Tools of Quality Management in the Land Regularization Process of a Federal Public Organ in the State of Amazonas

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SUMMARY

Although we commonly associate quality with manufacturing management processes, this article seeks to
understand and show the applicability of some quality tools in the stages of land regularization in a public agency in the State of Amazonas, but which can also be applied to the other states of our Federation. The improvement in the services provided in the body where the study was carried out was necessary since the process of land regularization is usually considered by many applicants as bureaucratic and rather time-consuming, since there are reports of citizens living all their lives in Union, and for decades tried to regularize this land, but unfortunately, due to the delay of the process, either by the change of a law, by the change in the internal processes, by the lack of some documentation or even by problems of litigation in that land, after all these years of work, died and did not achieve the objective end of the process that would be the titling of your property. For this reason, it was necessary to apply some quality management tools, such as the Ishikawa Diagram (Cause and Effect), which helps managers and servers to diagnose and solve the main problems that afflict the processes of this activity and also the Method 5W2H which is a very useful tool in the creation of action plans, enabling the prevention of new errors and ensuring the implementation of actions seeking a solution to problems in the system with responsibility and deadlines, thus ensuring continuous improvement in the Institution.

**Key words:** Quality Management, Quality Tools, Land Settlement, Processes, Federal Public Organ.

1. Introduction

Land regularization is the process of public intervention that aims at permanence of the dwelling populations of urban areas occupied in disagreement with the law for housing purposes, implying an improvement in the urban environment of the settlement, in the recovery of citizenship and the quality of life of the population beneficiary country. This process is a priority since it guarantees the socio-spatial inclusion of large numbers of residents throughout the country (ALFONSIN, 1997).

In Juran's (1990) view, since the dawn of mankind, there is the human need for quality, quality that has its concept evolving over time, going through compliance with specifications, vision of satisfaction and later to a more global concept as strategic tool in the sustainability of organizations. In this line of reasoning, Deming (1990) states that the quality sought in organizations is the pursuit of customer needs and the homogeneity of process results.

Despite the variations of concepts for each author, what does not change is the real need that the organizations have to solve problems to reach the total quality, being, the lack of method, the main cause of the low level of success in the fight against the problems within organizations (ARIOLI, 1998).

With this in mind, in order to optimize this hitherto problematic process, a study will be made on the possibility of using tools and quality management in the processes of one of the bodies responsible for this land regularization in Amazonas.
In this way, the following question can be asked: How can the land regularization process satisfy the needs of the citizens from the use of quality tools?

Therefore, this work has as main objective to describe how the quality tools can be used to assist in the process of land regularization in a public agency in the State of Amazonas.

Specific objectives are:

- Conduct a theoretical survey of quality tools to support the project;
- To describe the case study of the proposed improvement in land regularization processes using the quality tools such as the Ishikawa Diagram, Flow Chart and the 5W2H, as well as the results obtained;
- Propose the use of quality tools and explain how they could improve the regularization process and propose new studies.

The methodology for the production of this project will be through bibliographical research on the land regularization process and on the quality tools that can be used in the regularization process in previously produced books, articles, monographs and case studies.

Practical cases were also used in the process of land regularization in a body with this function in the State of Amazonas, where data were collected for analysis, as well as results of which contextualization was made between theory and practice.

At the end, it was carried out the analysis of the necessary stages for the regularization using the tools of the quality studied and adapted to the objective that was the improvement of this process. Data collection was performed based on the individual and unsystematic observation of the stages inherent to the organ process.

2.1 Land tenure regulation

The concept of land regularization as described by Article 46 of Law 11,977 / 2009, establishes that land regularization consists of legal, urban, environmental and social measures aimed at regularizing irregular settlements and the titling of their occupants, so to guarantee the social right to housing, the full development of the social functions of urban property and the right to an ecologically balanced environment.

