

# Vegetables Go to School in Southeast Asia and Africa: Training of Trainers workshop design and implementation

## **Palaniswamy, U.R.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
usha.palaniswamy@worldveg.org

## **Schreinemachers, P.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
pepijn.schreinemachers@worldveg.org

## **Hughes, J.d'A.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
jackie.hughes@worldveg.org

## **Luther, G.C.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
greg.luther@worldveg.org

## **Yang, R.Y.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
ray-yu.yang@worldveg.org

## **Mecozzi, M.**

AVRDC – THE WORLD VEGETABLE CENTER  
SHANHUA, TAINAN, TAIWAN  
maureen.mecozzi@worldveg.org

## **Cissé, G.**

ECOSYSTEM SERVICES, CLIMATE AND HEALTH, SWISS TROPICAL AND PUBLIC HEALTH INSTITUTE  
BASEL, SWITZERLAND  
gueladio.cisse@unibas.ch

## **Drescher, A.W.**

DEPARTMENT OF PHYSICAL GEOGRAPHY, UNIVERSITY OF FREIBURG  
WERTHMANNSTR. 4, D-79085 FREIBURG, GERMANY  
axel.drescher@geographie.uni-freiburg.de

## **Glaser, R.**

DEPARTMENT OF PHYSICAL GEOGRAPHY, UNIVERSITY OF FREIBURG  
WERTHMANNSTR. 4, D-79085 FREIBURG, GERMANY  
rüdiger.glaser@geographie.uni-freiburg.de

## **Holmer, R.J.**

AVRDC – The World Vegetable Center 4th floor, Research & Development Building  
Kasetsart University  
Bangkhen, Bangkok 10900, THAILAND  
robert.holmer@worldveg.org

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## **ABSTRACT**

AVRDC – The World Vegetable Center’s ‘Vegetables Go to School’ project focuses on promoting school gardens and increasing children’s consumption of fresh vegetables in Bhutan and Nepal in South Asia, Indonesia and the Philippines in Southeast Asia, and Burkina Faso and Tanzania in Africa. The project, conducted in collaboration with the Swiss Tropical and Public Health Institute and the University of Freiburg, Germany, is funded by the Swiss Agency for Development and Cooperation. Country managers and project collaborators were invited from the agriculture/horticulture, education, and health sectors of the participating countries to attend a four-week long training of trainers workshop to identify the current status of school gardens and ascertain specific needs in promoting food and nutrition security through school garden-based approaches. The workshop focused on criteria for the selection of schools, sampling procedures, garden design, crop selection, planting schedules and good agricultural/horticultural practices, data collection and management strategies. The participants engaged in hands-on capacity building activities at the Center’s Demonstration Garden and research facilities. Action plans created by the respective country teams at the end of the workshop included objectives, garden design layout, implementation, promotion, management, expected outcomes and nutritional impact assessment strategies. Following the training workshop, a three-day policy workshop brought together country policy makers, management and project advisory committees to evaluate the action plans and chart a course forward for implementing school gardens and obtaining data for impact assessment.

## **INTRODUCTION**

Malnutrition is a state of under- or over-nutrition caused by insufficient intake of macro- or micronutrients, as per the current recommended intake levels. Epidemiological surveys show developing countries that rank high in the prevalence of underweight also rank high in overweight populations. Globally, underweight prevalence is highest in South Asia (59 million) followed by sub-Saharan Africa (30 million); overweight prevalence is the highest in sub-Saharan Africa (10 million) followed by East Asia and the Pacific (7 million) (UNICEF, 2013). Malnourished populations are particularly susceptible to infection by disease-causing organisms such as bacteria, viruses, and parasites (Brown, 2003).

World food security takes into account food production and stabilization of food supplies, while food and nutrition security considers the crucial element of ensuring access by the poor to the food groups required for an active, productive and fulfilling life. Swaminathan (1986) defined food security as “physical, economic and social access to balanced diet, clean drinking water, environmental hygiene, primary health care and nutritional literacy.” This definition includes three dimensions: availability, access and absorption. Availability refers to the physical availability of food in desired quantities; access is determined by physical and economic access to food and the opportunities open to achieve them; absorption is defined as the ability to biologically utilize the food consumed, which is closely related to the availability of safe drinking water, sanitation, a hygienic environment, primary healthcare and to nutritional knowledge and appropriate practices. Thus food and nutrition security brings into focus the linkage between food, nutrition and health.

In 1996 the World Food Summit defined food security as “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.” This definition includes availability (sufficient quantities of food available

consistently); access (having sufficient resources for a nutritious diet); and utilization (appropriate use based on knowledge of basic nutrition and safe water and sanitation).

