HR innovation and management training in agricultural processes: greenhouses in northern Chihuahua

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Abstract

The municipality of Praxedis G. Guerrero in Chihuahua, has been characterized in the last decades by its low agricultural productivity limited to certain crops that are not meant to be for human consumption as cotton, alfalfa, sorghum, wheat and prairie, in winter wild oats, due mainly to the economic, political and social conditions of its environment.

This project focuses on HR innovation and management training competitiveness with technology of greenhouses, increasing its chain of value, being adjusted to the conditions of this arid Mexican field where the drought, proximity to a city in an industrial peak, pollution of the, specially the environment pollution and salinity of the earth and its condition of border community give the characteristics to promote its economic reactivations supported in this proposal. Key training will be providing it in order to maintain the alignment between Competitiveness and Technology Management.

Keywords: Training, innovation, management, processes, structure, innovation processes organization

Introduction

Praxedis Guerrero is a small community located in the desert area in the northern State of Chihuahua that borders on Texas USA. Similarly to most of the populations that share these geographical conditions, they also face the constant water shortage, due not only to the years of drought they have experienced, but also to: (1) the legal limitations that don't allow the drilling of wells in the vicinity of the Rio Grande; (2) the impossibility of retaining the water in the area because of the underground's characteristics and the burden of the cost that the construction of a dam would cause, (3) the season rain, received in winter which cannot be used for agricultural activities and (4) the use of residual polluted water coming from Ciudad Juarez.

Although it is true that Ciudad Juarez is one of the centers of manufacturing in the northern part of Mexico, the growth of this city has been such, that there was not a vision from the government on the ecological impact caused by the generation of residual waters not treated entirely and used by the near populations for agricultural purposes. Examples of these communities in the rural area are the Municipality of Juarez, Guadalupe and Praxedis.

The problems of society are increasingly complex and interdependent. Hence, they are not isolated to particular sectors or disciplines, and they are not predictable. They are emergent phenomena with non-linear dynamics, uncertainties, and high political stakes in decision making

Jacques Derrida's version of deconstruction is one of the most influential schools of thought among young academic critics (Derrida, 1989). It is salutary in that it focuses on the political power of rhetorical oppositions -- of tropes and metaphors in binary oppositions like white/black, good/bad, male/female, machine/nature, ruler/ruled, reality/appearance -- showing how these operations sustain hierarchical world views by devaluing the second terms as something subsumed under the first (Fox, 2005).

Research Question

- – Q1. It is possible to strengthen the Praxedis economy by human training on greenhouses´?
- – Q2. How it is the enhanced approach of management process on agriculture´?

Literature Review

The agricultural sector in Mexico has been in crisis for several years, with characteristics of low profitability, decapitalization, poor quality of the rural population's life and the deterioration of the natural resources, as well as the deep poverty and growth of the migrating population (Chauvet and Massieu, 1996).

If the behavior of global production and the main crops are analyzed, the results indicate that in the decade of the 80's, the agricultural GDP represented 5.7% of the total GDP diminishing on the average up to 4.7% during 1995-2000. This insufficient growth of the Mexican agriculture is a combination of structural factors and applied political sectors (Rello and Trápaga, 2001).

The agriculture has been affected by the application of an exchange policy that overvalues the exchange rate, discourages exports and agricultural production, and a lack of correspondence between the strategy of unilateral opening and the application of measures of sector development that increase the competitiveness of the agricultural producers. Numerous problems exist that limit increasing the production and the capacity to compete, as the incomplete markets -among them the loans and insurances -, an old rural institutionality in need of deep thorough changes, and the experience and limited capacity of the producers' organizations to carry out these tasks (Rello and Trápaga, 2001).

However, facing these circumstances the agricultural producers have adopted different strategies, some more successful than others, looking toward solving the setbacks. Currently, crops that have not been displaced by the foreign competition -as the potato that was protected by NAFTA - neither they have stopped to be successful, being agricultural products that are exported, as flowers and tomato (Chauvet and Massieu, 1996). The crops where where more problems and lower competitive capacity exist are rice, oleaginous and wheat. On the other hand, the production and exportation of vegetables and fruits have constantly grown due to comparative advantages that these crops have and the opportunities given by NAFTA. Traditionally, Mexico has been the most important external supplier of vegetables for the American market, with a participation of two thirds of its production (Rello and Trápaga, 2001)

In searching strategies to enhance the competitiveness of the Mexican agricultural field, this project looks for an opportunity to focus on the competitiveness strategy through the use of technology of greenhouses and increase in the chain of value, in a municipality of the United States-Mexico border, named Praxedis G. Guerrero.

