family care present a range of constraints for female students and professionals to overcome in order to study and work in AET institutions. As a female student from the University of Battambang reported,

“[We] also have the problem [that women] have to work a lot more than men. [They] need to do everything in house: help mother, help with care of younger sister or brother, my mom or dad. If [there is a] problem in house, need to join with mother and father to solve it. Men have less care, if it is something he wants he does it. But women have to think a lot [more] about family than the men.” (Female student, University of Battambang, Cambodia, June 9, 2013)

Balancing schoolwork and housework can be particularly burdensome to female students. Female participants in a focus group at the Royal University of Agriculture noted that most of them are not from Phnom Penh, where the university is located, and dormitory space for women is limited so many of them stay with family or friends. While these arrangements enable the women to attend the university, there is also an expectation that they will contribute to the housework when staying with relatives, thus taking time away from their studies.

The double burden of domestic tasks and work in AET institutions also presents constraints for female faculty. A female teacher at the University of Battambang noted that she often arrives late to work at the university because of housework, and one of the only female administrators at the Royal University of Agriculture explained that the demands of housework create a situation in which women are unable to complete work of the same quality as men, or unable to prioritize their university work in the same way as men, and are thus not promoted to higher level positions. Furthermore, the Rector of the University of Battambang reported that a very qualified female faculty member was unable to accept an opportunity to complete a Ph.D. abroad because her husband and family did not agree to it.

The gender disparity between higher and lower level faculty and administrator positions is quite pronounced. At the University of Battambang, for example, there are two tracks for faculty: 1) individuals come through civil service government channels, have a Master’s degree, and get a permanent position, or 2) contract staff are hired by the university and only have a Bachelor’s degree (often from the University of Battambang). All of the latter are women, while the former include some women at the level of administration, though none in agriculture. At the Royal University of Agriculture, the Dean of Agricultural Technology and Management is a woman (though the only one among the 10 Deans of the university) and there are only three or four women Vice Deans out of a total of about 30.

Gender issues are not addressed in AET curricula. While there is a course on gender offered at the University of Battambang, it is not specifically related to agriculture. Likewise, an elective short course



on gender and some student-organized workshops on gender issues are available at the Royal University of Agriculture, but no course addresses gender issues in agriculture specifically. Male and female students and administrators both expressed interest in such additions to AET curricula and even suggested making it required. However, there were also male students who said that a course addressing gender and agriculture would be unnecessary, “because all of the people already know that both men and women need to discuss together. [We] don’t need a course to tell us that” (Men’s focus group, University of Battambang, Cambodia, June 7, 2013). A female administrator also commented that such a course is unnecessary because male and female students already have the same opportunities. Perceptions that there are not constraints for women in AET institutions, or that adding a gender perspective to AET curricula is unnecessary, present potential challenges to increasing gender equality in higher education and AET.

Despite the challenges that exist for women students and professionals in AET institutions in Cambodia, and the lack of attention paid to gender in AET curricula there, female students are enthusiastic and driven to succeed in the field. One female student at the Royal University of Agriculture said:

“Many people said it is not good to send a girl to the city, but with lots of study through grade 12, I got high scores and my mom agreed but was still worried. I promised myself I will break the record in my village. No girl had ever studied in Phnom Penh, just short courses in University of Siem Reap. I said to myself I will get scholarship to study MS abroad. I never listen to people who say ‘she cannot do it.’ I only listen to me, and listen to the people who encourage me.” (Female student, Royal University of Agriculture, Cambodia, June 12, 2013)

Another girl in Phnom Penh was not discouraged by the perception of agriculture as a male domain:

“[Agriculture is] not just for men, because now we don’t have to use strength, we can use our brains to make a machine and girls can make a machine because girls have brains like the boys. Boys can think about something new, but girls can think too.” (Women student, Royal University of Agriculture, Cambodia, June 12 2013)

Several female students reported that they chose to study agriculture with the hopes of opening their own stores and businesses, managing their own farms, or working for the government and helping farmers.

