# Why they do what that they do? A study of purposes and strategic rules of Uruguayan's extensive beef farmers

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**Abstract**

*Farmers must make decisions that are taken by different criteria, which are in all cases personal and circumstantial. From a technical point of view, at the moment to propose any change in the farm structure, or any application of some particular technique -or even in the government policy making- it is essential to know why a farm is like it is and why the farmers do what they do. To know the goals for which a farm operates seems to be a priority, or viewed in the opposite way, to ignore the farmer's objectives can lead to mistakes when planning any farm intervention programs. The objective of this study is to describe the farmers main Purposes (P) and the Strategic Rules (SR) associated, as they are defined by the Global Approach method. For this research twenty case farms were analyzed by two methods: Multivariate simple correspondence analysis and a text concept linking software (Redes2009). The results show that the most frequent P's were: i) "Those related to patrimony", ii) "Those related to guarantee a money income", and iii) "Those related to keep a rural way of life". The main SR associated to these P were, respectively, i) "To assure incomes" and "To keep herd as capital"; ii) "To manage work and family participation at farm tasks" and "To keep a comfortable way of life and life's quality"; and iii) "To assure incomes" and "To handle the indebtedness". The SR defined as "To assure incomes" was the most frequent, and it is strongly related with two economical P (i and ii, stated above), and to others SR like "To reduce cost and money management" and "To handle internal and external information". In conclusion, the most frequently mentioned P was related to economic and social issues, linked with economic and social SR. The agro-ecological P per se was no present in this study.*

## Introduction

After the Green revolution, justified on a productivist paradigm, the sustainable agriculture paradigm is now installed (Loewy 2008; Arias et al 2006). On this context, nowadays in Uruguay, there is an effort in national agricultural research for developing a precision animal husbandry, sustainable and productive in the economic, environmental and social aspects (Montossi et al 2009). In that sense, the exploitations must be considered as a complex system, with an increased need to understand its way of functioning. Also, it supposes change the lineal model – and vertical- of innovation diffusion to another of simultaneous relationship between actors (research-extension-application) (Chia et al 2003, Rossi 2011).

In today's situation, the government drives also some politics to conserve the natural native pastures ("campo natural") as a differentiation and competitive factor of Uruguayan beef in the international markets (INAC-PCNCU 2012). This competitiveness presents a point of tension between the need to produce more in a conservationist background, in a high liberalized export-oriented context. (Levrouw et al 2007, INAC 2012). In that sense, the "ecological intensification" is a challenge that must be faced by the stakeholders (CIRAD 2012).

The national agricultural research institute assumes also that it exist a technology gap in some productive activities (INIA 2010, INIA 2011). That technology gap must be contextualized in an economic sense, but others factors like the actual farmer's possibilities to face any technological changes must be considered (Pereira 2003). On the other hand, even in the adoption of process technologies with low costs (f.e. stocking rate adjustment, seasonal breeding, autumn weaning) the possible failure becomes real when it means big changes in the usual way of working (Carriquiri & Fernández 2004). These kinds of technologies (considered as high system impact and low economic cost) have, however, a high "intellectual cost" that must be considered. In Uruguay, there are studies in family cattle breeding production systems showing the existence of non-economic factors linked to the technology adoption, as the farm infrastructure, the way to manage the exploitation and the personal and attitudinal characteristics of the farmer and his family (Molina 2008).

According with Figari et al (2002), the "degree of success" of any exploitation must be detached from the exclusive economic-productive topics. The diagnosis and problem solution at farm level must not be based on external criteria (others farms) nor normative (technical and economical optimum). Morales (2002) propose that one of the aspects to be considered in the way of functioning in the family-exploitation system is the effectiveness which the productive system helps to achieve its purposes. According to Osty (1978) "the exploitation is an organized whole which do not responds to a simple and uniform optimization criteria".

The "liveability" concept (Dedieu et al 2006) is applicable to the study of familiy farms, and it was created with the objective to integrate the life's quality and the agricultural work. At national level, it exist some antecedents (Figari et al 2003) showing the existence of dairy farm purposes of functioning related to non-economic issues, like social aspects.

In this work we attempt to describe the main purposes of farm functioning and the strategic rules linked to them, on group of cattle breeding family-exploitation systems. As main hypothesis we propose that there exist other purposes than economic ones.