Praxedis G. Guerrero is a small town located in a desert area in the northern part of the State of Chihuahua, in the border with Texas, USA. As most of the towns located in this geographical area, they face the constant shortage of water, not only due to the years of drought that they have lived, but also to: (1) the legal limitations that don't allow the drilling of wells in the vicinity of the Rio Grande; (2) the impossibility of retaining the water in the area for the characteristics of the underground and the inconvenient cost of building a dam; (3) the seasonal rain, received in winter , a time in when it cannot be used for agricultural purposes; and (4) the use of residual polluted water coming from Ciudad Juarez.

The use of residual water is restricted to crops of products that are not intended for human consumption like: cotton, alfalfa and wild oats. For this reason there is a need to diversify the products the field produces, to reactivate the economic activity, and to promote also, a better use of the natural resources as the water and the cultivated land; for this reason the National Commission of the Water (Comision Nacional del Agua) mentions in its Statistical Report that for the agricultural year 2001-2002 the crop rate was of $12,506 pesos per hectare (Apud. Of Rural Development Project Integral of Juarez Region Valley. CONAGUA: 2003) which allows us to see the limited use of the cultivated soil as well as its low productivity.

This project is focused on the technology of greenhouses and increase in the chain of value in Praxedis G. Guerrero has the experience of a starting company that uses greenhouse technology focused on tomato crops in the region and the successful

knowledge that this technology for food production in greenhouses has advanced considerably in the last 20 years.

The production in greenhouses, frequently denominated Agriculture in Controlled Atmosphere (CEA), usually is done with greenhouses' technology. The cultivation with this technology is probably today, the most intensive production technique for the agricultural industry. In combination with the greenhouses, this is high technology with intensive capital requirements. Even for the great majority of employees, this cultivation method only requires basic agronomy knowledge's. Since the regulation of the atmosphere and roots growth are the main interest in such agricultural systems, the production is carried on special premises designated to control the air and roots temperature, light, water and vegetable nutrition.

General objectives

To train human resources in the municipality of Praxedis G. Guerrero that strengthen their economy by including added value to the greenhouses´ processes, as well as to encourage the creation of small and medium companies to support those producing greenhouses to place their products in national and international markets.

Relevance and justification

A strategy focused on competitiveness requires not only support for the adoption of technology, but also an adjustment for conditions in Mexico, as in the case of the municipality of Praxedis G. Guerrero. Drought, proximity to an industrial city, environmental pollution, and a situation as a border community generate socioeconomic problems such as poverty and migration. The growth of Praxedis will be on average of 5% while Juarez (and its rural areas) has grown at a rate of 7% from 2000 to 2005 and expect an average annual growth rate of 9.6% to 2025 (Municipio de Praxedis, 2007).

Method and Data

In order to recruit and train human resources that will allow the correct community development and the granting of a model project (see figure 1) for places with similar problems, the following approach was carried out (Scott, 2002):

1. The pre-project is introduced by NMSU-UACJ to the Director of Rural Development of the municipality of Praxedis G. Guerrero, outlining the benefits for the community in forming human resources in the areas of Technologic Competitiveness and Rural Development. They agreed to summon, for this purpose, the producers of the region.
2. In the first general meeting with the producers interested in the project, the details were presented and they self-nominated and pre-selected the key candidates, taking into consideration requirements and the characteristics of the proposal which are: a) have a bachelor´s degree; b) have been born in the community; c) agree to reincorporate themselves to the community and d) spread the acquired knowledge for the community´s benefit.

3. Once the possible candidates were selected, a second meeting was called where the proposal was detailed in two main aspects: rural development – microenterprises and field competitiveness; the participants agreed on competitiveness with added value in marketing. Taking the above into consideration along with the fact that the municipality of Praxedis has previous experience in greenhouses and water problems, the options of competitiveness incorporating technology in greenhouses with added value to the product was presented.

4. In the third meeting, the candidates were interviewed in order to know their background according to the profile detailed in the proposal.