### *Bangladesh*

At the Bangabandhu Skeikh Mujibur Rahman Agricultural University (BSMRAU) in Bangladesh, students perceive the primary gender-based constraints in AET to be related to conservative ideas and religious views that women shouldn’t work in remote areas or study and should stay in the house instead. Female faculty members interviewed were also concerned about safety and the lack of lodging in remote rural locations. One woman lecturer noted that this is not an issue for women from the rural areas, but that the male family members in Dhaka would not approve of their daughters and wives working in remote areas because they would be working and staying alone. Faculty cited other constraints such as resistance from male leadership in regards to maternity leave and the lack of women in high-level decision-making positions. As in Cambodia, female faculty in Bangladesh noted the double burden that women in AET institutions face, though one woman also added that women are better at managing these demands than men:

“A women teacher at first must take care of family, then class, fieldwork, students. Everything you can imagine, in one person. It is a hardworking job. If you manage everything perfectly it is ok, but if not properly managed it is a tough job. Men will not take care of family, social work, but woman can control everything and maintain everything. Women can manage better than men—take care of her family members, other society members, students, report writing, presentations, etc.” (Woman professor, BSMRAU, Bangladesh, June 25, 2013)

Female faculty also noted that some male department heads and deans are supportive of women while others are not. One woman said that the current dean of her department is very supportive but described being harassed by the previous dean when she wanted to take the full six months of maternity leave that is guaranteed by government policy. Given the low numbers of women in high-level positions, the presence of supportive men that can be advocates for women in AET is particularly important.

Men and women faculty members emphasized that female students perform better than their male counterparts in classes, noting that the female students spend more time focused on their schoolwork and do not leave the campus while male students go out and are occupied with other activities. In this context, the complexities of conservative cultural norms pressuring women to stay in “appropriate” spaces such as the home or dormitory prevent women from attending school on one hand, but encourage women to focus on their studies on the other.

Gender is incorporated into AET curricula at BSMRAU through a graduate course entitled “Gender Issues and Youth Programs in Agriculture,” which is offered by the Agricultural Extension and Rural Development Department. This department also offers “Rural Development” at the undergraduate level, which addresses gender as one of many topics in a general overview of the subject. In addition, students and faculty agree that courses should address gender or that there should be seminars and workshops to increase gender awareness.

In terms of the numbers, faculty members at BSMRAU are overwhelmingly male, while the number of female students is increasing and, in some programs, greater than the number of men. As of June 2013, there were 147 faculty at BSMRAU: 126 men and 21 women. Of the 21 women faculty, four hold PhDs while the rest have Master’s degrees. Just over half (12) of the 21 women faculty hold Assistant Professor positions while the remaining nine are Lecturers. The women faculty are distributed across a range of departments and specialties including agricultural economics, agricultural extension & rural development, agroforestry, plant breeding & plant pathology, fisheries, and animal science & veterinary medicine.

Among undergraduate students at BSMRAU, a slight majority of students admitted to the Agriculture program have historically been female, and since 2011 more female than male students have been admitted. The Agricultural Economics program just started in 2013 but includes 11 female and nine male students. The Doctor of Veterinary Medicine program only admitted three female students (compared to 17 male students) in its first year in 2011, but has since admitted equal or near equal numbers for a total of 36 male and 24 female students since the program started. Since 1991, 2,107 male students and 218 female students have been admitted to MS programs, while 365 male students and 18 female students have been admitted to PhD programs. The first female PhD student was admitted to the Plant Pathology program in 2001.

Strategies to overcome gender-based constraints in AET proposed by men and women in Cambodia include: raising awareness about gender issues; explaining to families the importance of sending their daughters to school; providing more dormitories, scholarships (that include costs for lodging and food, not just tuition and fees), and safe transportation for female students; and supporting long-term (Ph.D. level) training for female professionals so they can compete for high-level decision-making positions.

