

Knowledge Transfer for a Horticultural Revolution: The Lifelong Learning for Farmers Model



*28th International Horticultural Congress
Lisbon, Portugal
22-27 August 2010*

Science and Horticulture for People

*Seminar:
Horticultural Education and Training in the
Age of Information, Bio- and Nanotechnology*

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Introduction

It is a pleasure to be here and I thank Professor Errol Hewitt for arranging the invitation. The Commonwealth of Learning, or COL, is pleased to have helped some African students attend the Congress.

Their reflections on the Congress will be incorporated into our ongoing work with African farmers.

I am presenting today on behalf of my colleague Dr. K. Balasubramanian, whose project this is. I shall present a short summary of our work and there will be a fuller version of this paper in the proceedings.

Our title is *Knowledge Transfer for a Horticultural Revolution: The Lifelong Learning for Farmers Model*. We argue that the current approach to agricultural extension, which is based on the green revolution, is unsuitable for the horticultural revolution that developing countries want to see. We shall suggest criteria for a better approach to horticultural extension and show how COL's Lifelong Learning for Farmers Model meets these criteria.

Our talk has five parts. First, we recall the origins of extension programmes and argue that they are no longer fit for purpose. Second we explore how the focus on the green revolution in agriculture has by-

passed the development of horticulture. Third, we examine emerging thinking about extension. Fourth, we show how COL's *Lifelong Learning for Farmers* programme draws on this thinking. Finally, we conclude by recalling the key premises that underpin the *Lifelong Learning for Farmers* model.

Problems with traditional extension programmes

First, why are most extension programmes no longer fit for purpose?

The term 'extension' originated in the nineteenth century when some British universities, acting in a spirit of *noblesse oblige*, started *ad hoc* adult education programmes by offering lectures in communities in their regions. The concept was applied more systematically in the USA with the creation of the land-grant colleges, which mounted extra-mural programmes aimed at farm families.

In both countries the pedagogical style of extension was didactic. The universities imparted their knowledge to people who did not have it. This method, which has been called the 'jug and mug' approach, can work when the aim is a simple transfer of knowledge from the informed to the ignorant. It appears to lend itself well to technology transfer: those who understand the new technology explain it to those who don't.

The green revolution, which focussed on cereal crops, was a process of technology transfer within a state-dominated system. It placed the technologies of new seeds and fertilizers within a framework of aid, subsidies, price controls and state intervention generally. National governments and international development agencies supported the extension model to give farmers the information they needed to operate these new processes successfully.

The green revolution achieved impressive gains in productivity in many developing countries.

However, the tight focus of extension on technology transfer in support of the green revolution meant that it passed over other important facets of rural development, such as gender, the environment and the wider issue of poverty. As Sulaiman & Holt have argued, the poor need help to 'pursue broader livelihood options in on-farm and non-farm sectors so that their vulnerability could be reduced'.

Allahyari encapsulates this by asserting that the 'conventional extension system cannot accomplish sustainability in agriculture; because today's agricultural extension must consider environmental implications, social issues, and overall economic growth within the agriculture sector'. Furthermore, globalization creates new challenges. By changing the conventional green revolution structures such as subsidies, procurement, price-control, state intervention etc, it suddenly requires millions of semi-literate and illiterate farmers to face new problems and opportunities. In sum, agriculture has become more volatile, competitive, knowledge-led and market-oriented, which has always been the case for horticulture.

The green revolution and horticulture

This leads to our second point, namely that the green revolution in agriculture has by-passed the development of horticulture. While horticulture generally refers to integrated farming system, the focus on this presentation will be on vegetables, fruits and flowers. During the green revolution cereal crops enjoyed a substantial amount of protection, which in developing countries, did not apply to horticulture.

Therefore, even in the pre-globalization period, horticulture was always competitive and volatile. There were no minimal price support, subsidy and procurement systems.

Moreover, horticultural operations are generally more intensive than agriculture. For example, the wage costs of cultivating tomatoes in California are 4 to 7 times more per acre than for growing rice.

