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Farmers' organisations and contracted R&D services

Service provision and innovation in the
coffee chain

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Farmers' organisations and contracted R&D services

Service provision and innovation in the coffee chain

Giel Ton and Don Jansen

1. Introduction

The backbone of a value chain is the sequence of production-processing-retailing of a product. So called value chain operators handle the material flow of the product through the different links in the chain: farmers are producing crops, sell them to the traders and processors who add value and sell the product further downstream. In developing countries most farmers produce small quantities. Individually they cannot supply sufficient produce to meet the needs of a trader and processor. Logistic requirements are the most obvious reasons, e.g. minimum truck loads, fixed container volumes, etc. Furthermore, when smallholders sell their products individually, they use to have very little negotiation power. They simply produce too little; there are plenty others that can supply the same quantity and quality. To improve their negotiating power and raise the on-farm price for their products, they need to organize themselves. Collectively they can reduce logistic inefficiencies in production and marketing, and, by doing so, they can make themselves attractive business partners. This collective action is done through farmers' organisations, such as cooperatives, village groups and farmer associations, but also through more loosely organized farmers' networks, like farmer field schools, contract farming, or being preferred suppliers to processors, traders and exporters. Even small developing countries use to have hundreds of these farmer groups.

Many different public and private actors are working in support of value chain operators in general and small holder producers specifically. They provide credit, market information, training, market regulation, etc. The way these stakeholders interact with chain operators may differ according to the service they provide. Some of them create their own functional group of farmers 'moulded' around the service they are providing. This may cause a complex arena of one-issue organisations that are functioning parallel-wise with essentially the same type of overlapping membership (e.g. credit groups, farmer field schools, women groups, etc.). However, there is increasing awareness that for attaining sustainable results it is preferable to adapt the service provisioning to the already established 'social capital' instead of starting to re-create it. Many service providers now try to use the organisational strength and (relative) financial and organisational autonomy of economic producer organisations already operating collectively as chain producers and processors in value chains.

In this paper we will analyze the increasing involvement of farmer organizations in agricultural R&D support¹. In several countries, the financing and quality control of these systems have changed quite dramatically in the last decades. These countries used to have R&D systems that relied almost exclusively on public financing of NARIs (National Agricultural Research Institutes). Now, new forms of R&D systems are introduced with competitive funding open to NARIs and private service providers. Control over quality of R&D processes and output has become more transparent and inclusive of stakeholders in the value chains². In the system of competitive funds, farmer groups are considered as the clients of R&D activities supplied by public and private service providers. Sometimes farmers' organisations are even involved in priority setting and governance of these R&D systems. Economic producer organisations involved in agricultural value chains are of special interest as they are knowledgeable about technical problems in production to which R&D can be targeted. However, the experiences with this involvement of farmers' organisations in R&D are mixed. In some systems their involvement results in a good functioning R&D system; in other systems there are suboptimal results³.

This paper discusses the implications of these strategies, aiming for empowerment and leverage for smallholder farmers in value chains, for public and private R&D innovation strategies and service provision. We will indicate the growing importance of competitive funds in R&D contracts between farmers' organizations and R&D service providers to tackle problems of smallholder farmers. There is

a growing role of farmers' federations as mediators between grassroots organisations and private service providers in the governance of the contracting process and contract conditions. We will also explore several mechanisms that underpin the governance of R&D arrangements by farmer organisations and apply this analytical framework in the analysis of R&D in the coffee value chain. As the prime case-study we have used the R&D system around coffee in Colombia that is largely managed by the National Coffee Federation (FNC).

2. Modern R&D systems: competitive grants for contracting service providers

Modern R&D systems with private research providers serving farmers' organisations are being introduced in various developing countries. The World Bank reviewed a whole range of different demand-led R&D systems in the world⁴. The review suggested that emerging new institutional arrangements are being widely tested and evolve along an evolutionary process⁵. Divergent countries like Uganda, Bolivia, Cameroon, Kenya and China are developing institutional frameworks for competitive funding. In spite of the context specific differences, all these new R&D arrangements tend to have a more or less similar architecture:

- The research and extension needs have to be submitted by organized farmers.
- The selection of proposals is done by applying several quality criteria and is increasingly related to the expected impact on the performance of the value chain.
- A public call for proposals invites private service providers to elaborate a proposal to meet the R&D needs.
- The proposals are evaluated by a specialised unit and one of the service providers is granted the contract.
- This service provider elaborates a detailed proposal in coordination with the farmers' organisation that originally submitted the R&D demand.