According to Alfonsin (1997), land regularization is the process of public intervention, under the juridical, physical and social aspects, aiming at the permanence of dwelling populations in urban areas that are not in compliance with the law for housing purposes. urban environment of the settlement, the
recovery of citizenship and the quality of life of the beneficiary population.

According to the Jones dos Santos Neves Institute (IJSN, 2010), the growing process of urbanization coupled with the disorderly development of cities constitutes a current scenario of irregularities in the constitution of urban space and its social and environmental aspects.

In this sense, land regularization of urban settlements proves to be one of the priority programs of urban policy necessary for the socio-spatial inclusion of large numbers of residents throughout the country.

Put another way, as presented in the land regularization book, Prestes (2011), to act in land regularization is not a possibility for municipal governments, but a necessity, a power-duty arising from the legal order that places this issue among public policies of municipal competence.

Prestes (2011) states in this book that one must recover historical time in which urban irregularity was not seen, one can not "pretend" that it is not an environmental problem or a deficiency of police power. Working with regularization requires knowledge of the reality, the work of the communities involved, and especially the interdisciplinary and interorganic engagement, so that these problems are seen from another spectrum, a look that makes all sectors of Public Administration responsible and makes possible the creation of strategies and solutions based on concrete cases, such as the improvement of the urban-environmental conditions worked and the dignity of the human person, resulting in social inclusion. Summarizing, the land regularization has this commitment, which is to recover a historical time, acting in the same direction.

According to Prestes (2011), this means transforming the ownership of a given area into property with address, identity, access to infrastructure service, collective equipment, social participation in environmental management and education processes, , benefiting the inhabitants with the legitimation of their possession, granting them new rights, such as security to the possession of the area they have occupied for many years and access to credit for housing improvement, guaranteeing the constitutional right to decent housing and to Citizenship.

2.2 Process

For Campos (1992) process is a set of causes th[máquinas, materias-primas, pessoas]at causes one or more effects[produtos, serviços]. For Cruz (2002), a process is the way in which a set of activities creates, works or transforms inputs, adding value to them, in order to produce goods or services with quality, to be delivered to customers (outputs) , whether internal or external.
Alves (2002) establishes that a process should be:

- Directed, by reason of a goal, that is, it is necessary to establish the goals and quality standards that the company tries to achieve;
- Systematic, in which the tasks that form a process are interrelated and interdependent;
- Capable, in order to meet the goals under conditions of normal operations; and
- Legitimate because it must be approved by the team that received the responsibility.

Within the process concepts, the definition of business process is defined, which according to Harrington (1993), is a group of logically linked tasks that make use of the resources of the organization to generate defined results, according to the objectives of the organization.

### 2.3 Quality Management

According to Coltro (1996), Total Quality Management is a long-term system, which mainly aims at full customer satisfaction through a process of continuous improvement of the products and services offered by the company. With quality as the main focus, the company needs to involve all its members, including managers, supervisors and other workers, in the constant search for improvements.

According to Ishikawa (1993), quality management can be approached in two ways. The first is the small quality, since it is limited to the characteristics of products and services that are considered important only to users and buyers. The second, the great quality, involves the satisfaction of several people involved in the life of an organization. However, the small quality, over time, tends to become a consequence of great quality. Based on this, it is noticed that the great quality is quite comprehensive with respect to the organization, often requiring a change of the traditional philosophy that is practiced in
the company, focusing on the quality and vision of the customer and not only on costs and productivity.

Coltro (1996) proposed five basic assumptions for this approach:

1) Quality is defined by the customer;

2) Quality is related to both market and cost profitability;

3) Quality is seen as a competitive differential;

4) Quality is built from strategic planning;

5) Quality requires the commitment of all members of the organization.

According to Cerqueira Neto (1991), large companies are committed to the implementation of full quality programs, whose results not only guarantee full customer satisfaction but also reduce operating costs, minimizing losses, considerably reducing service costs and optimize the use of existing resources.

