# Technology for Innovating the Amazon's Fish-Farming Activity

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**Abstract—** *This work is about the innovation with focus in the competitive strategy for the fish´s production in Amazon´s captivity. The assumption is the axis of the systemic analysis of contingencies in order to reduce operating costs and gain competitiveness. It is based on the Contingency Theory from the Joan Woodward´s perspective. The research questioning is: how is characterized the innovation in the competitive strategy context of the Amazon fish-farming. It was used the Case Study Method. The methodology of this work is both quantitative and qualitative, involved consulting experts and focus groups. As a result, it concluded that innovation in the competitive strategy context of the Amazon fish-farming, characterized by the breakdown of tradition that perpetuates unproductive or high-impact practices. It´s recommended that these idealizers would be internalize in the policies of the development agencies. This research provides information to the development of public policies for integrated local development and managers who wish to develop competitive strategies in sustainable fish farming.*
**Keywords— Amazon. Innovation. Contingency theory. Competitiveness. Strategy.**

## I. INTRODUCTION

This work is about the strategic competitive in the Amazon fish farming, based on the Joan Woodward´s contingency approach. The focus of innovation is direct for technologies in production processes traditionally developed in the Amazon fish farming, proposing sustainable use of environmental attributes aimed at the commercial impact of productive activity. Brings survey of structural and technological situation in the fish farming scene in Rolimde Moura city, Rondônia State, Brazil, for strategic and competitive context of the research scenario. Statistical analysis of these data lead the prevalence treated secondarily with support from the SWOT tool.

## II. JUSTIFICATION AND OBJECTIVES

The justification of this task is the needing to innovate for competitive excellence in fish farming activity. The objective here is to study the innovation by Joan Woodward, focused in the Amazon strategic competitive approach. It´s bringing as specific objectives to point proficient creators for sustainable innovation in the scenario under study (1); contextualize the manufacturing strategy in the face of competitive convenience of Amazon attributes (2), and analyse the innovation required in the face of tradition disruption about the trade impact of new demand (3).

## III. THEORETICAL REVIEW

The Contingency Theory brought as a base to this task, following the Joan Woodward´s conceptions like as indicated

by Pereira, Rodrigues and Gessi (2014). For the authors, Woodward has shown that the technology contingency the structure and organizational behavior, showing the functional relationship between the environment and organizations, and inspiring the search for management models appropriate to the achievement of organizational objectives.

Fagundes (2010) and Pereira (2014) also describing that to Woodward available technology determines the structure and performance in the organization. Given the above, aims to sustainable innovation from the link between natural resources and traditional knowledge, focusing on technology as a competitive strategy in the Amazon context, and focusing on productive practices undertaken in fish farming in the face of the needing for proficient idealizers to its competitive convenience.

### 3.1 Concepts About Proficient Idealizers for Sustainable Innovation

Pedro Filho (2015) proposes an efficient and effective way to promote Amazon enterprises, by the innovation based on Amazon attributes. The author believe that the attributes include biotic and abiotic resources of the biome, and influence in traditional practices. Given the occurrence of undesirable anthropogenic effects on human-ecosystem interface, it´s accompanied by Piacentini, Pedro Filho and Almeida (2015) understanding.

These understandings aligned to the perception of innovation in processes according to Andrade (2014), provide the view that the introduction of significant improvements in processes from a Contingency vision may involve sustainable approach to the Amazon attribute as described in Table 1.

*Table.1: Construct sustainable innovation processes in the study setting.*

| Elements | Concepts | Idealizer for sustainable innovation in processes |
|---|---|---|
| **1 Contingency approach** | 1.1 Appropriate format to achieve the organization goals resulting from the functional relationship between the environment and the organization. | New or significantly improved method through the appropriation of Amazon attributes taken from the analysis of technological contingencies,aiming the reduction of operational costs and gain competitiveness guided by a sustainable perspective. |
| **2 Nature´s Attribute** | 2.1 Set of traditional knowledge that involve the use of biotic and/or abiotic resources available in the biome. | |
| **3 Process Innovation** | 3.1 New or significantly improved production method in order to reduce production cost and improve the competitiveness. | |
| **4 Sustainability Approach** | 4.1 Interaction viable, equitable and endurable between the ecological, economic and environmental, to provide continuous constant or stable activity. | |

**Source**: Authors.

In this perspective, sustainable innovation in the processes can obtained through the nature's attributes, taken based on systematic and continuous analysis of the variables that affect the technological and strategic organization's framework.