Box 1: *Example of new demand-led R&D system- SIBTA*

Bolivia's new agricultural R&D system is called SIBTA (Sistema Boliviana de Innovación y Transferencia Tecnológica) SIBTA was designed in 1998 and replaced the in 1990 discontinued public NAR system (IBTA). It is a modern system geared to value chain development and subcontracting of R&D to private entities. It has four Foundations for Agricultural Technological Development (FDTA) as their operational units in the different Macro Eco Regions of Bolivia: Valleys, Highlands, Humid Tropics and Chaco. These FDTAs use an innovative form of prioritization of resources in R&D. They collect demand from legally constituted organized actors in the value chain, including farmer organisations, and review and assess these demands through an anonymous external panel. For the selected demands a public procurement call is placed to motivate private institutes to elaborate pre-proposals. An external review panel qualifies these pre-proposals and contracts a service provider to write a full proposal. The requesting farmers' organisation is asked for a formal 'no objection' of the proposed R&D arrangement with the service provider. An estimated 126-390 days after the initial demand⁶, the R&D activity can start.

Producer organisations responded positive to this new mechanism for agricultural R&D. The Board of Directors of the FDTA (60% private, 40% public) effectively included several persons from smallholder farmers' organisations. This opened up a way for the farmers' federations to be informed and to be taken into account. The board managed to take decisions in consensus, away from the traditional party-political interference in funding decisions. Co-financing exigencies were strict (15%), and were the main points of concern for farmers in the start-up phase. However this issue became secondary when co-financing arrangements with other supporting agencies, especially local municipal authorities, were admitted. The required 15% could to a large extent be covered by funds from the municipal budget or with donor support, leaving a limited financial obligation of the involved farmer organisation.

Discussions on the pros and cons of the FDTA system, shifted to issues of 'governance of' the R&D arrangements, rather than 'access to' them. Producer organisations that submitted demand proposals felt uncomfortable with the contract being signed without them, only between FDTA and the R&D service provider agency. They suggested a different modality: a contract directly between the producer organisation and the R&D service provider. The producer organisations, as clients, wanted sufficient negotiating power towards their suppliers, to eventually adapt the project in such a way that it would generate better results for them. A related point had to do with the property rights of the assets acquired during the R&D project. Producer organisations claimed the right to be final beneficiaries of the investments made in the project as

reward for their financial contribution. However, the contract made the transfer of these assets conditional on a positive evaluation at the end of the project. Obviously, this limited the power of the producer organisations in case of conflicts over the R&D arrangement. In several cases service providers used this property issue as a leverage to impose their views on the producer organisation.

Farmers' organisations that accept the R&D arrangement with a R&D service provider will have to invest time and money in it. In their decision making, they will assess the expected 'price' and 'quality' of the R&D services delivered and the expected benefits for them. Williamson (2002)⁷ points to another feature of transactions that will be part of their assessment: the 'remediableness' of the arrangement; the credibility of cost-effective procedures to adapt and fine tune it, when it does not produce the expected outputs. Agricultural R&D investments are risk prone. Research and extension normally do not produce immediate results; they may provide practical solutions to the farmer organisation only after a certain period of research and experimentation. So there will always be a risk of failure of R&D investments made. Farmers and farmers' organisations in developing countries use to be well aware of this risk, as they usually have had multiple experiences in the past of support activities that did not produce the promised results. Most R&D contracts between farmers' organisations and private service providers will have some possibilities to remediate an R&D arrangement when things do not go the way it was expected. However, these contracts use to be standard formats. They are elaborated by the (inter)national designers of the R&D system and most contract conditions are not negotiable for individual farmer organisations neither for the service providers. Any how, even if adjustment mechanisms exist, the possibilities for farmers' organisations to effectively use these will be limited due to high 'transaction costs'. Questioning an R&D arrangement will cost them time, money and, it may sometimes result in overt disagreements or conflicts that may cost them their reputation towards other (future) support agencies. Grassroots farmers' organisations will look for ways to prevent this negative image. That's why federated farmers' organisations ("farmers' federations") are increasingly involved in R&D governance issues. They can act on behalf of their member organisations and reduce the eventual costs for discussing R&D contract issues for them.