Safety is one of the primary constraints for women pursuing studies or professions in AET. Measures must be taken to provide safe lodging and transportation for female students and faculty. Working in pairs so that women do not have to travel alone to the field is another way to address this issue. It is also necessary to raise issues of public safety with civic and community leaders. Working with parents is recommended to change deeply held perceptions of danger that may not be consistent with recently improved safety measures.

Raising awareness of gender issues in AET is important at all levels to overcome assumptions that women already have equal opportunities in AET. To some extent this can be addressed at an institutional level with gender integration/mainstreaming policies and programs. Cultivating high level allies in the government that will advocate for policies that support women in AET is another strategy. Women's double workload is often invisible to male decision makers. In addition to increasing awareness of this barrier for women, on campus housing reduces the need to stay with family and friends and provides a space for female students to focus entirely on their education without the burdens of household responsibilities. Government-sponsored maternity leave is also a critical part of more gender sensitive policy.

Another challenge to overcome is the assumption that gender is only relevant to agricultural extension and rural development, but not technical fields in AET. AET programs should develop a gender awareness course that is required for all students in their first year to help change the "mindset" and "culture" issues that faculty and students reported. Developing a general course on gender issues in AET would meet this need and this basic course could be adapted for different country contexts. Likewise, a gender awareness workshop for faculty should be a required element of their orientation or continuing education. In these types of awareness raising activities, there is an opportunity to build on female students' enthusiasm and drive to own their own farms and businesses in the future.

Additionally, while it is critical to increase the number of female students in all levels of AET, support for women pursuing PhDs is essential. Without high-level degrees, women faculty are not able to advance into higher levels of university administration or decision-making positions. Long-term efforts to increase the pool of qualified women for these high-level positions is necessary to improve gender balance at all levels of AET institutions. As one woman administrator from the Royal University of Agriculture said:

"If we want to build women's capacity, we need to focus on long-term training, on getting degrees. NGOs are working a lot on women, but in short trainings. [We] cannot use these for getting higher positions and cannot do decision-making. Always when we have to decide something and need to have opposition, you need a degree. You can join 30-40 trainings and

increase your livelihood but for higher positions you need a PhD.” (Woman administrator, Royal University of Agriculture, Cambodia, June 12, 2013).

The support from men in high-level administrative positions as well as male students at the University of Battambang and the Royal University of Agriculture was another critical aspect of increasing gender equality in AET in Cambodia.

## 5. Good Practices

The challenges to addressing gender disparities in AET in higher education are complex and occur at many different scales. Therefore, effective interventions need to address the range of issues that affect women’s opportunities in AET. Many of the recommendations that emerged from the study in Bangladesh and Cambodia have been shown to be effective across regions. The table below combines these ideas with recommendations from similar studies conducted around the world.

**Table 1: Recommendations, good practices, and examples for addressing gender disparities in agricultural programs in higher education.**

Recommendation	Good practices	Examples
Increase opportunities for women to enter and progress through higher education in agriculture	<ul style="list-style-type: none"> <li>• Offer scholarships to female agricultural scientists</li> <li>• Offer pre-entry remedial programs targeted at women and other disadvantaged groups</li> <li>• Develop flexible PhD programs that work with women’s schedules</li> </ul>	<p>African Women Leaders in Agriculture and Environment (AWLAE), supports 20 women in doctoral programs.</p> <p>African Women in Agricultural Research and Development (AWARD) Fellows benefit from a two-year career-development program focused on fostering mentoring partnerships, building science skills, and developing leadership capacity. 320 women have benefited from the program.</p>
Address safety concerns	<ul style="list-style-type: none"> <li>• Encourage female extension workers to travel in teams</li> <li>• Construct on campus housing for women</li> <li>• Create a clear sexual harassment policy</li> <li>• Educate students and staff about sexual harassment</li> <li>• Provide secure living facilities for women working in rural areas</li> </ul>	
Create gender sensitive facilities at the University	<ul style="list-style-type: none"> <li>• Offer childcare facilities on or near campus</li> <li>• Construct on campus housing for women</li> <li>• Construct safe and reliable sanitation facilities</li> </ul>	Center for Gender at Eduardo Mondlane (Mozambique). Committees of students and faculty work with the Center to address gender issues and implement policy.
Promote gender sensitive government policies in higher education	<ul style="list-style-type: none"> <li>• Work with ministries of gender, education or social development to address gender issues in higher education</li> <li>• Develop a sectoral gender policy to provide a framework for integrating gender at all education levels</li> <li>• Create a monitoring and enforcement committee to ensure that the policies are enacted</li> </ul>	Gender mainstreaming policy at University of Nairobi with college based gender committees and gender focal points to implement the policy.
Awareness-raising of agricultural	<ul style="list-style-type: none"> <li>• Conduct presentations to dispel myths associated with agricultural careers and the idea that agriculture is a male profession</li> </ul>	