The overall impact of this is shown in this table, which shows what proportion of the consumer price for different crops goes back to the producer. The data is from West Bengal, India in 1994-95:

No	Crop	Producer's Share Of The Consumer Price (%)
1	Paddy	100
2	High Yielding Paddy	100
3	Wheat	80
4	Spinach	40-50
5	Egg Plant	40
6	Cucumber	50
7	Sweet Gourd	28-33

http://www.ncap.res.in/upload_files/workshop/ws1_chapter8.pdf

Other studies show a similar price spread for vegetables in Ethiopia, while banana farmers in Kenya receive only 36% of what the consumer pays. This disparity between vegetables and cereals is the result of inefficiencies in horticulture marketing, higher transaction costs, weak infrastructure and asymmetrical information systems.

Minot & Hill expand on this by observing that perishable horticultural crops: 'imply additional risk because their prices are more volatile, so the sale prices are more uncertain. The crops may get spoiled before sale; and, in the absence of competition, farmers don't have the option of returning to the market for better prices another day, so they may be forced to accept very low prices. A study of seasonality in Mali found that the off-season price was only 7 percent higher than the harvest price for rice and 40 percent higher for maize, but it was 100 percent higher for fruits and vegetables. Similarly, coffee prices in Uganda were found to be two and a half times as volatile as prices for staple crops like bananas and potatoes, making engaging in markets risky'.

Our key point is that the extension system that emerged from the cereal-based green revolution is unsuited to address the more volatile context of horticulture. In many green revolution economies of the 1950s and 1960s, forward-backward linkages were under the control of governments, which provided seed, fertilizers, credit, irrigation and, through procurement, a market. The extension system operated within this framework and could respond to the farmers.

However, the forward-backward linkages of horticulture have always operated (more or less) under open market conditions, which throw up issues that extension systems cannot address. Contrary to the case in green revolution agriculture, horticulture has no institutional structure to integrate the chain from grower to final destination. Extension staff are trained in production technologies, with limited perspectives about marketing issues and linkages.

New approaches: from extension to innovation

We turn now, in our third section, to examining new approaches to extension that are better suited to address the challenge of horticulture. Indeed, over the last three decades many have also challenged the fundamental concepts of extension as they apply to agriculture. The thrust of the critique is that extension should not limit itself to farm productivity issues but rather aim at improving livelihood options in the primary sector as a whole.

It captures this new orientation by talking of innovation systems instead of extension, thus abandoning the beneficiary-benefactor paradigm and treating the farmer as a partner in innovation, not a mere consumer of information.

In our full paper we explore two such approaches, which we shall summarise briefly here.

Roling's framework for extension

First, Roling creates a framework for extension with three dimensions: structure, process, and institutions.

The structure combines an agricultural knowledge system and an agricultural information system. The knowledge system consists of 'beliefs, cognition, models, theories, concepts, and other products of the mind in which the (vicarious) experience of a person or group with respect to agricultural production is accumulated'. Complementing this, agricultural information is generated, transformed, transferred, consolidated, received, and fed back in the other system. Combining the two systems allows farmers to apply their knowledge.

Roling defines process in five crucial elements; mobilization, organization, training, technical support and system management. The key institution is an active user constituency, which can force the knowledge and information systems to serve the needs of its members.

The Innovation System

The second approach relevant to horticulture is the innovation system proposed by Hambly Odame, Pant and their colleagues. In contrast to earlier notions of a research-driven process of technology transfer, this system views extension as a social process where knowledge and ideas from diverse sources are put into use.

Capacity building aims to influence the behaviour of the system and not merely pass on information based on research or the requirements of technology transfer. The goal is to create the capacity to innovate through knowledge networking, which expresses the 'collective action of organizations and

individuals in response to unpredictable economic, social, climate and environmental changes'. This unpredictability applies to horticulture even more than to agriculture.

Knowledge networking can take place through the combination of the four types of learning networks creating by applying codified and tacit learning to formal and informal knowledge sources respectively. We explore these in more detail in the written paper.

Here we simply represent informal codified knowledge by this photo and informal tacit knowledge by this one.