5. Taking the interviews as basis, it was possible to explore the real knowledge of the candidates concerning the project and the requirements, outlining the compromise of the participants, as well as their interests, in order to be able to link the initiative with the needs of the field producers in the community.

6. The following was concluded: a) Support the candidates to study the Master of Agriculture with Specialization in Agribusiness at NMSU, because in that way, they will provide with competitiveness and high value to the products obtained with the greenhouses technology.

Figure 1: Recruitment Process of Candidates
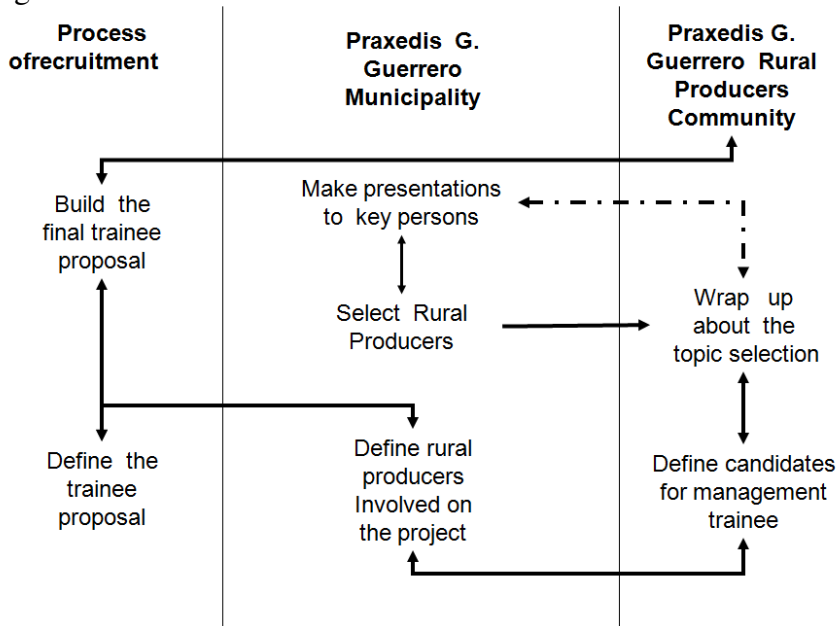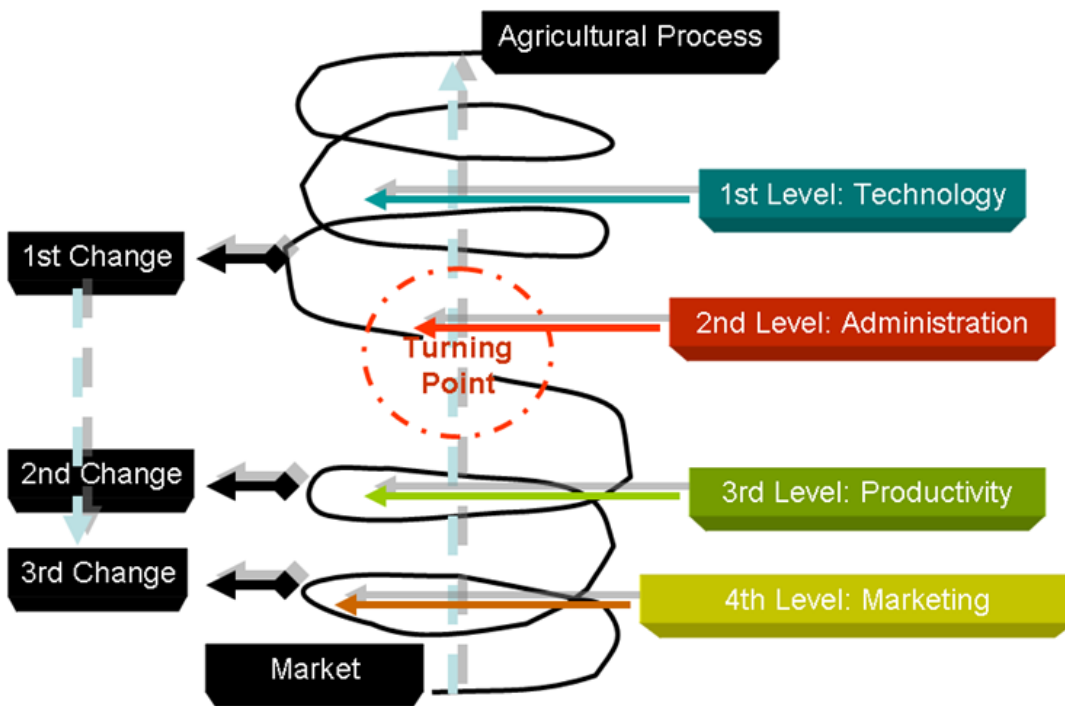

