INNOVATION SYSTEMS AND CAPABILITY BUILDING AMONG SMALLHOLER FARMERS: LESSONS AND INSIGHTS FROM KENYA'S FLOWER FARMERS

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INTRODUCTION

The relevance of the innovation systems approach to developing country agriculture has been demonstrated in numerous case studies[2] and advocated by many other analysts (Clark, 2001; Clark et al, 2002; Clark et al, 2003 Lundvall et al (2002); Spielman, 2005; Hall, Mytelka and Oyeyinka, 2006). The adoption of the innovation systems approach by development actors such as CTA[3] and World Bank[4] is rooted in the potential for the approach to help in diagnosing weaknesses within the national agricultural systems and advise policymakers on how to strengthen the systems. The results of pilot case studies supported by CTA and the World Bank demonstrate that the innovation systems approach can be used to determine and explain how different policies/ institutional frameworks and combination of agents (actors) are involved in innovative activity; and how their interactions or lack thereof contributes to or undermine learning and innovation. These studies have concluded that the approach is helpful in identifying problems/weaknesses that should be the object of policy response and how new policies might be designed to solve/mitigate the problems (World Bank, 2007; Francis, 2009).

In the Kenyan case study, innovation systems approach was applied to interrogate how the partnerships between farmers and agribusiness actors (exporters) and supported by other public sector actors (research institutes, regulatory agencies amongst others) and civil society (NGOs) contribute to building the capabilities of small scale farmers; and the institutional factors that shape interactive learning between farmers and other actors in the innovation system.

METHODS AND APPROACHES

This study examines the interactions between farmers and the different actors in the innovation system and how these interactions shape the processes of capability building. The case study begins by reviewing the policy and legal framework and its influence on learning, innovation and capability building. This is followed by mapping out of the actors relevant for building farmers innovation capabilities. Such actors are mapped based on their roles within the farmer-exporter partnerships. In order to explore the interactions between farmers and the different actors, we followed three strategies. First, we describe the organizations/actors, their mandates, functions and interactions to capture 'what the organization says about itself' (Roche, 1998) in regards to their activities and achievements

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[2] See a series of case studies published in Hall et al (2004);

[3] Details of the CTA programme on "Agricultural Science, Technology and Innovation (ASTI) Systems in the ACP" can be found at http://knowledge.cta.int/en/Dossiers/CTA-and-S-T/CTA-S-Tprogramme/ASTI ;

[4] The World Bank's department for agriculture and rural development funded a series of case studies in Africa, Asia and Latin America towards operationalizing the innovation systems approach. See World Bank (2007)

in relation to capability building. This information was obtained by interviewing the leaders/representatives of these organizations as well as from the annual reports, publicity materials (brochures), websites, strategic plans etc.
Secondly, we asked farmers and exporters their views on the roles and performance of the various organizations in order to get 'what they say about the different actors/actor groupings'. This was done through a survey using a structured questionnaire in which farmers and exporters were asked to rate the different actors according to a prescribed scale, and their responses for analyzed and compared. The data resulting from this survey tells of how the actors are viewed by their clients (farmers and exporters) and lastly, we held face to face semi structured interviews with farmers and exporters to capture their views, perceptions and opinions in their own words.

SUMMARY OF RESULTS/FINDINGS

The survey covered 116 farmers comprising 60 percent small-scale; 26 medium scale and 14 large scale. The farmers were interviewed on their perceptions of various actors and their importance as sources of new knowledge. Even though informant interviews and literature review identified various other organizations not included in this survey as important in building farmers' capabilities (for example marketing support organizations), this case study has focused mainly on the actors that were identified as being involved in capability building or providing a supportive role in building farmer capabilities. These include the R&D organizations and other actors which have R&D as one of their key functions (such as input suppliers and NGOs).

(i) Farmers prefer NGOs and Input suppliers as "partners R&D" and "sources of knowledge".

In general, 39% of all farmers rated 'other farmers' as main partners in R&D; 24.5% preferred input suppliers and while 20.7% preferred local NGOs. "Other farmers" are preferred as partners in R&D by 95.8% of small scale farmers, 100% by medium scale farmers and 33.3% by large scale farmers. "Input suppliers" are preferred by 64.6% of small scale farmers, 75% medium scale and 66.7% large scale farmers. Local NGOs are preferred by 41.7% of small scale farmers, 35% medium scale farmers and 33.3% large scale farmers. A similar trend is witnessed when farmers are asked for their preferred "sources of knowledge." 12.5 % of small scale farmers have rated 'other farmers' as 'quite important' and while 75% of them have rated other farmers as 'most important'. Similarly, 34.1% of small scale farmers rated input suppliers are 'quite important' while 36.6% rated them as 'most important'. Some 8.8 % of small scale farmers rated local NGOs as 'quite important' while 38.2% rated local NGOs as 'most important'. See table 1 and 2 for a breakdown of the responses by farm sizes

