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CASE STUDY ABOUT PROJECTS, MEASURES AND ERGONOMICS OF WORK IN PROCESS OF FISH EXTRACTION IN DOWN MADEIRA RIVER, RONDÔNIA STATE, BRAZIL

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ABSTRACT:

This task focuses on projects, work measures and ergonomics, with a focus on the fish extraction in the vicinity of the Municipality of Porto Velho City, Capital of Rondônia State, Brazil. This task is supported by the Contingency Theory, according to Chiavenato (2003) that explains the relationship between environmental conditions and appropriate management techniques to the achievement of organizational goals. It refers to a qualitative research, of descriptive nature, prepared through the method of case study with compatible procedures. In loco visits were conducted, interviews, questionnaires applying, the confrontation between theory and practice developed by actors consulted was done. The result was the identification of historical and socioeconomic characteristics of those involved, the demonstration of the stages of system organization and implementation process; description of the process of fish extraction and procedures performed in the activity of artisanal fishing; the possible benefits were detached with the implementation of forthcoming projects, working measures and ergonomics of work in the Fishing Colony visited, pointing recommendations. This study will serve as a college contribution to the interested in the construction of public policies for integrated local development.

KEYWORDS:

Administration. Ergonomics. Processes. Production. Project.

1. INTRODUCTION:

This work focuses on the fish extraction procedures, performed by small extractive workers who work in the capture process, storage and further distribution of the extracted product. Methodological elements were used, aiming to investigate and collect data about the operation process and the activities in the work of fishing. The problem that it seeks to answer through this research is: What is the influence of the projects, measures and ergonomics of work in the performance of fishing process?

This study aims to describe the study of the influence of the projects, measures and ergonomics of work in fishing processes. To attend this general goal, specific objectives were taken as: (1) describe projects, measures and ergonomics in the process of fish extraction, (2) analyze the projects, measures and ergonomics in the process of fish extraction in comparison with the theoretical and conceptual basis collected, and (3) propose measures of adequacy and improvements to the process.

2 THEORETICAL AND CONCEPTUAL REVIEW

The concepts and theoretical assumptions that involve the study of projects, measures and ergonomics of work will be discussed, using as a base to perform this activity, the Chiavenato (2003)

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Contingency Theory that explains the existence of a functional relationship between environmental technical conditions and administrative measures to achieve the objectives of the organization through the causal relationship, where organizations need to be systematically adjusted to environmental conditions. So, the study turns itself to the behavior analysis, influences and contributions of the individual's operation environment in face of the procedures performed in professional activity.

2.1 Description About Projects, Measurement And Ergonomics In The Process Of Fish Extraction

Here are presented the theoretical and conceptual approach on the projects, measures and ergonomics of work in fish extraction in order to identify the scientific insights on the topic that support the analysis, research, and development of this study.

2.1.1 Projects And Working Measures

According to Moreira (2006), the working project concerns the specification of content and methods associated with each job, which has as main objective the creation of an efficient and productive environment, where each individual knows what to do and how to do. This makes it possible to realize the great necessity for a good planning to perform the task. Henry Ford cited Corrêa (2005) complements this concept by stating that any job could be composed of three factors: 1) planning, (2) control and (3) execution. With those things, the author clarifies the necessity for interconnection of several factors necessary for the good progress of the projects.

2.1.2 Ergonomics of Work

According to Wisner (1987), ergonomics is the group of scientific knowledge concerning to man, necessary for the design of tools, machines and devices that can be used with the maximum comfort, safety and efficacy. For Ergonomics Research Society - the first national association of ergonomics founded in 1949 by Murrell - Ergonomics is the study of the relationship between man and his work, equipment and environment, and particularly the application of knowledge of anatomy, physiology and psychology in solving problems that emerged of this relationship. For the purposes of this study, it is important to define the physical ergonomics as those related to the characteristics of human anatomy, which deals with the human body's responses to physical and psychological burden. Including material handling, physical arrangement of workstations, work demands, and factors such as repetition, vibration, strength and static posture, related to musculoskeletal injuries and other projects of workstations, health and safety in the area of individual's professional performance.

