Internationalising University of Western Sydney: Agriculture and Environmental Education

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Abstract: This paper outlines internationalisation of the education that abreast training programs of the University of Western Sydney (UWS) encompassing areas from 'paddock to plate'. Along side with its formal undergraduate and postgraduate degree programs different approaches of education through training programs have been discussed that are conducted through the non-formal and formal educational methodologies. During the past 12 years (1996 – 2007) through its international training and study tour programs UWS conducted 147 international short training and study tour programs for 2,521 participants from 15 different countries from the Asia-Pacific regions in the areas of broad based agriculture and environment. This initiative helped participants especially from the developing countries in capacity building, developing leadership skill to analyse situation holistically in the real world situation. The paper also discussed internationalising education through student exchange programs at the postgraduate levels using example of EU-Australia post graduate student exchange pilot project. Global climate change and its effect on our livelihood nowadays, becoming a great concern, and internationalisation and globalisation of education especially climate dependent education like broad base agriculture and environment has a significant role to play. Our goal is to prepare the farming community and the extension professionals to prepare themselves for accepting the change in livelihood resulting from global economy and climate change. And international training programs have lot to contribute in facing the challenges.

Keywords: International training, Student exchange program, Internationalizing Extension, Climate change, Capacity building, System thinking

1 Introduction

Continued education is an important tool for transferring knowledge and technology. In the twenty first century when the world is rapidly changing with the changes in climate and socio-economic perspectives; agricultural education is playing a significant role for the farming community to deal with the changes for a sustainable future. In many countries particularly in developing countries agricultural education and training has been given priority, as significant contribution to GDP is coming from the broad based agricultural production and industries. Government participation in the direct management of educational institutions varies considerably from country to country. However, the overwhelming majority of higher and intermediate level institutions where agriculture is taught in the developing countries are dependent on government. In general, objectives, organisational structure and resources are determined by national policies, which also define the relationships between education, research and extension. Under these conditions, agricultural education is essentially seen as an instrument of the agricultural and/or educational policy of the government and oriented towards national objectives as they are perceived and defined (FAO report, 1997). Many countries had centrally planned economies, agricultural education and training was designed mainly to prepare officers for the administrative and technical services for rural and agricultural development, state farms and training centres. Governments of these countries are supporting as well as encouraging on-going training programs for farmers, extension workers, scientists, researchers, academics and administrators in the relevant areas. The training programs are organised locally and internationally funded by own government and/or by international donor agencies.

To help in capacity building for those work forces University of Western Sydney (UWS) along side with its normal academic degree programs organising international short training and study tour programs for some time. A study was conducted to evaluate the trend of international agricultural short courses and study tours organised in UWS in the last 12 years (1996-2007).

2 Purpose and Objectives

The overall purpose of this study was to analyse the various methods of continuous education provided by UWS in broad base agricultural and environmental areas and:

- To determine the change in knowledge, understanding, attitudes and aspirations by participation in international training program and the effectiveness of these programs in participants own country situation.
- To internationalise broad base agricultural and environmental education for the overseas graduate and undergraduate students and professionals to help action planning to face the challenges including climate change and sustainability.
- To focus on the importance and methods of internationalising continuous education for the current and future practitioners in broad base agriculture and environmental disciplines that needs donor agencies attention for funding towards international development programs.

3 Theoretical Analysis

The School of Natural Sciences of UWS has its global reputation for organising international training, short courses, study tours and short visits. Most of the courses are sponsored by international organizations such as World Bank, FAO, UNDP, AusAID, Overseas governments and institutions and international training and development consulting firms.

The training ranges from 1 day to 1 year depending on the requirement of the participants and their sponsors. In the last 12 years (1996-2007) the School of Natural Sciences successfully organised 147 training, short courses, study tours and short visits. More than 2,500 participants from 15 different countries of the Asia-Pacific region participated in those capacity building activities (Table 1). The majority of the participants were students (780) who came for short study tour to learn about Australian agriculture and environmental studies including the effect and influence of climate change in Australian agriculture (Table 2). The second highest ranking group of the participants are farmers (478). These two groups are mostly from China, Japan and Korea (Table 3).