Thus, through the management of all organizational resources, the relationship between the people involved in the company and the grouping of ideas and techniques aimed at increasing competitiveness (especially with regard to continuous improvements of products and processes), management quality in the organization.

2.4 Quality Tools

A quality product or service is one that perfectly meets, reliably, acceptably, securely and in a timely manner to the needs of the customer. Therefore, in other terms it can be said: perfect design, without defects, low cost, customer safety, timely delivery in the right place and the right quantity. The true criterion of good quality is consumer preference (CAMPOS, 1992).

For Peinado (2007) to manage the quality of both physical products and services, it has long ceased to be a differentiating factor and has become an indispensable requirement to participate and survive in the market.

Modern techniques in the area of quality were introduced by several experts who, in a revolutionary and visionary way, challenged the common place, creating a new order in the management of the quality in the organizations. These specialists, by distinction, became known as the gurus.
Still, according to Peinado (2007), among the most famous, frequently cited in the literature are:

- Shewhart (who developed the Statistical Process Control - CEP - and the PDCA Cycle);
- Deming (who created a famous 14-point list for quality improvement in an organization and introduced the PDCA Cycle in Japan);
- Juran (who focused on the cost aspect of non-quality, the costs of not getting it right the first time, and its impact on the price of the final product, as well as discovering the need for quality planning through a process that became known as the quality trilogy consisting of planning, control and quality improvement);
- Feigenbaum (who established the concept of total quality control where he preached that quality is the responsibility of every individual within the company);
- Ishikawa (who became known for developing the Cause and Effect Diagram, also known as Fishbone Diagram or simply Ishikawa Diagram and was also the mentor of QC Circles); and
- Taguchi (who focused on the fact that quality must be born along with the product design) and Crosby (who developed the concept of zero defect during the 1960s).

There are several tools that collaborate in the identification and understanding of problems related to quality. Some authors usually differentiate them as strategic and statistical, where the strategies would be those tools used for generating ideas, establishing priorities and investigating the cause of the problem. In the second group, of the statistics, would be those tools used to measure performance, seeking to evidence basic information for decision making in relation to improvement (VERGUEIRO, 2002).

2.4.1 Brainstorming

According to Simcsik (2001), Brainstorming is a managerial tool that highlights the creativity of people and teams through the generation of innumerable ideas about a proposed theme.

Araújo (2001) emphasizes that this tool is able to quickly generate, clarify and evaluate several ideas, problems and points of discussion. Captures the creative thinking of a team, the author emphasizes still that the important thing is the quantity of ideas presented and not the quality of the same ones.

For the consistent use of the tool Werkema (1995) recommends that the following steps be followed for the conduction of a Brainstorming:

- A leader should be chosen to direct the group's activities;
- During meetings, the leader should encourage the participation of group members and the process of generating new ideas;
- All members of the group should give their opinion on the possible causes for the problem analyzed;
- Meeting participants should present their ideas naturally as they come up, which makes the environment more informal;
- The leader should encourage the participation of the most intimate people (asking what their
opinion on the issue);

- No idea should be criticized;
- Criticism may inhibit the participation of some members of the group;
- After the construction of the Cause and Effect Diagram, a review should be carried out to eliminate the causes considered to be unviable;
- Ideas should be written on a blackboard;
- The presentation of the ideas facilitates the process of enriching the initial opinion of a participant, through the suggestions of other people present at the meeting;
- The tendency to blame people should be avoided;
- This is a destructive trend that diverts attention from the purpose of the meeting, which is to discover the specific causes of the problem.

### 2.4.2 PDCA Cycle

For Werkema (1995), the PDCA cycle (*Plan, Do, Check and Action*) is a management and control method that represents the direction to be followed so that the established goals can be achieved, becoming an efficient tool for the implementation of improvements in the process.

It is a strategic tool that standardizes the important information to the quality control, since it reduces the errors of analysis and facilitates the understanding of the information. It can be used for management forms based on maintenance, improvement and quality planning and innovation.

