

Analysis of the productivity of the construction sector in terrestrial communication routes, of the Central region of the state of Tabasco

Análisis de la productividad del sector de la construcción en vías de comunicación terrestre, de la región Centro del estado de Tabasco

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DOI: 10.35429/EJM.2023.31.14.8.18

Received July 15, 2023; Accepted December 30, 2023

Abstract

The study of productivity in the different sectors of the industry is an advance for the development of the same, which allows being a notable factor in developed or developing countries in the current globalized world. For the above mentioned, the present research allows to know the effect of the construction sector and the subsector of terrestrial communication routes, as well as the importance in the accessibility to the different communities and how this helps to strengthen the different branches of the economy. The methodology applied for the research was structural analysis (MICMAC), which allowed a search and selection of factors that directly affect the subject of study. As a result, 15 determining factors for productivity in the sector of study were classified and the level of impact was determined with the help of experts from organizations related to the same sectors, thus creating a real and comprehensive scenario of the situation and giving way to the construction of a development model for the region.

Productivity, Structural analysis, Land roads

Resumen

El estudio de la productividad en los diferentes sectores de la industria es un avance para el desarrollo de la misma, lo que permite ser un factor notable en los países desarrollados o en desarrollo en el actual mundo globalizado. Por lo antedicho, la presente investigación permite conocer el efecto del sector de la construcción y el subsector de vías de Comunicación Terrestre, así como la importancia en la accesibilidad a las distintas comunidades y como esta ayuda a fortalecer a las diferentes ramas de la economía. La metodología aplicada para la investigación fue análisis estructural (MICMAC), la cual permitió una búsqueda y selección de factores que inciden directamente en el tema de estudio. Como resultado, se clasificaron 15 factores determinantes para la productividad en el sector de estudio y del mismo modo se determinó el nivel de impacto con la ayuda de los expertos de las organizaciones relacionadas a los mismos sectores, de ese modo, se creó un escenario real e integral de la situación y dio paso a la construcción de un modelo de desarrollo para la región.

Productividad, Análisis estructural, Vías terrestres

Citation: ELISEO-DANTÉS, Hortensia, LÓPEZ-VALDIVIESO, Leticia, PÉREZ-GARMENDIA, Gloria and MOREJÓN-SÁNCHEZ, Juana María. Analysis of the productivity of the construction sector in terrestrial communication routes, of the Central region of the state of Tabasco. ECORFAN Journal-Mexico. 2023. 14-31:8-18.

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Introduction

Nowadays, we live in a time of technological development, structural transformations in organisations, modification of economic systems and opening of international markets, which generates competition not only at national but also at international level and consequently, every company has started to modernise processes, machinery, financial systems and train human resources, in order to increase its competitiveness and remain in the market.

In Mexico, as in any other part of the world, people possess skills and abilities with enormous potential to develop them, however, for various reasons they remain underutilised because there are no mechanisms to help them develop in an organised way (González, 2007). This is why it is essential for construction companies to restructure organisationally and achieve a competitive advantage in the construction market.

Despite the national economic downturn, which has affected the construction industry to a large extent, a large number of construction companies have managed to establish themselves in Tabasco. It is a fact that among these, some are more profitable than others, but most of them have a broad and urgent need to consolidate not only in the region, but also in the state and the country. In view of this, it is of great value to apply strategies that help these companies to achieve their medium and long-term objectives.

Methodology

Study design

The design and elaboration of the methodology was carried out through the use of two clearly differentiated but complementary tools: on the one hand, the Delphi Method, which aims to obtain a collective view of experts on a topic through repeated rounds of questions, where its use is truly effective when it comes to gathering information from a group that is considered as a unique set to analyse and solve a specific problem (Cabero and Infante, 2023), on the other hand, the Structural Analysis Method (MICMAC), which is a tool that allows identifying the key variables for the evolution of a complex system, be it an organisation, a sector, a market, a product or a territory, and the possible influences between them (Godet, 2000; Labrin, 2021).

The research has a mixed aspect, the qualitative part being the objective overview of the situation over the last few years of the sector by means of experts, proceeding to the analysis of variables and their corresponding factors, which show an accurate picture of the reality of the sector.

