

Sweetpotato Education, Research and Capacity Development through a CIP-Orissa Learning Site¹

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Abstract

CIP began systematic research on sweetpotato in 1985. Since then CIP scientists have studied and promoted sweetpotato as a means to help reduce extreme poverty, hunger and malnutrition, to increase food security, and to improve sustainable livelihoods for the world's poorest and most vulnerable populations. CIP has conducted training and capacity development programs as well as developed various learning resources to enhance the impacts of its sweetpotato research. This chapter provides a brief overview of CIP sweetpotato education and training activities and learning resources. It suggests how a new initiative in India could further advance CIP's pro-poor research and development agenda, strategic planning objectives, and impact targeting work while better meeting global Millennium Development Goals (MDGs). It reviews some elements of a plan with potential partners, tentative learning objectives and action research goals for operationalizing the "learning site" idea in Orissa.

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Introduction

Since 1985 the International Potato Center (CIP) has studied and promoted sweetpotato, globally as a means to help reduce extreme poverty, hunger and disease, increase nutritional and food security, and improve sustainable livelihoods for the world's most vulnerable populations. CIP's research also aims to contribute to ecologically sustainable development by protecting the environment and preserving sweetpotato genetic resources through CIP's genebank in Lima, support to national genebanks, and through in-situ field conservation. CIP's crop improvement and management research helps to improve and test new sweetpotato varieties, disseminate these to help increase yields, prevent disease, and assess those best adapted to different climatic conditions and agro-ecologies.

Today sweet-potato is considered the fifth most important world food crop by fresh weight after rice, wheat, maize and cassava. Of approximately 130 million tons produced annually in more than 100 countries Asia is the world's largest sweet potato-producing region, with 114 million tons. India only produces about 1 million tons, but Orissa one of its poorest States, yields almost a third of the national sweetpotato harvest. Sweetpotato is Orissa's second most important crop, next to cereals, and plays an important role in the state's predominantly agricultural economy. Sweetpotato is easily grown in marginal soils with few inputs and is a good source of high nutritional value food for poor farmers and especially in tribal areas. Yet Orissa remains a region of high poverty and malnutrition. Building on its expertise and resources CIP aims to enhance its sweetpotato research and learning for poverty reduction, health, food security and socioeconomic development with a special focus on Orissa. CIP scientists with support from its Capacity Strengthening Department (CIP-CSD) aim to help facilitate the development of a CIP "learning site" in cooperation with Indian and other partners.

CIP Capacity-building, Education and Training (for Sweetpotato, India and more)

CIP's approach to education, training and capacity development has evolved over the past few decades. Some past work has focused on developing and disseminating technical manuals for sweetpotato (e.g. Rasco, and Amante, 1994; Fliert and Braun, 1999; Stathers, Namanda, Mwanga, Khisa, and Kapinga, 2005; Adion, Valdez, Aguilar and Basilio, 2007). Recently the CIP-CSD completed another unique sweetpotato education tool in cooperation with the CIP Uganda office and local partners. It is supplementary learning resource for children and teachers to teach about sweetpotato growing, processing, nutrition, marketing and livelihoods (Kapinga, Byaruhanga, Zschocke and Tumwegamire, 2009).

Other published CIP work, on studying market potential, relationships and post-harvest commodities mainly applied to potato so far, are approaches or tools which could be further adapted to sweetpotato. CIP, for example, has developed and tested its "Participatory Market Chain Approach" (PMCA) with a "User Guide" (Bernet, Thiele and Zschocke, 2006). This work initially began in the Andes, with a focus on native potato products, to better bring poorer farmers to more diverse or specialized markets so they could receive greater incomes and sustainable livelihoods for their labour.

Preliminary testing has also been done in Uganda and Indonesia. CIP would like to assess this approach for sweetpotato production and market chains in South Asia.

In Africa and India CIP scientists have identified orange-flesh sweetpotato (OFSP) as an important part of a food-based approach to combat Vitamin A deficiency and associated diseases or deaths, particularly among children who are most vulnerable (Anderson, Kapinga, Zhang, and Hermann, 2007; and Ilangantileke and Sreekanth, 2006).

