

MULTIFUNCTIONAL AGRICULTURE AND INTEGRATION OF FARMING PRODUCTION SYSTEMS WITHIN AGRIBUSINESS CHAINS

Alejandro Cotes Torres¹; Nicolás Urbina Rojas² and
José Miguel Cotes Torres³

ABSTRACT

Nowadays is recognized that the agriculture goes beyond that only the food production, so the concept of agricultural multifunctionality is introduced in order to describe this fact, recovering the true sense of the agriculture, and classifying its functions in three groups: 1) food security, 2) environment, and 3) socio-cultural. In each one of these functions, the agricultural production systems generate two categories of products: a) the traditional outputs (commodities), such as food, fibers and energy, and b) the non traditional outputs (non-commodities), which included aspects related with the environment and territory, employment, human resources and work, food safety and quality, animal welfare, food security and economic autonomy of the rural regions among others. Finally, we explore the evolution that agricultural production systems have had from a productivist focus toward a model where the new paradigm is the multifunctional agriculture, where the developing countries could have an important place.

Key words: agrifood system, developing countries, economic development, international foods trade, non-commodities agricultural outputs.

RESUMEN

LA AGRICULTURA MULTIFUNCIONAL Y LA INTEGRACION DE LOS SISTEMAS DE PRODUCCION AGROPECUARIA DENTRO DE LAS CADENAS AGROINDUSTRIALES

El presente artículo inicialmente aborda el concepto de multifuncionalidad de la agricultura, donde encontramos que actualmente se reconoce que la agricultura va mas allá de la simple

¹ Profesor Asistente. Universidad Nacional de Colombia, Sede Bogotá. Facultad de Medicina Veterinaria y Zootecnia. A.A. 14490, Bogotá, Colombia. <acotest@unal.edu.co>

² Profesor Asociado. Universidad Nacional de Colombia, Sede Bogotá. Facultad de Medicina Veterinaria y Zootecnia. A.A. 14490, Bogotá, Colombia. <nurbinar@unal.edu.co>

³ Profesor Asistente. Universidad Nacional de Colombia, Sede Medellín. Facultad de Ciencias Agropecuarias. A.A. 1779. Medellín. Colombia. <jmccotes@unalmed.edu.co>

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producción de alimentos, clasificando sus principales funciones en tres ejes temáticos: 1) seguridad alimentaria, 2) medio ambiente, y 3) socio-cultural. En cada una de estas funciones se evidencia que los sistemas de producción agropecuaria generan dos categorías de productos: a) productos tradicionales ("commodities"), como son los alimentos, las fibras y la energía, y b) productos no tradicionales ("non-commodities"), los cuales incluyen aspectos relacionados con el medio ambiente y territorio, la generación de empleo, el manejo del recurso humano y de las condiciones laborales, la gestión de la calidad de los alimentos, el bienestar animal, la autonomía económica de las regiones rurales y su seguridad alimentaria, entre otros. Finalmente, se tiene en cuenta la evolución que han tenido los sistemas de producción agropecuaria pasando de un enfoque productivista, hacia un modelo donde el nuevo paradigma es la agricultura multifuncional, donde los países en vías de desarrollo pueden tener un papel importante.

Palabras claves: Sistema agroalimentario, países en vías de desarrollo, desarrollo económico, comercio internacional de alimentos, productos agrícolas no tradicionales

Multifunctional agriculture is considered to be a future way of agriculture, at least in Europe. The basic idea behind multifunctionality is that agricultural production provides not only food and fiber but also different non-market commodities, with characteristics of externalities and/or public goods. In the most broadest definition these non-market commodities or elements of multifunctional agriculture are: the impacts of agriculture on the environmental state of rural areas, rural landscape, biodiversity on and close to farm land, contribution of agriculture to the socioeconomic viability of the countryside and rural employment, food safety, national food security, welfare of production animals and agricultures' cultural and historical heritage (Arovuori and Kola, 2005).

More than thirty years have gone since Ray Goldberg introduced the concept of agribusiness, which had a great impact for academics, business and government agents. The bridge between the traditional views, focused exclusively on sector impacts, towards the adoption of the agribusiness

concept, focusing on dynamic inter-sector relations, is still far from being fully implemented. Many professionals and academics still think in terms of the independent functioning of agriculture, industry and distribution, in the food, fiber and energy markets, very frequently missing the really important dynamic elements. In doing so, our strategies tend to be short-sighted and the final outcomes are so to speak, inefficient, both at the governmental and private levels (Zylbersztajn, 1999).