Increasing agricultural production, productivity, or household income levels do not necessarily lead to improved food and nutrition security. However, there is evidence that targeted agricultural interventions, such as community, home and school vegetable gardens can result in healthier eating habits, including increased consumption of vegetables and fruits. Bhutta et al. (2013) drew attention to the fact that “schools offer an enormous opportunity for promotion of health and nutrition for older children and adolescents and could have an important role in their future.” This opportunity is also apparent in the finding by Langellatto and Gupta (2011) that school vegetable gardens were associated with greater vegetable consumption; this was related to participation in gardening and not to nutrition education. Others concluded that children who are engaged in gardening activities are more likely to eat fruit and vegetables, and are more likely to continue healthy eating habits throughout their lives (Bell and Dymont 2008; Morris and Zidenberg-Cherr 2002). In an analysis of 53 community gardens in South Africa, Shisanya and Hendriks (2011) concluded that although the gardens contributed to increasing consumption of fruit and vegetables, gardens alone were unable to solve the problem of food insecurity, thus underscoring the need for an integrated approach including improved productivity and agricultural and nutritional advice. The presence of a vegetable garden in the school provides physical proximity to a garden for schoolchildren, with opportunities to learn about the importance of vegetables in the diet individually as well as in peer groups.

The nutritional benefits of a school vegetable garden program may be jeopardized if the school, community and household environment is not safe and appropriate sanitary and hygiene practices are not followed. The success of a school vegetable garden program will therefore depend on the safety of water, sanitation, and hygiene practices that are adopted by the participants.

AVRDC – The World Vegetable Center’s ‘Vegetables Go to School’ project takes an integrated approach to promoting school gardens and increasing children’s consumption of fresh vegetables in Bhutan and Nepal in South Asia, Indonesia and the Philippines in Southeast Asia, and Burkina Faso and Tanzania in Africa. The objective of the project is to contribute to improved nutritional security in the target countries through school vegetable gardens linked to other school-based health, nutrition and environmental initiatives with close participation of local communities. The project, funded by the Swiss Agency for Development for Cooperation (SDC), is being implemented in collaboration with the Swiss Tropical and Public Health Institute (STPH) to provide expertise in water, sanitation and hygiene practices in the project schools, and the Albert Ludwig University of Freiburg in Germany, which will set up a collaborative research environment for baseline and research data collection, analysis and management.

## **VEGETABLES GO TO SCHOOL**

The project will be implemented in three phases: Phase I (2013-2015) focuses on research-for-development—building capacity in the target countries, establishing pilot school vegetable gardens, studying the impact pathways, and showing the evidence for impact. Phase II (2016-2018) will scale-out the implementation of school vegetable gardens in the target countries to increase the number of schools with school vegetable gardens. Finally, Phase III (2019-2020) will institutionalize the project benefits in the target countries.

The primary beneficiaries of the project are schoolchildren 6 to 18 years old. These girls and boys are expected to receive benefits in terms of more knowledge about the importance of a diverse, balanced and nutritious diet. This is expected to lead to more balanced diets and an increase in the daily consumption of vegetables, which would eventually result in better health of the children as illustrated in Figure 1.

## **PROJECT IMPLEMENTATION STRATEGIES**

During 2013, the project focused on building capacity and raising awareness about school vegetable gardens at various levels of government in target countries, establishing a national task force, and developing country-specific action plans for implementing school vegetable gardens in the project countries. The task force included a multidisciplinary panel of members comprised of senior officials from national ministries and departments of education, agriculture/horticulture, nutrition and health and a senior official at the national policy level. Vegetable gardens were designed and optimized for each specific country by selecting country-specific, nutritious and easy-to-grow vegetables with targeted cropping schedules, crop management technologies and protocols for ensuring seed supply for long-term sustainability.

### **CAPACITY BUILDING**

To establish national task forces, a team of government officials from the ministries and departments of education, agriculture/horticulture, nutrition and health from each country were identified and invited to participate in a four-week Training of Trainers (ToT) workshop at AVRDC headquarters in Taiwan. The aim was to equip the task force members to return to their countries and train teachers and other key project participants to implement all aspects of the 'Vegetables Go to School' project. A senior official at the national policy level from each participating country was invited to participate in a three-day policy workshop held in conjunction with the ToT.

### **NATIONAL TASK FORCE**

Each national task force is comprised of a team of multidisciplinary government officials of which one member assumed the role of the country manager, taking the responsibility of project implementation in their respective countries.