Source; Own development

Discussion

Existing Mexican agricultural processes as a whole, do not comply with actual expectations as of field development in the country, even with its socioeconomic and cultural specificities from its different economic regions.

Taking the above into consideration, there is a need to reflect on the prevailing conditions of agricultural operations. The influence of the existing agricultural structures in the actual processes and their intervention is still given with the incorporation of new

technologies which have demonstrated their success in different spaces must be emphasized.

To approach the Mexican agricultural phenomenon, the representation of the loop, conceived by Edgar Morin under the theory on complexity, is proposed. The steps (called levels) within a process in which the use of technology already exists (see figure 2), are incorporated. Nevertheless, between this and the administration process, a turning point exists, which prevents the product from reaching adequate productivity and marketing levels for its correct entrance into the market.

The graph represents the changes on paradigms that must be given from one level to another; in order for this to happen it is necessary to avoid turning points between one level and the other, to keep consistency with the expectations between the use of new technologies, administration, production, marketing and entrance into the market.

Figure 2: Loop: Innovation and administrative formation in agricultural processes

Source: Cuevas Own development Own development (2007).

It has been thus possible to discover the scenario about the greenhouses in the Municipality of Praxedis G. Guerrero. The knowledge about the way in which the perspective elements of the Loop integrate and their relationship with the innovation and

the requirements of the administrative formation in the agricultural processes, allow the disassociation of the tool, in this case, the greenhouse, and its integral context. In figure number 2, it is possible to watch the different levels and change expectations, and for these, the following aspects have been considered:

1st level: Greenhouses' technology.
- – Existing innovations
- – Advances in the knowledge about greenhouses.
- – Different types of greenhouses.

2nd level: Administrative field
- – Management has not changed.
- – There is no administrative innovation
- – Low profitability
- – High operating costs
- – Lack of credits
- Formation of human resources is considered an expenditure.

3rd level: Productivity.
- – Study of new technologies supporting greenhouses.
- – Research on new processes.
- – Research on field products with high performance in greenhouses.

4th level: Marketing of Agricultural Products.
- – Problems in the distribution of agricultural products.
- – Low knowledge of greenhouses' products market
- – High competition among traditional products.
- – Alternative markets.
- – Products' diversification.

Exploration is also conceived between the levels. Between the level that corresponds to Administration and to Marketing, it is necessary to correctly administrate the resources and guarantee the best entrance into the market. If marketing requires also high production standards (quality, costs and periods of time), its relationship is also influenced by the administration and the research existing with the new technologies.

Administrative field

The approximation to the Mexican field phenomenon under the Loop: Innovation and administrative formation in agricultural processes, originates in the need for solving the problem that exists in the field management, as in the Greenhouses in Praxedis, under the hypothesis of an inadequate handling in managing the existing resources, and the lack of innovating processes required in operating the greenhouses. For such purposes, verifying first the administrative field is suggested, but under the Management Shadow frame.

Management shadow is required in managing the resources, accounting, finances and training. With this tool, verifying the use of the resources that are available and its reorientation to desirable schemes is possible. This second level, which corresponds to

the administrative field, represents the link between the third level of agricultural productivity fundamented in the yield by existing products and the compatible conjugation of management tendencies from other economic activities.

Once you have the different levels, it is possible to break up the interaction between them, so that their composition is given in the relation shown in figure 3:

- R1: Processes' innovation – Management changes
- R2: Management changes – Formation of Human Resources
- R3: Generates feedback between the formation of Human Resources and Management changes.
- R4: Generates feedback between Management changes and processes' innovation.
- R5: Synergy that goes from the formation of Human Resources to the processes' innovation.
- Each standard and each category valorizes some point of view and silences another.

