SPEAKER SUMMARY NOTE

Session: **Scaling Up Interventions Focused on the Poor and Hungry**

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Title: Scaling Up Technology Development and Adoption by the Poor

The International Potato Center (CIP) has a global mandate to conduct research on potatoes and sweetpotatoes for the purpose of poverty and hunger alleviation, improved human health and the development of resilient, sustainable livelihood systems. The geographical areas where potato and sweetpotato are major crops also tend to be areas where rural poverty rates are high. Over the past decade CIP conducted fifteen impact assessment case studies, spanning our array of technologies and regions, in order to evaluate the economic and poverty impacts of our work done in cooperation with national agricultural research systems. We developed a scoring technique to appraise the "poverty content" in the case studies. Poverty content measures included: whether farm households adopting the technologies were more or less likely to be poor, whether consumers benefiting from increased supply (at lower prices) of the commodity were likely to be poor, and whether the technologies were likely to generate significant employment or health benefits within the affected regions. While technologies introduced into potato and sweetpotato production systems have made significant improvements to farm productivity throughout the world, especially in China, India, the Andean highlands, and central Africa, the poverty content has been quite variable, ranging from 18%–85%.

The Pro-Poor Research and Development Cycle

In order to enhance the impact of our research and technology, for the extremely poor, CIP has reorganized its research within a paradigm that we call the Pro-poor Research and Development Cycle (Figure 1). The components in the cycle include Targeting; Needs and Opportunities Assessment; Research-for-Development; Partnerships for Scaling Up; and Impact Assessment. Our targeting work assumes that to more effectively address extreme poverty, hunger and the challenges of human and ecosystem health, we must understand better the location of poverty and its relationship to our mandate crops. Needs and Opportunities Assessment characterizes the production systems such that we better understand the role that CIP's principal development vehicles (potato and sweetpotato research) play in improving livelihoods in these areas of poverty. Our Research-for-Development agenda generates research outputs that respond to the needs and opportunities of the extremely poor. CIP has developed, participates in, and continues to explore an array of partnership programs whose objectives are scaling up research outputs, and creating an enabling environment for outputs to be taken up and utilized in order to reduce poverty and hunger. Through Impact Assessment we continue to monitor our progress against these ambitious objectives.

Targeting identifies the geographical priority areas for research and technology investment and development. Typically done using GIS tools, targeting uses economic, nutritional, agro-ecosystem and other social and spatial information. Targeting extreme poverty and hunger results in defining regional, national or sub-national targets.

Development over the past several decades has resulted in a developing world today that is heterogeneous. The **Needs and Opportunities Assessment** must not only characterize the production and livelihood systems in the target areas but also the context within which the livelihood systems are embedded. Understanding if agricultural technology is targeted at a system in an agriculturally-based developing world, a transforming developing world or an urbanized developing world, as well as the institutional structure of the target area, is critical in order to generate the most effective technologies and to build appropriate **Partnerships for Scaling Up** those technologies.

For example, amongst the CIP impact assessment studies, the technology which demonstrated the highest rate of return was a sweetpotato clean seed program in China during the 1990s. Shandong Province on China's northern coastline produces about 17 million metric tons of sweetpotato annually, or about 12% of global production.

Between 1994 and 1998, stimulated by collaboration between CIP and Chinese scientists, virus-free seed was extended to about 80% of the hectares planted to sweetpotatoes in the province, resulting in significantly improved yield. The availability of virus-free seed is estimated to have increased average sweetpotato yield amongst adopters by at least 30%, with little or no change in the use of other inputs. The internal rate of return was estimated at 202%, with a net preset value of US$550 million. By 1998, annual productivity increases were valued at US$45 million annually, improving the agricultural income of the provinces' 7 million sweetpotato growers by 3–4%.

In the 1990s, China was characterized as an agriculturally-based developing world, in need of technologies for productivity gains. The effective government programs in China provided the critical partnership for scaling up the clean-seed technology. The provincial government mobilized provincial and prefectural research institutes, local governments, country extension programs and farmers. Finally, government subsidies for the establishment of the seed program made large-scale seed production possible in a short time and helped keep the farm price of improved seed low.

Target regions in Sub-Saharan Africa (SSA), today, can also be characterized as agriculturally-based, in need of productivity gains. However, the institutional context is distinct from that in China. To find the best ways to scale up and improve potato technologies and methodologies used by farmers and institutions, CIP studied of the characteristics, existing limitations and future possibilities of the potato using techniques to document the Agriculture Knowledge and Information System in different provinces in Uganda and Ethiopia. The work revealed just how complex the potato knowledge system is, with 16 to 21 components involving farmer families and organizations, governmental and nongovernmental institutions, service providers, input suppliers, market actors and media, as well as CIP. In Andean countries, such as Peru and Bolivia, the potato knowledge system is even more complex than in SSA, with stronger participation of NGOs and farmer organizations, respectively. The potato knowledge system has different degrees of complexity, depending on the relative importance of the potato as well as sources of information. Generally, there are a higher number of actors and interactions in dynamic knowledge systems, where potato production is more relevant for the household economy and where many components take active roles such as coordinating activities between institutions and strengthening capacities of farmer organizations. In a stagnant system, on the other hand, there are usually fewer active components, the market is more limited, potatoes are important mostly for home consumption, and where other knowledge systems, such as that related to livestock management, are dominant. The dynamism of the potato knowledge system determines the interest of institutions in new technologies and methodologies, such as participatory methods, to improve the potato system. For example, providing training for institutions is critical to replicate and scale up participatory research experiences.

The Andean highlands, home to some of the poorest rural households in South America, are part of the transforming and urbanized developing world. Native potato varieties and local knowledge for their cultivation and use are unique resources possessed by farmers in these areas. As the forces of globalization and market integration penetrate the Andes, they present both challenges and opportunities for farmers, including developing market niches and adding value to potatoes, particularly the native potatoes grown by poor farmers.

Market chain actors (including small-scale potato producers, traders and processors), researchers and other service providers have engaged in innovation processes via two principal tools for collective action: the Participatory Market Chain Approach (PMCA) and Stakeholder Platforms. The PMCA fosters commercial, technological and institutional innovation through a structured process that builds interest, trust and collaboration among participants. Stakeholder Platforms provide a space for potato producers, other market chain actors and service providers to come together to identify their common interests, share knowledge and develop joint activities. The PMCA and Stakeholder Platforms have empowered Andean potato farmers by expanding their knowledge of markets, market agents and business opportunities. Social networks built up among producers, market agents and service providers have stimulated commercial innovation, which in turn has stimulated technical and institutional innovation. These innovations have allowed small farmers to market their potatoes on more favorable terms and other market chain actors to increase their incomes as well. A successful example is T'ikapapa, the marketing of native potato varieties to the upscale domestic and export markets.

Scaling up technology development and adoption for the poor requires building appropriate partnerships for scaling up. The appropriateness of these partnerships will depend upon the state of development in the target areas and the existing institutional structures.