NEW TRENDS OF THE AGRICULTURE

As a consequence to the inherent complexity of the agriculture, we can say that the humanity in order to study the agriculture world divided it in two big disciplines; the "Fito-technique" (or Agronomy) that approaches the problem of the production, transformation and distribution of the products of vegetable origin and their derived; and the "Zoo-technique" (or Animal Science), which study the problem of the production, transformation and distribution of the products of animal origin and their

derived (Cotes and Cotes, 2005). For the above mentioned, the concept of agriculture multifunctionality should be understood as the concept which is applied not only to vegetable and animal production systems but also is extended along of agrifood system, which is the direct consequence of the agriculture complexity, mentioned previously.

So, on the basis of the concepts of human domination over nature, and of experimental science pioneered by Francis Bacon (1561-1626), and following the age of Enlightenment, the agricultural revolution, along with the industrial revolution, led during the 19th century to a rationalization of the agricultural production, including that of animal production. The last 60 years saw the progress of industrialization of this sector, together with a transition from a rural to an urban social structure, disconnecting the major part of the population from the agricultural production process (Marie, 2006). During this period, progress has been made in food security and self-sufficiency in terms of quantity, costs for the consumer, security of the products of animal origin and their physical quality (such as standardization, or marketability). The increased intensification of animal production together with the accelerated introduction of new biotechnologies over the last two decades resulted in an increased detrimental environmental impact, deep food and sanitary crises (such as BSE, FMD, contaminants in meat), and a distrust of the population (Cunningham, 2003; Hodges, 2003). As a consequence, a new demand is now emerging, centred on what could be named "subjective quality", stressing on the ethical and

sustainable aspects of livestock production along the agribusiness chains.

In this sense, roles of livestock keeping revolve around storing wealth, contributing to food and nutritional security, providing draught power, transport and manure, and serving traditional social functions (Holmann *et al.*, 2005).

However, agricultural activities, apart from producing food and fiber and other products for which there is a market and which therefore have a monetary value, also involve externalities for which there are no identified markets - i.e. they are subject to market failure. Such externalities may be positive or negative. Of course, all economic activities to some degree share this characteristic, although it seems that agriculture is unique in the range of externalities ascribed to it. Such externalities also may be termed public goods (or public bads, if negative) as opposed to private goods. The distinction is important in as much as public goods (or bads) and their associated market failures may justify government intervention to ensure or control their supply through subsidies or regulation or taxation. In practice agriculture is often held to produce a public good, in order to justify continued intervention by the State, although strictly speaking there are no grounds for such a claim (Food and Agriculture Organization of the United Nations (FAO) 2000).

To speak about economic and social impacts of agribusiness in national economies is a real challenge for anyone who has closely followed the recent developments of agribusiness. Not only

because we know very little about the impact of agribusiness on modern economies, but also because we feel that we have a certain role to play at turn of the century and the millennium, in terms of improving the quality of countries' life in the southern hemisphere, and this task has a strong link with agribusiness issues (Zylbersztajn, 1999).

Until relatively recently, it was agriculture's negative environmental externalities - pollution of surface and ground water and air, loss of habitats and biodiversity, soil erosion, etc - which received most attention from policymakers, involving taxes or regulations to correct for market failures. Now it is being increasingly argued that agriculture also produces positive externalities, alternatively known as multiple functions, the related market

failures of which merit policy interventions such as subsidies or other means of agricultural support to ensure their continued "production" (FAO, 2000).

The production or provision of these non-commodity outputs was assessed important as a whole, while environmental aspects, animal welfare, and food safety and quality being the most important (Figure 1). However, an issue of clear measurement of these elements arises. The most common example was how to measure the desired rural landscape, while there can be found several types of landscapes, which are desirable on the basis of historical, cultural or national conditions. The provision of food security was also considered important, but it can be ensured by the combination of domestic production and international trade (Arovuori and Kola, 2005).