In the term Agricultural Extension Education (AEE), there are three words that their definition has changed during the last few years. Every country had to think about the definition of Agriculture, Exten-

Table 1 Number of participants in international training and study tour programs at UWS in the past 12 years (1996-2007)

Year	Training		Study Tours		Total	
	Total training	Partici-pants	Total Tours	Partici-pants	Training& Tours	Participants
1996	7	97	6	170	13	267
1997	1	2	7	151	8	153
1998	10	133	5	44	15	177
1999	9	101	7	57	16	158
2000	7	50	8	80	15	130
2001	9	27	9	426	18	453
2002	2	27	8	224	10	251
2003	1	14	12	262	13	276
2004	4	23	6	104	10	127
2005	2	29	5	115	7	144
2006	3	32	6	128	9	160
2007	6	97	7	128	13	225
Total	61	632	86	1889	147	2,521

sion and Education in its own context however, there are some similarities amongst countries that could be shared equally for a better planning and development (Otroshi et al, 2004). Sharing those knowledge and ideas through the research, extension and academic training programs in UWS, collaboration among the participants from various countries have been established which has been reflected by continuous communication with the trained personnel and from their feedback.

Table 2 Categorical distribution of participants in international training and visitation programs of UWS in the past 12 years (1996-2007)

Year	*Acadm.	Res.	Exten.	Admin.	Farmer	Student	Tech.	Total
1996	2	2	85	22	98	58	-	267
1997	22	-	12	22	44	53	-	153
1998	-	18	77	76	-	-	6	177
1999	-	38	63	29	5	20	3	158
2000	26	25	18	15	10	36	-	130
2001	18	10	22	9	110	264	20	453
2002	4	4	3	12	74	154	-	251
2003	11	30	45	130	60			276
2004	23	16	23	11	54	-	-	127
2005	5	11	10	20	7	91	-	144
2006	13	24	17	22	-	84	-	160
2007	9	36	77	48	16	20	19	225
Total	133	214	452	416	478	780	48	2,521

***Acadm.** = Academics; **Res** = Researchers; **Exten.** = Extension Personnel
Admin. = Administrator; **Tech.** = Technicians

Table 3 Regional distribution of international participants in various training and study tour programs at UWS in the past 12 years (1996-2007)

Country	Training Participants	Tour Participants	Total
Australia	21	50	71
Austria	-	48	48
Bangladesh	31	34	65
China	493	428	921
India	32	2	34
Indonesia	1	9	10
Japan	-	669	669
Korea	33	529	562
New Zealand	1	-	1
Philippines	3	10	13
Singapore		17	17
Taiwan	-	1	1
Thailand	-	10	10
Turkey	-	13	13
USA	17	-	17
Vietnam		69	69
Total	632	1,899	2,521

The modern concept of extension which indicates knowledge, responsibility and profit sharing between extension workers and farmers is also evident in this study that 452 extension workers received the similar training with almost equal number of farmers from overseas (Table 2) who learned and shared ideas at the same time. It is evident that in developing countries most of the developmental funds where agriculture is a priority are managed and regulated by administrators and very often they become part of the training and visit activities (as participants) which later appear to be irrelevant and to some extent "misuse". In this study it was observed that about 16.5% (416) of the participants were administrators however, it may not be appropriate to claim that all of their participation was less important while many of them contributed their acquired knowledge and experience in policy making and developmental plan. However, this observation demands a further study on the extent of effectiveness of administrators' participation in technical training programs.

Participation of 347 academic and researchers from 15 countries (Table 3) of the Asia-Pacific region created an avenue of staff and student exchange program, collaborative research projects and international student study tour programs. Among the total 2521 participants the highest number (921) was from China alone followed by Japan (669) and Korea (562). China demands a significant development in the agriculture practitioners' community who learn to teach others (training for trainers). Teacher education in agriculture needs to be integrated into higher education in China. Until agricultural education is a part of the system of higher education, all reform efforts would merely a temporary solution (Shao & Bruening, 2004). This has been reflected by the number and frequency of the Chinese participants in the training programs and appears that they are not only educating their agricultural educators nationally but also encouraging international exposure through short training and study tours.

