

The agri-food market of rural producers and the perspectives of sustainability in the Chimborazo province, Ecuador

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Abstract

The agri-food market is present in the academic debate from the social and economic perspective, it includes the actors and agents of development as a mechanism to support and strengthen the sector, but it requires special attention in its approach to generate knowledge in its actions. In this context, this research aims to study the agri-food market of rural producers and their perspective of sustainability in the Chimborazo province of Ecuador, the study is descriptive and correlational. A survey has been carried out on 383 producers linked to agri-food activities to know the study variables behavior. The agri-food market social actors are related to the perspectives of sustainability to the extent that they are involved in the local products production processes, and on the other hand, the agri-food market is positively oriented towards the perspectives of sustainability, if the rights of producers for a decent life, creation of enterprises and technological improvement are guaranteed.

Keywords: Agro-food market, sustainability, social actors, rural communities.

I. INTRODUCTION

The agri-food sector refers to all goods or services related to farm products that are used for human consumption, through its main actors, farmers, merchants, entrepreneurs, society in general and local governments [1–3]. The market is made up of a group of sellers, genuine buyers and potential buyers who transact products or services [4,5]; while sustainability has three main pillars, namely: economic, environmental and social, therefore, what sustainability aims to do is allow present generations to improve and future generations to maintain living conditions to live it fully [6–8]. Therefore, the agri-food market will be one that attracts group's interest through a sustainability vision, setting as an objective the search for the common good, for the present and future generation.

The agri-food market acts together with the primary sector with its main actors and local

technological resources, which are necessary for market and the secondary sector evolution; consequently, consumers are essential in all markets, since they are the ones who consume and evaluate products with special attention to food quality or safety [9–11].

Thus, the rural agri-food sector can experience problems in production processes due to lack of policies that promote and foster sustained production and its markets, on the other hand, the lack of technological resources that help improve yields, production standards and Quality of products [6,12,13], the intervention of development agents is essential for the growth and strengthening of productive units and marketing centers in the territories, in addition to the approach and search for sustainability [14,15]. Consequently, the actors are the ones who make possible the emergence of a healthy diet and the markets as a center of articulation and exchange of products, with a

sustainability approach based on the three pillars [16,17].

In Ecuador's case, despite promoting and strengthening green revolution that is oriented towards sustainability [17], It does not necessarily mean that they are deepening sustainable production processes because there are still no experiences that have reached small producers in rural communities and give value to their production through transformation into derivatives [18,19]. However, it is important for medium-sized producers, since they increased production levels with new planting techniques and fertilizers; but it is observed that the markets are not developed due to lack of investment in technical education for those involved and in technology for development towards the secondary sector, the workforce would be made up of the majority that are small and medium-sized family units of farmers to comply with its perspectives of sustainability that is, in the first instance, to solve home basic needs and sustained agricultural activity continuity [20–22].

In this context, this research aims to study the agri-food market of rural producers and their perspective of sustainability in the Chimborazo province of Ecuador, since there is no empirical and scientific evidence of similar works in the local context; the investigation begins with a question: What is the perspective of rural producers agri-food market for sustainability in the province of Chimborazo? Consequently, there is a need to address this question in the agri-food market sector focused on small rural producers. Studying the elements, their relationships and the agri-food market functioning will allow collecting and recognizing the most important elements that make it up, as well as linking these elements with a perspective in terms of sustainability, which will be able to provide future scenarios based on reading and analyzing agri-food market current situation.

2. Theoretical considerations

Small producers are the least favored actors in supplying their products to food processing

companies and other agri-food markets [23]; but small farmers are considered the cornerstone of global food sustainability [17]. On the other hand, medium and large companies and agribusinesses are pressured to comply with sustainability standards and can create strategies with producers to have a better participation in the agri-food market [24]. In the same line, rural producers should consider the participation of small farmers, agricultural communities and agribusinesses in local markets to reduce the risk of product shortages, considering that the role of this sector is very relevant in providing food for living population in urban area [12,25].

The market and its productive initiatives can implement long-term sustainability, using strategies of environment and action context of rural producers, which are evaluated according to the results obtained through the instruments and resources used in the production processes and the participation in markets [26,27]. In this same line, according to the segment of the agri-food market, for example, from certified products, sustainability can be improved, a result evaluated by decision makers [28].