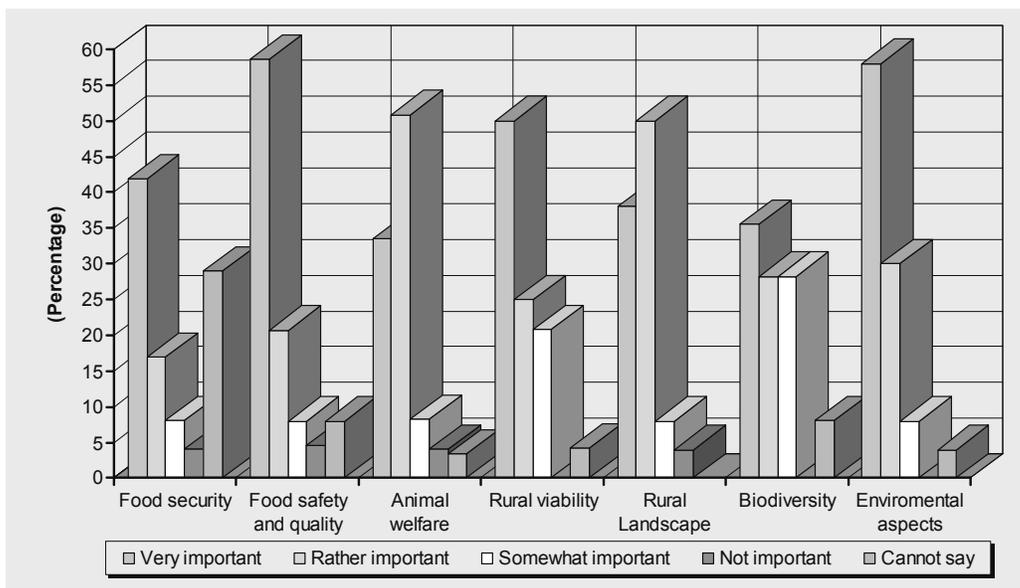


Figure 1. Importance of guaranteeing the production of some "non-commodities" agricultural outputs. (Adapted from Arovuori and Kola 2005).

Vandermeulen, *et al.* (2006) has carried out approaches to measure some elements that express the agriculture multifunctional, through the following model:

$$MF = \alpha_0 + \beta_{01}PR + \beta_{02}P(1 - R) + \beta_{03}S + \beta_{04}R + \beta_{05}SP$$

where:

MF: is the multifunctional farming system (dummy)

P: is the promotion of agriculture outputs (categorical)

S: is the level of services (categorical) in the region

R: is the region (dummy)

So, the variables "P" and "S" are defined by the following models (Vandermeulen, *et al.*, 2006):

$$P = \alpha_1 + \beta_{11}F + \beta_{21}C$$
$$S = \alpha_2 + \beta_{12}F + \beta_{22}C$$

where:

F: is the farmers' participation in local rural policy (categorical),

C: is the citizens' participation in local rural policy (categorical).

The idea behind this model is that the presence of multifunctional farming systems directly depends on regional and local policy, and also that this presence is indirectly influenced by the degree of participation of farmers and citizens in local policies or in other words the presence of multifunctional farming systems is embedded in a local environment which may be supportive or not (Vandermeulen *et al.*,

2006). This is especially important to Latin American countries, where the agribusiness sector is the most important of their economies, so should be an obligation of their leads to formulate a policy according with the multiple functions of the agriculture to improve the quality life of their people.

There is a broad consensus on what these multiple functions are, although there are a variety of taxonomies by which they are organized. The main point is that they should be genuine externalities and not simply extensions of agriculture's economic primary function of producing food, fiber, etc, although they may be in joint supply with them. If this strict definition is applied, the following is a shortlist of functions (FAO, 2000):

- Food security, including nutritional and food safety aspects, sometimes termed "strategic" functions.

- Environmental: protection of natural resources, including natural habitats and biodiversity and so contributing to the sustainability of food production systems; disaster prevention (floods and landslides); protecting rural landscapes.

- Social and cultural: linked to employment and income generation in rural areas and hence sustaining the viability of rural communities and maintaining rural society.

Some of these functions are interrelated or synergistic. For example, protecting rural landscapes may promote tourism

and hence generate employment and so maintain rural communities. Some observers contend that agriculture's multiple functions cannot be separated and therefore must be performed "on the same spot", but that would rule out the use of tradable permits between agricultural regions. These positive externalities or multiple functions have also been described in general international usage as non-trade concerns (NTCs) for example, in Article 20 of the Agreement on Agriculture. However, as has been seen, when the multifaceted issue of food security is opened up, as it was at the Rome Summit in 1996, there are several clear links between trade and food security (FAO, 2000).

Setting such semantic considerations aside, the next step is to examine what are NTCs commonly cited under the three headings above - food security, environment and social - and relate them to the Rome Plan of Action and particularly its Commitment Three⁴ which, as noted above, sets out to pursue, *inter alia*, sustainable food and agricultural policies and practices, considering the multifunctional character of agriculture. A pertinent observation at this point is that some of the main proponents of NTCs are industrialized countries, in particular those with what may be termed "difficult" agricultural production environments (harsh climate, mountainous terrain, etc) and with an enduring rural tradition and concern for the

⁴ Commitment Three makes reference to sustainable food, agriculture, fisheries, forestry and rural development, policies and practices; agreed in the World Food Summit, November 13 1996.

conservation of rural landscapes. They also possess the financial means to subsidize their agricultural sectors and their populations generally spend a small share of their disposable income on food (FAO, 2000).