**Material & methods**

This study was carried on twenty cattle breeding family-exploitation systems, which participated in the "Integrating knowledge project" (Morales & Dieguez 2009). The case studies are comprised in the Agriculture ministry denomination as "family farmers" (MGAP 2008). In this universe, and to referring to it, we utilize the term "family exploitation system", as a productive system conceived to satisfy the family needs (Osty, 1978).

With the objective to identify the reasons by which the family-exploitation systems works, it has utilized an adaptation of AGEA methodology (Marshall et al 1994). That methodology consists of a systematized plan of farm visits to request different kind of information, with the main objective to characterize it, concluding with a diagnosis.

The AGEA was designed to approaching the farm with a systemic viewpoint (Chia et al 2003), where one of the activities is the system modelization using diagrams. The use of diagrams allows representing the complexity of family-exploitation systems, in an unambiguous and comparable way, highlighting the essential issues. Also, the model construction is made with the farmers, where the diagram is easier to understand and examine than a plain text (Marshall et al 1994).

In this study the Purposes-Strategic rules diagram (Marshall et al 1994) for each study case was employed as a tool to understand the main objective of farm functioning. Figure 1 shows an example of the Purposes-Strategic rules diagram utilized on this study.

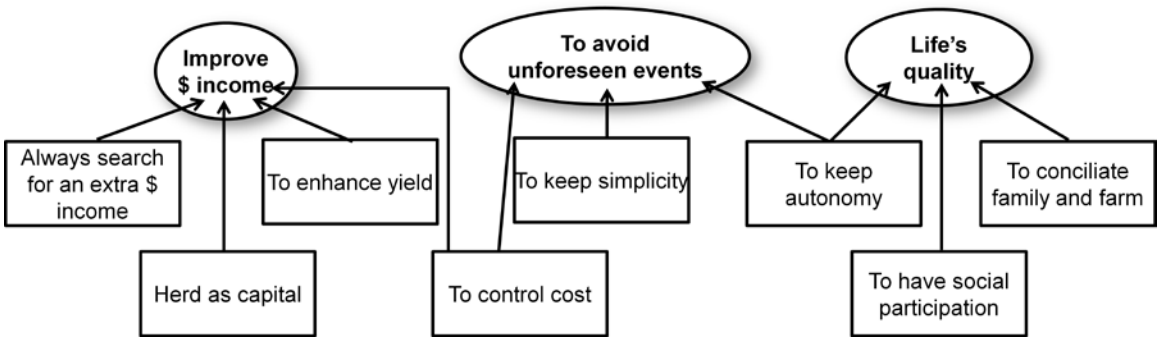


Figure 1: An example of Purposes-Strategic rules diagram utilized in this study. The circle indicates de Purposes and de square boxes indicates de Strategic rules.

In agreement with Marshall et al (1994), a “Purpose” (P) is the expression of a set of aspirations carried on by a number of people, about the aim of exploitation functioning. The P of exploitations responds to the question “for what they do what?  they do”. Marshall proposes that in a farm, the major and basics P are to live and to reproduce itself. However, this two main aims are broad and vague, and fits to any farm. In order to understand the way of functioning of a particular farm, a deeper comprehension of main P is needed.

A “Strategic rule” (SR) is a driving line which allows to act in the present in coherence with the perception of possible futures (Marshall). The SR responds to the question “what is doing” in the farm to attain its P. Noteworthy that the SR can be shared between several P, as it is showed in the example of figure 1.

In the Purposes-Strategic rules diagram, after this two levels, in hierarchy there are "Strategic decisions" related to the farms operating system, which respond to the question "how the things are made". This level will not be addressed in this paper.

To analyze the kinds of possible P founded in the study case, it was set a priori a classification by its nature, according to the three sustainability areas: Economical, Agro-ecological and Social issues.

The results were analyzed using two methods. First, by the Multivariate analysis of Simple Correspondence, as a tool to associate the  P and the SR. With the same data set it was made also a Cluster Analysis (using the Euclidean distance) to distinguish the possible natural groups of similar P.

In a second instance, the results were evaluated by the Associated Words Analysis using the Redes2005 software created by the University of Granada-Spain (Cognosfera 2012). This analysis, based on the Network and Nodes theories shows graphically the relation between concepts (words). For this study it was considered a minimal occurrence of a word of three times, with a co-occurrence of three times, in a group size between three and seven words.

**Results & discussion**

In order to summarize information of the Purposes-Strategic rules diagrams of the twenty study cases, the P was assembled by its nature, resulting in eight different groups. Likewise, the SR was also grouped with the same criteria, resulting in eleven different items. Table 1 shows the P and SR groups obtained from the study cases.