According to Ishikawa (1993) and Campos (2004), the PDCA cycle is composed of the following steps, as illustrated in the figure below and explained below:

![PDCA Cycle Diagram](image-url)

**Figure 2 - PDCA**

- Planning (P): This step consists of establishing goals and establishing the method to achieve the proposed goals;
- Execution (D): Perform the tasks exactly as planned in the planning step and collect data that will be used in the next process verification step. In the execution stage, education and training at work are essential;
- Verification (C): From the data collected in the execution compare the result achieved with the planned goal;
- Corrective Action (A): A step that consists of acting on the process in function of the results obtained, adopting as default the proposed plan, if the goal has been reached or acting on the causes of not meeting the goal, if the plan has not been effective.

According to Campos (2004), to understand the role of quality tools within the PDCA cycle, we must once again point out that the goal is achieved through the PDCA method. The more information (facts, data, knowledge) is added to the method, the greater the chances of reaching the goal, and the greater the need to use appropriate tools to collect, process, and dispose of this information during the PDCA turnaround.

It is important to highlight that the increase in the sophistication of the tools used should occur due to the increase in the capacity to reach the goals.

Going through all the stages of the PDCA cycle, through the tools, as Tubino (2009) states, the organization's productive system moves to a higher level of quality, in which the emergence of new problems will be seen as opportunities for improvement.

2.4.3 Flowchart

The flow chart represents, with rationality, logic, clarity and synthesis routines or procedures in which documents, information received, processed and issued are involved, as well as their respective responsible and / or organizational units (OLIVEIRA, 2001).

According to Cury (2005), there are several types of graphs, but the processing chart, par excellence, for administrative analysis works, is the flowchart, a universal graph representing the flow or normal sequence of any work, product or document.

Still, Cury (2005) says that the symbologies of the flows show the origin, how the information is processed and destined, and the flowcharts have the following advantages:

- Allowing to verify how all the components of a system, mechanized or not, actually work,
facilitating the analysis of its effectiveness;
- A simpler and more objective understanding than other descriptive methods;
- Facilitate the localization of deficiencies by easy visualization of steps, transport, operations, forms, etc.;
- The rapid understanding of any proposed change in existing systems, by clearly showing the modifications introduced.

According to Peinado (2007), a flowchart is drawn using several standardized symbols, as shown in Table 1 and they are important so that all the progress of the process is detailed and that all its steps and actions are identified in a more precise way.

![Flowchart symbols](image)

Table 1 - Symbology used in flowcharts. Source: Peinado, 2007.

### 2.4.4 Ishikawa Diagram (Cause and Effect)

The Cause and Effect Diagram, also called the Fishbone Diagram or Ishikawa Diagram, is a diagram that aims to establish the relationship between the effect and all causes of a process. Each effect has several categories of causes, which, in turn, can be compounded by other causes (RODRIGUES, 2006).

According to Werkema (1995), the construction of a Cause and Effect Diagram must be carried out by a
group of people involved with the considered process. The participation of as many people as possible involved in the process is very important so that a complete diagram can be constructed that does not omit relevant causes.

In order to investigate causes it is advisable to hold a meeting conducted by a technique known as "Brainstorming" which aims to help a group of people to produce as much ideas as possible in a short period of time.

In general, according to Peinado (2007) in manufacturing organizations, the causes of problems are usually directly linked to six areas, known as the 6M: Labor, Materials, Machinery, Measures, Environment and Methods.

For service organizations, these areas are not applied, being replaced by others, such as: politics, legislation, place, personnel, procedures, etc. In the case of some analyzes, some of the "M's" may also be omitted.

Figure 3 shows an example of a cause and effect diagram for an industrial problem of over varying the thickness of the powder coating layer of a metal surface.

Figure 3 - Cause and Effect Diagram Model of an Industry. Source: Peinado, 2007.