Box 2: Research linkages with Farmers' Federations

A World Bank study in West and Central Africa⁸, on the linkages between research service providers and farmers' organisations concludes that strong, federated farmers' organisations tend to be a more effective mechanism for empowering farmers in technology development processes than, for example, simply using participatory methods or working with small farmer contact groups. Also ⁹stress the importance of larger organisations like farmers' federations. This increases the possibilities for upward participation of different local groups of farmers and provides a mechanism of downward accountability of the voices of farmers in national R&D systems. The most successful organisations appear to be¹⁰:

- Possessing several levels, at least three, from grassroots to federative level
 - Based on free membership around common interest
 - Access to different sources of funding
 - Based around successful and remunerative economic activities
 - Benefiting from support of an external organisations for animation, capacity building and input/marketing support
-

These farmers' federations are not a homogenous group. Some federations have a more or less homogeneous membership of grassroots organisations that are all producing the same commodity. Other federations will represent grassroots organisations within a geographic region but with very diverse activities and a whole range of commodities. When we want to integrate farmers' organisation in R&D for value chain development these differences do matter. It is obvious that organisations that are grouped around the same commodity will be more knowledgeable on problems and bottle-necks in the chain. They are crucial in the process to specify and select the most important bottle-necks and R&D needs in the chain. Instead, regional or national federations typically focus on issues relevant for

agriculture as a sector, not limited to a specific commodity. They are more knowledgeable on issues related with general policy and legislation, like poverty reduction strategies, property rights, commercial law, credit provisions, etc. In the design of an R&D system these differences have to be correctly understood. A proper distinction has to be made between different roles of farmers' organisations in agricultural R&D:

- articulating research demands;
- governing the institutional process and arrangements of R&D for smallholders.

Where grassroots organisations and commodity federations are especially knowledgeable on R&D demands for chain development, their second level organisations tend to be more knowledgeable on issues around contracts, processes and governance of R&D systems. There seem to be typical strengths and weaknesses of the different types of farmers' organisations in R&D systems (Table 1).

Table 1: Strengths and weaknesses of different types of farmers' organisations in their participation in R&D systems

	ARTICULATING R&D NEEDS FOR CHAIN DEVELOPMENT	CONTROLLING THE PROCESS AND CONDITONS FOR R&D FOR CHAIN DEVELOPMENT
grassroots organisations	++	-
commodity based federations	+	+
sector wide regional/national federations	-	+

We illustrate this 'new' role for farmers' federations as process controllers in a novel R&D system related to the provisioning of extension services to farmer groups. The PROSAT project aimed to create a local market for private extension service providers. It co-financed research and extension services directly to farmer groups that contracted private extension workers. The idea was to boost demand driven support to groups of farmers by creating a market of service providers in R&D. However, no mechanisms existed to benefit from the experience of the farmers' federation. The active involvement of the farmer federations in the screening of proposals could have been functional in targeting the R&D support to organisations with a minimum of experience in marketing. The main argument to exclude the farmers' federation of the R&D system was that they would assist member organisations submitting proposals, and at the same time sit at the table were these proposals would be evaluated. This apparent contradiction could have been easily resolved when the differences between types of farmers' organisations had been properly understood and roles had been distributed correspondently: grassroots farmers' organisations for contracting R&D services; and farmers' federations for controlling the process of R&D provisioning.