Likewise, this objective reality is complemented by the views of all the experts involved in the development of the sector, which allows the study to incorporate the added value of practical advice based on real experiences.

The interview has been the main methodological tool for the elaboration of this methodology, as it constitutes a qualitative research method in which, through a dynamic interaction between the interviewer and the interviewee, the latter expresses him/herself with total freedom, addressing the subject in question. At the same time, the interpretation of the data by means of statistics gives the quantitative sense to the research.

Application of the Delphi method

From the theoretical framework, it was determined that external factors affect the sector more than internal factors. It was therefore necessary to involve experts on the subject. The Delphi method was used to locate these experts.

Due to the research work carried out and the experience of more than 10 years working in construction companies in the state, we had a good reference of who the experts on the subject could be. Therefore, only two rounds or phases were necessary.

As a first phase, an interview was conducted with the government agencies involved in the construction sector, in the area of the Roads of Terrestrial Communication in the municipality of Centro, in the State of Tabasco.

The first approach was unstructured, without a predefined script, but rather the supposed experts were asked to establish which are the most important events and trends in the area under study.

References were also requested from these agencies as to which companies could be considered as experts on the topic in question.

Once these companies were located, they were asked to give us their general views on the research topic. As a result of this first phase, it was possible to find out which government agencies and companies were knowledgeable about the issue.

Instrument

In the second phase, a questionnaire was applied, which was elaborated with information from the theoretical and contextual framework, as well as the information resulting from the first phase of the Delphi Method.

The questionnaire is shown below:

Questionnaire on the occasion of the investigation of the topic: Analysis of the Productivity of the construction sector, Subsector Roads of Terrestrial Communication, in the municipality of the centre, of the State of Tabasco.		
Instructions: Your organisation has been chosen, as it is considered to know more about the topic in question, as well as a wide experience of it. The answers you provide will be used for teaching purposes only and in full confidentiality.		
1.-	How do you understand the term Productivity?	R: _____ _____
2.-	Do you believe that a company certified in quality management has a competitive advantage? Why?	R: _____ _____
3.-	Does your organisation work on implementing a culture of leadership and teamwork? Explain.	R: _____ _____
4.-	In general terms, what proposals would you make for the reactivation of the sub-sector?	R: _____ _____
5.-	Do you consider that the construction sector is of vital importance in the country's environment? Why?	R: _____ _____
6.-	How do you consider the road system of our state, comparing it with other states of the Republic? Why?	R: _____ _____
7.-	Do you consider that the projects generated in the state are in accordance with the existing climate and type of soil? Why?	R: _____ _____
8.-	What work carried out in this sub-sector, do you think has given more benefits to the state?	R: _____ _____

9.-	What project do you think would help to improve the road network in the central municipality and metropolitan area?	R: _____ _____
10.-	How does it affect the fact that foreign companies are participating in works in the state?	R: _____ _____

Table 1 Questionnaire for experts
Source: Own elaboration

Based on the answers obtained in the questionnaire of the second phase, it was possible to determine the experts who are suitable for the application of the Structural Approach, of which 4 agencies and 10 companies remained after the screening.

Procedure

The 14 experts were asked, with respect to their wide experience and knowledge, to name the factors that affect the Productivity of the Construction Sector, Subsector Roads of Terrestrial Communication, of the municipality of the Centre of the State of Tabasco. Using La Moda, one of the statistical tools of central tendency, the most representative factors were obtained.

The factors that emerged were the following:

N°	Factors
F1=	Implementation of new construction procedures
F2=	Training of personnel
F3=	Efficient site supervision
F4=	Feasibility study of projects
F5=	Climate of the region
F6=	Experience of construction companies
F7=	Limited financial support to companies
F8=	Impact of the economic crisis
F9=	Allocation of works to foreign companies
F10=	Reduction in public spending
F11=	Unfair competition
F12=	Irregularity in payment periods by agencies
F13=	Regulation of trade unions
F14=	Teamwork within and outside companies
F15=	Public works planning, programming and budgeting

Table 2 Factors determined by experts
Source: Own elaboration

The scheme for identifying the relationship between the factors consists of a double-entry matrix, in which the factors appear in both columns and rows, so that the influence of each factor on the others can be established in each of the crossing cells.