### 3.2 Concepts Required for Manufacturing Strategy and Competitiveness of the Amazon Attributes

In Pereira (2014), the strategy is the means by organizational managers can influence the external environment, the organization´s technologies, structures and control mechanisms and management. The above author accompanies Chiavenato (2003) in his taxonomy to present the strategic perspective of Design, which involves among

others, the internal assessment of the organization as a competitive strategy.

Competitiveness in this scenario can read in order to associate innovation and strategy as Leão(2014) understanding, which considers competitiveness as the organizational ability to perceive changes and to prepare to face them taking a proactive stance.

### 3.3 Concepts of Innovation, Tradition and Demand Focusing on Business Impact.

Cyrino (2010) advert for the impacts caused by commercial fish farming´s effluents, revealing that the productive effort in fish farming may result in increased environmental

degradation if are not implemented some preventive measures.

The definition of traditional knowledge presented in Castelli and Wilkinson (2015) indicates that local communities have knowledge, technologies, and innovations and practices that taken part of in their lifestyles. Thus, management customarily developed by farmers as their traditional practice is the result of a historical process, which in last instance define them as a collectivity.

Pereira (2014), it appears that technology can have a flexible profile associated with the technical expertise and raw materials that can used in different products or services. In this context, a product may be described as abstract, whether characterized as one that has adaptability to the environment and the technological flexibility; strategy for external and internal consensus; and emphasis in research and development, marketing and human resources.

Therefore, the improvement of production practices traditionally developed in the face of new demands with business impact, it´s represent the revision of knowledge, technologies and practices according to precepts proficient to study setting.

## IV. METHODOLOGY

In this study, we sought to inference by quantitative strategy to support qualitative data analysis, following the indications in Coimbra and Martins (2013). According to these authors, Yin (2011) calls for the case study as a thorough analysis method of the aspects of a phenomenon, situation or problem; and Punch (2010) recognizes the combination of different paradigms in a common methodological platform. The research based on the Contingency Theory according structural and technological aspects resulting from Joan Woodward´ studies indicated in Pedro Filho (2015).

The study involved consulting for group of experts composed by professors from the of Rondônia´sFederal University (Brazil), to debate and setting ideal parameters for sustainability in fish farming. Delphi technique used by the expert, like indicated in Landeta and Barrutia (2011) and Vanzetto (2012). It consulted to focus group for strategic and competitive context of the scenario following Dias (2015). The group made up of six fish farmers with higher productivity in Rolim Moura city, Rondônia State, Brazil and twenty stakeholders. The methodological matrix applied in the study is showing in Figure 1 and Table 2 as described.
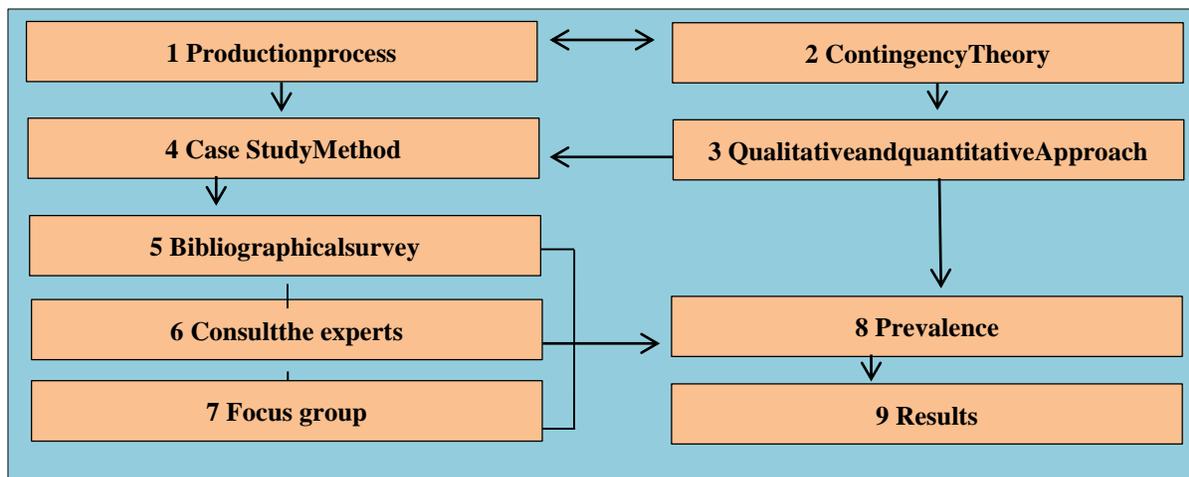