FOOD SECURITY FUNCTION

This objective or peacetime function receives high priority in several industrialized countries, mainly for strategic reasons because their food security as such, in normal conditions, is hardly in question. For example, Norway recognizes that because of high food production costs, it would be much more cost-efficient for several countries, including Norway, under ordinary circumstances, to rely entirely on world markets for their food supplies. However, based on historical experience and due to the uncertainty associated with future international supplies, national production policies have been and will always be a central element in Norway's food security policy. National stocking of food can only partly compensate for the risk that a tight international food supply situation may be of long duration. This risk applies not only to a situation of war but also to peacetime crises such as plant and animal diseases, extensive radioactive fallout, or major shifts in global demand and supply. Food security policies based on a minimum level of self-sufficiency, by preserving the capacity to produce, can be regarded as a risk insurance, with the public costs involved related to the population's risk aversion and its willingness to pay for that insurance (Royal Ministry of Agriculture of Norway (R.M.A.N.) 1998).

In this sense, FAO (2002) makes the following reflection: Does food security in fact increase with the level of self-sufficiency? It can indeed be argued that a policy of self-sufficiency is likely to make domestic food prices more rather than less unstable. Also, by promoting food self-sufficiency, the agricultural sector is likely to become more dependent on inputs with high import content, particularly with regard to energy. In turn, energy, i.e. fuel, is more likely than food commodities to be subject to effective trade embargoes or sudden price hikes. Yet political support for a food self-sufficiency policy still remains strong in some countries. However, the government response could be a more rational food security policy based on a range of options. Such a policy would be based on an assessment of the main sources of food supply uncertainty: firstly, unforeseen variations in supply caused by natural events - adverse weather or outbreaks of pests and diseases of important food crops in major producing countries; secondly, man-made events such as hostilities or disasters (such as another Chernobyl) of a sufficient magnitude to affect trade flows; and thirdly, political interventions short of war such as trade embargoes. In the face of such uncertainties, there is a range of possible policy interventions, other than only promoting self-sufficiency; they relate to consumption (e.g. promoting the substitution between foods), production (e.g. making it more responsive to a sudden need to increase supply), storage and marketing (strengthening supplier-importer links).

ENVIRONMENTAL FUNCTION

The potential for agriculture to yield environmental services is now widely recognized among the OECD countries. Thus a recent OECD paper states: The provision of environmental benefits and amenities is increasingly seen as an element of the "multifunctionality" of the agricultural sector (Organization for Economic Cooperation and Development (OECD) 1998). The word "amenities" is significant because it differentiates the industrialized and developing country concerns, with those of the former focusing primarily on protecting agricultural landscapes and those of the latter focusing on the resource protecting services - prevention of soil erosion and watershed protection; for example, without which food security may be threatened. In this way the Commitment Three, agreed among 186 Heads of State in the World Food Summit, November 13 1996, is of key importance because it is concerned with the expansion of food production (and hence with the issue of a certain degree of self-sufficiency in food), and with the sustainability of policies (and hence with the natural resource-use aspects of food production); it also refers specifically to the multifunctional character of agriculture, but without explicitly stating what that involves (FAO, 2000).

SOCIO-CULTURAL FUNCTION

Again, the respective industrialized developing country interpretations of this function are nuanced differently. The former are primarily concerned with avoiding the depopulation of the countryside which uncontrolled social and economic

forces would probably bring about. They are also concerned with maintaining populated rural landscapes and viable rural communities for tourism purposes while also noting that an agrarian structure based on many relatively small, owner-occupied family farms is more conducive to social stability and cultural preservation than one dominated by relatively few large holdings (FAO, 2000).

On the other hand, the "livestock ladder" may allow the poor to progress from modest livestock holdings, such as a few poultry, to acquiring sheep and goats or pigs, or even cattle (International Livestock Research Institute (ILRI), 2003). Livestock production provides a constant flow of income and reduces the vulnerability of agricultural production (Holmann *et al.*, 2005).

Food security also is thought to be promoted by a decentralized, evenly distributed, production structure. The developing countries, and many developed countries also, tend to refer to agriculture as being a traditional "way of life" which has cultural and societal connotations. Rapid rural-urban migration is also cited as a potential disruptive force in a developing country society, contributing to urban unemployment, crime. Increasingly, discussions on the multifunctionality of agriculture have come to take on a "normative" stance. They do so by implying that there is some desirable typology of agriculture or agricultural and rural development paradigm that would maximize these functions or positive externalities. This typology has become known as "multifunctional agriculture" (FAO, 2000).

It is pertinent to ask, while not denying the validity of certain of the arguments for a multifunctional agriculture; what is the appropriate area of policy to achieve the benefits or services sought: food, agricultural, rural, social, and regional? In all of these areas of policy, international trade has a bearing, of course. Another issue is: Are all of the functions listed above in joint supply with agriculture's primary function of producing food, fiber, etc.? In other words, is it necessary to produce these products to achieve the externalities sought? The answer must be: not always (FAO 2000).