Box 3: Private extension provisioning to farmer groups - PROSAT

The PROSAT project aimed to create a local market for private extension service providers. PROSAT co-financed research and extension services directly to farmer groups that contracted private extension workers. Farmer group involved in PROSAT had to pay a monetary contribution, gradually increasing from 10% of the salary in the first year to 60% in year three. The idea is that afterwards the R&D worker could be paid totally by the group. This worked quite well with established producer organisations that had funding donor support. Smallholder organisations without such support, however, were generally not in the position to pay such large amounts. They had to find informal arrangements to keep the R&D arrangement going. PROSAT lead to the appearance of various groups of beneficiaries that emerged around individual unemployed extension officers.¹¹ The officer him/herself forms the association around his personal contacts in a village, neither requiring nor expecting a real monetary contribution from them. In these projects the contribution of the beneficiaries was generated by a voluntary reduction of the extension officer salary. Most projects with these newly established groups had focused on production without a proper analysis of the future market conditions¹². Many prospective new crops or rural processing activities had been introduced and supported, but the newly established farmer groups did not develop the capacities for effective marketing and, as a result, could not raise enough income to pay even a minimal salary for the R&D officer.

3. Governance systems for agricultural R&D: the case of coffee

The preceding section shows that contracts between clients and suppliers of agricultural R&D are becoming increasingly important. The content of these contracts is varying a lot between institutions and donors, and governance of contract conditions is increasingly a task out of the realm of individual farmers and grassroots organisations, and an issue where farmers' federations increasingly have a role to play. How can a R&D system be designed so that these farmers' organisations can play this role in a way that meets expectations? The performance of these farmer representatives in the governance of the R&D system will not be the same in each country and in each commodity group, as the economic and organisational strength of the relevant farmers organisations and the enabling financial and policy environment can differ widely. We use four dimensions on which effective governance of R&D systems by farmers' organisations can be rated:

1. The influence of farmer organisations relative to other stakeholders in the governing bodies
2. The financing mechanisms that underlie R&D arrangements and define the public or private character of the R&D investments
3. The coordination and information flows between grassroots, commodity based and national farmers' federations represented in the governing bodies
4. The linkage of the R&D system with enabling regional and national sector policies.

We will apply these on the R&D systems around one and the same commodity in three different countries: the coffee sector in Uganda, Brazil and Colombia.

R&D on Coffee in Colombia

Coffee producers in Colombia are mainly family based small holders. To a large extent this is due to the mountainous area in which coffee is produced where mechanisation is extremely limited and the production of high quality coffee requires high labour use for picking of individual berries due to uneven ripening¹³. Colombian coffee farmers are actively involved in the R&D system around coffee through the commodity based federations FNC (Federación Nacional de Cafetaleros or National Federation of Coffee Producers). FNC has 360.000 members in 15 departmental committees and 353 municipal committees. FNC supported the formation of 38 coffee marketing cooperatives that manage 488 delivery points. FNC concentrates the quality control of R&D arrangements through the democratic election of representatives in the various organs of the FNC. Through a levy on the exported coffee and a membership fee, farmers effectively pay for most of the services that their organisation undertakes. This feeling of ownership of the farmers is used by FNC to motivate the farmers to participate in the different platforms to decide on the quality of the R&D services delivered to them. The services provided by FNC are partially paid for by the National Coffee Fund, which is filled by a levy on exported coffee. The National Coffee Committee, where the government is represented along with a representation from the FNC, decides on the distribution of funds from the National Coffee Fund. For various services, such as R&D and social projects, FNC also raise additional funds from (local) governments and other donors¹⁴. Quality control and decision making on topics to address in Social Project and Extension is largely done by the FNC committees at municipal and departmental level. Quality control on research (centred in the FNC institute CENICAFE), marketing, diversification and risk management is the responsibility of the FNC national congress, where e.g. investment strategy and results of it are hotly debated. Membership to the FNC is voluntary and currently about 70% of coffee farmers is member. Most farmers appreciate the high quality of services delivered (already for 80 years) and the relatively freeness of corruption. The latter is to a large extent due to the control over funds at grass-root level and the professionalism, austerity and discipline of the staff of FNC¹⁵. The quality and efficiency of these services is controlled by the National Congress of the FNC and, to certain extent, by the Provincial and Community Committees. The latter are strongly involved in the development, financing (often to a large extent from additional funds) and outsourcing of social projects (such as development of schools and school curriculum, road development), and the checking of spending and quality of results. Within the system there is a strong horizontal exchange of information (between those executing, controlling and making use of services) and a vertical exchange between the various layers of organisation within the FNC. This facilitates the execution of control and the decision making on allocation of funds.