According to Werkema (1995), the steps for constructing the Diagram are as follows:

- Define the characteristic of the quality or problem to be analyzed;
• Relate within the rectangles, the primary causes that affect the quality characteristic or the defined problem;
• Relate secondary causes that affect primary causes;
• To relate the tertiary causes that affect the secondary causes; and
• Identify in the diagram the causes that seem to have a more significant effect on the quality or problem characteristic.

2.4.5 5 Why

According to Lucinda (2010), the method of the five whys was created by Professor Taiichi Ohno and consists of discovering, through questions, the root causes of a certain problem in question.

When analyzing a problem, it is important to take it to the highest level possible to discover the primary cause.

The 5-why technique causes us to analyze each cause on several levels, always questioning "why" until we get to the root of the problem, which does not mean that we should use the 5 why. However, care must be taken to carry out the tasks as long as the causes converge in simpler solutions that do not involve large costs and that are within the competence of the group involved in solving the problem (SILVA, 2009).

Belohlavek (2006) explains that the "5 reasons" are supported by different levels of reasoning, according to the level of the problem and defines each of the whys as:

• Why "how it works" something - the first "why" is intended to describe its operation, allowing to solve problems from the operational point of view;
• Why the "intrinsic logic" of something - this "why" refers, from a more logical point of view, where the parts of this something allows solving problems without there being the functional mismatch between these parts;
• Why the "causal analysis" of something - the third "why" explains the problem as a system, which allows us to analyze beyond the boundaries of the problem and to analyze the limits of the problem;
• Why the "conceptual analysis" of something - The fourth "why" analyzes the problem from its nature, its essences and the context in which it is inserted;
• Why the "natural laws" of something - The last "why" explains reality on the basis of natural laws, so you can find solutions to problems at the universal level, whose consequences are also universal.

2.4.6 5W2H

According to Vergara (2006), the 5W2H action plan is mainly used in the mapping and standardization of
processes, in the elaboration of action plans and in the establishment of associated procedures and indicators. It is basically managerial and seeks the easy understanding through definition of responsibility, methods, deadlines, objectives and associated resources.

This Method consists of asking seven questions about an action to be taken in order to obtain the information that will generally support planning. The name of the Method, 5W2H, is due to the English language What, Who, Why, Where, When, How, How Much (DAYCHOUW, 2007).

According to Peinado (2007), the method consists of elaborating a form for each action proposal, containing the answers to the following seven questions, as described in table 2:

Table 2 - Form 5W2H Method

<table>
<thead>
<tr>
<th>WHAT (O que?)</th>
<th>WHERE (Onde?)</th>
<th>WHY (Por quê?)</th>
<th>WHO (Quem?)</th>
<th>WHEN (Quando?)</th>
<th>HOW (Como?)</th>
<th>HOW MUCH (Quanto?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
<td>- O que será feito?</td>
</tr>
<tr>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
<td>- Quais são as contramedidas para eliminar</td>
</tr>
</tbody>
</table>

Source: Peinado, 2007 - with adaptations

According to Daychouw (2007), 5W2H can be used in several areas of knowledge, helping in planning, for example:

- Quality Planning - Identify which quality standards are relevant to the project and thus determine how to meet those standards;
- Procurement Planning - Identify which project needs can be met by contracting outsourced products or services, i.e., outsourcing;
- Human Resource Planning - Identify which project needs can be met through the Human Resources available in the organization;
- Risk Planning - Identify which risks to consider, the project.

2.4.7 Pareto diagram

The Pareto Diagram is a graph formed by vertical bars, where the information is evident and visualized in
a clear way. The information demonstrated through the Pareto Diagram allows to determine and establish numerical targets that can be reached (WERKEMA, 1995).

Corroborating Paladini (1994), Pareto's economic model was translated into Juran's Quality area, in the form that some elements are vital and many, only trivial. Taking into account two types of causes, we must:

- Few Vital: small number of problems with great impact, causing great losses;
- Many Triviais: represent a high number of causes with little significant losses. In this way, it is possible to attack the problems, efficiently, prioritizing the causes that are responsible for most of the losses.