Table 1: The Purposes and Strategic rules of Uruguayan's extensive beef farmers.

| | Purposes (P) |
|---|---|
| **P1** | To guarantee a money income. |
| **P2** | Those related to patrimony (to keep/enhance patrimony). |
| **P3** | To reduce risks. |
| **P4** | To have financial health (no indebts). |
| **P5** | To have good/better yield. |
| **P6** | To be concerned by child development and farm succession. |
| **P7** | To be social and productive integrated. |
| **P8** | To keep a rural way of life (life quality). |

| | Strategic rules (SR) |
|---|---|
| **SR1** | To assure incomes. |
| **SR2** | To reduce cost (and money management). |
| **SR3** | Risk management. |
| **SR4** | To handle the indebtedness. |
| **SR5** | Those related to productivity. |
| **SR6** | To keep herd as capital (do not undercapitalized). |
| **SR7** | To handle internal and external information. |
| **SR8** | Work management and family participation in farm tasks. |
| **SR9** | Social and productive integration. |
| **SR10** | Quality and kind of life. |
| **SR11** | Ethic values. |

The P was ordered, going from economic-productive-financial issues (P1 to P5) to social issues (P8) passing through socio-economic issues (P6 and P7). The primary classification of P was according to the three sustainability areas, but none was classified as agro-ecological *per se*. Moreover, the SR's were also classed according the same criteria, where we found a group with economic-financial issues (SR1 to SR6) and social issues (SR9 to SR11). Between these two groups, we distinguish to others kind of SR, one of theme related to the information management (SR7), and other associated to the work management and family participation in farm tasks (SR8), which can be conceived as a socio-economic issue.

The figure 2 shows the proportion of study cases that presented each P.

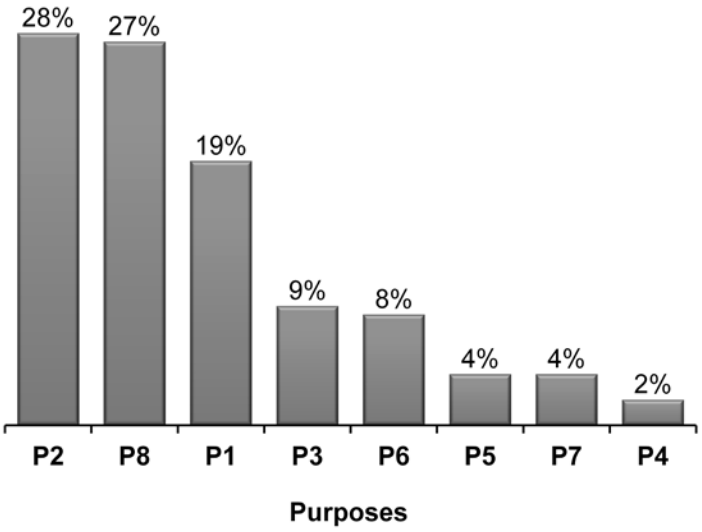


Figure 2: Total proportion of farm purposes

The most frequent purposes were those related to patrimony (P2), to keep a rural way of life (P8) and to guarantee a money income (P1). These results agrees with Marshall et al (1994) who found that the most frequent purposes on a family-exploitation system are the searching of the economic viability, with adequate work conditions and life quality, the security, the independence of system and people, the exploitation image, the spirit of taking account of the environmental development (social role, external responsibilities) and to guarantee the succession.

In the same way, another study conducted at Uruguayans family dairy farms (Figari et al 2003) the systems purposes reported were associated to money incomes (related to attain a money income necessary to affront the family needs); others linked to the way of life (to keep traditions and habits, do not modify the learned way of produce…) and also other purposes related to the security (do not risk, do not have a money debt, do not depends on others…).

To put in evidence the existence of natural clusters of P, it was made a Cluster Multivariate analysis. The graphic result is presented in the figure 3.