EVOLUTION OF PRODUCTION MODELS IN THE AGRIFOOD SYSTEM

Theoretical considerations formulated by Davis and Golberg (1957), and by Malassis (1973), the agrifood system is understood as the total sum of operations of readiness and supply of inputs, of production in the agricultural units, of storage, transformation and distribution of foods (Cribb, 2004).

It is fair to say that -in the Anglo-American context at least- the last 15 years have seen the emergence of some of the most interesting and challenging theoretical debates about the nature, changes and future trajectories of modern agricultural regimes and rural areas from a variety of economic, social, political and environmental stances (Burtton and Wilson, 2006). The most powerful concept to emerge from these debates has undoubtedly been the notion that modern agricultural regimes have moved from "productivism" to "post-productivism" (e.g. Cloke and

Goodwin, 1992; Marsden *et al.*, 1993), and more recently from productivism to multifunctional agricultural regimes (e.g. Wilson, 2001; Potter and Burney, 2002). While the productivist era placed great emphasis on maximum food production and the predominant role of the countryside as a site for production of food and fiber, the post-productivist era has been characterized by a reduced emphasis on food production and an increased emphasis on the countryside as a place of “consumption” with high environmental sustainability. Much recent literature has attempted to conceptualize the possible transition from productivism to post-productivism to multifunctionality (Cloke and Goodwin, 1992; Marsden *et al.*, 1993; Wilson, 2001; Evans, Morris and Winter, 2002). However, problems have emerged with the implied linearity of the productivist/post-productivist transition model, and it has been argued that this bipolar assumption does not fully en-

capsulate the diversity, non-linearity and spatial heterogeneity that can currently be observed in modern agricultural regimes (Wilson, 2001). As a result, the notion of a “multifunctional agricultural regime” has been suggested as an “alternative endpoint” that acknowledges that productivist and post-productivist action and thought can occur simultaneously spatially as well as temporally (Potter and Burney, 2002; Wilson and Rigg, 2003).

So, multifunctional agricultural regimes are characterized by a “territorialization” of agricultural regimes, with intensively farmed regions (often in the lowlands) geared towards productivist food and fiber output, and post-productivist farming regions (often in the uplands) aimed at extensification, wildlife and habitat preservation and sustainable countryside management that also includes non-agricultural pursuits (e.g. recreation, “consumption” of nature, diversification, etc.).

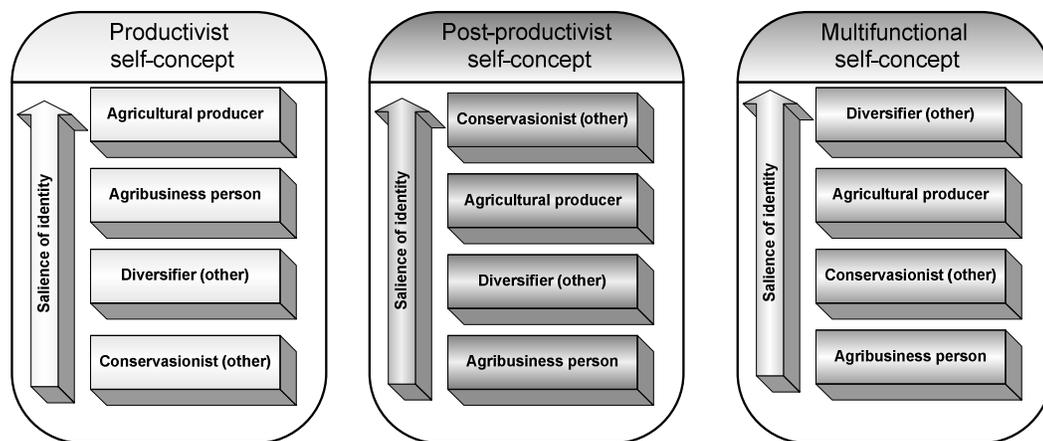


Figure 2. Hypothetical conceptualization of productivist, post-productivist and multifunctional farmer self concepts (Adapted from Burtton and Wilson, 2006)

In Figure 2, for the productivist self-concept, roles that typify production dominate and non-productivist roles involving diversification and emphasis on conservation are viewed negatively. These counter-identities may thus be seen by the productivist farmer as part of the "other". In the post-productivist self-concept, production roles, while still important, are of lesser salience. Identities based on roles that emphasize outright commercialism at the expense of the environment or smaller-scale approaches to agriculture (i.e. agri-business approaches) are seen as part of the "other". For multifunctional self-concepts, there is no notion of "otherness". Multifunctionality emphasizes the ability for all identities to coexist. While one identity will be salient, there are no approaches to agriculture which the farmer actively opposes. In effect, the distance in terms of salience of identities may be negligible (Burtton and Wilson, 2006).

On the other hand, for Hollander 2004, the concept of multifunctionality emerged in the context of increasing pressure from the WTO that is perceived as threatening to rural land-based economies and their associated landscapes.

