



Speaker Summary Note

Session: Science and Technology Levers

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Title: **Achieving Nutritional Security Through Better Diet Diversity: Vegetables for enhanced vitality, variety, and value¹**

The problems:

- Undernutrition in pregnant and nursing mothers and weaning children resulting in permanent health consequences and potentially infant mortality under 2 years old.
- The double burden of global ill health from under and imbalanced malnutrition leading to increased child mortality rates (under 5 years old), and chronic rates of obesity in children and adults and subsequent morbidity and mortality through diabetes, metabolic syndrome etc. The resultant economic costs to society of such preventable ill health.
- Tunnel-vision focus of donors and policy makers on a very few, staple crops. The risk then of being able to feed the world in 2050 but not being able to nourish it.
- Biofortification of staples alone is an impractical and insufficient way to move forwards to bring about nutritional security.
- Crop diversity, to ensure suitably balanced diets, is constrained by serious under-investment in research and development and a gross imbalance between the necessary food categories of cereals, root crops, protein-rich crops, fruit and vegetables
- A specific dearth in investment for research and development for small-scale producers; particularly, for the poor with limited access to land either in rural or urban environments.
- Even within the vegetables, lack of diversity exists today because of an over-reliance on a few exotic species and significant under-evaluation of nutritional quality considerations by present day breeders in the hybrid vegetable sector. Nutrient content of exotic varieties has been sidelined in favor of even ripening, long shelf-life and visual attractiveness suitable for sale as products in supermarkets.
- Lack of good agricultural production and storage practices to ensure that wholesome, nutrient-dense products can reach the market.
- The side-lining of disciplines such as home economics and domestic science in the secondary and tertiary education sectors today have undermined the understanding and knowledge needed by families on nutritional status, balanced diets and suitable food purchase and preparation.

¹ Paper co-authored with Jacqueline d'A. Hughes, AVRDC.

The solutions:

- A balanced diet can be provided economically for all people through employing an adequate diversity of intake with suitable sources of protein, carbohydrates, fats, fiber, vitamins and micronutrients.
- Vegetables are one of the best sources of micronutrients, vitamins and proteins in the human diet.
- An increasing diversity of vegetables—both exotic and indigenous—requires concentrated and consistent research and development attention and a factorial increase in investment.
- This should include support for “home garden” scale research support.
- Reduce risks and costs for vegetable producers and marketers by making them more climate, pest and disease resilient and having adequate post-harvest value addition.
- Ensure new vegetable varieties are sufficiently nutrient-dense and ensure that consumers know how to prepare them to retain the micronutrient bioavailability.

The changes needed to achieve success:

- Innovative science and technology approaches needed to address the constraints:
 - Improving smallholder farmer enterprise resilience to risk by growing a sufficient range of well-researched crops, including fruit and vegetables. There should be a focus on risk mitigation, ensuring an adequate yield of a range of crops even in the face of an uncertain or hostile climatic environment.
 - Breeding for crops therefore requires that they should be resilient in the face of climatic events and that are adaptable to changing environments which will include agronomic and pest and disease constraints. This requires long-term breeding and agronomic support to defend producers against major pests, weeds and diseases which continue to have a high mutation rate and seemingly have a preference within the plant-kingdom for nutrient-dense vegetables.
 - Breeding for higher nutrient density (global and indigenous vegetables)—as nutritional quality is critical.
 - Low cost protection measures against pests, viruses and diseases should remain as a high priority issue for investment as they can be a much more effective means of control than breeding or chemical protection.
 - Post-harvest value addition—is not only needed for the large supermarkets but for all producers large and small worldwide to ensure quality is maintained at minimal cost.
 - Marketing can be much improved with better knowledge available to producers and consumers and specifically with reference to improved nutrition.
- Donors, science and technology must
 - Diversify their interests and make consistent investment into high value crops (including vegetables) which will support the goal of nutritional security not just food security. This should include support for “home garden” scale agriculture.
 - Ensure nutritional quality is at the forefront of the breeders’ minds—in addition to the numerous other characteristics which have to be considered.
 - Look for innovative, affordable technologies to ensure fresh, perishable vegetables reach markets with maximum nutritional and economic value.