*Fig.1: Methodological Matrix research.*
**Source**: Authors.

*Table.2: Descriptive of methodological matrix research.*

| Element | Description |
|---|---|
| **1 Production process** | Research subject: innovation in production processes in fish farming. |
| **2 Contingency Theory** | Basic theory for the task, following the technological approach resulting conducted by Joan Woodward´s studies. |
| **3 Qualitative and quantitative Approach** | Paradigm approach that guides the nature of the study. |
| **4 Case Study Method** | Methodological approach to the research. |
| **5 Bibliographical survey** | Theoretical categorization to support of the study. |

| 6 Consult the experts | Survey desirable parameters and variables to categories involving Amazon attributes taken sustainably. |
|---|---|
| 7 Focus group | Identification of the factual context according to fish farmers and stakeholders, based on the categories listed in theory. |
| 8 Prevalence | Relevant measures that stand out in the study scenario, identified based on statistical assessment of the data collected. |
| 9 Results | The elucidation of the prevalence aimed at reconciling between strategy and the structural of organization´s adjustment. |

**Source**: Authors.

It was used secondarily SWOT tool, as shown in Chiavenato (2014), to consider competitive strategy aspects in the fish farming scene. The consulting experts provided the ideal state descriptive for the variables in the Amazon scenario, and the attributes of nature as parameters of pro-innovation action, according to the design in Table 3. The focal group offered to identify the factual context as traditionally practiced and perceived by the respondents.

*Table.3: Data collected on the experts 'consultation and structured as SWOT tool.*

| Strategic dimensions and indicators | | Variables |
|---|---|---|
| External | 1 Opportunities (opportunities). | 1.1 New lines of products;<br>1.2 New technologies;<br>1.3 New processes; |
| | 2 Threats (Threats). | 2.1 Substitutive products;<br>2.2 New customer demands;<br>2.3 Competitive pressures; |
| internal | 3 Forces (strengths). | 3.1 Natural resources available;<br>3.2 Advanced technologies;<br>3.3 Efficient processes; |
| | 4 Weaknesses (weakness). | 4.1 Operating limitations;<br>4.2 Obsolete technologies;<br>4.3 Inefficient processes; |

**Source**: Authors.

The auxiliary instrument applied Likert scale with Statistical Package Software support for the Social Sciences for Windows (SPSS) for the treatment of correlation according to Pearson coefficient. Based on Almeida (2014) and Vale, Teixeira and Sant'Anna (2015), we used the average ranking for treatment of measurements obtained via Likert scale, and correlation analysis using Pearson correlation coefficient, to determine the strength of association between the variables and infer the prevalence of significant elements that can be innovated. The providence indicated identified the variables, the ideal matrix in face of the conceptual elements considered, the assessment and critical analysis.

## V. INNOVATION BY JOAN WOODWARD´S APPROACH FOCUSING ON A FISH FARM IN THE AMAZON

The Ministry of Fisheries and Aquaculture in Brazil issued the Development Plan of the Brazilian Aquaculture 2015/2020 (BRAZIL, 2015), which analyzes the Brazilian fish production on the basis of 2013 year. In this period, we obtained a production of 1.241.807 tons, and of this total 61,6% were from fishing and just 38.4% originated in fish farming.