Once the above-mentioned scheme was available, the experts were asked to indicate how each of the factors directly influences the others, whether actual or potential, or whether the influence is null. At this point, the mean, another statistical tool of central tendency, was used to establish, according to all the experts' criteria, which factor did or did not influence the other factors.

After reaching a consensus on the type of influence between the factors, the results were converted into a binary system in which the number 1 was assigned to those factors that have a direct influence, either actual or potential, and 0 to those factors where the influence is null.

When the interdependence between the factors had been analysed, the sum of the rows and columns was calculated.

The sum of the rows indicates the number of factors on which the analysed factor influences and is called the degree of motoricity, which can also be represented as a percentage according to the proportion that its motoricity represents in function of the sum of the motoricity of all the factors, the degree of motoricity expressed as a percentage is called the motoricity index.

In the same way that the sum of the rows was analysed, we proceeded to analyse the sum of the columns, these indicate the degree of dependence that a factor has, that is to say, it indicates how many factors influence it; the degree of dependence expressed as a percentage represents the Dependence Index.

This allowed us to generate the interrelation of factors, obtaining the following Motricity and Dependence Matrix as shown in table 3 and table 4 of Motricity and Dependence Values.

Factor	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12	F13	F14	F15	Total Motricity
F1	1	1	1	1	1	1	0	1	0	1	0	0	0	0	0	10
F2	1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	8
F3	1	1	1	1	1	1	0	0	1	0	0	0	1	1	1	8
F4	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	11
F5	1	1	1	1	1	1	0	1	0	0	0	0	0	0	1	8
F6	1	1	1	1	1	1	0	0	1	0	0	0	0	0	1	8
F7	1	1	1	1	1	1	0	0	1	1	0	0	1	0	0	5
F8	1	1	1	1	1	1	0	1	0	1	0	1	0	0	0	6
F9	1	1	1	1	1	1	0	0	1	0	1	0	0	0	0	7
F10	1	1	1	1	1	1	0	0	1	0	0	1	0	0	0	5
F11	1	1	1	1	1	1	0	0	1	1	0	1	0	0	1	7
F12	1	1	1	1	1	1	0	0	1	1	0	0	0	1	0	6
F13	1	1	1	1	1	1	0	0	1	0	0	0	0	1	1	4
F14	1	1	1	1	1	1	0	0	0	0	0	1	0	1	1	5
F15	1	1	1	1	1	1	0	0	0	0	0	0	0	1	1	5
Depende nch total	10	10	10	10	10	10	4	9	6	3	4	3	3	6	7	89

Table 3 Motricity and dependency matrix
Source: Own elaboration

Factor	Description	Motor values	%	Dependency values	%
F1	Implementation of new construction procedures	7	7.87%	10	11.24%
F2	Training of personnel	8	8.99%	7	7.87%
F3	Efficient site supervision	8	8.99%	10	11.24%
F4	Feasibility study of projects	8	8.99%	5	5.62%
F5	Climate of the region	6	6.74%	6	6.74%
F6	Experience of construction companies	9	10.11%	6	6.74%
F7	Limited financial support to companies	5	5.62%	4	4.49%
F8	Impact of the economic crisis	6	6.74%	9	10.11%
F9	Allocation of works to foreign companies	2	2.25%	6	6.74%
F10	Reduction in public spending	5	5.62%	3	3.37%
F11	Unfair competition	4	4.49%	4	4.49%
F12	Irregularity in payment periods by agencies	6	6.74%	3	3.37%
F13	Regulation of trade unions	4	4.49%	3	3.37%
F14	Teamwork within and outside companies	5	5.62%	6	6.74%
F15	Public works planning, programming and budgeting	6	6.74%	7	7.87%
TOTAL		89	100%	89	100%

Table 4 Motor and dependency values
Source: Own elaboration

Results

The sums of the 1(one) per column can be seen in table 3, and these values represent the number of times each factor is influenced by the others, i.e., the number of times each factor depends on the others. So, for example: "staff training" is influenced by 7(seven) factors which equals 8%.

