

Acknowledging gender in providing knowledge resources and capacity building for men and women to support smallholder horticulture in the developing world over the last 40 years by AVRDC

By

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Introduction: The importance of gender in the successful provision of horticultural knowledge resources and capacity building for development

Since its inception in 1971, AVRDC (the Asian Vegetable Research and Development Center, subsequently renamed AVRDC – The World Vegetable Center in 2008) has been active in capacity building and knowledge and technology transfer among scientists and farmers worldwide. The Center's original Charter, signed by representatives of six Asian nations, the USA and the Asian Development Bank (ADB) indicates that AVRDC was to conduct research, carry out training, and develop and extend basic information on vegetable horticulture to improve farmers' profitability and eliminate malnutrition in Asia.

In its more recent global perspective, AVRDC is aware that small-holder horticulture is principally the responsibility of women in most of Africa, Latin America and Asia and it is a means of overcoming cultural and social restrictions to undertaking activities outside the home. Kitchen gardens are also important places where mothers educate their children about food production and related aspects of agriculture and the environment. Such gardens and semi-commercial plots also act as an empowering vehicle for women by providing opportunities to them for receiving information on ways to overcome malnutrition and to provide cash for additional household expenses (Bushamuka *et al.* 2005). These authors indicated that 85% of women in Bangladesh who participated in the Helen Keller International Homestead Gardens Program stated that they had considerably increased their contribution to the household's resources and hence have increased their status and decision making power. Gender issues are also of critical concern in horticultural research as species selection and prioritization is influenced by whether the principal grower is male or female (Jamnadass *et al.* 2011). This may be more related to social rather than economic issues. For example, Weller *et al.* (2011) indicated that for the Eldoret region of Kenya, although Amaranth (*Amaranthus* spp.) is a highly nutrient-dense and cheap vegetable, its consumption is often associated with poverty and this may limit its marketability. In contrast, in western Kenya this vegetable is commonly consumed with other leafy greens such as African nightshade (*Solanum* spp.) to improve its taste so such social pressures may be quite restricted culturally or geographically.

Horticulture is also a potential engine of additional paid employment for both men and women in both rural and peri-urban areas; it creates jobs from the homestead field all the way to the market and beyond. For the landless poor and people dependent on wage labor, horticulture can create jobs in field work, harvesting, sorting, grading, drying, cleaning, processing, transporting, storage and

marketing. Most of these jobs in the developing world appear to be largely the domain of women, and can thus be a source of empowerment. For example, Weinberger and Lumpkin (2007) reported that women accounted for 65% of the labor employed in packing houses in Kenya and Zambia. Even higher proportions of wage-earners (80-100%) were reported to be female in vegetable processing and packaging activities in Mexico, Guatemala and Zimbabwe.

AVRDC had recognized the importance of gender-related factors in its research and capacity building efforts from its inception in 1973 yet nevertheless has recently tried to give this approach substantively more prominence at an institutional level as is evident from the data presented in the following text and in tables.

Training and Capacity Building

AVRDC first offered training courses at its headquarters in Taiwan, but since the 1980s an increasing amount of training has been done in the Center's regional offices. Long-term formal training courses began in Thailand in the 1980s and in Tanzania in the 1990s, supported by project funds. In both Africa and Asia projects have also supported many short-term practical training sessions for farmers, extension workers and researchers. From 2002 onward training courses have been restructured in response to changes in donor priorities, in particular the long-term courses. The Center continues to offer a large number of training apprenticeships for undergraduates, graduate and postdoctoral students that have contributed to individual capacity building and the research output of the Center.

Riley (1977) reported that 57 scientists from 9 countries had been trained in the establishment years of the Center. A decade later Marlowe (1988) reported that the Center was involved in research, service and production internships and training, the latter held particularly at Kasetsart University in Kamphaeng Saen, Thailand in what was then termed the AVRDC Regional Training Course (RTC). Established in 1981, the RTC became a five-month training course in 1982. A large number of trainees from the People's Republic of China (PRC) and other Asian nations have since benefited from AVRDC's experience and formal training courses.

A further decade later an effort was made to assess the impact of this substantive course both in Indochina (Geal and Udomsade, 1998a) and the People's Republic of China (Geal and Udomsade, 1998b). The trainees from Indochina reported almost universally that the training at AVRDC had materially helped them in the conduct of their employment, had a positive effect on their presentation and knowledge transfer skills, and helped in their professional advancement. Inadequate English language skill possessed by the trainees was the principal constraint to the course's success and measures were put into effect to help in this matter. Students from the PRC reported that their supervisors felt that they had gained in competence in the execution of their professional responsibilities, and that participation in the course had given them greater confidence in the execution of their duties. However, lack of funding and research facilities proved to be a constraint for trainees to be able to fully exercise the new skills they had gained.