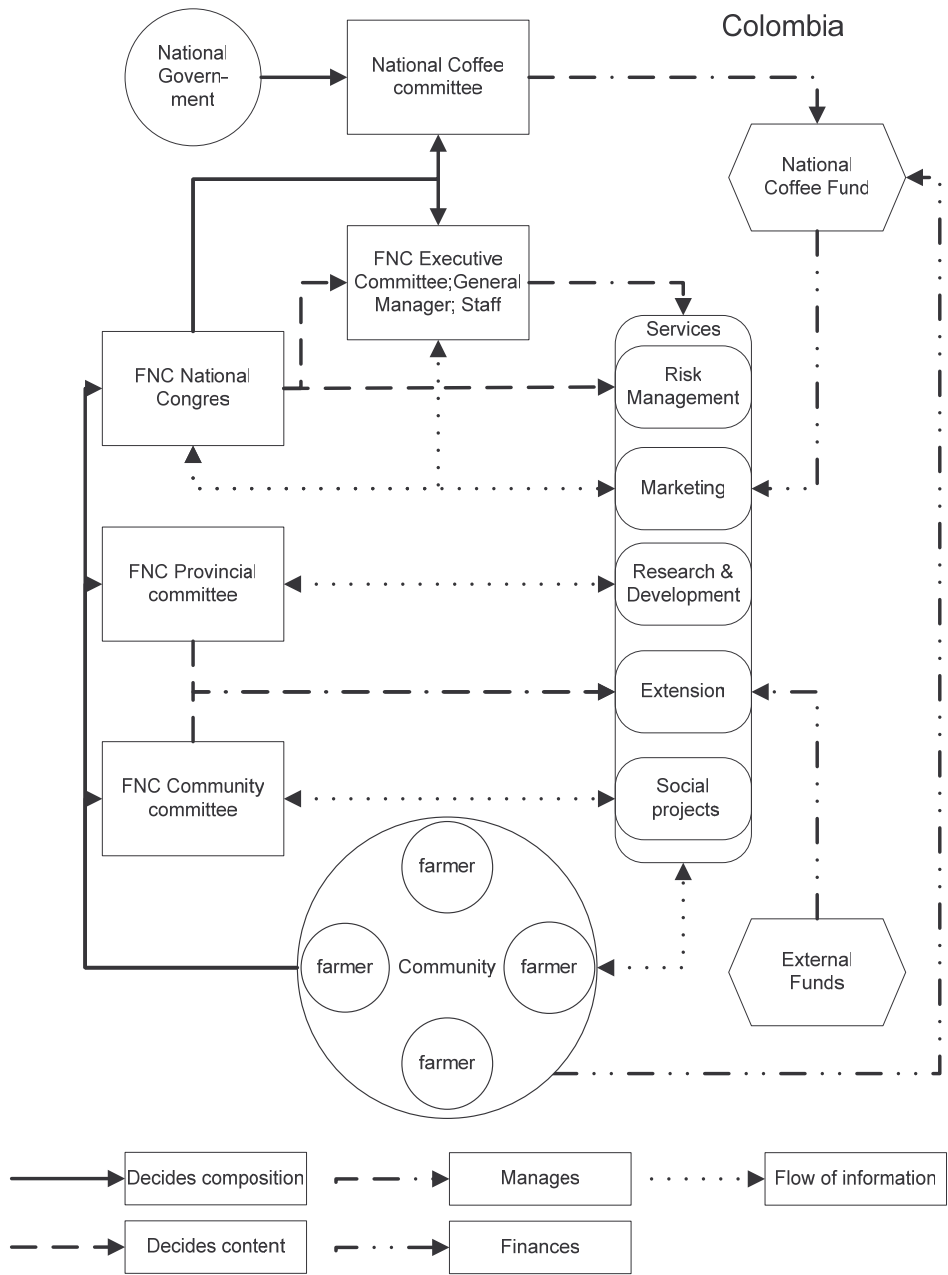


Figure 1: Coffee R&D system in Colombia

R&D on Coffee in Brazil

Coffee production in Brazil is dominated in quantity of production by large landowners, but in quantity of producers by family based small holders. 70% are smallholders (<20 ha), with 20% of total Brazilian production, 20% are medium size (20-200 ha), with 40% of production and 10% are large farms (>200 ha) with 40% of production. Coffee Policies and funding of activities (from the national fund FUNCAFÉ, which is filled through a levy on exported coffee) are discussed and to a large extent decided upon by the Coffee Policies Deliberative Council (CDPC), with 7 representatives of government, 4 of national commodity and geographical producer organisations and 3 of coffee industry associations. Large part of the funds goes to financing of the coffee harvest (in 2002 around 97%¹⁶) and only very little to R&D (in 2002 around 0.8%). Research on coffee is coordinated by the Brazilian Consortium for R&D in Coffee (Consórcio Brasileiro de Pesquisa e Desenvolvimento do Café - CBPDC), where more than 40

research and extension organisations can access competitive funds on basis of proposals submitted to research calls issued by the public institute Embrapa. Decision on how to allocate the research funds is largely concentrated in Embrapa, without representation of producer organisations. Eligible are all established non-profit research organisations. Funds from FUNCAFÉ achieve an almost 10 fold additional funding, e.g. from state funds¹⁷. In Brazil, agricultural research is mainly executed by governmental organisations¹⁸, with the Research Department of Ministry of Agriculture (Embrapa) as central institute at national level. In addition there is a large number of state organisations, including Universities and schools of agriculture, such as the Agronomic Institute of Campinas (IAC) and some non-profit agencies. Also private companies are involved in research, mainly towards development and improvement of products or services they want to sell in the market. Examples of the latter are Instituto Brasileiro de Análises (IBRA), provider of services to analyse soil samples and developer of software to automate fertilizer application advice, and Pinghalenze, maker of harvesting and processing equipment. Besides state level extension organisations, there is a plethora of private consultancy firms, such as Desicão Consultoria, that cater to provide extension and other advisory services to individual farmers and farmer organisations. However, most services are delivered in a top-down, not-participatory approach. Governmental extension services have limited resources to interact frequently with producers and have to spread their resources over many crops. Most private extension service providers, often with renowned university staff that works part-time for the consultancy firms, are very capable in technical issues but much less so in participatory methods, and deliver services that are generally too expensive for individual small holders. Currently there are only a few functioning cooperatives in coffee that nevertheless have relatively good extension services. Interaction between extension services and research is quite strong, especially through the coffee research consortium, but the interaction is dominated by the professionals in these organisations. Most research is towards 'technified' agriculture¹⁹, with generally higher input use than common among small farmers.