In India CIP has worked with local government and farmers through the UK-Department for International Development (DFID)-sponsored Western Orissa Rural Livelihoods Project (WORLP) since 2003. They evaluated implementation of piloted OFSP field trials which helped the community, learn better which varieties were most suitable for different conditions as well as farmer's perceptions of appearance, yield and root content for best adoption. CIP identified clones most appropriate for new varietal development and release (Attaluri and Rath, 2006). CIP initially distributed at least 10,000 OFSP cuttings (Mohanty and Das, September 2005, pp. 26-27). CIP maintains experimental fields and a net-house in Bhubaneswar, while much local collaboration continues on providing vines for distribution and testing of promising OFSP clones.

Another CIP contribution to education and research about sweetpotato, and for our knowledge of participatory research and adult learning processes more broadly, has been through its work with farmer field schools (FFS) or FFS networks. FFS are innovative, evolving, locally specific, farmer-centered, adult learning models which encourage farmers and indigenous communities to engage in on farm research among their peers, become local experts, and discover or apply new knowledge to improve their crops, communities and livelihoods. In Asia some CIP-partnered FFS activities have focused on sweetpotato, such as in the Tarlac region of the Philippines outside of Metro Manila, and on learning integrated crop management (ICM) tools for sweetpotato crops in Indonesia. CIP has also studied FFS participatory research and learning processes, partly to improve FFS methods and results (e.g. van de Fliert, et.al., 2003).

Beyond working with farmers alone, CIP is also interested in using organizational learning studies and lessons to improve its own research, administrative and development practices. For example, CIP is a partner in the GGIAR-led Institutional Learning and Change (ILAC) Initiative with some other centers or organizations. ILAC aims to study and support, and build capacities of collaborative pro-poor agricultural innovation programmes, and draw lessons from these to facilitate knowledge sharing among rural innovation professionals. ILAC's work seeks to improve the design, implementation and evaluation of agricultural research and development programs (Horton, Galleno, and Mackay, November 2007).

CIP, through its Users' Perspectives With Agricultural Research and Development (UPWARD) network, based in the Philippines has also facilitated various projects on organizational learning as a means to improve our understanding and implementation of capacity development efforts for community-based natural resource management (CBNRM) in Asia (UWPARD, 2007).

From its Lima headquarters the CIP-CSD provides access to manuals and other learning resources free online, or for minimal cost through CDs, seminar podcasts and print materials (www.cipotato.org/csd/material.asp). In future CIP plans to improve this website as an open access distance learning tool, while adding additional resource materials on sweetpotato with more regionally, locally relevant information.

CIP is committed to building capacity for interdisciplinary, cross-sectoral research while facilitating and studying institutional learning and change, and evaluating the quality and impacts of its capacity development efforts, through new educational or research approaches to enhance sweetpotato production and utilization. CIP would like to build on its good foundations in Orissa to develop a learning site to do better targeted and applied research for understanding and promoting sweetpotato.

CIP Impact Targeting in South Asia: Toward an Orissa Learning site

CIP views its sweetpotato research and education work as a contribution to poverty reduction, hunger elimination, food security and the global community's Millennium Development Goals (MDGs). CIP's objectives are reflected in *The CIP Vision* (CIP, 2004) and a new research and development paradigm called the Pro-poor Research and Development (R&D) Cycle, to guide the production of CIP's intended agricultural development research outputs and outcomes. These outputs and impacts are measured, assessed and analyzed for tangible impacts on livelihoods of the poor in geographical areas with overlapping high poverty/hunger, poor nutrition, and environmental vulnerability or climatic stress affecting agriculture. This responsive R & D framework consists of six principal, but overlapping and mutually reinforcing, elements or stages:

1. Geographical targeting
2. Needs/opportunities and capacities assessment
3. Research for sustainable livelihoods
4. Partnerships for Impact
5. Scaling Up/Out
6. Impact assessment (and evaluation)

(adapted from CIP, 2007, pp. 24-29)

Recently CIP as part of CIP's pro-poor R & D framework conducted new socioeconomic and geographic targeting research with planning exercises to help it decide how to best invest its limited resources. CIP's resulting *Strategic Plan* (CIP, 2007) led CIP to select the Indo-Gangetic basin of southern Asia (Bangladesh, India, Nepal, and Pakistan) as one priority global region to focus some future work with national and local partners as it further refines its strategy through micro-targeting in specific locations while it studies and applies (through further study and training) lessons learned about impacts with partners and communities. Micro-targeting then led CIP to select the State of Orissa in India as a potential focus for some long-term applied research, capacity-building and education on sweetpotato-based cropping and food systems in a CIP learning site.