Sustainability is reflected by the current state of the environment with a cooperation of the government (development agents) and non-governmental organizations that are capable of undertaking actions to meet sustainability in the social and economic sphere. [14,29]. Similarly, sustainability consists of meditating on the type of relationship that man and his actions has with the environment and natural resources [3,24]. Thus, the sustainability and agri-food markets knowledge has evolved due to the ways in which society has participated in them [19].

The agri-food market has seen the need for its activities to contribute to long-term sustainability, which implies transforming monoculture agriculture into organic farming and traditional local practices, and not promoting production based on the excessive use of chemicals since affects consumers health [3], In this way, for sustainability in the agri-food sector, an analysis of its components and operation is also necessary, and adequate

policies and strategies are required from national and local development agents [17, 25,30], but it is also necessary to know the activities of the primary productive and agro-industrial sector, in such a way that a systematic interaction could be sought.

In any type of market and especially in the agri-food market, the actors are part of a value chain and important links, so coordinated work will facilitate achieving sustainability in the three pillars: environmental, economic and social [15,31]. For some authors, this process begins in public institutions with the design of economic and productive policies oriented to the sector, and the active participation of small rural agricultural producers [20,32,33]; Activities carried out in a coordinated and transparent manner will provide an important vision for agri-food development and sustainability [34]. Thus, the agri-food market details a set of products that are the primary basis, these products are agricultural raw materials and finished products for consumption and guarantee a quality of life [2].

Sustainability was defined in 1987 by the UN, the responsibility is placed on humanity for development to be sustainable over time, to meet the needs of present generations but without compromising future generations and their ability to meet own [33]. In this context, sustainability is a science that is transformed over time with different perspectives according to the environment in which it is applied through the study and evaluation of the environment, the economic and social areas [25,35–37], This statement expresses that sustainability in the context of agriculture guarantees that the land remains productive and has the capacity to promote territorial development and agri-food markets accessible to the population [18,38,39].

In the agri-food market sector, sustainability is understood as the maintenance of well-being over a long period, in which people and companies interact, allowing the strengthening of production processes, their markets, suppliers and, above all, consumers [12]. In this same line, the sustainability of agri-food markets will be an endogenous and exogenous

task; endogenous because the actors are the ones who define their development and the forms of production based on their knowledge and experience; while the exogenous has to do with the participation of other external agents, public and private institutions, academia, non-governmental organizations, and others [22,24].

- Agro-food market

The agri-food market is considered a system that allows transactions of agri-food products, it is a system of economic relations and institutional forms that bring agricultural raw materials and food products to the final consumer [5,6,10,40,41], the agri-food market is developed through economic relations through transactions between producers, industries, and consumers [16,32,42,43]. The agri-food market carries out complex activities from cultivation, transformation to distribution of products for society to consume [4,44]; thus, the agri-food market is a force field because the society that generates the demand for products is with whom the transactions take place [21].

Other authors point out that the production and creation of value in the primary and industrial production of food is the center in which the agri-food market is sustained, the commercial links, distribution and logistics that influence the generation and appropriation of value [45,46]. Therefore, the agri-food sector and its markets play a fundamental role in the existence of societies and in their economic development, this sector is related to food production and the multiplier effects within economies [47–50].

The agri-food sector, due to its social and economic implications, deserves special treatment by local organizations and public and private institutions, because it is vital for the survival of the population and constitutes the axis of the family and local economy [39], This must be made up of companies that produce supplies and services, the primary sector, the agri-food processing industry, transport, storage companies, food marketing and distribution companies [46].

Consequently, the agri-food market brings together other activities for its development,

such as the actions of the industrial sector, growth and technological progress, innovation and logistics [51,52]. In this context, according to the authors who refer to the term agri-food sector and its markets, they coincide that primary and industrial production made up of producing companies and, above all, food distribution, which are part of the access to safe food for the population and with implications for the economy [30,53].

