Speaker Summary Note

Session: Building Resilience by Improving Health, Nutrition, and Knowledge

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Title: **Building resilience in healthy landscapes for men, women, children, and communities through fruit and vegetable horticulture**[1]

In formulating the new Sustainable Development Goal (SDG) 6—"To improve agricultural systems and raise rural prosperity"—the United Nations incorporated *de facto* ideas of individual, community and system resilience. The goal exemplifies the importance of horticulture, calling for a shift towards healthier diets; ensuring the supply of safe, diverse and nutritious food; reducing food losses and waste; empowering women along the value chain; fostering new visions and business models for smallholders; preserving the environment; and developing coherent policies at all levels. At the Global Forum for Food and Agriculture 2014, agriculture ministers from 65 countries further pledged to promote the diversity of agricultural production to enhance dietary diversity to meet nutritional needs.

The horticultural sector, especially that concerning tropical fruit and vegetables in the developing world, must now be recognized and be suitably supported with human and financial resources so that SDG 6 has a realistic chance of rapid attainment. Likewise, this equally applies to research on other nutrient-dense foods such as pulses, minor grains, fish and small-stock. Women are the backbone, and often the primary stakeholders, of the horticultural value chain in developing countries. They are also the principal determinants of what is eaten by families in the home. Thus the key to eliminating micronutrient malnutrition, particularly its foetal and child dimensions is in the hands of women—if they can be suitably empowered. To establish and ensure women as the essential gatekeepers for healthy family diets, they need better nutritional knowledge and the ability to obtain the necessary resources to either produce or pay for sufficient dietary diversity.

Building resilience through improved human health

The World Health Organization (WHO) recommends dietary diversity including daily consumption of at least 400 g of fruit and vegetables per person (equivalent to the weight of a football). Such a diet, balanced with sufficient energy and proteins, allows men, women and children to grow, learn, work and earn to their full potential. If the household grows vegetables and fruit year-round in a home garden of only 50 m^2 (with sale of any surplus to put cash in women's purses), and is supported by good nutritional and food safety knowledge, effective postharvest value addition through quality preservation, and the use of improved cooking techniques that allow maximum nutrient retention and bioavailability of dietary minerals and vitamins ... then the household members would surely have better health in general, and thus greater resilience in the face of the typical shocks of life experienced by individuals or the community.

Building resilience through more diverse farming systems with fruit and vegetables

Smallholders engaged in mono-cropping cereals such as maize, wheat or rice historically have been caught in a downward spiral of poverty and malnourishment. When shocks occur, these families or specific family members often migrate from rural areas to cities to find work, as their cropping system lacks sufficient diversity to provide food to support the household. Integrating horticultural crops into such systems is feasible; initial production costs are low as long as land and labor are available. With the addition of a few new fruit and vegetable crops to the household food production system, the risk of damage from specific diseases and insects is more favorably distributed and the likelihood of complete crop failure across the enterprise is much reduced. Some fruit trees and shrubs reduce soil degradation as well as provide food, mulch, energy, shade and fodder, thus making a significant contribution to household sustainability. Diversity builds enterprise resilience and this concept would also be enhanced with the potential

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inclusion of other pulse, small-stock and fish system options offering superior dietary diversity. Although the amount of knowledge, skills and labor required to manage a variety of crops/livestock may be higher than what is needed to grow only rice or maize, the effort is accompanied by an increase in security from having access to a wider range of food resources, which might also reduce the detrimental effects of climate variability.

Building community resilience by reducing climate risk

Global climate uncertainty challenges the resilience of agricultural communities worldwide. Current climate projections in East Asia suggest that average air temperatures will increase by as much as 1°C in the next 25 years, shifting crop production zones and the ranges of pests and diseases. The Intergovernmental Panel on Climate Change (IPCC) warns of a greater number of extreme weather events such as droughts, floods, high winds, etc. and these increasing in intensity in the coming decades. The direct effects of these extreme climate events on crop growth can be somewhat mitigated through protected cultivation and other technologies, but much more must still be done.

Immediate investment is required in research and development of horticultural breeding, agronomy and seed production to combat these deleterious developments. For example, an extra 1°C in average air temperature implies an extra three generations of whiteflies a year in Taiwan (the location of AVRDC headquarters) and a substantive redistribution of the suite of pests and pathogens preying on fruit and vegetables. Using more locally adapted biodiversity available for horticultural crops could also make a substantive difference in community resilience to climate change. Research to promote new crop adaptation in these areas is needed immediately as it will take approximately a decade to produce material with improved resistance if the process is started today.

Building resilience by incorporating higher value crops with good market demand and ensuring better postharvest quality retention

The chances of a subsistence wheat farmer being able to grow his/her household out of poverty on a smallholding is low, as their enterprises typically cannot compete with those of larger land owners. Yet, even with only 0.1 ha under a valuable horticultural crop such as tomato, the chances of an enterprise becoming more resilient are greatly improved. In Eastern and Southern Africa, for instance, tomato varieties such as 'Tengeru 97' and 'Tanya' remain in high market demand throughout the entire production season, forcing Darsh Industries of Arusha, the dominant regional company in the processing of tomato paste and tomato ketchup, to import 70% of its tomato pulp per year from the People's Republic of China. Gluts of perishable vegetables can cause market prices to drop during the main harvest period which is a risk to farmers, but this issue can be resolved with good planning, storage and marketing management, preferably at the community, as well as enterprise, level. Better education, policy and management skills coupled with access to markets and affordable extension services are needed to bolster community resilience.

Building resilience through sustainable improvements to incomes, food security, and the environment

This is the goal of the new Association of Independent Research and Development Centers for Agriculture (AIRCA)—nine international R&D institutions that, with their combined expertise and those of their collaborators, seek to deliver "Healthy soils, healthy crops and livestock, healthy families, healthy businesses and healthy landscapes." This integrated approach to research, development and policy recommendation strives to function effectively from a field to a landscape level. AIRCA believes this approach is necessary if UN Sustainable Development Goal 6 and the required resilience at a landscape level are to be achieved in the near future. Further details are presented in Nicholls et al. 2013.

REFERENCE

T. Nicholls, I. Elouafi, C. Borgemeister, J.J. Campos-Arce, M. Hermann, C. Hoogendoorn, J.D.H. Keatinge, S. Kelemu, D. J. Molden, and A. Roy (2013). Transforming Rural Livelihoods and Landscapes: Sustainable Improvements to Incomes, Food Security and the Environment. AIRCA: ISBN 978-92-95098-30-5. 34 pp. http://www.airca.org/?page_id=385.