2.1.3 Description On The Process Of Fish Extraction

Primitive people used fishing as a source exclusively for own consumption, which were used several tools to make catching fish. Throughout history, fishing, which has always been part of human cultures, has become a way of life, providing identity to numerous communities as artistic object.

Fishing is the extraction of aquatic organisms from the environment in which it is developed, used for several purposes, such as alimentation, recreation, ornamentation or marketing. According to Brazilian Law 11,959 of June 29, 2009, fishing is the every fishing operation, action or act of extracting, harvesting, catch, seize or capture fisheries, embedded or not, where our main actor is the fisherman. Within this context, the commercial fishing is classified into two types, namely: (1) the artisanal and (2) the industrial. The non-commercial fishing is classified as: (1) scientific, (2) amateur (3) and subsistence. For the purposes of this study, the research focus is scientific investigation on artisanal fishing which according to the Ministry of Fisheries and Aquaculture (MPA), is that the professional, properly licensed, practice the fishing for commercial purposes, autonomously or in a household system, with his own means of production or through contract partnerships, with or without small vessels.

The Ministry of Fisheries and Aquaculture (MPA) of Brazil Government is responsible for the rules and ordinances for regulation of this activity on the national scenery. Together with IBAMA and state agencies, they perform the policing and prevention work in the preservation process, supervision and regulation by means of ordinances, obeying the specific necessity of each State. On June 29, 2009 it was created the law n ° 11,959 which regulates the National Policy for the Sustainable Development of Aquaculture and Fishery, which regulates all fishing activities repealing the law n ° 7679 of 23 November 1988 and devices of the decree-law n ° 221 of 28 February 1967, aiming at a sustainable development of fishing as a source of alimentation, employment and income, seeking the sustainable use of our fishing resources.

2.2 Analysis Of Projects, Measures And Ergonomics In The Process Of Fish Extraction In Comparison With The Theoretical And Conceptual Basis

The process analysis operate as a strategic tool for decision making, since, from the observation of the current context of the organization in comparison with the recommendations proposed by the theoretical bases that compose an analysis, it is possible to identify failures, malfunctions and improvement initiatives of the organization. According to Campos (1996) analyze the process is to find the most important causes that cause the problem through the analysis of the important features. Liker and Meier (2007) when discussing about solving problems, claim that every problem is an opportunity for improvement. So, the analysis uses the information collected about a process to confront with a state of better performance and starting from the reflection of this confrontation, suggest proposals for improvement and adjustment of the process in a preventive or mitigatory way.

2.3 Measures Of Adequacy And Improvements Of The Projects

At the very beginning of the process of identifying failures and observation inconsistencies, it is necessary to plan the improvements and the necessary adequacy measures. The improvement project or adequacy of a technique is a element of the adaptation of the organization to the context in which it operates. Chiavenato (2003) when dealing on the contingential approach to the adaptability of the organizations to processes, cites the school of design as the most influential approach on the process of formation of organizational strategy, since the antecedents of adequacy defended by the school of strategic design tries to reconcile internal aspects of the organization and external aspects of the environment. In this context it is important to analyze the projects, measures and ergonomics of the work, in order to analyze the usual practices for this activity, which seeks for efficiency and better performance for the activities performed in the process of fish extraction.

3 METHODOLOGY

According to Oliveira (1999), method is a group of processes by which it becomes possible to know certain reality, produce a particular object or develop certain procedures or behaviors. So this is the necessary path taken to reach the goal of the activity, using theoretical and conceptual bases where the necessary recommendations to the development of the study is displayed, reproducing like this, the paths of study synthetically. The research of this study is a result of a useful collect of information for the analysis of the process in question by researching among all the actors and institutions involved in the task. In this study it was applied the method of case study, seeking data from individuals who work in fishery, in order to perform the comparison between the causal relationship and the scene found in loco. The study provides comparisons between theories and practices, aiming at a better comparison between the activities developed by the actors researched and the scientific antecedents collected, performing, after the analysis of the process, suggestions and the adaptations of necessary improvements to adjust the differences existing in the process.