careers targeted at girls	<ul style="list-style-type: none"> <li>• Use successful female professionals as positive role models</li> <li>• Popularize agriculture as an appropriate profession for women beginning in primary school and break the myth of agriculture as a male profession</li> <li>• Conduct outreach effort with parents to encourage them to send their daughters to school</li> </ul>	
Mainstream gender in University	<ul style="list-style-type: none"> <li>• Appoint a gender focal point person in each department</li> <li>• Develop a gender and diversity policy accompanied by an implementation strategy</li> <li>• Undertake a policy audit for gender sensitivity</li> <li>• Establish a policy on maternity leave</li> <li>• Establish quotas for female faculty members and students</li> <li>• Develop monitoring systems to track the participation and performance of all groups</li> <li>• Develop gender sensitive curricula</li> <li>• Include gender specific career tracks for female agricultural scientists in the curriculum</li> <li>• Create an undergraduate course on gender issues in agriculture</li> <li>• Develop a center for female students to receive counseling, healthcare, and information in a supportive environment</li> <li>• Establish a student mentorship program with professional female scientists</li> </ul>	<p>Sokoine University of Agriculture in Tanzania has a gender Policy that requires collecting gender disaggregated data and monitoring gender issues</p> <p>Makerere University in Uganda established a Gender Mainstreaming Division to advocate for a gender balance in enrolment, support gender focused research, provide scholarships for female students, promote gender sensitive policies, and engender the curricula.</p>
Build staff and student capacity in gender and diversity	<ul style="list-style-type: none"> <li>• Require gender and diversity seminars for staff and faculty</li> <li>• Conduct in-service seminars with science and agricultural teachers to raise gender awareness</li> </ul>	Sokoine University of Agriculture in Tanzania conducts workshops with secondary school teachers and SUA faculty

## 6. Conclusions

Women are underrepresented at all levels of education, and this gap only becomes wider at the higher levels, particularly in science subjects, including agriculture. On the positive side, the number of women at all levels is increasing, and the proportion of women studying agricultural sciences is larger than the share of female professional staff employed in agriculture. This is a positive trend; assuming appropriate incentives can be provided to encourage these students to pursue careers in agricultural research and enter Ph.D programs, there will be a larger pool of qualified women to compete with men for higher level academic and administrative positions (Beitema and Di 2010 p.40). This optimism was echoed by the only full professor at BSMRAU, in Bangladesh, who commented: “I think in our future women will be leading national agricultural systems, research and education institutions” (Woman professor, BSMRAU, Bangladesh, June 25, 2013).

Gender initiatives cannot be confined to external donor funding and a few committed individuals within the institutions. Mainstreaming gender in higher education needs leadership at the highest level, commitments of resources, long term awareness raising, and the right policies in place. This

transformation is not only necessary to meet the goals of gender equity, but also to address the agricultural challenges facing the world.