According to Campos (1992), the prioritized causes can be redeployed by the same methodology as the need for a more accurate analysis. This process can be repeated countless times. So a major problem of beginning can be separated into smaller problems and more focused.

The steps for constructing a Pareto chart include the following steps (CARPINETTI, 2010):

1. Select the types of problems or causes to be compared, frequency of occurrence of different types of defects resulting from a process, or causes for a problem to occur. This selection is made through data collected or through group discussion (Brainstorming);
2. Select the unit of comparison, for example, number of occurrences, cost;
3. Define the time period over which the data will be collected, seven hours, three days or two weeks;
4. Collect data on site;
5. List in descending order the categories from left to right on the horizontal axis in the frequency order of occurrence, cost;
6. At the top of each category, draw a rectangle whose height represents the frequency or cost for that category;
7. From the top of the top triangle, a line must be added to represent the cumulative frequency of the categories.

3. CHARACTERIZATION OF THE RESEARCH INSTITUTION

The institution studied in the project is a federal autarky whose mission is to implement the agrarian reform policy and carry out the national land tenure and whose vision is to be an international reference for solutions of social inclusion. Among the strategic guidelines of this municipality for this implementation are:

- Promoting the democratization of access to land through the creation and implementation of sustainable rural settlements, land regularization of land and management of the country’s land structure, contributing to sustainable development, deconcentration of the land structure, reduction
of violence and poverty in the countryside and promotion of equality;
• To allocate public lands, demarcating and titling the lands occupied by traditional communities and quilombolas, and managing the national land structure by knowledge of the land network through the registration and certification of rural properties, contributing to the policies of social inclusion and sustainable development.

The body where the case study was applied has the following sectors with their respective functions represented by table 3:

Table 3 - Activities carried out in a land regularization body

<table>
<thead>
<tr>
<th>Sector</th>
<th>Performed activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 - Customer Service</td>
<td>• Assistance to public doubts, providing general information;</td>
</tr>
<tr>
<td></td>
<td>• Formal opening of processes;</td>
</tr>
<tr>
<td></td>
<td>• Registration in the system;</td>
</tr>
<tr>
<td></td>
<td>• Contact the applicant to resolve disputes;</td>
</tr>
<tr>
<td></td>
<td>• Routing of processes to other sectors.</td>
</tr>
<tr>
<td>2 - Cartography</td>
<td>• Management of technical parts (real estate plants);</td>
</tr>
<tr>
<td></td>
<td>• Attachment of the parts to previously registered processes;</td>
</tr>
<tr>
<td></td>
<td>• Conducting overlapping studies (conflict of interest);</td>
</tr>
<tr>
<td></td>
<td>• Provision of information on the location of real estate;</td>
</tr>
<tr>
<td></td>
<td>• Production of maps that help the field inspections;</td>
</tr>
<tr>
<td></td>
<td>• Follow up of certification and georeferencing of lands.</td>
</tr>
<tr>
<td>3 - Analysis</td>
<td>• Screening of processes with verification of documents or certificates;</td>
</tr>
<tr>
<td></td>
<td>• Clearly and accurately identify all pending processes and refer them to the responsible sector.</td>
</tr>
<tr>
<td>4 - Finishing</td>
<td>• Inclusion and research in the Rural Cadastre System;</td>
</tr>
<tr>
<td></td>
<td>• Process compliance and finalization analysis;</td>
</tr>
<tr>
<td></td>
<td>• Clearly and accurately identify all pending cases and forward them to the responsible sector;</td>
</tr>
<tr>
<td></td>
<td>• Routing of processes conforming to the Titration Sector.</td>
</tr>
<tr>
<td>5 - Titration</td>
<td>• Submission of the analyzed processes to the Legal Council;</td>
</tr>
<tr>
<td></td>
<td>• Receipt of analyzed processes;</td>
</tr>
<tr>
<td></td>
<td>• Titling of real estate and delivery of titles to squatters.</td>
</tr>
</tbody>
</table>
4. CASE STUDY

In order to carry out the study in the aforementioned body, it was necessary firstly an alignment meeting with the coordination of the work team composed of three public servants with great experience in the work in land processes.

