

**Table 1: Definition of Structures and Variables included in the Model**

Structure	Variable	Definition of Variable
<b>Macro-context</b>		
International trade barriers	Non-tariff barriers based on social issues	Laws, regulations or contracts based on social indicators pertaining to the production process which restrict trade in agricultural products and services.
	Tracking and certification controls and regulations	Laws, regulations, standards or contracts pertaining to the quality of foodstuffs and agribusiness products throughout the production process, for the purpose of assuring security to consumers on the domestic and foreign markets.
	Non-tariff barriers based on environmental issues	Laws, regulations or contracts based on environmental indicators relating to the production process which restrict trade in agricultural products and services.
	Tariff barriers	Laws, regulations or rules that restrict trade to protect products of domestic agribusiness.
Advances in knowledge	Advances in biology and biotechnology	Progress in the knowledge base of research in biology and biotechnology.
	Advances in information technology	Progress in ICT (Information and Communication Technologies) relating to communication and the flow of information.
	Advances in nanotechnology	Progress in the knowledge base for nanotechnology.
Traditional and local knowledge	Traditional and local knowledge	A dynamic body of knowledge and practices accumulated by traditional communities and by agricultural production systems through their interaction with nature and with their agricultural activities.
Environmental sustainability in agriculture	Environmental sustainability in agriculture	The capacity of an agro-ecosystem to maintain its productive functionality over time.
Epidemics, pests and food contamination	Epidemics, plagues and food contamination.	Occasional outbreaks of pests, diseases and/or food contaminants, of different types in different countries or regions.
Competitiveness of agricultural business	Competitiveness of agricultural business	The capacity of agribusiness in LAC to replace similar products, offering prices and quality desired by consumers.
	Differentiation of innovative products	Products with value added increased through the application of Research and Development (R&D) and marketing.
	Access to markets for innovative differentiated products	Placement of innovative products with greater value added on international markets.
	Information Technology (ICT) as a tool for facilitating agribusiness transactions	Use of electronic communication tools to reduce transaction costs in trade in agribusiness products.
	Costs of commodities	Production and transaction costs of commodities in agribusiness.
Changes in end users' demands	End user's demands	Requirements for diversification of characteristics of agribusiness products on the part of different segments of consumers.
	Demand for safe and healthy foodstuffs	Interest in foodstuffs that are not likely to threaten the health of the population and for nutraceuticals (foods with therapeutic properties).
	Consumer information	Access to product information relevant to the needs of end users.
Social monitoring of innovation	Public perception of S&T	Public trust in the findings and conclusions of scientific and technological activities.
	Social monitoring of innovation	Influence of stakeholders on research processes and products and their impact.
Governance	Governance	Stability of social, economic, environmental and innovation policies in LAC, resulting from broad social and political consensus.
<b>Structure</b>	<b>Variable</b>	<b>Definition of Variable</b>
<b>Macro-context</b>		

Development policies	Integration of macro-, meso- and micro-policies on innovation and social development	Facilitation of development thanks to consistency between federal, state and sectoral policies
	Formulation and implementation of agrarian policies	Capacity to define agrarian policies and existence of organizations capable of implementing them.
	Policies on biosafety	Policies on reducing the risks associated with food and agriculture (including major environmental risks. This refers to policies on food security, health and plant and animal life.
	Social development policies	Policies on guaranteeing access to education, land, credit, health and housing for vulnerable populations in the country and in the cities.
	Policies on incentives for the organization of research	Policies on development of science and technology.
Management of regulations and standards	Regulations and standards	Mechanisms for regulating copyright in scientific production, including patenting of live organisms (cultivars), and terms for marketing agricultural byproducts, in LAC and other regions.
	Application of regulations and standards	Measures taken to enforce and monitor the application of regulations and laws on agricultural S and T and on agricultural products.
Global climate change	Global climate change	Increase in the frequency and intensity of climate phenomena (temperatures, rainfall, wind) and their impact on agriculture.
Urban food security	Access to food security	Capacity of urban consumers (especially the poor) to obtain food on a regular basis, in the amounts required for wellbeing.
	Access to food safety	Capacity of urban consumers (especially the poor) to obtain healthy foods, i.e., foods that do not represent a risk of biological contamination, that are hypoallergenic and that have a low level of contamination by contaminating agents.
Social inequality	Social inequality	Relative access to jobs, food security, education and health of different social groups (small family farms, wage-earners, subsistence farmers, large-scale producers) that are involved in agricultural production.
Education of players in production systems	Education of players in production systems	Level of schooling of players in production systems.
<b>R&amp;D systems</b>		
Demand for and focus of research	Focus of research	Strategic orientation towards different types of objectives and results of R&D activity and social groups targeted.
	Harmony between R&D organizations and their environment	Consistency between mission, objectives and products of R&D organizations and the needs and aspirations of their clients, users and beneficiaries, and other stakeholders.
	Priority of actions	Strategic choices of issues/problems addressed by projects and project portfolio of R&D organizations.
	Demands for research	Needs for knowledge and technology in order to take advantage of opportunities or to overcome hindrances to the performance of agricultural production systems.
	Prospective approach to demand for research	Systematic evaluation to identify future demand for R&D.
Incorporation of advances in formal knowledge	Incorporation of advances in formal knowledge	Incorporation of advances in knowledge to the R&D process.
<b>Structure</b>	<b>Variable</b>	<b>Definition of Variable</b>
<b>R&amp;D Systems</b>		
Incorporation of traditional and local knowledge	Incorporation of traditional and local knowledge	Incorporation of traditional and local knowledge and practices into the formal process of producing knowledge and technology.
Resources available for	Alternative resources for financing R&D	Non-government sources for financing of research