One government official each from the ministries/departments of Education, Agriculture and Health constitute a Country Team. Team members are senior officers with sufficient in-country experience to hold a senior position within the national governing system. The key incentives for country team members are; to derive satisfaction out of interesting, creative work that would improve the nutritional status of schoolchildren in their countries; and international exposure. The Country Manager is a member of the country team and has close connections to the lead implementing agency (the Ministry of Education or the Ministry of Agriculture/Horticulture) to be able to effectively implement the project in the country.

To ensure enough support for the implementation of the Vegetables Go to School Action Plan, one senior government officer was invited to Taiwan to attend a three-day policy workshop on school vegetable gardens. This person was a Principal, Permanent or Deputy Secretary or Director or Director General who can support and catalyze changes in policies to favor the project outcomes. During the workshop, they met their counterparts from other countries as well as government officials from Taiwan. The policy workshop highlighted the potential of school vegetable gardens by presenting success stories from the Philippines, Thailand, Taiwan and the United

States. The senior government officer is expected to work closely with his/her Country Team to adjust the action plan and develop a strategy for implementation, scaling-out and attracting additional resources.

### **TRAINING OF TRAINERS (TOT) WORKSHOP**

The aim of this workshop was to provide hands-on training to the country teams on the best practices in design and implementation of school vegetable gardens. A detailed program was developed for the ToT workshop (Table 1). A manual was prepared to provide instructions in the layout and implementation of school vegetable gardens and contained general principles that set the framework for a successful project implementation locally. The team also visited local school gardens in Taiwan and interacted with the schoolchildren and staff in charge of the school gardens and the children.

### **SCHOOL VEGETABLE GARDEN IMPLEMENTATION**

AVRDC staff trained the country teams on horticultural aspects including garden designs based on sound principles of crop rotation, choice of diverse vegetables, preparation and management of healthy seedlings, integrated crop management, identification of pests and natural enemies (predators, parasitoids and pathogens), soil health and fertility management, composting, integrated pest management, and best practices in seed saving. Many important issues for successful garden implementation were addressed. The country teams also received hands-on training at the AVRDC Demonstration Garden, and from the Nutrition and Genetic Resources and Seed groups at AVRDC headquarters in Taiwan. The AVRDC project team assisted the country teams in developing garden plans and practices specific to each country of implementation.

During the ToT, communication strategies suitable to various audiences including students, parents, colleagues and community to create awareness and generate interest about the school gardens were discussed. Topics of discussion included analyzing audiences and information; crafting and delivering messages, announcements and updates; and, planning garden tours and open houses for the parents and community.

The importance of experimental design, randomization, replication and control during the research phase (Phase-I) of the project was presented to the country teams. Target school selection criteria were discussed and the randomization procedure was explained to the team. Sampling and data collection strategies were discussed among the team members.

Project impact assessment strategies were discussed during the ToT workshop to assess the impact of vegetable gardens relative to the objectives. The outcome indicators of opinions/attitudes, preferences, awareness, knowledge, vegetable consumption patterns and nutritional status were discussed with each team. The country teams developed monitoring and evaluation schedules, tools and data collection protocols suitable to their countries.

### **NUTRITION**

Training topics in nutrition included information about the food basics, role of macro- and micronutrients in human health, major food groups, sources, dietary reference intakes, the importance of a balanced diet, as well as the importance of vegetables as key sources of micronutrients and beneficial phyto-compounds as a substantial part of daily diets to meet the micronutrient needs. The team visited local schools in Tainan

County in Taiwan and interacted with the kitchen staff and the schoolchildren. The project team assisted the country teams in developing dietary assessment tools including 24-hour recalls and food diaries suitable to their countries. Possible case studies of interventions in the value chain were presented and discussed.

### **WATER, SANITATION, HYGIENE AND HEALTH (WASH)**

The STPH team provided training on the importance of safe water, sanitation, hygiene and health in the target schools. Specific ways of ensuring a health-promoting and disease-preventing environment to minimize children's exposure to risk of injury, safe handling of food grown on the plots to keep the produce free of pathogens and chemicals, and maintaining a safe environment for children, teachers and parents were discussed.

### **COLLABORATIVE RESEARCH ENVIRONMENT (CRE)**

The University of Freiburg (ALU) provided training on creating a collaborative research environment in a web-based platform to facilitate data collection, analysis, sharing, and archiving with appropriate web-based tools. The multiple benefits of CRE in a large project were presented to the country teams: it provides the same tools for all partners, ensures a common data structure, secures data management and archiving, allows for sharing of the data between partners as per the access rules agreed upon, and enables joint data analysis with standardized tools. The CRE can be used for effective communication among project partners and to disseminate project results. The team assisted the country teams in identifying and defining the variables that are suitable for their countries. A tentative draft list of required data including baseline and research data was developed during the ToT workshop. A core data set was drafted to describe the geographic location of schools, school gardens and schoolchildren for each country.