At the meeting, we demonstrated all the quality tools previously explained in this research project, where it was decided to use four tools, which were:

- **Brainstorming**, in order to find the possible causes for the slowness of the regularization process;
- Flow chart, to represent with rationality, logic, clarity the procedures that are being carried out in the body and what may have improvements;
- Cause and Effect Diagram in order to establish the relationship between the effect and all causes of a process and identify in the diagram the causes that seem to have a more significant effect on the problem and finally the 5W2H to draw up action plans and establish associated procedures indicators to be created.

The first tool used was the flowchart, because the servers were aware of the flow of the titration process, being responsible for each activity and knowing the countermeasures of each problem or even the approximate time of each step, however there was no document some that represented this flow to any new employee of the organ, that is, knowledge was all actually acquired in practice, without the use of flowcharts or any other type of procedure.

Thus, together with the technical coordination, the flowchart of figure 4 was constructed.

After the best visualization of the process, two meetings were scheduled with all the servers, old and new, in order to construct the Cause and Effect Diagram. The first meeting explained the work being done, the benefits and the help needed to implement quality tools.

At this meeting the Working Flow Chart was presented, which was analyzed and approved by all, besides the explanation about the tools of Ishikawa Diagram and 5W2H, which would be built after the completion of the first tool. After these two meetings, the Ishikawa Diagram of figure 5 was generated from the **Brainstormings**: 

Source: Own author.
Figure 4 - Flow chart of the land regularization process. Source: Own author.
After capturing the maximum possible factors that cause the delay in land regularization (effect), the analysis of each point was made, and those considered irrelevant or that were already solved were eliminated. Among them was the shortage of personnel that was solved by hiring new servers from a recent competition, the use of outdated computers or the lack of computers, which was solved with a recent bid that allowed the purchase of new machines and the use of old software that was solved with the updating of the geo-referencing query cadastre system.

Once this was done, an action plan based on 5W2H was constructed (Table 4), adapted without H for Cost (How much?). Since the implementation of the actions was independent of the use of financial resources, since for this to occur, the process is even more time-consuming due to all the bureaucracy of public bodies.

Table 4 - 5W1H built plan

<table>
<thead>
<tr>
<th>WHAT (What?)</th>
<th>WHERE (Where?)</th>
<th>WHY (Why?)</th>
<th>WHO (Who?)</th>
<th>WHEN (When?)</th>
<th>HOW (How?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of training</td>
<td>Brasilia</td>
<td>Lack of training</td>
<td>New Servers</td>
<td>Jul / 2017</td>
<td>One-on-one training course</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Servers with no knowledge of processes.</td>
<td></td>
<td>on all processes.</td>
</tr>
<tr>
<td>Lack of training</td>
<td>Amazonas</td>
<td></td>
<td>Servers using outdated procedures.</td>
<td>Old servers</td>
<td>Recycling workshops old</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>servers from the knowledge acquired by the new</td>
</tr>
<tr>
<td>Lack of training</td>
<td>Amazonas</td>
<td>Lack of information regarding new processes or new laws.</td>
<td>All servers</td>
<td>Aug 2017</td>
<td>2-hour weekly alignment</td>
</tr>
<tr>
<td>Lack of Performance Indicators</td>
<td>Amazonas</td>
<td>There is knowledge of an annual goal, but there is a tool that monitors this progress.</td>
<td>Division Chief</td>
<td>Jul / 2017</td>
<td>meetings with all servers</td>
</tr>
<tr>
<td>Inappropriate Work Division</td>
<td>Amazonas - All departments</td>
<td>Many servers, even the old ones have no clear notion of their tasks.</td>
<td>Division Chief</td>
<td>Aug 2017</td>
<td>Monthly monitoring of quantity of titles in each process, main causes that left them stopped and amount of finished titles.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Reorganization of the sectors of the organ according to the demand and the time of execution of each step</td>
</tr>
</tbody>
</table>

Figure 5 - Cause and Effect Diagram built. Source: Own author.
Inappropriate Work Division
Amazonas - All departments

Due to the slowness of some steps some processes accumulate work while the previous sector is idle.