## 7. References:

- Aikman, Sheila, Halai, Anjum, & Rubagiza, Jolly (2011). Conceptualising gender equality in research on education quality. *Comparative Education*, 47(1), 45-60.
- Beintema, Nienke, M. (2006). Participation of Female Agricultural Scientists in Developing Countries. Washington, DC: IFPRI.
- Beintema, Nienke, M. & Di Marcantonio, Federica (2010). Female Participation in African Agricultural Research and Higher Education: New Insights. *IFPRI Discussion Paper 00957*. Washington, DC: IFPRI.
- Johanson, Richard, Saint, William, Ragasa, Catherine, & Pehu, Elja (2008). Cultivating Knowledge and Skills to Grow African Agriculture. In Tembon, Mercy & Fort, Lucia (Eds.) *Girls' Education in the 21<sup>st</sup> Century: Gender Equality, Empowerment, and Economic Growth*. Washington, DC: The World Bank.
- Karl (1998). Enrolment of Women in Higher Agricultural Education: Case Studies from Côte d'Ivoire, Jordan, Nigeria, Philippines and the Caribbean. *SD Dimensions*. Rome: FAO.
- Mangheni, Margaret, Lilian, Ekirikubinza-Tibatemwa, Lora Forsythe (2010). Gender Issues in Agricultural Education within African Universities. *Ministerial Conference on Higher Education in Agriculture in Africa*. Kampala, Uganda.
- Meinzen-Dick, Ruth, Quisumbing, Agnes, Behrman, Julia, Biermayr-Jenzano, Patricia, Wilde, Vicki, Noordeloos, Marco, Ragasa, Catherine, & Beintema, Nienke (2011). Engendering Agricultural Research, Development, and Extension. Washington, DC: IFPRI.
- Morley, Louise (2006). *Hidden transcripts: The micropolitics of gender in Commonwealth universities*. *Women's Studies International Forum*, 29: 543-551.
- UNESCO (2003). Gender and Education for All: The Leap to Equality. Paris: UNESCO.
- UNESCO (2008a). Regional Overview: Arab States. *Education for All by 2015 – Will we make it?* Paris: UNESCO.
- UNESCO (2008b). Regional Overview: Central and Eastern Europe and Central Asia. *Education for All by 2015 – Will we make it?* Paris: UNESCO.
- UNESCO (2008c). Regional Overview: East Asia. *Education for All by 2015 – Will we make it?* Paris: UNESCO.
- UNESCO (2008d). Regional Overview: Latin America and the Caribbean. *Education for All by 2015 – Will we make it?* Paris: UNESCO.
- UNESCO (2008e). Regional Overview: the Pacific. *Education for All by 2015 – Will we make it?* Paris: UNESCO.

UNESCO (2008f). Regional Overview: South and West Asia. *Education for All by 2015 – Will we make it?* Paris: UNESCO.

UNESCO (2008g). Regional Overview: sub-Saharan Africa. *Education for All by 2015 – Will we make it?* Paris: UNESCO.

UNESCO (2012). Education for all Global Monitoring Report. Paris: UNESCO.

Van Crowder, L. (1997). Women in Agricultural Education and Extension. *SD Dimensions*. Rome: FAO.

Van Crowder, L., Lindley, W. I., Bruening, Th. H., & Doron, N. (1998). Agricultural Education for Sustainable Rural Development: Challenges for Developing Countries in the 21<sup>st</sup> Century. *The Journal of Agricultural Education and Extension*, 5(2), 71-84.

## **7. Additional Resources**

Davis, K., et al. (2007). Strengthening Agricultural Education and Training in Sub-Saharan Africa from an Innovation Systems Perspective: Case Studies of Ethiopia and Mozambique. *Discussion Paper 00736*. Washington, DC: IFPRI.

Department of Agriculture, Forestry & Fisheries, Republic of South Africa (2008). *Agricultural Education and Training Access Barriers Report*. South Africa: Department of Agriculture, Forestry & Fisheries.

Karl, Marilee (1997). Higher Agricultural Education and Opportunities in Rural Development for Women: An Overview of the Situation and Summary of Five Case Studies. Rome: FAO.

Tembon, M. and L. Fort, Eds. (2008). Girls' Education in the 21st Century. Washington, DC: The World Bank.