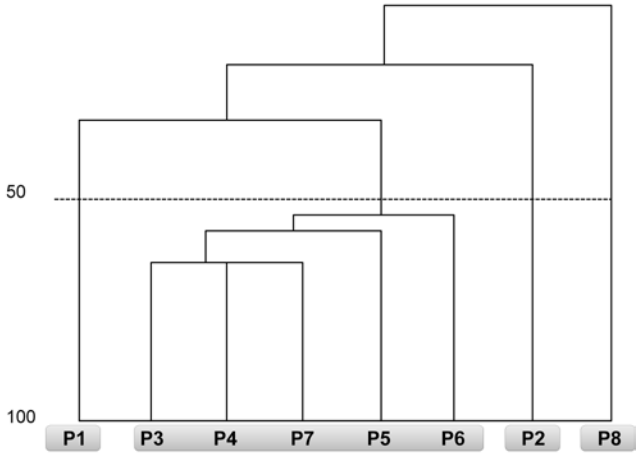


Figure 3. Graphic result of Cluster Multivariate analysis

The Cluster analysis suggests that, considering a similitude level of 50 (halfway between none differentiation in one group and the whole differentiation in eight groups) it exist four natural groups: P1, P2, P8 and finally another cluster grouping the rest of the P. The proximity level suggest that the P8 (to keep a certain way of live with a social character) may be differentiated from the economic P. Into economic purposes the P2 (those related to patrimony and P1 (to guarantee a money income) are differentiated from the other economic P. These results are consistent with the frequency of P (figure 2) where the most frequent P were clearly differentiated from the rest of P.

Considering the linking between the P and the SR, table 2 shows the frequency of occurrence for SR in P. The percentage value indicates relatively how many SR occurs in each P. To complement the analysis figure 4 presents a graphic results of the Multivariate simple Correspondence analysis, showing the proximity between P and SR.

Table 2: Frequency of occurrence of SR in each P (darker fill indicates more frequency).

| | P1 | P2 | P3 | P4 | P5 | P6 | P7 | P8 |
|---|---|---|---|---|---|---|---|---|
| **SR1** | 30% | 35% | 9% | | 4% | | | 22% |
| **SR2** | 30% | 26% | 15% | 4% | | 4% | | 22% |
| **SR3** | 6% | 38% | 19% | 6% | | 6% | | 25% |
| **SR4** | 36% | 27% | 18% | 9% | | | | 9% |
| **SR5** | 15% | 35% | 4% | | 19% | 12% | 4% | 12% |
| **SR6** | 18% | 82% | | | | | | |
| **SR7** | 22% | 22% | 6% | | | 17% | 6% | 28% |
| **SR8** | 11% | | 11% | | | | | 78% |
| **SR9** | | | | | | 10% | 40% | 50% |
| **SR10** | | | | | | | | 100% |
| **SR11** | | | | | | 57% | | 43% |

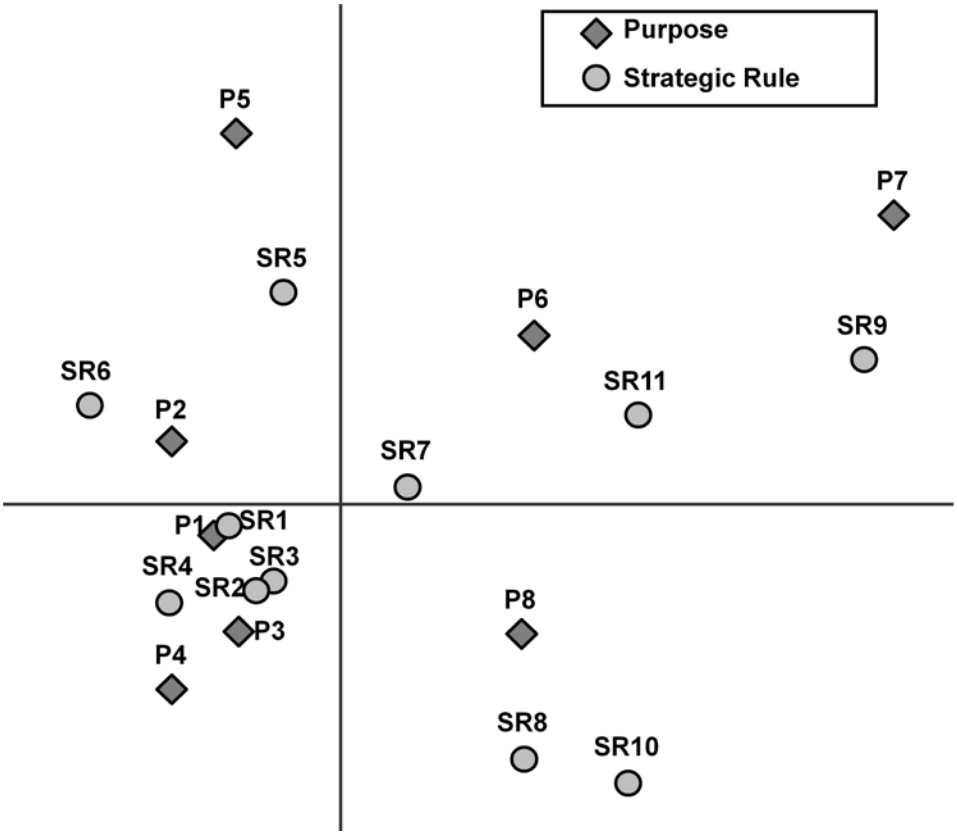


Figure 4. Graphic results of the Multivariate simple Correspondence analysis.