"Efficient site supervision" (F3) is influenced by 10 (ten) factors, i.e., 11%. And so on for each of the factors. For this reason, these values are called dependency indexes, because they indicate the degree or percentage of subordination of each factor with respect to the others.

For example: "Experience of the construction companies" (F6) is the factor with the highest degree of motoricity, having a value of 9 (nine), corresponding to a percentage of 10%.

Table 4 determines the quadrants in which the values of the table will be located, the procedure is the following, $100/n$, where n = number of factors; applying this expression to our data we have $100/15 = 6.67$, therefore, in figure 1, we show how the quadrants are located in which the factors that affect the sector will be located, specifying those of greater importance for the same.

In the power zone are the factors that have the highest mobility and the lowest dependence.

In the conflict zone (also called the work zone), there are factors with high mobility and high dependence. These factors are very influential, but also highly vulnerable. They influence the others but are also influenced by them. For this reason, they are in conflict. They are important, because any variation in them will have effects on the output zone and on themselves.

In the output zone are all those that are a product of the previous ones with low motility and high dependence.

The zone of autonomous powers is characterised by factors with low motility and low dependence, so it does not significantly affect any movement they have.

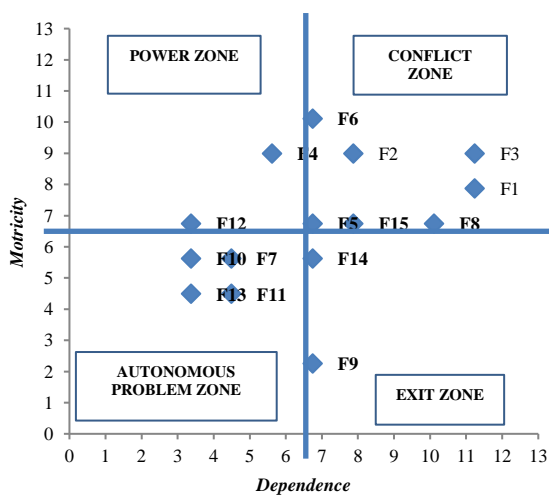


Figure 1 Cartesian plane of motricity and dependence
Source: Own elaboration

As a conclusion of the integral analysis, the factors found in each zone can be observed, which provided the tools to diagnose the problem and design the model, shown in figure 2.

Power zone	
F4 =	Feasibility study of projects
F12 =	Irregularity in payment periods by agencies

Table 5 Factors in the power zone
Source: Own elaboration

Autonomous problem area	
F7 =	Limited financial support for business
F10 =	Reduced public spending
F11 =	Unfair competition
F13 =	Regulation of trade unions

Table 6 Factors in the autonomous problem area
Source: Own elaboration

Conflict zone	
F1 =	Implementation of new construction procedures
F2 =	Training of personnel
F3 =	Efficient site supervision
F5 =	Climate of the region
F6 =	Experience of construction companies
F8 =	Impact of the economic crisis
F15 =	Public works planning, programming and budgeting

Table 7 Factors in the conflict zone
Source: Own elaboration

Exit zone	
F9 =	Assignment of works to foreign companies
F14 =	Teamwork within and outside companies