R&D on coffee in Uganda

Coffee production in Uganda takes mainly place by low input-intensity smallholders, with an average farm size of 0.2 ha, and is the main source of income for about 500,000 households. Early 1990, the coffee sector of Uganda was liberalized, with a withdrawal of the government from marketing and trading, the abolishment of the Coffee Board and the establishment of the Uganda Coffee Development Authority (UCDA). The latter is financed by a 1% levy on coffee exports, and is in charge of monitoring quality, enforcing regulation, collecting and disseminating statistics, promotion of Uganda's coffee and managing the replanting programme²⁰. In 1997, the National Agricultural Advisory Service (NAADS) was created, as part of the Plan for Modernization of Agriculture (PMA). To support the development of private service providers, The Uganda National Agricultural Research Organisation (NARO) operates a competitive grant scheme for private R&D service provisioning. Officially, farmers now have a larger say than before in content and delivery of extension, research and market information: farmer groups prepare plans concerning services to be provided and to monitor and evaluate their performance. Funds from the Ministry of Finance are made available to these plans after aggregation at Farmers Fora, in which the farmer groups are represented. Farmer groups are supposed to contribute 2% towards the costs of services received. In practice however, the influence of farmers is (still) limited: farmers' organisations have minimal participation in annual review meetings of the PMA and in monthly planning meetings at district level, because of the arcane and abstract discussions; access to good services is not always possible, due to an inadequate quality and quantity of service providers; and there is a lack of mechanisms for giving farmers access to information from research²¹. Furthermore, 'local government planning processes are still fairly weak and not completely inclusive and are also liable to influence by elected officials, leading to questionable investment decisions'²². Extension workers are starting to use participatory methods to identify farmer's needs for information but in-depth conceptual understanding of participatory processes and communication and facilitation skills are often lacking²³. The emergence of NAADS in Uganda and the use competitive funding seems a promising institutional framework to link farmers' organisation with R&D service providers. It may stimulate professionals to provide the required services to farmers' groups. However, in many areas the private service system needs to be built up almost from scratch.