According to official data published by the Brazilian Institute of Geography and Statistics (IBGE, 2015), the Northern region of the country accounts for only 15,32% of fish captivity production, in which prevail Tambaqui, Pirarucu and Pirapitinga (*Colossomamacropomum*, *Arapaima gigas* and *Piaractusbrachypomus*). The fact that the Amazon Basin, the largest river basin in the world, lie in this region may help explain the fact prevail marketing from the fishing instead more than captive production. However, the anthropic pressure on this watershed, not only for fish extraction but also for other activities such as navigation, could cause the depletion of fish stocks, leading to economic, environmental and social fragility in the region.

It is in this scenario that discusses the situation of the Rolim de Mouracity, whose location is showing in Figure 3. The fish production in this municipality is predominant in

captivity, having sold about 1.5 tons. to supply local fairs and in the surrounding cities and supermarkets.



*Fig.3: Location of the of Rolim de Moura city.*
**Source**: Authors.

Considering that in its Aquaculture Development Plan (BRAZIL, 2015) Country outlines the expansion of its fish production through commercial aquaculture, and considering the need for increased food production to meet the world's population. As well as the growing demand for healthier foods, it is understood that it is appropriate to propose the expansion of fish production in confinement in the Rolim de Moura city, not only by abundance of natural attributes now underutilized as well as notorious commercial and nutritional quality of the species there consolidated.

However, the presence of state agencies for development and technification of rural production, aquaculture in the locality uses predominantly traditional, inefficient means the production, marketing and control of environmental impacts. Whereas these elements are in the environmental

organizations' context, the approach is supported by the Contingency Theory as the same idea that Woodward to provide impact on competitive strategy. In this session, we list up creators to sustainable innovation in the study context; the manufacturing strategy contextualized in the face of competitive convenience of Amazon attributes, and analyses the innovation required in the face of tradition disruption on the commercial impact of the new demand.

**5.1 Proficient Idealizers for Sustainable Innovation in the Scenario Study**

Experts were consulted about indicative for taken as representative of the parameters for the guidance of the pro-innovation intervention according to the drivers part listed in Table 5.

*Table.5: Benchmarks for pro-innovation intervention.*

| Strategic dimensions and indicators | | Variables | Drivers for pro-innovation intervention with sustainability |
|---|---|---|---|
| External | 1 Opportunities. | 1.1 New product lines;<br><br>1.2 New technologies;<br><br>1.3 New processes; | 1.1.1 Filleting: differentiated cut the fish as an alternative to traditional in whole pieces.<br>1.2.1 Amazon Attributes: waste processing and creation in dams networks.<br>1.3.1 Sanitary control: Sanitizing production-turning sub products in feed. |
| | 2 Threats. | 2.1 Substitutive products;<br><br>2.2 Customers´demands;<br><br>2.3 Incoming pressures; | 2.1.1 Competitiveness: advantageous price in relation to the offered.<br>2.2.1 Consumer preferences: demand decline to the consumer demand.<br>2.3.1 Impairmentby competition: Deficiencies negatively affecting the business. |

| | | | |
|---|---|---|---|
| **Internal** | **3 Forces.** | 3.1 Natural resources available;<br>3.2 Advanced technologies;<br><br>3.3 Efficient processes; | 3.1.1 Availability of specimens: it´s no necessary import or adaptation of exogenous species.<br>3.2.1 Fish cub technique, polyculture and consortium: breeding and rearing of other animals.<br>3.3.1 Semi-intensive breeding and cooperative Creation: Emphasis on intensive control of production and cooperation or collaboration between producers. |
| | **4 Weaknesses.** | 4.1 Operating limitations;<br><br><br>4.2 Obsolete technologies;<br><br>4.3 Inefficient processes; | 4.1.1 Organization and qualification: Disqualification of stakeholders playing traditional practices inefficient impactful.<br>4.2.1 Extensively creation: traditional low system technification and productivity.<br>4.3.1 Lack of livestock and livestock planning control: creation of structure planning Absence, profitability and biometric measurements undertake the activity. |

**Source**: Authors.

Regarding the Opportunities indicator, filleting indication constitutes an alternative to traditional management, although there is a factual reality that is the lack of technology or training for innovation in itself the product transformation process under the requirement of the modern market. This lack of technology also reflects the performance of the technical assistance agency and even the consolidation of public policies in this sector.