3.1 Focus Groups

The focus group investigated in this research is formed by cooperative workers of a fishermen colony engaged in fishing activities in the city of Porto Velho and vicinities, small districts and other municipalities in the Rondônia State. The research was done with 15 cooperative members of this syndicalist institution that represents the group of fishermen operating in the localities mentioned. There was a questionnaire applying and an interview with the focus group in order to collect formal and informal data that was the object of analysis in this study. Besides the *in loco* research and coordination of the Group of focus, it was performed the investigation by interview applying and field research in the colony that acts as a representative body of the fishermen in this region. After the study of the scenery of operation of the individuals involved in the activity of fish extraction, data were collected with social scientists, experts in fishery activity, where an interview was performed with a professional in the area, a PHD on Biological Sciences and a public representative of the institution Santo Antônio Energia Corporation, organization responsible for the construction of the Santo Antonio Hydroelectric Plant, on the Madeira River in Porto Velho City, Rondônia State Capital, in order to get knowledge about projects to reduce the environmental impacts that reflected in the environment of fishing with the construction of this dam.

4 CASE STUDY ON PROJECTS, MEASURES AND ERGONOMICS OF WORK IN PROCESS OF FISH EXTRACTION

The case study was conducted in a colony of Aquaculture and Fishery, founded in 1954 in the city of Porto Velho. The organization studied is a Fishermen's Colony, with the function of seek benefits before government agencies through the syndical activity. It is located in the city of Porto Velho, in the Region of

Lower Madeira. It also involves the fishermen of the Municipality of Machadinho do Oeste, and the districts of Calama and Extrema. Currently, there are about three thousand fishermen associated with this colony.

The activities performed by this entity are defrayed by the collaboration of associates who pay an amount equal to 3% of the total production. In this society, the individual identifies himself through a document of identification and it gives him the right to request a fishing terminal for the marketing of his fish. To obtain this document, those interested shall submit themselves to a process that begins through the filling of a specific questionnaire related to the fishing activity, with the purpose of reveal their knowledge in order to measure their suitability to act as a fisherman associated to the colony. Below, in Chart 1, has the detailed reports on the profile of associated Fishermen Colony.

Chart 1: Profile of fishermen consulted.

Characteristic	Socioeconomic Profile	
Gender	Male 85%	15% Female
Age	40% - 25 to 45	60% - 46 to 65
Scholarity	40% Literate	60% Primary school
Place of birth	100% Northern Region	
Occupation	100% autonomous professionals involved in the fishery activity	
Income	100% (one) to (two) times the minimum wage	