Uganda uses a levy on exported coffee to maintain a national fund that is mainly used to finance the UCDA, the Uganda Coffee Development Authority, for marketing (e.g. by having a plant for soluble coffee established in Uganda to cater for the local and regional market), collection of statistical data and managing the replanting programme. Farmers are not represented in the UCDA; it is therefore clear that farmers have little say about the way the money available to UCDA is used and the quality of the R&D service provisioning. Services to reduce price risks, like minimum prices, strategic stocks or hedging, are not offered. Other R&D services are paid for from general taxes and by substantial funding by foreign donors. The execution of R&D is by national research organisations under competitive funding, but it is rather obscure how decision making is taking place on topics to be researched and funding to be allocated among the (public) research institutes. Private research organisations do not exist, but extension services are executed by public as well as by private enterprises. The latter to a large extent are made up by former employees of the public extension service. Private extension services are also delivered by some coffee exporters such as Ibero Uganda and Kawacom. Although officially farmer groups may get funding by submitting proposals from R&D via Farmers For a to the NAADS, there is in fact little real control over quality and efficiency of services by farmers, since they often lack the capacity to monitor and evaluate the R&D arrangements offered. Due to the lack of a strong higher level federation of coffee producers, their representation in the NAADS system is still not very efficient and effective. Founded in 1995, the National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE) has still limited capacity and mobilisation power to really play that role.

Comparing farmers’ influence in the governance of the R&D systems

The three case studies reveal that both the level of privatization of the agricultural research system in combination with the political and economic power of farmers’ organizations determine the impact of the respective variables. For example, in Colombia where The National Federation of Coffee Producers (Federación Nacional de Cafetaleros – FNC since 1938) organizes and delivers many services to coffee producers, such as extension, marketing, risk management etc. The Brazilian case indicates that public and private stakeholders can be effective in finding chain innovations, but that there is a tendency to concentrate on a producer segment that can pay for their technologies or services, leaving out smallholders. In Brazil the public entities involved in research and extension are competent and function quite well. When public R&D institutes are weak, and also the farmers’ organisations have limited capacities to ‘drive’ R&D for chain development, like in Uganda, other forms of funding have to be designed. The emergence of NAADS in Uganda using competitive funding seems a promising institutional framework to link farmers’ organisation with private service providers. It will stimulate professionals to provide the required services to farmers’ groups.

This analysis of the coffee R&D in the three countries indicates significant differences on the four dimensions. These dimensions determine the context in which farmers’ organisations can effectively govern the R&D system. Also the articulation of the farmers’ interests may differ between the smallholder sector and the big coffee estate farmer, as shown in the Brazil case. We may summarize the differences in this ‘R&D governance arena’ in the following matrix, where the effective influence of farmers in the governance of the R&D system can be rated.

Table 2: Rating dimensions for farmers’ organisation (FO) influence in R&D governance in coffee

	COLOMBIA		BRAZIL		UGANDA
	smallholders	estates	smallholders	estates	smallholders
relative influence of FOs	+	+	-	+	+/-
financing mechanisms R&D	+	+	+	+	+/-
coordination between FO levels	+	+	-	+	-
enabling policies	+	+	+	+	-

4. Conclusions

Smallholders in developing countries need to organize themselves to become attractive business partners in value chains. Therefore, they have created farmers' organisations that engage in collective marketing or processing activities. To survive competition with other national or international value chains that can serve the same markets, they need R&D to improve production and increase the performance of the value chain. R&D service providers increasingly try to capitalize on the relative organizational strength and financial autonomy of farmers' organisations that are active as chain operators. Instead of starting parallel organizational structures 'moulded' around their specific services, as they used to do in the past, they tend to concentrate support services more and more in already established economic farmers' organizations.