### **FIELD TRIPS AND SOCIALIZATION**

Rapport and strong interpersonal relationships are crucial to the success of a project. Effective and successful socialization in capacity building ensures commitment of the team members to the successful implementation of the project and "elicits the best in an individual by breaking in." This was achieved during the ToT and policy workshop through ice breakers, informal discussions with the group, organized dinners and lunches with the AVRDC staff, research partner teams and sightseeing trips around Taiwan; informal coffee hours in the morning and the afternoons; visits to local vegetable markets and day/night markets; shopping trips; and visits to local temples. There were ample opportunities for socialization and building rapport between the country teams and the project team. The integrated and coordinated activities also allowed the country team members to mingle and interact among themselves, enabling strong networking opportunities.

### **PERFORMANCE MANAGEMENT SYSTEM FOR THE PROJECT AND THE COUNTRY TEAMS**

To make sure that the project is piloted and rolled out successfully in the project countries, AVRDC has appointed a full-time Project Manager for the Vegetables Go to School Project. A project team consisting of five AVRDC scientists and research team members from the STPH and ALU was formed to advise the country teams and monitor progress.

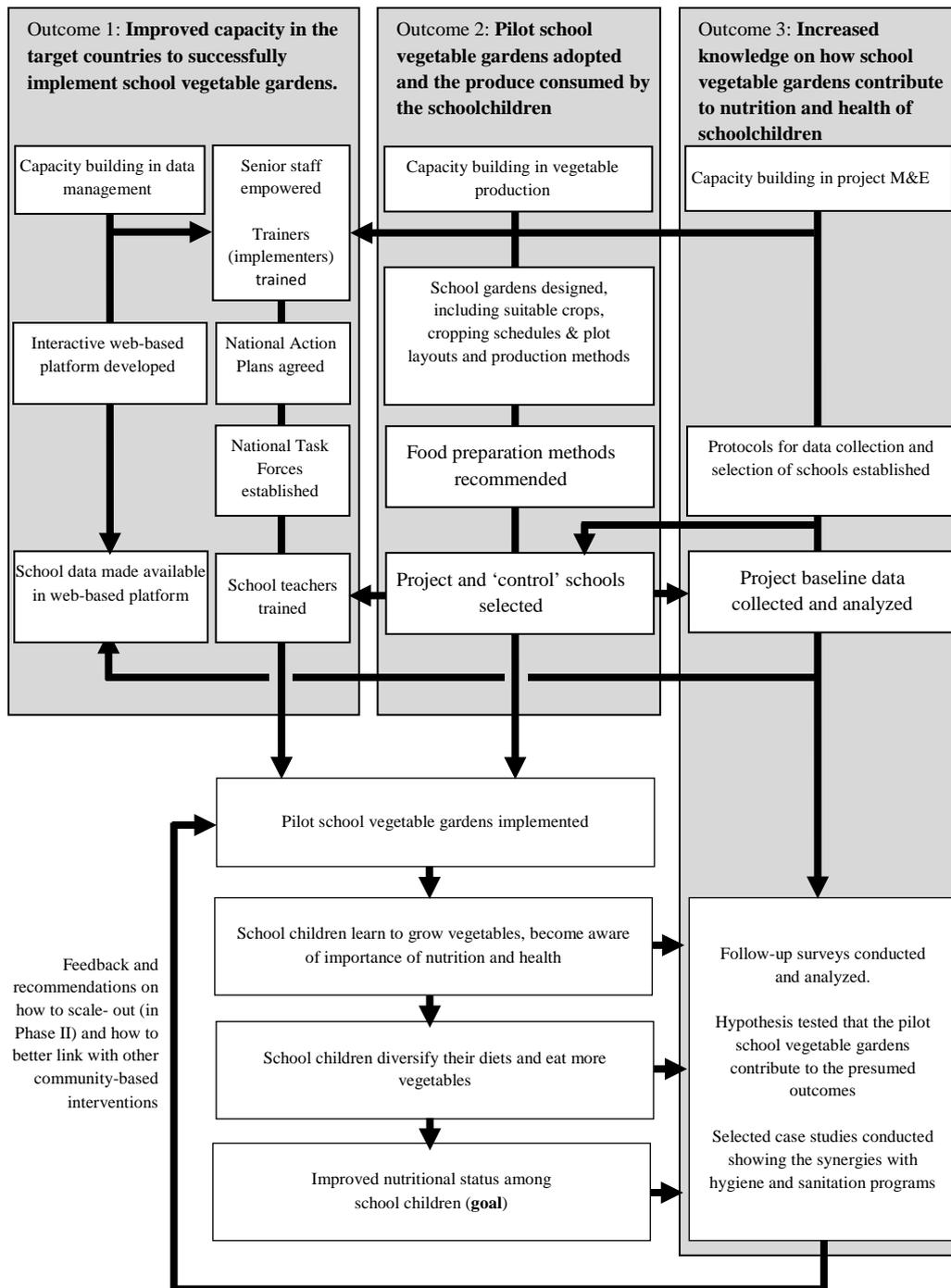
Additionally assistant country managers will be appointed in each country who will be assigned the task of ensuring on-site implementation of the project and data collection as per the research protocol. The assistant country managers will work closely with the national teams and the AVRDC scientists in the successful implementation of project activities. Timely execution of activities will be monitored by regular on-site visits made by the AVRDC scientists, the Project Manager, and meetings with the country managers.