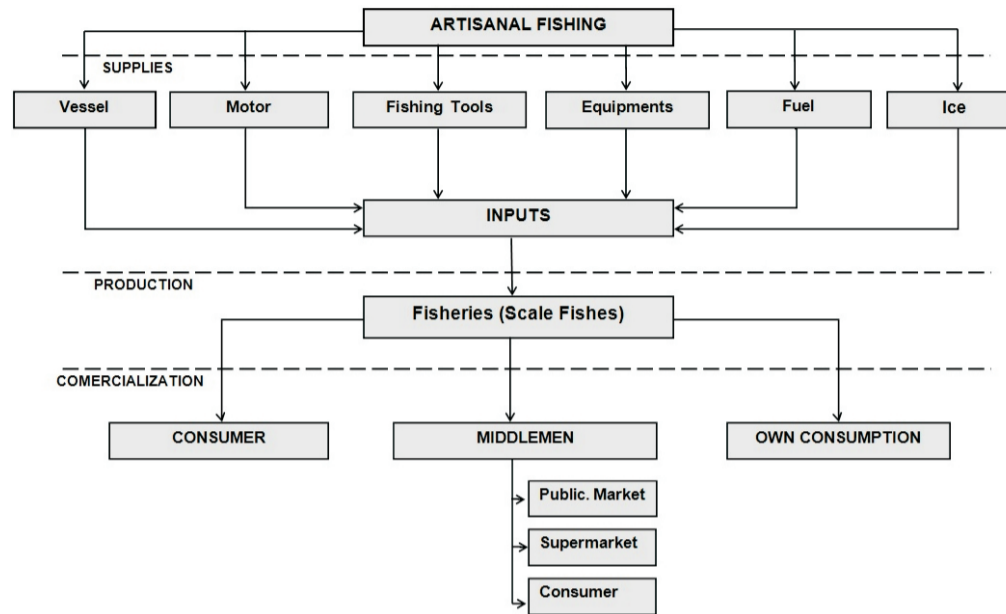
Source: Research data.

According to the information collected in this research, most of the actors involved in this study, the knowledge on fishery activities is transmitted from father to son or by older and more experienced people in their communities, so, many of these individuals holds no information about the techniques or the specific scientific knowledge and ergonomic measures necessary for the proper performance of the activity. It was perceived a familiarity with the environmental context, since the fishermen are familiar with the environment they work, as rivers, ponds, lakes and types of fish that exist in these natural environments.

4.1 Description On Projects, Measurement And Ergonomics In The Process Of Extraction Of Fish.

The fishing process described by the actors investigated is organized in a simplified manner without the use of appropriate scientific knowledge to the security measures and ergonomics necessary to perform the work efficiently. The individuals studied perform the fishing process according to the shown in Figure 1.

Figure 1: Diagram of artisanal fishing activity.



Source: Research data.

As shown in Figure 1, the process is initiated by the combination of inputs, such as boats, mostly canoes with outboard motors. Equipment is still necessary such as fishing nets, fishing lines, hooks, floats and safety equipment, such as life vests and enough fuel supply to the vessels during the fishing process. Other required inputs for the formation of the useful elements for the development of fishing activity are the coolers and the locations for the storage and conservation of fish. In the context of the research development, the modalities of fishing performed by the active individuals in the process of fish extraction were identified, as shown in Chart 2.

After the stage of fish capture, the active actors in the process conserve the fish by the storage of the products in coolers with a capacity of approximately 100 liters. Once the fishermen finish the process of fishing, those involved return to the fishing terminals where the fish has three routes of outflow, as shown in Chart 3.

Chart 2: Modalities of fishing practiced.

Modalities of fishing	Process description	Main materials used
1 Waiting fishing	1.1 Fishing in which the fisherman extends the fishing net along the margin of the river or stream. The fishing net for this type of fishing is made with a firm line and weights to immerse the fishing net, such as buoys for marking and identification	1.1.1 Fishing net 1.1.2 Canoe
2 Groseira fishing	2.1 In this process, the fishing line is thrown as far as possible from the margin of the river, aiming to capture large fishes, such as pirarara, jau and others small fishes without scales.	2.1.1 Fiber line 2.1.2 Weights made in lead and hooks.
3 Fishing with fishnet	3.1 The fisherman goes up the river and then he throws the fishnet in a local of running water. In this type of fishing the tip of the fishnet has a large buoy to avoid the sinking of the fishnet into the water. It is necessary to maintain a distance of approximately fifty meters from the buoy to the boat. After that, the fishnet is pulled into the boat and the fishes are caught.	3.1.1 Own fishnet 3.1.2 canoe and outboard motor

Source: Research data

Chart 3: Destination of fish.