We shall now explain how they are applied by the Commonwealth of Learning where the bringing together of informal and formal codified knowledge is an important process.

COL's Lifelong Learning for Farmers (L3F) model

The Commonwealth of Learning (COL) is a Commonwealth inter-governmental organisation whose mission is to help developing countries apply information and communications technologies and open and distance learning to education, training and learning generally. Our motto is *Learning for Development*.

One of its initiatives, *Lifelong Learning for Farmers (L3F)*, aims to strengthen the learning process among extension officers and farmers and create linkages between the various stakeholders in the rural economy. Its grassroots-focussed approach involves banks, universities and marketing agencies as partners with the farmers. COL is currently implementing the model in India, Kenya, Mauritius, Jamaica, Papua New Guinea, Sri Lanka and Uganda.

L3F is based on four premises:

- (i) Unexploitative contractual relationships between rural producers and the public and private sectors promote rural entrepreneurship;
- (ii) Learning can be a self-sustaining process that draws in secondary stakeholders to support L3F as a win-win proposition. In particular, appropriate capacity building improves the performance of rural credit and encourages the banking sector to support L3F;
- (iii) Capacity building also enlarges the market for bank credit among marginalized sections of the rural poor, particularly women;
- (iv) Through structures such as rural internet kiosks, rural tele-centres, mobile phones and community radio, ICTs can facilitate the capacity building process acceptably and effectively.

The banks, microfinance institutions and ICT companies will gain if these premises prove valid and will have incentives to deploy this strategy widely, enhancing their businesses while making the rural poor more prosperous. Using the ICT facilities also reduces the transaction cost of lending.

L3F and Roling's extension system

Roling's Extension System influenced the L3F programme through its concept of an active user constituency. This helped us focus on social capital, particularly cognitive social capital, as an important pre-condition for success. Roling's identification of the five elements of process as mobilization, organization, training (capacity building), technical support and system management became our framework.

L3F and the innovation system

L3F does not simply provide farmers with learning materials but also links them to other stakeholders and enhances their ability to negotiate with them.

Here we focus on what we have learned about knowledge networking in the L3F initiative in India, where we work with non-governmental organizations, universities, colleges, farmers associations, banks and marketing agencies in Tamil Nadu, India.

The aim is to strengthen the codified learning and tacit learning in the informal knowledge environment and link it with formal knowledge environment so as to generate an upward spiral of learning networks. Distance learning is one of the important instruments through which the relationships and linkages are addressed.

Informal Knowledge Sources and L3F: codified learning

COL emphasizes the importance of cognitive social capital in building the informal knowledge sources. In India, with our partner VIDYAL, L3F has helped to strengthen a micro-finance and self-help group association of 5000 women members and a farmers' organization with 600 members. These organizations were mobilised to become codified learning centres.

Our partners VIDYAL, Arul Anandar College and the M. S. Swaminathan Research Foundation have helped them emerge as Village Knowledge Centres, with local weather stations, legal conciliation centres, and so on. Information is collected about products, productivity, weather, market demand and supply and bank credit schemes on a regular basis. The farmers' association does seed germination studies and assesses the quality of seeds.

After training by COL the farmers' and women's organizations have developed print-based and web-based distance learning materials on horticulture, animal husbandry and agriculture. Through online information bulletins, street notice boards, newsletters and voice mail messages on mobile phones, information on such topics reaches thousands of women and farmers on a daily basis.

More recently, audio learning materials have been developed for mobile phones and are reaching nearly 6000 farmers and labourers daily. Both the organizations have achieved near self-sustainability with microfinance and marketing of horticulture seeds. This is how a codified learning network has been established through the development of cognitive social capital.

Informal Knowledge Sources and L3F: tacit learning

Lifelong Learning (L3) is the informal and formal process of continuous learning. In the L3F programme the aim is to create *social learning capital* by interlinking social capital, informal lifelong learning and the idea of quality learning conversations.