R&D	Financial resources for production of R&D	Financial resources needed to generate technologies and knowledge required by clients/users of R&D.
	Infrastructure for generation of R&D	Facilities and equipment needed for the production and generation of technologies and knowledge required by clients/users of R&D.
Performance of research	R/D products and services	Portfolio of products and services generated by R&D organizations for their clients.
	Efficacy of research	Delivery of products based on the needs of consumers, clients and society as a whole.
	Efficiency of research	Capacity of R&D organizations to generate products and services at lower cost.
Management of R&D	Planning, Follow-up and Evaluation system in research organizations	Systematic procedures for setting objectives/goals, allocating and assigning resources, executing projects and programs and making adjustments in the execution and evaluation of end products and services obtained as a result of research carried out by R&D organizations.
	Project portfolio	Set of projects designed to solve a major strategic problem in a region or a country.
	Projects (type and quality)	Management tool, the objectives of which have been clearly defined in terms of a specific problem or the needs, opportunities or interests of groups that wish to transform ideas into results (within a given time frame and cost).
	Management of research teams (individuals – teams - networks)	Mechanisms for planning, monitoring, evaluating and organizing R&D work.
	Multidisciplinary approach	Interaction, synergy and interface between different areas of knowledge.
	Rewards system	Processes for showing appreciation for and ensuring accountability in research work done by R&D organizations, through tangible and intangible rewards.
Opportunities for public and private R&D	Opportunities for public and private R&D	Sphere of action for research conducted by public and private organizations.
	Public-private partnerships	Arrangements between public and private enterprises to supplement resources for research projects in which they share an interest.
	Competition between agricultural R&D organizations	Strategies of public and private R&D organizations for opening up opportunities in markets for agroindustrial technology.
	Privatization of the research system	Full transfer of public research infrastructure and activities to the international private sector.
Participation of society in the research processes	Participation of society in the research process	Involvement of social groups in decision making and in carrying out research.
Appropriate technologies for agricultural production systems	Appropriate technologies for agricultural production systems	Degree to which technologies generated by R&D systems foster sustainable development and are suited to the culture, resources and circumstances of agricultural production systems.

Structure	Variable	Definition of Variable
<b>Agricultural Production Systems</b>		
Incorporation of knowledge into production systems	Support for the incorporation of knowledge	Existence of technical assistance mechanisms (private or public) to support the adoption of appropriate technologies by production systems.
	Incorporation of knowledge into production systems	Choice and adoption of appropriate technologies in production systems.
Markets supplied	Integration into production chains	Degree to which production systems are linked to and participate in established production chains.
	Markets supplied	Markets to which agricultural production systems send their products.
Social organization of vulnerable production systems	Social organization of vulnerable production systems	Mechanisms for achieving production scales and bargaining capacity, and for improving management and marketing of agricultural production systems.
	Social movements focusing on the most vulnerable production systems	Social mobilization to influence access to resources and empower production systems.
Resources available for agricultural activity	Resources available for agricultural activity	Access of agricultural production systems to credit, land, water and knowledge.
Performance of agricultural production systems	Efficiency	Relationship between costs and earnings of production systems.
	Quality of products and processes	Relevance and sustainability of agricultural products and processes.
	Products, byproducts and waste materials	Types of products, byproducts and waste released into the environment.
Income inequality in agriculture	Income inequality in agriculture	Relative access to income of different social groups (small family farmers, wage-earners, subsistence farmers, large-scale producers) participating in agricultural production activities.