This specific training course (since 2011 named the International Vegetable Training Course, IVTC) has been conducted annually since 1982 and is available to trainees from all nations. In 2006 it was shortened to a three-month course conducted in one-month modules that cover the entire vegetable value chain, from good cultivation practices, to growing healthy crops, to improvements from field to market. From 1982 to 2013 the IVTC has trained 747 scientists (32% female), most of whom were from Asia (S. de Lima, personal communication 2013)

Similar training activities have been conducted in sub-Saharan Africa since the establishment of AVRDC's African Regional Center in Arusha, Tanzania in 1992. An internal review of AVRDC training by Easdown, Oluoch and Ooi (2007) noted that the long-term courses began in Tanzania in 1994 with funding from the German Federal Ministry for Economic Cooperation and Development/German

Technical Cooperation (BMZ/GTZ), followed by partial funding from the United States Agency for International Development (USAID) from 2001-2002 and AVRDC core funding until 2006. The course ran for five months until 2000, after which it was reduced to four months until it was discontinued in 2007. During this period 152 research and extension personnel from 28 countries in Africa were trained—79 men and 73 women.

The review found that from 2000 to 2007 a total of 358 horticultural professionals were also trained, mainly in Africa and Asia, through additional short-term specialized courses that ran for one to three weeks. In Tanzania seven courses were funded by diverse projects to improve the knowledge and skills of trainees from 16 countries in topics such as germplasm conservation, vegetable production processing and utilization, indigenous vegetable production and marketing. In Thailand courses of similar length were hosted in conjunction with the International Seed Testing Association (ISTA) and the Asia and Pacific Seed Association (APSA) to improve skills in seed testing quality and health for participants from 14 countries in Asia.

In recent years, short courses from 2 to 5 days in length held at AVRDC regional offices have had an impact on large numbers of farmers, researchers and extension workers. Between 2000 and 2007, 6436 people were trained. In Tanzania training topics included vegetable production and utilization, seed production and nursery production. Almost three-quarters of the 2122 trainees were women. One of the most popular short modules supported the distribution of "healthy diet gardening kits" consisting of packs of traditional African vegetables and priority global vegetables for use in home gardens. It is estimated that more than 10,000 resource-poor households received kits from 2001 to 2005 alone (Ojiewo et al. 2010). In Southeast Asia a range of short courses on topics such as vegetable seed production, off-season vegetable production, vegetable home gardening and postharvest handling of vegetables were held for more than 4300 farmers and extension workers, mainly in Vietnam, Laos, Cambodia and Myanmar. The growth of AVRDC and the establishment of a regional office in South Asia in 2006 expanded the reach of short-term training courses. For example, between 2007 and 2012 the AVRDC project funded by the Sir Ratan Tata Trust to promote safe vegetable production and home gardening trained more than 40,000 farmers, extension and research workers in one-day courses—40% in safer vegetable production, 35% in home vegetable gardening, and 5% in 1-3 day courses.

AVRDC training courses have also been replicated in Central and West Asia. Training of collaborators in Central Asia, usually in partnership with national programs or universities, has been very positive. Since 2006 varied programs for regional and national training were conducted for partners in Central Asia and the Caucasus. A total of 183 trainees, including 111 women (60%), improved their skills in gene pool conservation, varietal trial methods, breeding methods, vegetable seed production, integrated pest management (IPM), and new effective technologies concerning vegetable production, processing and consumption. These efforts included training for farmers, higher degree students, youth and horticultural professionals. Several agricultural colleges in the region have held annual training sessions on vegetable production, including how to grow new species introduced for cultivation and for seed multiplication. These training sessions have allowed students to further promote vegetables for dietary diversity in both the family kitchen and for overall health purposes. (Mavlayanova, 2013a; Mavlayanova, 2013b). AVRDC scientists have conducted capacity building activities for both men and women in Qatar and Abu Dhabi (UAE) on grafting and other IPM methods. They have also contributed to planning meetings for vegetable research and development for the Persian Gulf region, which were held in Bahrain.

In addition to the short- and long-term training courses for groups that AVRDC has conducted, there has also been a long-term focus on apprenticeships for researchers from around the world. Most of these have been conducted at AVRDC headquarters where many of the Center's scientists are located. Between 2000 and 2007 AVRDC hosted 585 research trainees from 85 countries: 475 low-skill (e.g. undergraduates), 85 medium-skill (e.g. Masters or PhD students) and 28 high-skill (e.g.

sabbatical scientists or postdoctoral researchers). Table 1 provides a summary of people trained by the Center from 2008-2012.

AVRDC's training initiatives are focused on poor countries, with a particular emphasis on practical training in countries where the Center has had a long-term presence such as in the Mekong region (Ooi et al. 2007). Between 2000 and 2007 for instance, trainees from Vietnam and Tanzania accounted for 59% of the total, and together with those from Lao PDR, Cambodia, Sudan, Myanmar, Taiwan and Philippines accounted for 92% of the total. More recently, substantive training has also occurred in south Asian countries, particularly India and Bangladesh. Every individual scientist and technician at AVRDC contributes to capacity building and training, yet the very substantive example of Dr. M.L. Chadha, who served the Center from 1991-2011 in Asia and Africa, deserves special recognition (Chadha, 2013). His personal efforts to strengthen the scientific knowledge of partners and the practical production skills of small-scale farmers and their families to improve livelihoods and health were extremely meritorious.