The results presented in table 2 and figure 4 shows the coherence of the association between the different kinds of P and SR nature. The SR 1 to 7 are associated with P1 and 2 (economic-productive aspects) whereas the SR 8 to 11 are associated with P 6 to 8 (socio-economic aspects).

The P 1, 3 and 4 (to assure incomes, to reduce risk and to have financial health) seems to be strong related with SR 1, 2, 3 and 4. On the other hand, the P2 (those relative to patrimony) is mainly associated to SR6 (those relative to capital). Another aspect to highlight is the fact that the P8 (related to keep a rural way of life and life quality) is linked with SR8 (work management and family participation in farm tasks).

For further exploration in the relationship between P and SR, an Associated word analysis was made. The figure 5 shows the graphic result of this analysis.

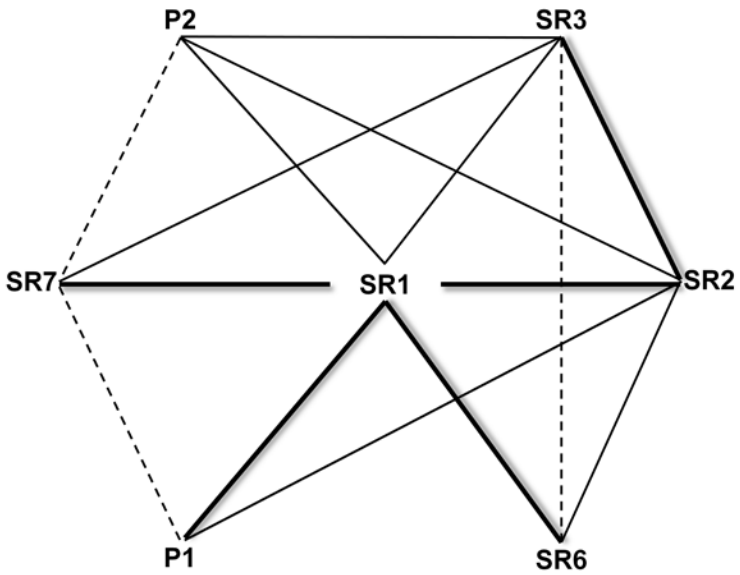


Figure 5. Graphic result of the Associated words analysis.

As it is showed in the figure 5, the SR1 is the most frequent concept, strongly related with P1 and P2. Also, this SR is linked with SR2, 6 and 7. On the other hand, the P1 is also strong related with SR. These results are consistent with the previous analysis, suggesting the high frequency and strong relation of economic P. Due to a high concurrency of SR1 in the studied cases, other P not directly related to economic goals are masked (P6 to 8 do not appears in the graphic result).

**Conclusions**

At the beginning of this research, the intention was to put in evidence some possible link between the P and the three areas of sustainability. In that way, the P observed in the study cases were originally classified by its nature in economic, social and agro-ecological issues.

The P of all study case were ranged in the economic and social groups. The fact of the nonexistence of agro-ecological purposes itself may be reflect of the everyday life with a strong bond with the productive resources in family farms with an extensive production on native pastures.

The results of the present research show that in the cases studied some purposes of farm's functioning of the economic kind exists, as those related to patrimony like to keep or to enhance patrimony (P2) and to guarantee a money income in quantity and stability along the year (P1). The social group of purposes was mainly to keep a rural way of life (P8). Likewise, others family-exploitation system purposes found were related to risk management, the indebtedness, the yield and other linked with social integration and succession concerns, which share several SR. The most frequent SR was to assure incomes (SR1) related with several purposes, most of them economic ones.

If we try to understand the -family- farm systems, either in an individual way or in a group analysis, the inclusion of a categorization on functioning purposes seems to be important to enhance our knowledge of its particular way of work. The main P in the present study was associated with the socio-economic aspects of sustainability, with aims like: to attain a money income working in a rural way of life. These two aspects combined (the incomes and the way of life simultaneously)

are still the most relevant factors if we try to answer the question "why does a family farm function?".

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