Destination	Description
1 Middleman	The Fishermen move to the fishing terminal, where the colony of fishermen performs the weighing of the fish for their internal control. The fishermen generally do not have definite people to buy, so they hope for the resellers to acquire their products to distribute to local shops.
2 Consumer	These are people who buy the product at the floating or at the fishing terminal for a lower value practiced in local market. The purpose of the purchase is usually intended for personal consumption and family.
3 Own Consumption	Fishermen remove certain amount of the production to their own consumption and family.

Source: Research data.

4.2 Projects Analysis, Measures And Ergonomics In The Process Of Extraction Of Fish In Comparison With The Theoretical And Conceptual Bases.

With the development of the study and the application of theoretical concepts collected initially on conceptual review of this research, it was possible to investigate in loco the practices exercised by the actors involved in the process of extraction of fish in the colony. After the scientific survey, the data obtained with the methodological procedures were analyzed and discussed in order to gather the information obtained from the questionnaires, interviews, field observation and the meeting of the group of focus in relation to the accomplishment of the objectives proposed in this activity.

During the research it was observed that the fishermen are familiar with their work environment, but these individuals hold no effective techniques to get a better efficiency on measures of preventing accidents at work, in view of the better performance of the activity and the improvement of the quality of life. As investigated in loco, the colony of fishermen, which is responsible for representing the class, does not dispose of policies to attend the standards, the quality procedures and safety regulations. So, the fishermen only use the knowledge obtained from the experience in the profession as a guide to perform their activity. In the research conducted in the colony of fishermen, the data collected shows that most actors involved in fishing processes reports health problems caused by issues ergonomics of the work, with emphasis on musculoskeletal disorders such as spine problems.

With the analysis finished, proposals have been suggested for the improvement and process of adequation, the theoretical confrontation allowed to interfere on issues presented in the conceptual studies compared to the identified practices the research scenery. Thus, this adequation proposals are proposed aiming to develop the performed processes with the efficiently utilization and the better performance of activities, watching over these suggestions, the impacts of the projects, measures and ergonomics have in daily work and family of the individual, and from this inference, propose better practices for the prevention or correction of the current processes.

3 Measures Of Adequation And Improvement Of Projects

After the completed analyzes, the measures of adequacy and enhancements to the process, are exposed, as illustrated in Chart 4.

Chart 4: Proposals for improvements and adjustments to the process.

Failures and opportunities for improvement	Adequacy proposals
1 Lack of training.	1.1 Further training in the process of catching fish, aiming instruction on personal protection equipment.
2 Lack of information and guidance.	2.1 Promote lectures on the season of fish reproduction, on fishing laws and on materials that can be used to capture the fish; 2.2 Clarify about the process of capture of fish during this period, explaining to the fishermen the places where the activity of fishing is not allowed.
3 Application of improvement courses in the process of storage of fish.	3.1 Capacitate the fishermen for storage of fish in appropriate locations.
4 Activation of the ice factory and processing machine of fish.	4.1 Perform partnerships with government agencies and enterprises, for the activation of the ice factory and the machinery for the product processing.
5 Lack of partnerships with business and government institutions.	5.1 Develop projects under the guidance of the colony to the fishing area, considering that with the construction of the hydroelectric plants, the fishermen reported a fish decrease. 5.2 Promote partnerships with public and private agencies with the aim of gaining resources for projects development.

Source: Research data.

5 FINAL CONSIDERATIONS

This paper presents the steps of the process of extraction of fish offered by our actors, ranging the processes of capture, appropriate measures of work and the improvements necessary for the effectiveness of this process. In the context discussed, the case study reports the theoretical confrontations discussed by authors and the reality faced by our fishermen identifying the failures and performing the necessary improvements for the proper performance of this activity. Therefore, the influence of the projects, measures and ergonomics of the work, act as normalizing elements and suitability for processes performed in the research institution. These elements enable the identification of failures, improvements proposals, as well as preventive measures in the process in order to develop the activity of the working individuals in the context of fishing. These factors also have a direct influence on fish quality and on the life of the individual who performs the process.

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