## **POLICY WORKSHOP**

A policy workshop was conducted to bring awareness of the project to senior policy level officers from the project countries, so as to obtain their support in the implementation of the project. The policy level officials attended sessions during which country team members presented success stories with school vegetable gardens; they also participated in a panel discussion to share their expertise in school gardens, agriculture, nutrition and health. Each official worked with their respective country teams to finalize the country action plans for successful implementation. The policy-level team members serve as members of the project advisory council who will continue to advise and assist the national task force in project implementation.

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**Figure 1.**The impact pathway of the project around the three project outcomes leading to the overall impact goal: to contribute to improved nutritional security in the target countries through school vegetable gardens linked to other school-based health, nutrition and environmental initiatives with close participation of local communities.

**Table 1. Vegetables Go to School project, Training of Trainers workshop program**

Day	Activities
1	Welcome and icebreakers; presentations by the country teams on current status of school vegetable gardens in their respective countries
2	Visit to the AVRDC Demonstration Vegetable Garden followed by presentations on crop selection, cropping schedules, seedling preparation, integrated crop management (ICM), soil health and land/bed preparation; visit to the local night market
3	Transplanting, starter solution application and visiting composting heaps, integrated pest management (IPM); biological control with natural enemies; developing and finalizing the year-round planting schedule for school garden
4	Vegetable seed regeneration and quality preservation followed by visit to the AVRDC Germplasm facilities where the team learned to determine the seed quality
5	Group work on country action plans
6	Excursion to Tainan
7	Free day
8	Vegetable garden design and implementation; natural enemies and pests; field collection of insects and classification activity; IPM methods; appropriate stages for harvesting
9	Communication strategies: analyzing information, crafting and delivering messages
10	Proposed evaluation plans, data collection and analysis for impact assessment; group work and presentation of evaluation plans by the Country Teams
11	Visit Tzu-Lung elementary school and composting area; demonstration of compost making and liquid fertilizer preparation; participate in local food preparation and promotion activities
12	School garden programs in Tainan: Visit Guo Yi Elementary School, Liujia District, Tainan; Visit Andian Elementary School, Annan District, Tainan; visit to the Taiwan sugar factory
13	Work on country action plans
14	Free day
15	Presentations on school vegetable garden and nutrition, school lunch programs in Taiwan, nutritional practice and promotion in schools, evidence base interventions, program design and case studies
16	Functional properties of different vegetables; nutrition-sensitive postharvest handling of vegetables; vegetable preparation, recipes and cooking methods; cultural perspectives and eating habits; determinants of malnutrition in school children; methods of nutritional assessment
17	Synergies between agriculture, nutrition and health, monitoring and case studies
18	Collaborative research environment: target groups, benefits, structure, requirements and responsibilities for effective data flow; country specific data requirements
19	Work on country action plans
20	Excursion to Zhoulalai Farm, Taiwan
21	Free day
22	Welcome the senior policy level officers from the project countries; present an overview of the project and set expectations; share experiences with school vegetable gardens by the policy level officers in their respective countries
23	Presentations on topics of horticulture, nutrition and health; presentations of country action plans by the country managers; welcome dinner for the senior officers from the project countries
24	Presentation of action plans and panel discussion by the senior policy level officers from the project countries; discussion of follow up plans, way forward and concluding remarks