THE MULTIFUNCTIONAL AGRICULTURE CONCEPT AND ITS IMPACT ON INTERNATIONAL FOOD TRADE

Multifunctionality has emerged as a key policy concept in the WTO agriculture negotiations, defining the terms of an important debate about non-trade concerns in the liberalization of agricultural trade and the extent to

which it is legitimate to compromise GATT disciplines in the interests of domestic policy considerations. It has many dimensions, touching on the contribution of agriculture to rural development, food security and animal welfare (Potter and Burney, 2002).

The European Union Agricultural Commissioner defined "multifunctionality" as the link "between sustainable agriculture, food safety, territorial balance, main-training the landscape and the environment and what is particularly important for developing countries, food security" (Hollander 2004). Thus, "multifunctionality" entered the lexicon of globalization at the close of the century as part of the conceptual apparatus and the discursive strategies deployed to debate and negotiate neoliberal agricultural trade policies in domestic and international forum. Some proponents of the multifunctional model emphasized European distinctiveness, whereas others provided a more generic statement. Because the concept emerged in defense of the perceived particularities of European rurality, it has been characterized as "a model that reflects the specific history, cultures and choices of European society" (Givord, 2000; mentioned by Hollander, 2004).

In the parlance of WTO negotiations, "multifunctionality" provides the philosophical underpinnings to argue for the expansion of the Green Box, the category of policy measures not subject to multilateral sanction because they are decoupled from production and therefore not considered to be trade distorting. Multifunctionality provides a strategic opening in which to recognize

the landscape functions of agriculture and rural settlement, so that the resultant social and ecological complexity can be defined as public goods and maintained through state policies. It represents a shift in emphasis from the negative to the positive environmental externalities of agricultural production to argue for recognition of the social and/or environmental goods that are "jointly produced" along with agricultural products (Swinbank 2002). The response at the international level has varied according to the interests and alignments of various states. For example, Japan, South Korea, Norway, and Switzerland, with the EU have formed the "Friends of Multifunctionality" to emphasize "non-trade" aspects of agricultural production in multilateral negotiations. In contrast, multifunctionality has provoked a critical response from the Cairns Group⁵, which regards it as "a smokescreen for the continuation of protectionist agricultural policies" (Potter and Burney, 2002).

As the above mentioned consequence, Arovuori and Kola (2005), find that around the European population's 95 % is agree with having some subsidy type for the agriculture and this way to maintain the production of "non commodities", while 90 % thinks is justifiable, the application of these subsidies for the production of foods, fibers or traditional products in the

primary sector. Additionally, only the 30% thinks that the subsidies or helps to the agriculture should decrease, while the rest of the population considers that they should stay.

According to the policy model being promoted by the United State of America and some other friends of multifunctionality, the phenomenon of joint production in agriculture means that it is necessary to maintain certain widely flung systems of farming across rural space in order to sustain valued agricultural landscapes and the biodiversity they contain. On this view, the liberalization of agricultural markets and the restructuring of agricultural production, especially in marginal areas, may have undesirable environmental consequences that need to be anticipated in the design of domestic subsidies. The model envisages the continued need for multifunctional instruments that support farmers' incomes in marginal areas in order to ensure continued occupancy of rural land and thus the proper management of farmed landscapes (Potter and Burney, 2002).

Alliances for and against multifunctionality, and government and NGO position statements, have two distinct versions of the concept, which are labeled "weak" and "strong" multifunctionality. Weak conceptualizations of multifunctionality tend to defend a limited set of national interests in the agricultural sector. Strong versions challenge the current structure and logic of trade liberalization as regulated by various GATT agreements and the WTO and view multifunctionality as a path to radical reform (Hollander, 2004).

⁵ The Cairns Group is a coalition formed in 1986 to advocate agricultural trade liberalization, comprising 17 agricultural exporting countries (Argentina, Australia, Bolivia, Brazil, Canada, Chile, Colombia, Costa Rica, Guatemala, Indonesia, Malaysia, New Zealand, Paraguay, the Philippines, South Africa, Thailand, and Uruguay) that together account for one-third of the world's agricultural exports.