The analysis of three different coffee R&D systems in Colombia, Uganda and Brazil, shows that no blueprint for effective governance of coffee R&D is possible. The R&D system will evolve according to the organizational development and policy influence in the agricultural sector. Therefore, the way in which the tasks around R&D are distributed between public and private stakeholders in these three countries differs widely. These specific evolutions and ruptures in the agricultural sector determine to a large extent the actual and future possibilities for farmers' organisations to effectively govern the agricultural R&D system. The national federation of coffee producers in Colombia has managed to undertake several R&D tasks that in Brazil are considered to be the function of public NARIs and that in Uganda are hardly functioning, or starting to be performed by an incipient sector of private service providers. The Colombian R&D centre on coffee, CENICAFE, was already established by the FNC in 1938. The introduction of marketing innovations (e.g. the 'Juan Valdez' brand of Colombian coffee) by the FNC is an illustration of a successful chain innovation that was made possible by a transparent and effective governance of coffee R&D. It is clear that the Colombian model of concentrating R&D in a national farmers' federation can not be replicated in countries where farmers' organisations have a shorter history and less organisational strength. However, the example makes clear that in those contexts where farmers' organisations do have a respected position in the value chain and have possibilities to minimize free riding by those not contributing to the system, this potential can be exploited.

The rating dimensions to assess the farmers' governance of the R&D system might be applied to other commodity sectors and value chains than coffee. It seems useful to assess the efficiency of demand articulations between farmers and suppliers of R&D. The innovations that will result of R&D with grassroots farmers' organisations will improve chain efficiency. This will be especially through incremental innovations in the chain. For more systemic innovations the farmers' organisations will have to integrate the entire chain from production-processing-exporting like FNC does for Colombian coffee. In absence of such a strong commodity based federation, in many countries a multi-stakeholder approach might be necessary complement.

Competitive funding seems functional to make R&D more responsive to the demands of these farmers' organisations. It is flexible to incorporate R&D needs of farmers' organisations, in production but also more downstream the value chain, in processing, exporting, etc. There seems to be a convergence towards an institutional architecture of these R&D systems that gives a larger role to farmers' organisations. We have shown that there are many different ways to involve them in these R&D systems. Some systems make it easier for them to perform their roles properly than other R&D systems. To exert control over R&D services, contracts should include detailed conditions about services to be rendered, by whom and at what costs, and be complemented by a legal system that enables parties to force compliance with these contracts. Such a contract-based system will only work in competitive market situations where parties have the possibility to choose other providers (for produced and services) on basis of their performance. This requires that farmers' organisations dispose of the capacity to formulate proposals for services to be provided and to monitor and evaluate the efficiency and quality of the services rendered. The build-up of such capable farmers requires considerable efforts (labour and funds).

It is important to distinguish different types of farmers' organisations that may play different roles in the R&D system. A coordinated involvement of these different types of organisations in the national R&D system may prevent frustrations. Often too high expectations are placed on either grassroots organisations or on the national federations. Grassroots organisations and commodity based federations can play a crucial role in articulating R&D demands, while regional and national farmers' federations are especially functional for monitoring the R&D process. These federations support their members in negotiating with private service providers. They can monitor the R&D process and 'mediate' in case of conflicting views between the farmers' organisations and the private service providers. To facilitate this monitoring role, both the designers of R&D systems and the farmers' federations need to build knowledge and experience on possible and effective ways of arranging R&D. Therefore, it is important to open up effective channels of communication and learning between the designers of R&D systems and the farmers' federations in a country.

5. Notes

- ¹ We use the abbreviation R&D (Research and Development) as a container concept that includes all research and extension activities related for solving bottlenecks for value chain performance.
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- ¹¹ CIOEC (2000). *Agenda para el Desarrollo Estratégico de las Organizaciones Económicas Campesinas*. La Paz, CIOEC-Bolivia.
- ¹² IFAD (2005) *Bolivia- Country Programme Evaluation*, Rome and La Paz, IFAD Office of Evaluation
- ¹³ Thorpe, R. (2000). *Has the Coffee Federation become redundant? Collective action and the market in Colombian Development*. *Working Paper No. 138*. Helsinki, The United Nations University/ World Institute for Development Economics Research.
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- ¹⁶ MAPA (2003). *Relatório de atividades FUNCAFÉ*. Ministério da Agricultura, Pecuária e Abastecimento. Secretaria de Produção e comercialização. Departamento do Café. Brasília, Brazil.
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