The use of Amazonian attributes, optimization may occur with the use of natural resources such as river or reservoir hydroelectric dams, generation of inputs such as organic fertilizers and others, from the breeding with environmental control of the activity. The sanitization will provide cost savings through the transformation of production waste in reusable food in the production process.

As for the threats, the rise in production costs do not reflect the competitive quality gain, the quality of the consumer search can also result in declining demand, front products from other regions or substitutive products to offered. Loss-making processes can undermine market positions conquered earlier, due to pressure from new competitors.

Among the factors to provide the fish farming strengthening are availability of water resources and the diversity of species from the Amazonian habitat. Together, these factors are to support the success of production and matrix creation, as well demand and product are accept in the market place.

The fingerling production technology increases qualitatively and quantitatively the creation possibility, which can be expanded by fish group creation of different species or in interaction with other animals, that provide useful inputs to production, increasing competitive and productive efficiency of the process. The semi-intensive farming proves to be suitable for search productivity with quality, having emphasis on control of biotic and abiotic resources that interact with the production, as well as fish increase and improve feed to speed up the production process.

About weaknesses identified in the sector, producer´s limitations in the organization of productive activity and the lack of skilled labor, contribute to use practices considered unproductive or highly impactful to the environment. In some cases, the fact that the activity considered secondary in the productive context result in an amateurish tract to conducting business. Emphasizing the choice of obsolete technologies such that: extensively creating, adopting less complex processes in planning the activity, the choice of species and definition of target group, in livestock control, monitoring water quality, biometric control, weighing and measuring fish.

**5.2 Manufacturing Strategy Context**

The manufacturing strategy come from the competitive convenience of Amazon attributes. The search results conducted to evaluate competitive convenience of activity were analysed statistically to answers systematization. It was used a General Eastern rank of the responses of each group, as shown in Table 6 is. 7

*Table.6: Evaluation parameters.*

| Evaluation | Conditioning | |
|---|---|---|
| Below 3 | Activity Negatively affects. | 🟥 |
| Between 3 and 4 | Activity Indifferent. | 🟨 |
| Above 4 | Activity positively affects. | 🟩 |

**Source**: Authors.

*Table.7: Results achieved.*

| Strategic dimensions | | Variables | Fish farmers | stakeholders | General |
|---|---|---|---|---|---|
| | | | Average ranking | Average ranking | Average ranking |
| **1 External** | **1.1 Opportunities** | 1.1.1 New product lines. | 3.50 | 3.75 | 3.63 |
| | | 1.1.2 New Technologies. | 4.00 | 3.25 | 3.63 |
| | | 1.1.3 New processes. | 3.50 | 3.30 | 3.40 |
| | **1.2 Threats** | 1.2.1 Substitutive products. | 1.33 | 2.10 | 1.72 |
| | | 1.2.2 New client demands. | 1.33 | 1.80 | 1.57 |
| | | 1.2.3 Competitive pressures. | 1.00 | 2.75 | 1.88 |
| **2 Internal** | **2.1 Forces** | 2.1.1 Available natural resources. | 5.00 | 4.60 | 4.80 |
| | | 2.1.2 Advanced technologies. | 2.67 | 2.60 | 2.63 |
| | | 2.1.3 Efficient processes. | 4.00 | 3.40 | 3.70 |
| | **2.2 Weaknesses** | 2.2.1 Operational limitations. | 2.00 | 3.00 | 2.50 |
| | | 2.2.2 Obsolete technologies. | 2.17 | 3.25 | 2.71 |
| | | 2.2.3 Inefficient processes. | 2.17 | 3.00 | 2.58 |

**Source**: Authors.

The results provide analysis in the strategic dimensions that impact competitiveness in the study setting. In foreign strategic dimension, the variables related to the category Opportunities were not indicated as elements that affect organizational performance, which could pose limitations in the perception of respondents as the industry environment, if the category Threats had not been highlighted as significant, indicating that market variables have great influence on the industry.