Table 8 Factors in the exit zone
Source: Own elaboration

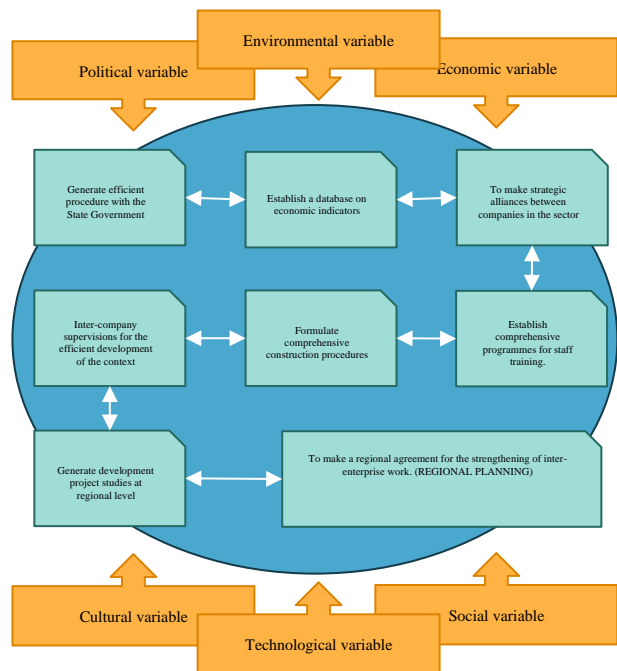


Figure 2 Development proposal
Source: Own elaboration

Conclusions

In view of the results obtained, the following are determining aspects for productivity in the sector under study:

- Implementation of new construction procedures. The construction industry in general, but mainly in the area of roadways, is lagging behind with respect to: the technological level reached in other sectors of the industry; the technological level reached in research both in construction products and construction techniques, as well as; the level of development of construction in other countries. Several factors influence the slow adoption of new technological advances in our environment. Among these factors are: construction companies are highly conservative and risk-averse; to date they have not found the need to improve their processes since the profitability they have obtained has satisfied them; their competitors are also highly conservative. These factors generate a certain inertia in the construction industry towards change and modernisation. Thus, few companies see technological innovations as powerful opportunities to generate business. However, circumstances are changing substantially due to a number of factors, including increasing domestic and foreign competition. If this situation continues, Mexican construction companies will slowly lose competitiveness, until they disappear in the face of more aggressive local or foreign companies.
- Training of personnel. In this area, the right of all employees to be trained is considered unavoidable and we believe that, as long as they do so, the company will improve its productivity to the same extent, so this position should be considered indispensable and should be considered in accordance with the policies of each company.

Training in the construction industry should be targeted at all levels of organisations, but its seasonality, dispersion and constant rotation make it very difficult.

There are many reasons why an organisation should train its staff, but one of the most important is the current context. By this we mean that we live in a highly changeable context. In this circumstance, behaviour changes and we are constantly confronted with situations of adjustment, adaptation, transformation and development, which is why we must always be up to date. Therefore, companies are forced to find and implement mechanisms that guarantee successful results in this dynamic environment. No organisation can remain as it is, nor can its most valuable resource (its personnel) be left behind, and one of the most efficient ways to prevent this from happening is to provide permanent training.

- People are essential to organisations and now more than ever, their strategic importance is growing, as all organisations compete through their people. The success of an organisation increasingly depends on the knowledge, skills and abilities of its workers. When the talent of employees is valuable, rare and difficult to imitate and above all organised, a company can achieve competitive advantages that rely on people.
- This is why the fundamental reason why training employees is about giving them the knowledge, attitudes and skills they need to achieve optimal performance. Because organisations in general must provide the basis for their employees to have the necessary and specialised preparation that will allow them to face their daily tasks in the best conditions. And for this there is no better way than training, which also helps to achieve high levels of motivation, productivity, integration, commitment and solidarity among the organisation's staff.

- Efficient site supervision. Site supervision can be a determining factor in both the success and failure of a project. A large number of structural and service problems in construction are not attributable to design or material deficiencies, but mainly to poor supervision. The professional who performs the job of site supervisor is confronted not only with problems of a technical nature, but also with conflicts generated by human interaction. In addition to the competencies needed to deal with technical and human problems, the supervisor must have a set of positive values and attitudes for the proper performance of his or her work. In order to achieve their objectives, supervisors must make proper use of the means of communication available to them, especially the site logbook.

Supervision will be able to fulfil each of its responsibilities as long as it has the support of the company's management, which will be responsible for ensuring that the general operating conditions are in place. To give some examples: if the construction company does not have a safety policy on site and does not provide the necessary resources, the supervisor will be unable to carry out an efficient job in this area; or if materials are not purchased at the right time and arrive late on site, it will be difficult for the supervisor to comply with the execution programmes.

- Project feasibility study. Projects are often carried out without taking into account the feasibility of the project, as there is no analysis of the need for the project, including supply and demand analysis and determination of the relative priority of the project in the sectoral programme or national/regional economic development of the country.