As its strategic plan suggests CIP will use “learning alliances” or “learning communities of practice” to extract “lessons” from the pro-poor R & D cycle while capturing those educational and research outputs for further use in training events (CIP, 2007, p.25).

CIP has already identified a number of community problems and research challenges in Orissa to better study. CIP scientists have collected preliminary data on income, livelihoods and socioeconomic patterns, food consumption habits and nutrition levels. To combat some deficiencies CIP introduced new germplasm, especially OFSPs with high carotene and high dry matter, and conducted participatory evaluation of improved varieties with tribal growers. CIP supplied clean planting material and helped produce healthy planting material for distribution through nursery development. CIP has also collaborated with local farmers to understand their basic knowledge of SP crop production, and combine this more technical scientific knowledge, for better production and post harvest uses of sweetpotato. Over the next two years CIP further aims to:

- Better assess Vitamin A levels and the bioavailability of OFSPs among malnourished peoples in Orissa.
- Develop market chains for sustainable income and enhanced crop production creating market demand with the OFSP products.
- Produce more clean plant material through Self Help Groups.
- Conduct awareness campaigns on the OFSP products and more importantly the indigenous products in the local communities.
- Educate poor communities on the nutritive value of OFSPs
- Provide improved varieties to sweetpotato growers.

(Cortbaoui, Ilangantileke, Campilan and Attaluri, 31 January 2008).

Learning Objectives and Action Research Goals for an Orissa Learning Site

An Orissa learning site would serve as an action research platform where CIP and its partners together learn to operationalize the pro-poor research and development cycle under unique socio-economic and agro-ecological conditions for greatest impacts. It would utilize education research as well as knowledge of pedagogy, adult education, extension systems, FFS, school gardens, distance education, educational evaluation, etc.

In the context of unique Indian sociocultural and educational innovations a CIP learning site will collaborate with local partners to develop consensus on shared learning and research objectives. It would build on and strengthen capacities of existing agricultural extension and curriculum activities of the Krishi Vigyan Kendra (KVK) network of agricultural knowledge/farm science centres across Orissa while also conducting collaborative research with local government, university and NGO experts. A learning site more particularly would develop and implement projects, programs, evaluation tools, resources, capacity development strategies and impact pathways to facilitate:

- Building or strengthening capacity of existing educational/learning and research institutions for applied study of sweetpotato-based agricultural systems (Universities, KVKs, schools, community centres, etc.)

- Field-based, institutional (schools/universities) and online resources development, access and dissemination (physical and virtual libraries of books, CD's, podcasts, instruction manuals, etc) on sweetpotato-based cropping and food systems.
- Building capacity for, study and evaluation of more effective implementation of international (MDG), national and state policy objectives.
- Applied learning (with field testing) about CIP scientists' breeding, varietal selection, adaptation and promotion in varied agro-ecologies, socio-cultural, sub-regional and climatic conditions of Orissa.
- Knowledge management, communications, branding and social marketing of Orissa sweetpotato products
- Teaching about sweetpotato (growing, nutrition, utilization, cooking, marketing, etc.) with new textbooks for students and teachers, field manuals, demonstration sites in schools gardens, and parent/community learning
- Documentation and dissemination of lessons from sweetpotato production and marketing "best practices" through PMCA tools and resources.
- Identification of state-level training and professional certification needs, with universities/extensions Departments to assist KVKs to better conceptualize and deliver training of trainer (TOT) programs for sweetpotato
- Human resources/institutional mapping to assess scaling up potential of existing or future programs.
- Research products (working papers, edited books, journal articles, commissioned policy studies, etc.) based on collaborative studies with local academic partners, farmers, government officials, donors, etc.)
- Drafting of model policies and development on new government programs (in cooperation with agriculture, health, education, economic and trade ministries) for improved sweetpotato production, value-added processing, marketing and local consumption in Orissa, and for export.