All servers
Jul / 2017

Training of all servers in all processes. With the possibility of a person acting in more than one process (flexibility).

Lack of Written Procedures
Amazonas - All departments

All knowledge about the processes is passed on verbally. In the absence of these, processes stand still. and there is no standard work.

Old servers
Aug 2017

Create standardized written procedure of all the processes performed in the body with the respective countermeasures for problems that may occur.

Too Much Dependence on Central Office
Amazonas

Any and all titling process is sent to the central office in Brasília.

Titration Sector
Jul / 2017

Obtain a decree authorizing the issuance of less complex securities by the state seat itself.

Processes incorrectly registered
Connections

Some registries, due to lack of standard are incorrectly registered.

Connections
Aug 2017

From the retraining courses and the standardization of written procedures, there will be a safer way to complete this step.

Processes registered without georeferencing
Connections

Some processes are stopped because the region in which the property is located has not been georeferenced.

Cartography industry
Jul / 2017

Even without georefer., the process will have continuity and the other processes will be carried out normally. Once the region is georeferenced the process will be terminated.

Deadline incorrectly informed to applicants
Connections

At the time of the beginning of the regularization program the politicians had informed that the titles would be emitted in 30 days.

Connections
Jul / 2017

Inform the applicants that the process has a real forecast of completion in 90 days. Preventing them from seeking information about the process in the service unnecessarily.

Source: Own author.

After the 5W1H plan was generated, a new flowchart was constructed in order to streamline the work process, as can be seen in figure 6. Basically, instead of the process being "stopped" waiting for the completion of other time-consuming processes such as the georeferencing and certification of this work or the registration and registration of the region in which the property is located, the process will normally flow to the completion sector, where, once these issues are resolved, it will be finalized and ready for titling.

In addition, less complex processes and without any litigation will be titled from the state division itself, in order to avoid the process going back and forth between Manaus and Brasília and the errors detected by Brasília will be corrected and titled already in the Amazon, avoiding so to return once more to the capital guaranteeing agility.

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CONCLUSION

The improvement in the services rendered in the organ in which the study was carried out was necessary since the process of land regularization is usually considered by many applicants as bureaucratic and rather time-consuming, since there are reports of citizens who have lived all their lives in the lands of the Union and for decades tried to regularize this land, passed away and did not achieve the objective end of the process that would be the titling of their property.

In spite of all the importance of this process, due to some problems such as reworking, altering a law, lacking some documentation or certificate from the claimant of the regularization, problems of litigation on the ground or still have an inefficient workflow, land regularization of a rural property usually lasts about 4 or 5 years instead of lasting 6 months, as promised by our governors in times of election campaign, ie the service provided does not meet the satisfactions of citizens, in this case, clients of the regularization body.
In the increasingly globalized and competitive world, it is imperative to adopt new technologies quickly and effectively. Companies that do not will be at a disadvantage compared to their competitors, will have their ability to reach targets and solve problems that are compromised (MARSHALL et al, 2008).

Although the public body studied has no competition, given that it is a service that every citizen has a right, guaranteeing quality in the public service is a differential so that the rulers remain in power since this will maintain their credibility by ensuring that public services efficiently, as well as being able to reduce expenses with the public vault by optimizing its processes, avoiding unnecessary losses and expenses, as Campos (2004) states, quality leads to better productivity in companies, their resources and, consequently, a reduction of costs that will influence the organizational performance.

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