- Sustainability Pillars

The term sustainability incorporates three dimensions or fundamental pillars such as environmental, economic and social, in 2002 the UN mentioned the three as pillars of sustainability or also known as the triple baseline, these three pillars constitute the basis that allows interaction between the components of sustainable development, which are interrelated with each other; It is considered that the actions and their effects must be equitable with the actors involved in the local development processes, and guarantee said sustainability [15,31,35]. The social, economic and environmental dimension can be achieved if a balance is considered between the actors and agents of development that predominate and ensure the population quality of life [33], without neglecting a multidimensional approach considering the ecological, economic and social aspects at the community level [20]. Consequently, sustainability has a multidimensional approach [10], that is to say, that it concerns the three elements that compose it and if the community works in this approach, it could achieve the desired benefits in all its aspects, that is, economic, environmental and social, through actions that converge in sustainability [24,37].

a) Environmental sustainability

To achieve environmental sustainability it is important to know the limits for the exploitation of local resources and ecosystems [52]. In this sense, the idea is to achieve responsible management of natural resources and the natural environment that have been maintained, for example, by rural producers, which are related to beneficial actions for their

environment and ancestral practices; however, the new demands of the market encourage an unprecedented exploitation and use of natural resources, which from rural communities, becomes a threat because it goes against their forms and culture of production and marketing [30].

Environmental sustainability from the perspective of small producers is oriented towards the responsible use of local resources and responsibility in caring for the environment, as well as articulations and coordination with development agents and representative public organizations, together with the cooperation between neighboring communities in the management of environmental problems that both share to reduce the impact that it may generate in agricultural production [38,45]. In the same way, a diversified agri-food production will be sought according to the ecological potentials and the productive yields according to local crops, soil and land [32]. It is also necessary to reduce water waste, alteration of land by chemical compounds, adequate water, land, energy, and raw materials use. And finally, take into account the environmental changes that are produced by monoculture, pesticides and deforestation, changes that must be restored for safe generation of food for current and future population [20]. These aspects, rural producers must consider strengthening processes and responsible production.

b) Social sustainability

Social sustainability is achieved through the social principles mentioned in the Rio conference in 1992, which claims that everyone has the right to lead a decent life with social justice, which implies an intergenerational and intragenerational relationship and the participation of groups of interest [7], social sustainability also encompasses equality and well-being, linked to social justice dimension; that is, to guarantee equity in access to rights and food for the communities [11].

In the same way, social sustainability is related to nature and its productive capacity over a long period of time, this dimension must allow

an equitable distribution, access to resources and the collective search for social welfare for all [43]. The population has the right to a decent life to satisfy their basic needs for a collective subsistence. Thus, the agri-food sector must manage, between development agents and stakeholders, collective benefits in terms of access to resources through local production [15]. On the other hand, it is necessary to promote communities and productive units participation in decision-making processes that allow improving their economies and the agri-food market [24].

Chimborazo province develops a significant growth in agri-food production, which implies that the peasant families that are dedicated to generate agriculture products and raw materials, ensuring food for all [20]. It is mentioned that the agri-food sector in which the agri-food market is included must promote the participation of the actors and that production generates significant work sources for people in rural sectors and supply agri-food products.

c) Economic sustainability

Economic sustainability must have the capacity to produce goods in a continuous and balanced manner in the different productive sectors without causing shortages [8]. Income generation for producers in a sustained manner over time must be a joint strategy of actors and their institutions [16,27,54]; producers economic sustainability is achieved when income is constant and under the concept of community cohesion, in such a way, to ensure purchasing power that allows access, goods consumption and services by the entire population [18].

3. Materials and Methods

The type of research is descriptive - correlational; descriptive because it deals with the variables of the agri-food market and

sustainability perspectives individually, establishing definitions, characteristics, stakeholders, and elements that compose them. It is correlational because it establishes a relationship between the two variables with the individual factors that each one covers; the objective is to analyze them and establish the degree of relationship that both have in a group of people who are linked and have knowledge in the agri-food area and the perspectives of sustainability that are developed.

The sample reaches 383 producers linked to agri-food activities established in the Chimborazo province, they were surveyed to know the study variables behavior, dichotomous, open, and structured Likert scale questions are included in the questionnaire. The survey has been carried out in ten cantons of the province; thus, institutional documents consultation such as INEC, Municipal Governments and Associations that are related to this conglomerate is also included as secondary sources.

For data analysis, the SPSS Software was used, the descriptive statistics are presented in the first part, and then hypothesis contrast through the regression model. Being the hypotheses: H1. The social actors of agri-food market have an important relationship with sustainability perspectives in the province of Chimborazo. H2. The agri-food market is positively oriented with sustainability perspectives in Chimborazo province.