L3F makes a special effort to strengthen the tacit learning network through social learning capital. For instance, members of the farmers' and women's organizations have bought mobile phones through bank credit for learning through voicemail. They are encouraged to share their learning with other association members using their mobile phones and the mobile phone company allows free phone calls among the group members to facilitate this.

COL has helped the groups to develop a framework for quality learning conversations through which the members share their learning experiences with others. These conversations are recorded and discussed in the codified learning network. In addition, the members regularly meet during community festivals and organize visits and picnics during which information and knowledge are shared. These activities provide a platform for the informal exchange of information and knowledge.

Linkages between Formal Knowledge and Informal Knowledge Sources

A key feature of L3F is to establish links between formal and informal learning networks and participatory learning content development is an effective locus for interaction among actors from both networks.

Thus a consortium of agricultural and veterinary universities supports the farmers' and women's associations in developing business plans and purchasing materials such as seeds, animals and other inputs. The women's association assesses the problems in a particular area, aggregates the queries and sends them to the universities by video e-mail. The university staff provide answers in the same way and these video emails are then stored in a digital library for the easy access.

One college participating in L3F has established a 'Light on the Wall' learning-cum-business centre where the association members and academics meet regularly to discuss issues. The basic premise of L3F is a win-win framework for all the stakeholders and under this framework the farmers' and women's associations play an active role in the universities' field research. University students do field training under the supervision of the farmers and the distance learning materials developed by the farmers are recognized as textbook materials for university diploma courses in agriculture and horticulture. Similar linkages are in place with financial and marketing institutions.

Trends of L3F

The L3F initiative is in the take-off stage. To call it a success would require a self-sustaining and self-generative system with secondary stakeholders such as banks and markets directly supporting the system as a win-win strategy. We are not fully there yet but the trends are positive.

Sri Lanka' Central Bank, using the L3F perspective, has launched a distance learning programme for rural banking staff in Sri Lanka in collaboration with Open University of Sri Lanka.

In India, a total direct and indirect investment of \$ 50,000 by COL to its partner VIDYAL has helped to generate credit and assets worth \$ 1.3 Million in 400 households in the last year. Through L3F around 400 women have managed to develop enterprises in goat rearing, fodder cultivation, and floriculture.

We have compared the health and fitness of goats managed by members of L3F and non-L3F people in the same region. A thorough study of animals in 30 households showed that the quality of animals among the L3F members was significantly better than in non-L3F households.

	L3 Participants	Non-Participants
Mean Weight of Male Goats in Kgs	31.20	25.80
Mean Weight of Female Goats in Kgs	25.60	22.00
Mean Height in adults in cm	70.13	63.60
Mean Length of adults in cm	63.73	55.27
Mean Chest Girth of adults in cm	69.87	67.53
Kidding intervals (in month) per household	6.93	8.27
Total no of kids born per household	32.13	28.47
Triplet Kidding %	17.22	7.50
Mortality of Kids	2.20	7.67
Total Income from selling of goats per HH	Rs.44407	Rs.24133

We believe that the participation of the farming community in innovation through L3F and the linkages with the secondary stakeholders partly explain these outcomes.

Key premises for a paradigm shift

In conclusion, COL's Lifelong Learning for Farmers model is a paradigm shift based on the following premises:

1. *Extension is a facilitation process through which a community is empowered to manage agricultural knowledge systems and agricultural information systems.*
2. *Extension takes place in the context of already established social capital such as cooperatives, Self-help Groups, associations etc., which form a strong active user constituency. Cognitive social capital is a precondition for lifelong learning.*
3. *The community is not a mere consumer of information but partner in knowledge management.*
4. *Facilitating Self-Directed Learning among the active user constituency is an important dimension of L3F.*
5. *L3F and Learning for Livelihoods are the processes of community understanding and internalizing Value Premise Analysis, Value Chain Analysis, Value System Analysis, and Value Coalition Process in the primary sector.*
6. *In L3F, an extension agent (or agency) is one who facilitates the community level knowledge management and transforms social capital into social learning capital.*

We believe that such an approach has the potential to revolutionize the horticultural sector in developing countries.

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