In addition, a project should consider aspects such as:

1. Study and comparison of potentially viable alternatives.
2. Project design (purpose, scope, location, etc.).
3. Analysis of technical feasibility, taking into account natural and site conditions, availability of materials and labour, and possible construction methods.

4. Estimated cost for the project.
5. Implementation schedule and maintenance scheme.
6. Analysis of the technical and financial capacity of the institutions involved in the project.
7. Evaluation of the technical validity, economic and financial feasibility of the executing company.
8. Assessment of the environmental and social impact.
9. Possible risks of the project, and recommendations and procedures necessary for the implementation of the project.

- Climate of the region. This is a factor that has an important effect on road construction, as the region has very rainy days during several months of the year, which causes delays in the works, as most of the roads are asphalt-based, and this material cannot be worked with humidity.

The prevailing water table also causes delays in the works and deterioration of the same; even having to implement new construction processes to lower the water table. This is especially true when working on earthworks.

Heat is another point to consider, as high temperatures can cause heatstroke among personnel. This is because work is always carried out in the open. This means that the productive hours of field personnel are reduced.

- Experience of construction companies. Due to the many factors that can be found in this sector, the experience of the construction companies is very important. This applies to all areas, from the profile of staff recruitment, tendering, execution and control of work, finances, alliances with other companies, facing local and foreign competition.

This results in the delivery of works on time, on cost and on quality.

- An experienced company knows that its staff is a very important part of the company, so it seeks their development by encouraging continuous personal and professional learning, while recognising their skills.

- Lack of financial support for companies. One of the problems faced by companies in the sector is precisely financial, due to the reduction in bank credit and loans, lack of liquidity of the companies, financing the start-up of the work, etc.
 - Small companies in the sector do not have the capacity to compete with companies that belong to large groups and that can invest their assets in other activities (energy sector), thus diversifying their product, improving their negotiation capacity, opening up to internationalisation processes, etc.
 - At present, companies consider that financing possibilities and investment are the two key elements to ensure growth.
 - Impact of the economic crisis. Construction is the engine of the economy and the real "locomotive" that pulls the other economic sectors along. When it stops, there is a real recession in employment and activity.
 - The government must understand, and I am sure it already knows, that without construction there is no life, that investments in infrastructures are decisive and key to the economic and social growth of any territory, and that the construction of land communication routes responds to a social demand and, above all, increases the quality of life of citizens.
 - The banks bear part of the responsibility for the situation we are experiencing today, together with the voracity of the different public administrations to collect taxes and bleed companies economically, taking away their liquidity to undertake new projects and invest.
 - Investment in infrastructures, such as roads, has been historically proven, not only here, but in any part of the world, to be the basis for strengthening the economic system and a sure way out of any crisis. Furthermore, it generates economic activity not only directly in construction, but also indirectly and above all in the creation of employment in other productive sectors, which leads to the generation of income that would allow for the satisfactory maintenance of fundamental services in any society.
 - Allocation of works to foreign companies. Although there are few foreign companies competing in the same sector, offering the same type of product/service, they have gradually been gaining ground, especially in works involving a high contract value.
 - The degree of rivalry between these companies and the local ones will increase as the number of foreign companies increases, as they are companies with a large infrastructure and production capacity.
 - In addition, these companies do not know the environment, such as the climate, the culture of the workers, the types of soil in the region, etc., which puts the execution of the works at risk; this is already being seen in the "Libramiento de Villahermosa" project, assigned to a Spanish company and which to date is considerably behind schedule.
 - Reduction in public spending. The cutback in investment plans undertaken by the public sector to comply with deficit reduction has had a substantial impact on the road construction sector. Budget cuts should never be made in the investment chapter; there are other items that could be reduced or eliminated, and their absence would not even be noticeable. And we are referring to so many superfluous expenditures that we see in administrations at all levels of government.
- Road construction has been a sector that has not only been left without investment, but also without air, and has been left without breath by the banks and the public administration, both federal, state and municipal.
- Unfair competition. The awarding, in some cases, of works to the lowest proposal, without it necessarily having been solvent, based on a deficient evaluation of the technical proposals. This promotes unfair competition, as companies lower their prices exaggeratedly in order to be awarded the works.
- This weakens the profitability argument in terms of costs, regardless of the effect on the quality of the product and the quality of the service, a situation that does not contribute to the client's interest in achieving the best quality construction, in the shortest time and at the best price.