Interestingly majority of the training participants from these three countries were sponsored either by their own government and/or by the international donor agencies however, the study tour participants who are mostly students and farmers managed their own expenses. This is a good indication that farmers and students from the participating developing countries do not wait for financial help or support from their respective governments or donor agencies to enrich their skill and knowledge through overseas training and study tours. The training and study tours assisted participants to respond to the needs of individuals and communities impacted by cultural diversity and global interdependence. In addition, the training assisted participants to improve individual's country programs by helping extension and research people through their expanded knowledge and increased cultural sensitivity to local problems and programs. It helped in developing leadership quality and capacity building and strengthening international linkage to take participatory actions in addressing global issues in relation to agriculture as a whole. These method of continuous education provided opportunities to university academics and international communities to develop research, extension and academic relationship of mutual interest The transfer of technology through these international programs accomplished by continuous education covered the broad based agriculture including crop production, livestock and environmental management, experiential learning, human resources management and extension methodologies and systems learning (Table 4).

Internationalising also promote cross-cultural exchanges and prepare professionals and students to live and work in a global community. Research suggests that current efforts in the internationalisation of education are less than needed and educators need to expand the base of interested students in study abroad opportunities (Ibezim and McCracken, 1994). Zhai (2004) identified cultural interaction as the underlying theme to creating cultural sensitivity and respect among students. Besides short and long term study abroad opportunities, academic and cultural orientation programs at host universities allow for host and overseas professionals to communicate in an informal environment. This supports some of the international student exchange programs of the UWS embedded with the universities regular degree courses. One of them popularly known as LEAFSE (Learning through Exchange-Agriculture, Food Systems and Environment) operated in the environment, food and agricultural study areas considering events from "paddock to plate". This 3-year project was designed to facilitate exchange of post-graduate students on a pilot scale between four

Table 4 Courses with corresponding duration of the international training programs at UWS in the past 12 years (1996 – 2007)

1 day - 1 week	2 - 3 week	1 - 2 month	3 month – 1 year
Agriculture Farming Systems	Livestock Development	Livestock System Development	GIS and Range Land Ecology
Seed & Machinery Quarantine	Agriculture & Management	Forage Germplasm Conservation	Land use & Economic Policy
Farming & Animal Husbandry	Seed Production & Technology	Veterinary Instrument Quality	Forage Production & Utilisation
Agricultural Development & Management	Water Management	Farming Systems and Farm Management	Human Resource Management in Agriculture
Pasture Development	Ecology & Development	Bio-technology	GIS and Modelling
Environmental Management	Agriculture & Environment	Seed Production	Research Management
Grassland Farming	Fruit Processing	Experiential Learning	Agriculture Extension
Pest Management	Irrigation & Water Management	Agro-climatology & modelling	Food Technology & Management
Fisheries and Aquaculture	Stockbreeding	Noise Assessment & Control	Irrigation & Management

institutions in Europe and four in Australia (Sriskandarajah et al, 2003). All the participating institutions had a strong education and research tradition in agriculture and natural resource management. They also had active international collaboration among them already in place, mainly in undergraduate education and research. While keeping the case of organic agriculture as a focal point, this project was chosen to broaden the field to include Agriculture, Food Systems and Environment, thus allowing Masters level students to choose from a wider range of courses and at the same time obtain an integrated knowledge from the different contexts through exchange and collaboration. Under the project framework a total of 68 students (32 from Australia and 36 from Europe) were exchanged in 2004 and 2005 (Table 5). All students participated in a joint study program (JSP) workshop to commence their period of study. The bulk of the semester's study (80%) came from course units on offer at the host institution while the remaining 20% of the semester load consisted of- an intensive 2-3 weeks of introduction and initiation of the JSP held at one of two European institutions; Cross-Country Seminars linking participating students locally and internationally through use of IT tools; and concluding seminar and evaluation of the JSP. Through the LEAFSE project some achievements included learning to deal with complexity; application of systemic thinking to deal with such complexity in Agriculture, Food Systems and Environment; being responsible for own learning while on exchange; incorporation of technology blending virtual and real elements of a distributed class room; fostering inter-cultural understanding; and staff development (Sriskandarajah et al, 2005) .

International student exchange programs could make a difference as Miller (2004) described - graduates ready to address questions with new lenses, and ready to work with interdisciplinary teams. Graduates will be better able to be of service to their agency, or university department, college, university, profession, country and the world. They can be scholars and not just researchers, and they can be contributors to the professional knowledge base, they can "make a difference."