Figure 3: Relations during the process
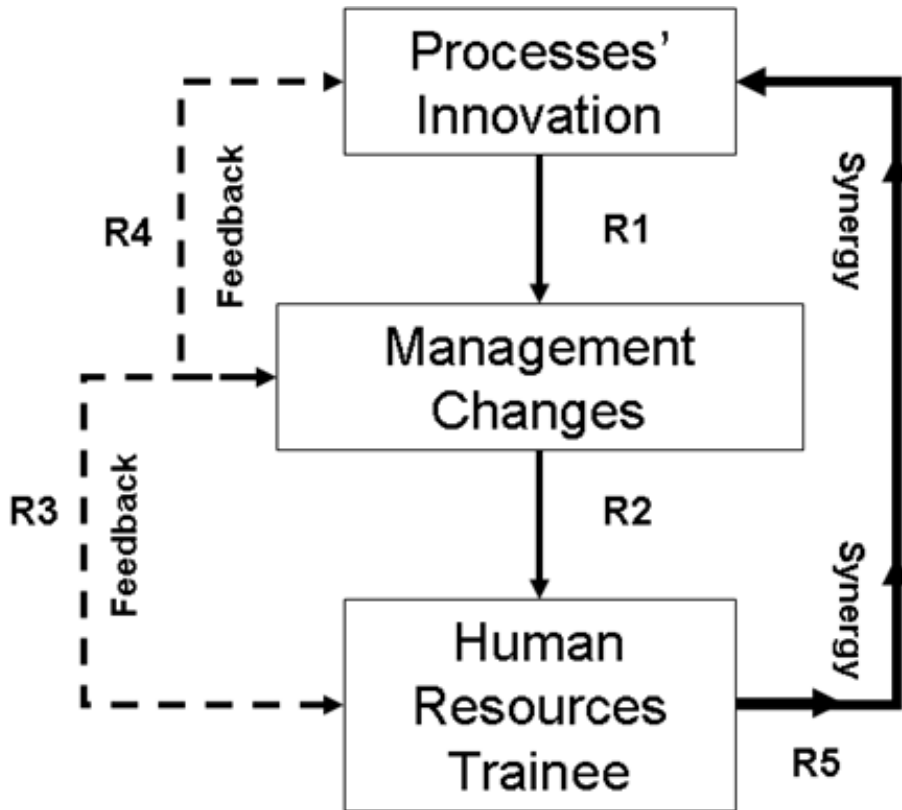
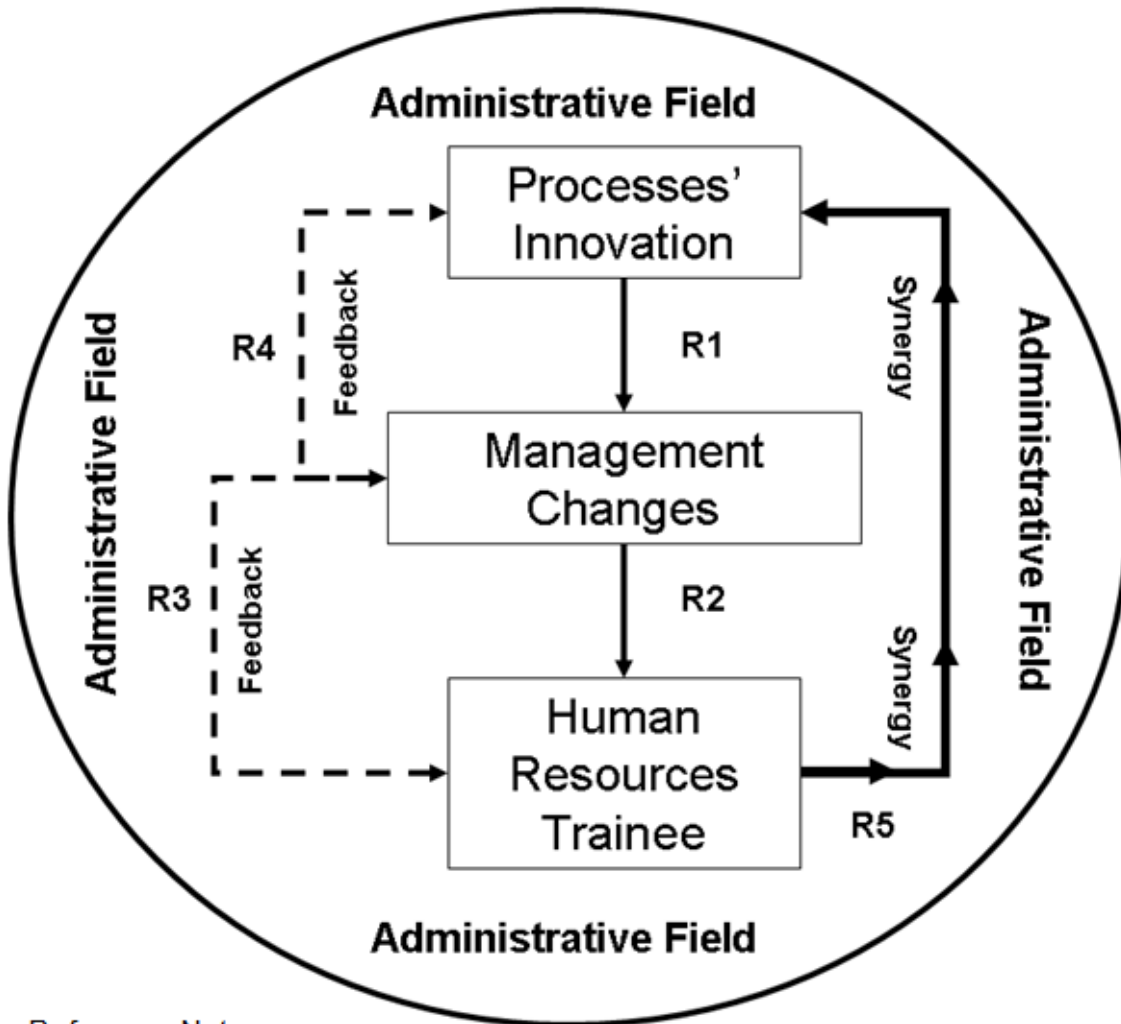
Reference Note :