Steps for Planning, Developing and Operationalizing an Orissa Learning site

Some good ground work (theory, preliminary field-studies and publications) for establishing a learning site in Orissa has already been laid. Aside from CIP's sustained presence in the region with a field liaison office in Bhubaneswar since 2003, several international CIP scientific and senior administrative staff visited. Consultations in 2008 with public and private university administrators and professors, senior government officials, and sweetpotato researchers all indicated strong support for collaboration in a

learning site project. Some steps (not necessarily in this order) for planning, developing and operationalizing an Orissa learning site include:

- Do a more systematic needs and capacity assessment for developing a locally specific capacity development strategy for sweetpotato learning and utilization
- Build on existing synergies with former or current projects and funding sources for related work on capacity-building for cropping systems (e.g. WORLP supported by DFID)
- Identify potential donors and core partners (local, national and international) for submitting a major project proposal (and sub-projects for specialized themes) and develop a concept note.
- Select a field site(s) after developing more specific criteria
- Establish laboratory, net-house, library and computer facilities in primary and secondary locations cooperating with local partners to insure the necessary buildings, technologies, and fields for long term projects to allow crop improvement/management research with field experiments/trials and demonstration sites for sweet-potato based cropping systems
- Design and hold (with local hosts) a visioning, conceptualization and planning workshop on research and development objectives for a learning site involving CIP, local scientists, farmers, government officials, donors and other partners.
- Identify core themes/topics and methodologies (basic natural, biological, social sciences and interdisciplinary) for research projects and publications in a planning workshop (expected project outputs)
- Develop a capacity building (CB) and strengthening strategy on sweetpotato production, research and learning for Orissa (in the context of a conservation agriculture/food systems approach and potential for scaling up/out)
- Develop a social marketing (public awareness) and branding strategy for sweetpotato values and activities (growing, processing, eating, nutrition, selling, etc.) and Orissa as sweetpotato state

Conclusions

CIP believes Orissa State could be a good region for a “learning site” for applied study of sweetpotato-based cropping and food systems. It would be based partly on CIP’s strategic planning work and geographic impact targeting with a pro-poor vision, interdisciplinary, long-term, partnership and participatory research oriented, pedagogically sound, farmer-centered approach to research strengthening and capacity development. To encourage local ownership and participatory development for site(s)

selection, project implementation and long-term sustainability, CIP could work with a range of potential partners including:

- Indian State and National Agriculture, Rural Development, Health, Economic/Labour, Education Ministries/Offices
- Local Universities (public and private) in Orissa including researchers (multi-disciplinary contributions) and extensionists
- Farmers' education or collaborative learning, and socio-economic organizations (such as KVK's, cooperatives and other groups)
- Indian Council of Agricultural Research (ICAR) and its specialized regional study centres (such as CTCRI) and other partners
- NGOs (local and international)
- Private Sector and Government Donors
- Other International Organizations (e.g. UNICEF, UNESCO, FAO, etc.) interested in agricultural education, research and learning (as well as meeting MDGs) which could provide value added support or shared resources for a learning site.

Finally although a learning site should be considered as physical location(s) it is much more. Rather than one isolated center, a learning site could be viewed as a virtually linked node, as well as a physical pilot center to stimulate and share learning (north-south and south-south) in a regional or global network of similar interconnected sites in different agro-ecological systems and climatic conditions. A learning site is also a means to encourage continuous or life-long educational processes (institutional, organizational and personal) where CIP scientists, donors, farmers and other partners learn together to operationalize, as well as continually assess and improve, a pro-poor research and development cycle.

References

- Adion, Irene M., Maria Teresa SJ Valdez, Clarita J. Aguilar, Carlos S. Basilio (2007). *Farmer Field Schools on Sweetpotato-Based Cattle Fattening*. International Potato Center (CIP)-Users' Perspectives With Agricultural Research and Development (UPWARD) (Los Banos, Philippines)
- Anderson P. Kapinga R. Zhang D. and Hermann M (2007). Vitamin A for Africa (VITAA): An entry point for promoting orange-fleshed sweetpotato to combat vitamin A-deficiency in sub-Saharan Africa (*Proceedings of the 13th ISTRC Symposium, Arusha, Tanzania, 2007*), pp. 711-720.
- Attaluri, Sreekanth and Subrat Kumar Rath (2006). "Farming for Better Health:

- Experimenting with Sweetpotato for vitamin A nutrition improvement in India,” in Dindo Campilan, Arma Bertuso, Rajindra Ariyabandu, Lorna Sister (eds.) *Learning Participation in Action: Field Research Experiences in South Asia* (Los Banos, Laguna, Philippines CIP-UPWARD, pp. 81-85)
- Bernet T., Thiele G. and Zschocke T., (2006). *Participatory Market Chain Approach (PMCA) – User Guide*. (Lima, Peru International Potato Center (CIP) – Papa Andina.
- CIP. *The CIP Vision: Preserving the Core, Stimulating Progress* International Potato Center (CIP), 2004.
- CIP. *Strengthening our assets: enhancing our impact. The Strategic Plan for Research of the International Potato Center 2006-2016* (version March 2007) for comment. (Available at <http://www.cipotato.org/cip/Strategy.pdf>)
- Cortbaoui, R., S. Ilangantileke, D. Campilan, S. Attaluri (31 January 2008, Draft, revised) *Targeting Orissa as CIP Learning Site in South Asia: OFSPs for Vitamin A Nutrition Improvement* (unpublished CIP document)
- van de Fliert, Elske, Graham Thiele, Dindo Campilan, Oscar Ortiz, Ricardo Orrego, Modesto Olanya, and Stephen Sherwood (2003). “Development and linkages of farmer field schools and other platforms for participatory research and learning” in CIP-UPWARD (ed.) *Farmer Field Schools: Emerging Issues and Challenges* (Los Banos, Laguna, Philippines CIP-UPWARD), pp. 385-405.
- Fliert, Elske van de and Ann R. Braun. (1999). *Farmer Field School for Integrated Crop Management of Sweetpotato. Field guides and Technical Manual*. Bogor, Indonesia: International Potato Center.
- Horton, Douglas., Viviana Galleno, and Ronald Mackay. (November 2007) *Evaluation, Learning and Change in Research and Development Organizations: Concepts, Experiences, and Implications for the CGIAR*. ILAC Working Paper 2, Rome, Institutional Learning and Change Initiative.
- Ilangantileke, Sarath and A. Sreekanth (2006). “Importance of Orange-fleshed Sweet Potato in Combating Vitamin A Deficiency and its Relevance in India” in S.K. Nasar, M. Nedunchezhiyan, K. Rajasasekhara Rao, P.S. Sivakumar, R.C. Ray, R.S. Misra, and A. Mukherjee (eds.) *Root and Tuber Crops in Nutrition, Food Security and Sustainable Environment*, (Bhubaneswar, Orissa, India: Regional Centre of Central Tuber Crops Research Institute, CTCRI), pp. 241-245).
- Kapinga, Regina., Patience Byaruhanga, Thomas Zschocke, Silver Tumwegamire (2009). *Growing orange-fleshed sweetpotato for a healthy diet: A supplementary learners’ resource book for upper primary school* (CIP, 2009 forthcoming).

- Low, Jan W., Mary Arimond, Nadia Osman, Benedito Cunguara, Filipe Zano, and David Tschirley (2007) "A Food-Based Approach Introducing Orange-Fleshed Sweet Potatoes Increased Vitamin A Intake and Serum Retinol Concentrations in Young Children in Rural Mozambique1–3," *The Journal of Nutrition*, Vol. 137, 1320-1327.
- Mohanty, A., A. Das (September 2005) *Promoting Livelihoods through Cropping Systems (Working Paper No. 51)* Government of Orissa, Department for International Development WESTERN ORISSA RURAL LIVELIHOODS PROJECT CNTR: 98 7800.
- Rasco, E.T. Jr. and Amante, V.d.R. eds. (1994) *Sweetpotato variety evaluation, Volume 1, Training Manual. Southeast Asian Program for Potato Research and Development (SAPPRAD)* (Los Banos, Philippines).
- Stathers, T., S. Namanda, R.O.M. Mwanga, G. Khisa, and R. Kapinga. (2005). *Manual for Sweetpotato Integrated Production and Pest Management Farmer Field Schools in sub-Saharan Africa*. International Potato Center. Kampala, Uganda.
- Theisen, Kelly and Thiele, Graham. (2008). *Implementing CIP's Vision: Impact targeting*. International Potato Center (CIP), Lima, Peru. Social Sciences Working Paper 2008-4. 24 p.
- Users' Perspectives With Agricultural Research and Development (UPWARD) (January 2007) *Learning to Use Evaluation in CBNRM Capacity Development in Asia, ECD-CBNRM Project Brief No. 1* (Manila: Philippines)