Another situation that is killing the patience of many businessmen and entrepreneurs is the unfair competition from a multitude of public companies that distort the local market. Entities that often operate in the heat of a political and family clientelism that is unacceptable at a time when the survival of many private companies hangs in the balance.

- Irregularity in payment periods by agencies. The administrative practices of public entities for the payment and amount of advance payments, estimates, cost and scope reviews and financial costs mean that builders largely assume the financial and project risks without compensation.

In addition, we have increasingly delinquent public administrations, which not only allow themselves to be late in making payments, but also use all kinds of tricks to either not accept the works or not recognise the debt.

Government debts to construction companies, which in some cases are several months in arrears, sometimes make it impossible for companies to pay their workers and suppliers. In many cases, the situation of small and medium-sized local construction companies in this sector is desperate and dramatic.

- Trade union regulation. The road construction industry is currently living with a situation of overflow, extortion and delinquency on the part of trade unions and pseudo-unions. They operate with impunity to extort money not only from new construction sites, but also to demand quotas of up to 5% of the workers' wages.

The construction industry is a driving force in the country and has led to crime seeing illicit activities in it. Nowadays, there are fronts of unemployed people everywhere and they demand the list of building permits from the municipalities, and before the construction starts they are already looking for the entrepreneurs.

- Teamwork inside and outside the companies. Teamwork is one of the psychological working conditions that has the most positive influence on workers, because it allows for companionship. It can have very good results, as it usually generates enthusiasm and produces satisfaction in the tasks recommended.

The strength that integrates the group and its cohesion is expressed in the solidarity and the sense of belonging to the group that its components manifest. The more cohesion there is, the more likely the group is to share common values, attitudes and norms of behaviour.

Working in a team is beneficial not only for one person but for the whole team involved. It will bring us more satisfaction and make us more sociable, it will also teach us to respect each other's ideas and to help colleagues if they need our help.

In recent years, globalisation and the increasing involvement of multinational companies in infrastructure development have forced the country's companies to take drastic and innovative actions to survive and improve their competitiveness. It is foreseeable that the construction sector will see mergers between companies or large investments with the main objective of acquiring a considerable size and sufficient resources to continue to position themselves as industry leaders and to deliver higher quality products and/or services.

Companies have as an option to generate income, grow and position themselves in the market, the formation of consortiums, strategic alliances, mergers or even new companies to meet the demand for infrastructure that the country requires.

- Planning, programming and budgeting of public works. This is an important part in which government agencies often give little importance, resulting in works that do not work properly, do not meet expectations, or the budget is insufficient.

Conclusions and recommendations

The construction sector, specifically in land communication roads, in the region of Centro, Tabasco, is an area with many needs and red spots that must be urgently addressed, since productivity in this sector is of vital importance for the growth of the state and the nation, and hundreds of populations depend on this sector.

Some very important points to be taken into account by the agencies are the following:

1. Obtain the authorisation document of the resource to carry out the work.

2. Drawing up the Executive Project. In addition to the design, this includes the definition of standards, specifications and applicable technologies.
3. If necessary, obtain permits if the work affects rights of way and/or requires crossings of state or federal highways, railroad tracks or railroad tracks.
4. Prepare the environmental impact study and obtain authorisation from the corresponding regulatory agency.
5. If applicable, obtain a municipal building permit.
6. Obtain the feasibility of municipal services: water, drainage, etc., if applicable.
7. Obtain the feasibility and/or validation from the corresponding regulatory agency, if the type of work requires it.
8. To have the economic resources destined to cover the expenses derived from the actions of planning, project elaboration, execution, supervision and quality control of the work.
9. To draw up the tender conditions.
10. To program and schedule the events required for the awarding of the works contract when it is by tender.
11. Programming and scheduling the execution of the work.
12. Validate the execution and supervision contracts.
13. Coordinate with the financial area the payment of work estimates and/or settlement.

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