(ii) The role of Universities and research institutes is only marginal

Overall, 3.7% of all the farmers interviewed would choose local universities and research institutes as partners in R&D, 2.9% would choose foreign universities and research institutes; 2.5% would choose foreign private consultants while 0.4% would choose local private consultants. When broken down by farm size, only 2.1% of small scale farmers

would choose local public universities and research institutes, 10.4% of them would choose foreign universities and research institutes while 44.4 % of the large scale farmers would choose local public universities and research institutes and 11.1% of the large scale farmers would choose foreign universities and research institutes . When asked for their preferred "source of knowledge", 84.6% of small scale farmers rated local public universities and research institutes as 'least important' while 86.2% of them (small scale farmers) rated foreign universities and research institutes as 'least important' sources of knowledge.

DISCUSSION

The contrast between the choices for partners in R&D is striking. In aggregate, the knowledge – generating organizations are ranked lowest in choice as partners in R&D. Further analysis show that whereas input suppliers are valued as partners by all the farm categories, only 33 percent of large farmers consider 'other farmers' as important R&D partners as contrasted with small scale farmers (95.8 percent) and medium scale farmers (100 percent). On the contrary, 66.7% of large farmers choose input suppliers and 55.6% choose foreign private consultants as main R&D partners. The disaggregated data also show that even though the overall partnerships with public research institutes and universities is rated low, 44 % of the large farmers reported having partnerships with them. This is attributed to the fact that the large scale farmers can pay for the services such as consultancies, research, soil testing etc. Based on these findings, there are two trends emerging from the results:

(a) That generally research organizations (both local and foreign) are rated poorly as 'sources of new knowledge' to farmers and are unlikely to be chosen by farmers as 'partners in R&D'.
(b) That farmers obtain knowledge more easily and readily from input suppliers, 'other farmers' and NGOs. Both the input suppliers and NGOs are rated highly as 'sources of new knowledge' and are more likely to be chosen by farmers as 'partners in R&D'

Our analysis and discussions of these emerging trends is guided by the following questions: Why have farmers rated the R&D/training actors poorly as sources of knowledge and partners in R&D? What are the NGOs and input suppliers doing differently?
We argue that this trend may be explained by the organizational culture and routines of the various actors (universities and research institutes versus the input suppliers and NGOs). Cameron and Quinn (1999:14) have observed that organizational culture "encompasses the taken-for-granted values, underlying assumptions, expectations, collective memories and definitions present in the organizations". The culture reflects the prevailing ideology that people carry in their heads and conveys a sense of identity to employees, provides unwritten and often un-spoken guidelines for how to get along in the organization, and it enhances the stability of the social system that they experience." They further argue that at the organizational level, "culture is reflected by what is valued, the dominant leadership styles, the language and symbols, the procedures and routines and the definitions of success that make an organization unique." This culture and routines have also been referred to by other analysts as the "traditional habits and practices of the actors" (See Mytelka, 2000; Mytelka and Farinelli, 2000 and Hall, Mytelka and Oyeyinka, 2006). They influence the

organization's ability to reconfigure and re-orient its functions in light of changing contexts (Teece, 1996).

(a) Exploring the 'peripheral' role of R&D organizations

Hall, Mytelka and Oyeyinka (2006) have noted that the habits and practices of organizations are shaped by the historical, cultural and political settings in which they are embedded. Most of the public R&D/ training organizations in Kenya were formed in the era of the linear models of development characterized by top – down, hierarchical orientations. The apparent weak role for the knowledge producing organizations in supporting farmers suggests that the universities and research institutes are 'still stuck' in what Gibbons et al (1994) have called mode 1 science[5]. The characteristics of mode 1 science suited well the transfer of technology (ToT) models in which research was conducted by the universities and research institutes and the findings passed on to extension agents for onward transmission to farmers for adoption. The inadequacies of the ToT models and mode 1 type of approaches have led to mode 2 science[6] to explain what Gibbons et al, 1994 and Nowotny et al, 2001 have called 'the new production of knowledge'. This view is consistent with the systems of innovation approach which advocates for close interactions between these multiple actors as a means of promoting learning and innovation.