The Internal strategic dimension, the Forces category highlights the variable Natural Resources as the most important factor that positively affects the results of the activity. The result of variable Advanced Technologies, indicates these resources has adversely affected the performance of the sector, conciliated with that shown in Weaknesses Category, the variable Technologies Obsolete as responsible for weaknesses in the competitive performance. Variables Limitations Operating and Inefficient Processes also considered critical, although these elements have been well evaluated only the perspective of fish farmers.

**5.3 Analysis about Required Innovation**
The required innovation as result of this study involves the breaking of tradition in the face of commercial impact of the new demand.SPSS software generated the Pearson´s correlation coefficient for variablesin the Table 7, indicated in the previous session, assessment was transformed into indicative of similarity and difference or approximate distance between the values vectors; these steps have allowed reveal the prevalence, with the highest strength of association, as shown in Tables 8 and 9 below.

*Table.8: Evaluation parameters.*

| Concept | Representation |
|---|---|
| Variables with a stronger association. | 🟥 |
| Variables with stronger association articulated in the strategic dimensions. | 🟨 |
| Variables with weaker association. | 🟩 |

**Source**: Authors.

*Table.9: Prevalence obtained by correlation of Pearson´s coefficient.*

| Variables | Similarity Correlation between variables and values | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1.1 | 1.1.2 | 1.1.3 | 2.1.1 | 2.1.2 | 2.1.3 | 3.1.1 | 3.1.2 | 3.1.3 | 4.1.1 | 4.1.2 | 4.1.3 |
| **1.1.1 New product lines.** | 1.00 | , 667 | , 667 | , 667 | 1.00 | , 667 | 1.00 | , 667 | 1.00 | , 667 | , 667 | 1.00 |
| **1.1.2 New Technologies.** | , 667 | 1.00 | 0.00 | , 667 | 0.00 | 0.00 | , 667 | 0.00 | 0.00 | , 667 | , 667 | , 667 |
| **1.1.3 New processes.** | , 667 | 0.00 | 1.00 | , 667 | 0.00 | 0.00 | , 667 | 0.00 | 0.00 | 0.00 | 0.00 | , 667 |
| **2.1.1 Substitutive products.** | , 667 | , 667 | , 667 | 1.00 | , 667 | , 667 | , 667 | , 667 | , 667 | , 667 | , 667 | , 667 |
| **2.1.2 New client demands.** | 1.00 | 0.00 | 0.00 | , 667 | 1.00 | , 667 | , 667 | 0.00 | 0.00 | 0.00 | , 667 | , 667 |
| **2.1.3 Competitive pressures.** | , 667 | 0.00 | 0.00 | , 667 | , 667 | 1.00 | , 667 | 0.00 | 0.00 | 0.00 | , 667 | 1.00 |
| **3.1.1 Available resources;** | 1.00 | , 667 | , 667 | , 667 | , 667 | , 667 | 1.00 | 0.00 | , 667 | , 667 | , 667 | , 667 |
| **3.1.2 Advanced technologies.** | , 667 | 0.00 | 0.00 | , 667 | 0.00 | 0.00 | 0.00 | 1.00 | , 667 | , 667 | 0.00 | , 667 |
| **3.1.3 Efficient processes.** | 1.00 | 0.00 | 0.00 | , 667 | 0.00 | 0.00 | , 667 | , 667 | 1.00 | , 667 | , 667 | , 667 |
| **4.1.1 Operational limitations.** | , 667 | , 667 | 0.00 | , 667 | 0.00 | 0.00 | , 667 | , 667 | , 667 | 1.00 | , 667 | 1.00 |
| **4.1.2 Obsolete technologies.** | , 667 | , 667 | 0.00 | , 667 | , 667 | , 667 | , 667 | 0.00 | , 667 | , 667 | 1.00 | 1.00 |
| **4.1.3 Inefficient processes.** | 1.00 | , 667 | , 667 | , 667 | , 667 | 1.00 | , 667 | , 667 | , 667 | 1.00 | 1.00 | 1.00 |

**Source**: Authors.

The prevalence represent the perspective between the structural and technological environment of the traditional scenario study, as recommended in Woodward, in the face of competitive strategy in the Amazon. The prevalence proven by variables correlation is the great point in the dimensions articulation, featuring the ideal arrangement for intervention effect, according to prevalence of drivers as shown in Table 10.