Relationships= R

Influence= ⟶

Interrelation Feedback= ------▶

Source: Cuevas Own development (2007).

Consequently, the focus is configuring the administrative field node (see figure 4), that will allow generating the necessary human resources to complete of the third and fourth levels, as an unavoidable step for restructuring and eliminating the SEQUENCE(?) of the loop.

Figure 4: Node of the administrative field.

Reference Note :

Dynamic field= ◯

Relationships= R

Influence=———▶

Interrelation Feedback= - - - - - - ▶

Source: Cuevas (2009).

Finally, as immigration of the population is a phenomenon that affects the Mexican field for its low rewards and undesirable levels of life, the approach to this phenomenon must be from an "agricultural enterprise" point of view, with requirements in investing in forming human resources.

Conclusion

The proposal refers to reorientation management in the Mexican field, not only in the greenhouses themselves but as a feasible model under the vision of improvement of the processes that change, through the formation of human resources, to generate a continuous synergy in innovating operating processes and agricultural management. These will reflect, afterwards, productivity and merchandising nodes, which, once satisfying their requirements will have access to the market with better possibilities in quality, prices, delivery dates, granting competitiveness.

The Mexico-USA border not only shares economic, industrial and commercial ties, but also, fortunately or unfortunately for the region's inhabitants, these two countries are intertwined by environmental issues due to natural resources, mainly the water issue that joins both Mexico and USA communities in a determinant manner . Water is the scarcest, most fragile and appreciated resource in the border region shared with the Americans. The amount of water in the region is precarious, not only because of the natural conditions in the west area (the climate of the region is prone to serious droughts, particularly in the Rio Grande region), but also the manner it has impacted the evolution of the border cities with an extensive industrialization based on the industry assembly plant. (Cohen, 2005).

On the other hand, the problem concerning water in the border involves different actors with different necessities. On one hand the farmers require the vital liquid to continue developing their activities and the cities demanding more and more water to supply their residents, industrial and service sectors. On the other hand, the water issue involves the government's meddling at different levels (local, regional, national and international) due to the fact that most of the sources of supply are shared among states, municipalities and town at national and international levels by the interaction in the international treaties regarding the Rio Grande and Colorado rivers in the Mexico- USA border area (Bustillos, 2004)

Questions for further research

- – QFR 1. It is the management of innovation technologies a right choice for economic development at agriculture small business?
- – QFR 2. The conceptual process model can be success at the Mexican agriculture?

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