In Kenya, the changes from the ToT models to the innovation systems approaches have been reflected in the key shifts in agricultural policies witnessed from the mid-1980s. However, even though research institutes have tried (to varying degrees) to engage some other actors in their research (there are isolated cases of involving NGOs and large scale farmers), the organizational structures of these organizations have remained largely hierarchical with strict lines of command. Their procedures are still bureaucratic with several layers of approvals before any initiative can be implemented. Robert Chambers (1989:182) has attributed these 'old habits' to the combined effect of training and organizational culture and summarized on the capacity of R&D/training organizations to change thus:

"Normal professional training and values are deeply embedded in the transfer of technology model, with scientists deciding research priorities, generating technologies and passing it onto extension agents to transfer to farmers. Normal bureaucracy is hierarchical and centralizes, standardizes and simplifies. When the two combine, as they do in large organizations, whether in agricultural universities, international agricultural research centres, or national agricultural research systems (NARS), they have an impressive capacity to reproduce themselves and resist change."

[5] In this mode, research agenda are set by the researchers/scientists and relevance is determined by the interests of this group and excellence is based on the cognitive authority of peer review. The research is largely disciplinary and the actors involved are largely homogenous.

[6] The mode 2 science acknowledges multiple actors, 'multiple knowledges' and the multiple ways of knowing. In Mode 2, knowledge is generated in the context within which it is applied and research agenda is set by multiple actors and appeals to the wider social and economic goals. Knowledge is produced in a trans-disciplinary manner and its relevance judged on how it addresses the impending needs of its users.

(b) The NGOs and Input Suppliers: What do they do differently?

NGOs are characterized by small sizes, institutional flexibility, horizontal structures (as opposed to hierarchies) and short communication lines. These attributes have accorded them more direct contact with farmers and shorter response time to farmers' requests. On the other hand, strong collaboration with input suppliers stems from the way they (input suppliers) have organized their business and engagement with farmers. Other than promoting their products, they offer training and field demonstrations for farmers on the dosage, safety measures on pesticide use, plant protection and good agricultural practices in general. Besides, the input suppliers (mainly agrochemicals) have sales and marketing staff who are trained in agronomy and would occasionally visit the farmers to help identify problems in the greenhouses or the fields. This approach has built the confidence and trust between the farmers and input suppliers.

CONCLUSION

From our analysis, it appears that the organizational culture (together with its incentive structures) shapes the propensity of the individual agents/actors within these organizations to interact with other actors (organizations) within the wider innovation system. It can be argued that the hierarchical culture of the R&D provides limited incentives for agents who would want to operate in a new and potentially 'disruptive' manner. In other words, there is little support for new forms of organization that do not conform to the bureaucratic procedures that characterize these organizations. The NGOs project more of a 'clan culture' where success is defined more in terms of sensitivity to customers and people and the organization places premium on teamwork, participation and consensus. The input suppliers are characterized by 'market culture': more results-oriented with emphasis on winning market share and penetration.

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Table 1: Choice of main partners in R&D by farm size						
			size of farmers			Total
			small scale	medium scale	large scale	
Main partners in R&D[a]	other farmers	Count	46	20	3	70
		% within Identity	95.80%	100.00%	33.30%	
	input suppliers	Count	31	15	6	52
		% within Identity	64.60%	75.00%	66.70%	
	local public universities and research institutes	Count	1	1	4	6
		% within Identity	2.10%	5.00%	44.40%	
	foreign universities and research institutes	Count	5	0	1	6
		% within Identity	10.40%	0.00%	11.10%	
	foreign private consultants	Count	0	0	5	5
		% within Identity	0.00%	0.00%	55.60%	
	local NGOs	Count	20	7	3	30
		% within Identity	41.70%	35.00%	33.30%	
	international NGOs	Count	2	0	0	2
		% within Identity	4.20%	0.00%	0.00%	
Total		Count	48	20	9	77

Percentages and totals are based on respondents.

a. Group

Table 2: Importance of actors as 'source of new knowledge'

		least important	not quite important	important	quite important	most important	Total
Small Scale	**local NGOs**	12	2	4	3	13	34
		35.30%	5.90%	11.80%	8.80%	38.20%	100.00%
	foreign NGOs	13	1	3	0	7	24
		54.20%	4.20%	12.50%	0.00%	29.20%	100.00%
	input suppliers	3	4	5	**14**	**15**	41
		7.30%	9.80%	12.20%	**34.10%**	**36.60%**	100.00%
	local private consultants	23	4	0	0	0	27
		85.20%	14.80%	0.00%	0.00%	0.00%	100.00%
	foreign private consultants	20	0	0	0	2	22
		90.90%	0.00%	0.00%	0.00%	9.10%	100.00%
	foreign universities and research institutes	25	1	2	1	0	29
		86.20%	3.40%	6.90%	3.40%	0.00%	100.00%
	local public universities and research institutes	**22**	2	0	2	0	26
		84.60%	7.70%	0.00%	7.70%	0.00%	100.00%
	farmers	1	1	4	6	36	48
		2.10%	2.10%	8.30%	**12.50%**	**75.00%**	100.00%