AGRIFOOD SYSTEM TRENDS

The increasing pressure of urbanization results in incentives to develop new activities and to valorize the so-called multifunctional nature of agricultural farms (Vandermeulen *et al.*, 2006; Van der Ploeg, 2003). This multifunctional nature of farming is defined by the OECD (Maier and Shobayashi, 2001) as the joint production of commodities (food and fibers, transformed products, marketable products) and non-commodities such as food security and safety, water protection, rural way of life, soil conservation, rural landscape, biological diversity or health (Durand and Van Huylenbroeck, 2003). In fact, all forms of farming are intrinsically multifunctional because whatever production models or systems applied a bundle of commodity and non-commodity outputs ranging from social, environmental, economic to cultural goods and services is produced (Hall and Rossillo-Calle, 1999). The difference is that in an urbanized environment these non-commodities are more valued by the citizens resulting in a pressure on traditional farming systems. But as certain production systems may result in a higher production of desired non-commodity outputs than others, a shift towards more multifunctional farming systems might contribute to dealing with the pressures of urbanization (Meert *et al.*, 2005). Not only the farmers might benefit from multifunctionality, but it also contributes, as Marsden (1999) writes, to a more consumer oriented countryside, in which different services and goods are

produced and delivered and which respond to the increasing demand for a countryside oriented towards leisure, especially in the vicinity of larger urban centers (Goetgeluk and Schotten, 2000; Deelstra, Boyd, and Van den Biggelaar, 2001).

This pressure on conventional farming systems is, according to Heimlich and Barnard 1997, coming from two specific impacts of urbanization. On the one hand, urbanization influences the market environment and in particular the prices for labor, land, and other primary inputs. On the other hand, the local institutional environment is influenced by conditions imposed by an increasing number of non-rural inhabitants. Examples of this institutional influence are more restrictive rules on farming (e.g. environmental regulations, licenses) and other policy priorities for open zones resulting in less protection of zones dedicated to agriculture.

As can be seen in Figure 3, rural landscape and biodiversity on and close to farm land are most often regarded as pure elements of multifunctionality. However, besides agriculture, environmental aspects and rural viability are also due to other rural industries. Food safety and quality is, to a large extent, guaranteed already in the primary production, but it is at least an equally important issue for the processing stage. Welfare of production animals is an issue at the farm level, but transportation of animals may have even more harmful effects on animal welfare (Arovuori and Kola, 2005).

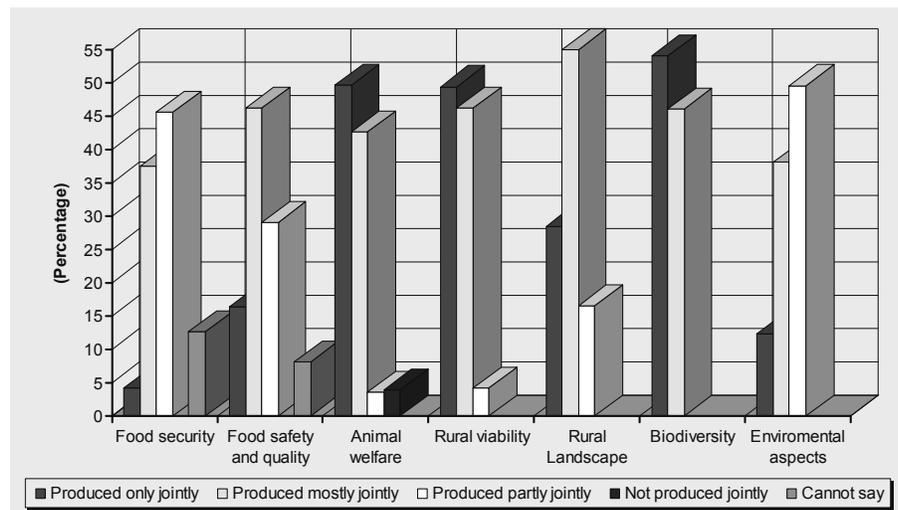


Figure 3. Multifunctional elements produced jointly with agricultural production (Adapted from Arovuori and Kola, 2005)

In relation with the animal welfare issue, its definitions are numerous and depend on the components taken into consideration. Biological functions (Broom, 1991) may be considered as central, giving rise to “objective” indicators such as productivity, behavior, physiological parameters, anatomy and health. An alternative approach concerns the affective states of the animal: feelings, pain, suffering (Duncan and Fraser, 1997). Still another approach concerns living conditions respecting the “natural” conditions of a given species and allowing the species specific behavior to be experienced (Rollin, 1993). The diversity of scientific dimensions of animal welfare consequently requires a multidisciplinary approach and a balance of science with philosophical components. In that sense, animal welfare is a mixture of science and values (Fraser, 2004).

Furthermore, it is also necessary for the social acceptability of the animal pro-

duction sector, which remains a significant (and central) component of rural development. In this sense, animal ethics is a critical element of the sustainability of livestock production systems and, more than a constraint, it should be considered as an opportunity to fit the expectations of the society (Marie, 2006).

On the other hand, the US policymakers do not use “multifunctionality” with the same interest in cultural diversity and ecological complexity that their European counterparts do (Hollander, 2004). For example, the US Department of Agriculture (USDA) report on multifunctionality omits any reference to questions of biodiversity or landscape heterogeneity, reducing agro environmental goods to “scenic vistas” (Bohman *et al.*, 1999).