Technology Dissemination

AVRDC has remained active in technology dissemination since its beginning and this role is now the specific responsibility of the Global Technology Dissemination (GTD) Group, which has collaborating staff spread throughout AVRDC's regions (Luther et al., 2009). GTD has four main roles:

1. To promulgate vegetable production, postharvest, marketing and food preparation technologies to all actors along the vegetable value chain from small-scale producers to consuming family members. This includes managing the Demonstration Garden (0.63 ha) at headquarters, which exhibits traditional and AVRDC-improved vegetables, IPM and integrated crop management (ICM) technologies, and nutritional information on the more than 100 crops on display. The GTD group provides tours for visitors; over 700 people from more than 40 countries have benefited from the educational experience this garden provides during each of the past two years.
2. To assist in recovery efforts following natural and man-made disasters among disadvantaged groups who have been severely affected. This is through short-term development activities such as vegetable gardening demonstrations, distribution of seed of hardy and fast-growing vegetables, and the potential establishment of small-scale entrepreneurial activities for the unemployed.
3. To provide guidance and leadership for AVRDC's training activities worldwide (Table 1) and to coordinate the promotion and administration of such activities at our headquarters in Shanhua, Taiwan. This has included logistical responsibility for a continuing stream of interns and higher degree students at headquarters. GTD provides guidance for conducting farmer field schools and other stakeholder innovation and training activities internationally.
4. To provide leadership and guidance for development-oriented projects and activities at AVRDC. This includes participatory appraisals to ensure stakeholders' needs are incorporated into development project planning and implementation, downstream research to adapt AVRDC's technologies to local conditions, and technology dissemination approaches to maximize impact at the farmer and consumer levels.

GTD allies itself closely with the communication professionals at the Center and this collaboration results in a range of publications on how to grow, market, cook and eat vegetables appropriately. These include the quarterly news bulletin "Feedback from the Field" and *Fresh*, the AVRDC

newsletter, which is produced every two weeks. Distributed by email and posted on the Center's website and social media outlets, these publications are now received by thousands of farmers, private sector employees and scientists worldwide and help AVRDC to achieve the research and development impact it desires for its research efforts.

GTD uses and promotes a range of methods and approaches for the dissemination of AVRDC's technologies, which include: Training of trainers, farmer field schools, field days, use of the mass media and internet, videos, dramas, songs, school garden curriculum development, home garden promotion, seed kits, extension publications and other means of getting the message across. Efforts are expanding to assist in the demonstration of advanced germplasm for national program scientists and for the private sector, offering open days and seed fairs across AVRDC regions, and the construction and use of a purpose-built, state-of-the-art postharvest training facility at AVRDC Eastern and Southern Africa in Arusha, Tanzania.

Conclusions

Merely feeding the world in 2050 will not be enough; it also must be *nourished*. AVRDC – The World Vegetable Center's original mandate to eliminate poverty and malnutrition remains the driving force behind our efforts to develop horticultural capacity worldwide through training, capacity building, knowledge transfer, and technology dissemination. We now seek to further develop our close relationship over the last decade with the Global Horticultural Initiative. We seek to use GlobalHort as a means to scale up our research dissemination to both men and women and to act as a potent advocacy medium for the Center and for all its other collaborators in the continuing challenge to secure funds for international public-sector research and development in vegetable horticulture. Failure in this campaign may undermine global efforts to bring about food and nutritional security for all people on the planet.

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Table 1: AVRDC Training Summary 2008-2012

Year	No. short term trainees	% Female	No. of interns	% Female	No. of higher degree students	% Female
2008	1,893	26	72	51	10	60
2009	22,505	56	128	49	24	38
2010	27,564	39	82	35	26	42
2011	24,502	53	83	38	18	44
2012	11,943	58	194	41	38	43

Table 2a. Publication information for AVRDC 2008-2012 (Part 1)

Year	Total externally reviewed per scientist (journal articles, books, book chapters)	Publications per scientist in Thomson impact factor or equivalent journals	Percentage of papers in journals, book chapters and conference proceedings with developing country co-authors	No. of TV, web, radio, press and related material
2008	1.5	0.6	29%	50
2009	1.6	0.6	40%	60
2010	1.8	0.6	73%	118
2011	2.2	1.1	43%	232
2012	2.4	1.0	63%	254

Table 2b. Publication information for AVRDC 2008-2012 (Part 2)

Year	No. of unique visitors	No. of development documents posted	No. of mature technologies accessed	<i>Fresh</i> Newsletter readership	Facebook monthly reach (unique users)	Twitter followers
2008	n/a	n/a	3	n/a	n/a	n/a
2009	n/a	20	6	1200	n/a	n/a
2010	277,889	25	14	1500	n/a	n/a
2011	311,970	30	14	1800	n/a	n/a
2012	336,391	26	16	2930	9100	328