Traditionally the developmental endeavours in developing countries in the areas of agro-ecological and environmental sector were considered as of more regional and locally prevailing conditions than the global issues as a whole however, with the growing effect of climate change and its consequences in human life and their activities, ecosystems, biodiversity, global economy, altogether in people's livelihood it is now becoming today's burning concern. Research has shown that the peoples' fundamental attitudes about

Table 5 Student numbers and the institutions from Australia and Europe engaged in the LEAFSE exchange program

Institution	2004		2005		Total	Study Area
	Hosted	Sent	Hosted	Sent		
Australia:	**17**	**16**	**19**	**16**	**68**	Agronomy, Horticulture, Biology, Food Science, Organic Farming, International Development, Land & Water Management, Environmental Management
**UWS	4	5	5	3	17	
UQ	5	4	5	5	19	
UNE	3	4	5	5	17	
UWA	5	3	4	3	15	
Europe:	**16**	**17**	**16**	**19**	**68**	
KVL, Denmark	4	5	3	6	18	
Uni. of Wales, UK	5	3	5	4	17	
Wageningen Uni.	5	5	4	6	20	
Uni. of Kassel	2	4	4	3	13	

**University of Western Sydney, Australia
University of Queensland, Australia
University of New England, Australia
University of Western Australia, Australia
The Royal Veterinary and Agricultural University, Denmark
University of Wales, Aberystwyth, United Kingdom
Wageningen University and Research Centre, The Netherlands
University of Kassel, Witzenhausen, Germany

international involvement is favourable and aligns with broad interpersonal and professional relationships, such as those with community members, extension workers, researchers and policy makers (Place et al, 2000).

Therefore, any future planning to face these challenges demands the holistic approaches and should be addressed holistically and globally. Regional or local improvements may solve the current issues but if we are talking about long term sustainability then there are not many options left but sharing the generated knowledge and experience through internationalisation. And international short training, study tours and exchange programs needs to be continued which is a quickest and effective way for dissemination of innovations, ideas and technologies through training the trainers and practitioners. Studies showed that internationalising extension training program enhanced by including diverse partners of extension, demonstrating the importance of involving extension agents, local officials, teaching faculty members and graduate students which served well for learning from one another and particularly for providing different perspectives (Vergot et al 2006, Ludwig 1993).

Technological and extension concerns in terms of human factors such as economic improvement, health, efficiency variables, limitations of the farmers, capacity building as well as their working environment must be promoted. These include new ways to promote better interaction between humans, the technology and the environment in which they operate in (human-technology-environment interaction); ergonomic approach or the development of technologies that are safe to farmers, contribute to reduction of fatigue and stress, increase comfort and work satisfaction, and improve farmers' quality of life (FFTC 2005). To accomplish and achieve this human-technology-environment interaction in the area of broad base agriculture, training must continue as long as technology transfer is concerned. Thus training for the professionals and practitioners should cover experiential learning, human resources management and knowledge sharing. Government and donor agencies need to encourage more farmers and practitioners' participation in training activities and the training providers should be careful about the delivery of their products that should emphasise the human-technology-environment interaction.

4 Conclusion

When global changes in economy as well as in the climate changing the environment, biodiversity, people's lifestyle and attitude; it is becoming important that we prepare ourselves to accept those changes and learn how to deal with the situation. Global understanding and internationalising education through short and/or long term basis is significantly essential. Non-formal and formal education through internationalisation of UWS training programs playing a significant role. International governments and the donor agencies need to provide more help and cooperation by providing funds and other logistics to farmers and agricultural practitioners to learn, share and exchange today's ideas when global economic and climate change demand holistic endeavours to face the challenges for tomorrow. Results and statements showed that participants in international training program as well as in the exchange programs gain a better understanding of what an internationalised continuous education is, how international experiences affect agricultural practitioners and the groups that support them, opportunities available for international programming, and how international linkages and interdependencies affect the lives of our clientele. Globally when we are concerned about the climate change effect on our livelihood and sustainability, we need to prepare every one in the loop to face the challenges by internationalising agricultural and environmental education through short training and exchange programs. International fund providers need to put more attention as climate change is a global issue and be addressed globally and holistically.

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