In the European case for example, the “*Contrat Territorial d’Exploitation*” (CTE) is a contract arrangement committing

the entire farm, for a period of five years. "It must be based on a project involving the entire farm. Through this project the farmer agrees to develop multiple-functional farming activities. These should contribute not only to farm production and creation of added value, but also protect and manage natural resources, landscapes and biological biodiversity, whilst giving stability to land areas and employment" (Ministere Français d'Agriculture (M.F.A) 1999).

So, when local policymakers promote actively local agriculture, farmers will be more encouraged to start direct marketing, processing of farm products or set up farm-tourism activities (Vandermeulen *et al.*, 2006). This trend could be an opportunity to developing countries, especially for Latin American; because for example, Colombia is one of the most biodiverse countries in the world, second only to Brazil that is seven times larger (Chará and Murgueitio, 2005). In less than 1% of the land, Colombia has more than 10% of world species. In relation with the number of species in the world, it is estimated that Colombia has 15% of the orchids, 20% of the birds, 7% of the mammals, 15% of the primates, 6% of the reptiles, 10% of the amphibians and 20% of the butterflies in a relatively small area (McNeely, *et al.*, 1990; Instituto Alexander von Humboldt, 2003).

Keeping in mind a holistic approach, the CTE of France, contain two fundamental elements. The first of them is a socio-economic section, in which are included the aspects related with the employment, the human resources and work, product quality, animal well-being, economics

issues and autonomy of the rural regions. The other element is environmental and territorial section, where the main concerns are; the preservation of the water, soils, air, biodiversity, landscape and cultural heritage, the prevention of the natural risks, and the optimization of the use of the energy resources (Gafsi *et al.*, 2006).

Finally, several researchers (e.g. Meert *et al.*, 2005) have demonstrated that the diversification and participation in agro-environmental programs may be adequate preventive survival strategies to be developed by farmers who are not possible to expand their farm business (Vandermeulen *et al.*, 2006). Additionally, these preventive practices contribute towards a more consumer-oriented countryside (Marsden, 1999).

CONCLUSIONS

Nowadays, is more accepted that agriculture provides not only food and fibers but also generates a non-commodities outputs which have been more valued in the last years by the population of industrialized countries, especially keeping in mind that most of the population of those countries lives in the cities, and the fact of preserve the environment and the rural sector becomes something so important and ideologically fair for most of their inhabitants. Probably, the same trend will increase in developing countries in the next years.

The non-commodities outputs, could be an alternative of social and economic development for many of the

agricultural production systems around the world; especially for Latin American countries which have a natural wealth in their agriculture-ecosystems and biodiversity of fauna and flora; which could be used through entrepreneur projects in order to foment the farm-tourism activities to get the benefits that these non-commodities offer to the human welfare. These indeed will be a change in the paradigm from an agriculture eminently governed by a productivist model, toward a model that accepts and develops a multifunctional agriculture in developing countries, which should let to join the diversity of points of view and interests of the stakeholders within agribusiness chains.

The concept agribusiness system, recover the true sense of the agriculture and remain us that it is necessary a holistic view in order to carry out their main objective, which is not other different than to provide welfare and health to the humanity, through the efficient and economic use of the natural, animals and vegetables resources. That true essence of agriculture nowadays is manifested through the concept of the multifunctionality itself, and therefore, both the managers and the agricultural professionals should be agents of development in each one of their countries. In this sense, as agricultural engineers as animal scientist are called in first instance to assume this challenge, especially in Latin America, where agribusiness chains are fundamental part of the national economy; projecting the agricultural production systems toward the satisfaction of the

necessities of the final consumers, and forgetting the old paradigm of some centuries ago, where the important issue was just to produce; which unfortunately separated to the primary sector of the marketing issue and food distribution system.

Because of the increase importance that non-commodities have taken in the last years; it will be the main threat for Latin American countries, who many times claim that subsidies and aids received by agricultural producers in the industrialized countries disappear. In fact, the trend of developed countries is to maintain the subsidies policies, independently of the terms in that agreements of free trade are negotiated.

There are many non-commodities (for example, environmental aspects and food security), which are not necessarily guaranteed having a lot of farming production systems; so regional and national policies intervene in favor their existence. This constitutes an interesting element of discussion, because it suggests the complexity that exists among the commodities and non-commodities agricultural outputs.

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⁶ National University of Colombia www.unal.edu.co>

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⁷ GIAECA is the acronym in Spanish Language of the "*Grupo de Investigación en Administración y Economía de Cadenas de Agronegocios*". This research group is recognized by COLCIENCIAS, which is the top organization that manages the Science and Technology National System of Colombia.

⁸ DIB is the acronym of the "*División de Investigación de Bogotá*" of the National University of Colombia.

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