4. Results

Linear regression is applied to determine the degree of influence of independent variable in dependent variable of hypotheses raised in the investigation. In the first model, the correlation between sustainability perspectives with social actors of Chimborazo agri-food market showed a correlation coefficient $R=47.3\%$, and on the other hand, $R^2=34.5\%$, which represents the dependency degree between its variables.

Table 1. *Summary of the first model*

Model Summary					
Model	R	R squared	R squared adjusted	Standard error of the estimate	Anova
1	0.473a	0.345	0.079	0.121	0.012

The Anova for this model is 0.000, thus accepting the H1, but that it is not significant, in this way it is possible to affirm that the social actors of the agri-food market are related to sustainability perspectives in Chimborazo province, it is important to highlight that this relationship occurs to the extent that they are involved in the processes of sustained and

systematic production of local products. The agri-food market social actors consider as important the work carried out, they try to seek sustainability in production processes and generation of new local markets.

The second model results establish a correlation coefficient of $R=57.2\%$ and a determination coefficient of $R^2=42.7\%$; the Anova value for the model is 0.000.

Table 2. *Summary of the first model*

Model Summary					
Model	R	R squared	R squared adjusted	Standard error of the estimate	Anova
1	0.573a	0.427	0.091	0.898	0.000

These values allow to maintain that there is an acceptable relationship, where the agri-food market is positively oriented with sustainability perspectives in Chimborazo province; In this hypothesis, it should be noted that there is a clear focus of projections in sustainability search, to the extent that rights of producers, a decent life, creation of enterprises and technological improvement are guaranteed. Developing these undertakings would help to reduce income inequality in the rural sector.

The surveys carried out on rural producers establish some practical actions so that agri-food markets have a greater orientation towards sustainability to: Establish productive units in disadvantaged rural communities in the province cantons, which promote employment and contribute to rural development. Control use of chemical products in food products, this will contribute to economic, social, and environmental sustainability, by lowering costs and reducing negative effects on the ecosystem and access to healthy food. Promote good sustainable agricultural production practices in farmers that generate less impact on the ecosystem and rational consumption of natural

resources; associate with companies or productive agri-food units that allow opening opportunities for productive development with better yields while taking care of the environment and promote the agroecological technology incorporation to contribute to ecological conservation and thus strengthen agri-food markets with a competitive character.

They also point out that State institutions should guide efforts to consolidate spaces where the agri-food market is representative in Ecuador and provinces, through the generation of sustainable agroecological projects, promote family farming and establish agro-industries, in such a way that rural producers have access to the production processes modernization and consequently access to competitive markets; this figure would give rural communities a greater degree of involvement in participatory processes, their planning, improvement and changes in production systems, and would lead to true sustainability.

5. Discussion

The results of the research establish a certain similarity with other studies in relation to the first hypothesis, where the actors of the agri-food market are related to the perspectives of sustainability, since they are the main actors in the growth and development of the agri-food market, based on their main activity and sustaining the family economy. There are works that contribute to this perspective, affirming that rural communities and producers are the ones that manage and develop local markets [21,28,55], this position helps to affirm the initial approach; however, there are other variables that are closely related to the phenomenon under study, since the model does not fully explain the association of the actors with the perspectives of sustainability. The one that has the greatest acceptance in the literature and coincides with the results of this study, refers to the second hypothesis, that agri-food markets are oriented towards sustainability perspectives, taking into account certain factors such as the right to property, productive initiatives and incorporation of technology and environment [6,56–58]. There are investigations that contribute more importantly in relation to the environment and technological aspects.

From this perspective, the research reveals, in a rural context of the Chimborazo province, that the perspectives of sustainability of agri-food markets are significantly related to social actors, the rights of the producer, linked to new ventures and the incorporation of technology and environment. Thus, it constitutes a pioneering investigation in the context of producers in rural areas, agri-food markets and sustainability; at the same time, it encourages future research to be carried out in this line.

6. Conclusions

The agri-food market in the province of Chimborazo is related to sustainability in the social component through productive units, healthy food resources, employment, and well-being in social actors; the environmental component, which is resource cornerstone for

production with responsible use of each of the environmental resources, in relation to the economic sphere, seeking cohesion and sustainable equality in rural producing family's income.

Rural agricultural production activity is linked to the agri-food market and the prospects for sustainability, given the practice and forms of local production and marketing. However, sustainability would be important if they incorporated technological aspects and universal care for the environment and natural resources, together with the improvement of production yields that would allow producers to generate higher economic income.

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