*Table.10: Prevalence data statistics as credible drivers' intervention.*

| Strategic dimensions | | Variables | Drivers of pro-innovation prevalence with sustainability |
|---|---|---|---|
| **1 External** | **1.1 Opportunities.** | 1.1.1 New product lines; | Filleting: the fish cut in differentiated form, as an alternative for a traditionally sold in whole pieces. |
| | **1.2 Threats.** | 1.2.1 New customer demands; | Consumer preferences: It may result in the decline of demand in the consumer demand for quality. |
| **2 Internal** | **2.1 Forces.** | 2.1.1 Available resources; | Availability of arrays of fishing specimens, and plenty of aquifers means: It is not necessary to import or adaptation of matrices associated with water abundance in the Amazon. |
| | | 2.2.1 Efficient processes; | Semi-intensive farming and operational arrangement cooperative system: Emphasis on productivity through intensive control of production and the sharing or collaboration between producers involved in cooperative system. |
| | **2.2 Weaknesses.** | 2.2.2 Inefficient processes; | Lack of planning and zootechnical control: Planning Lack of production and business profitability; the biometric measures lack and other controls linked to the production cycle compromise the success of the activity. |

**Source**: Authors.

Breaking the tradition in its negative sense, perpetuates unproductive or high impact practices, occurs in the interaction axis between the new product lines parameters, new customer demands, available resources, and the relationship between efficiency and inefficiency processes. Therefore, the new demand impact will occur in the prospect of offering new products aligned to customer interests without, however, disfigure knowledge and effective production practices.

The fish filleting is an opportunity to innovate the product offered, provided it includes the quality perception required by customers. This offer can extended through diversification of specimens of the Amazon habitat, making use of the competitive force provided by the available natural resources.

The diversification prospect in species surpasses the traditional monoculture, by implementation of semi-intensive farming system, promoting the production process based on a consortium with other fish species. At the time that meets the demand for quality required by the customer cancels the parameter inefficient processes.

Notwithstanding this, the qualitative and quantitative increase in production can also occur by sharing or collaboration between producers involved in cooperative system, although it is essential to implement the livestock planning and zootechnical control. This proposed joint can increase production and promote the sharing of good practice not to compromise the quality, favouring the emergence a stronger and more coordinated economy, disrupting production methods traditionally practiced.

## VI. CONCLUSION

This research studied innovation by Joan Woodward focused approach in the Amazon strategic competitive considering natural attributes as technological variables in the organizational environment in which they operate to fish farmers. Therefore, it has provided consulting experts to survey the structural and technological situation in the fish-farming scenario; focus group heard for strategic and competitive context of the research context; and statistical analysis led the prevalence treated secondarily with the SWOT tool.

Based on these results it can be said that sustainable innovation based on the proposed creators realigns production to market and innovation processes in fish farming valuing and incorporating the attributes of nature and favourable historical elements.

In order to respond to questions that guided this study, innovation in the competitive strategy context of the Amazon

fish characterized by disruption of tradition that perpetuates unproductive or high impact practices. The study scenario occurs in the interaction axis between the parameters of new product lines, new customer demands, available resources, and the relationship between efficiency and inefficiency process.

However, although the proposed creators have proven to be compatible with the factual context in the study setting, providing valid operating indicative producers, it is understood that overcoming amateurish treatment that accentuates the option of obsolete technologies in conducting business, demand also the internalization of these creators in state development agencies to fish farming. This study will serve for reflection among stakeholders in the development of public policy for the integrated development of the Amazon and fish farmers.

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