



ISSN: 0975-833X

Available online at <http://www.journalcra.com>

INTERNATIONAL JOURNAL  
OF CURRENT RESEARCH

International Journal of Current Research  
Vol. 15, Issue, 10, pp.26103-26107, October, 2023  
DOI: <https://doi.org/10.24941/ijcr.46087.10.2023>

## RESEARCH ARTICLE

# THE HOUSING PRODUCTION MECHANISM IN THE INFORMAL SECTOR IN THE REPUBLIC OF CONGO

Destin Gemetone Etou<sup>1,2\*</sup>, Vivien Romaric Ekouele Mbaki<sup>1,2</sup>, Alain Symphorien Ndongo<sup>1,2</sup> and Christian Tathy<sup>1,2,3</sup>

<sup>1</sup>Laboratory of energetic mechanics and engineering (LMEI)

<sup>2</sup>National Superior Polytechnic School (ENSP), University Marien Ngouabi BP 69 – Brazzaville, CONGO

<sup>3</sup>Higher Normal School (ENS), University Marien Ngouabi BP 69 - Brazzaville CONGO

### ARTICLE INFO

#### Article History:

Received 25<sup>th</sup> July, 2023

Received in revised form

19<sup>th</sup> August, 2023

Accepted 15<sup>th</sup> September, 2023

Published online 31<sup>st</sup> October, 2023

#### Key words:

Production, Housing, Informal Sector.

#### \*Corresponding author:

Destin Gemetone Etou

Copyright©2023, Destin Gemetone Etou et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Destin Gemetone Etou, Vivien Romaric Ekouele Mbaki, Alain Symphorien Ndongo, Christian Tathy Christian Tathy. 2023. "The housing production mechanism in the informal sector in the republic of Congo". *International Journal of Current Research*, 15, (10), 26103-26107.

### ABSTRACT

This article looks at how house-building projects are carried out by companies operating in the Republic of Congo's informal construction sector. This sector is fuelled by the high demand for housing among the population as a result of demographic pressure and the lack of a housing policy on the part of the public authorities. These companies, which are considered to be the most numerous, apply a non-regulatory management system to the production of housing. The survey carried out in this so-called informal sector enabled us to understand the organisational methods and difficulties encountered by these companies. Very active in the construction of single-storey and two-storey (R+1 and R+2) houses, this sector employs a workforce that is mostly young and lacking in professional qualifications, consisting mainly of labourers or "tâcherons". They assess and plan projects, often on the basis of experience, having worked alongside construction specialists (engineers or architects) or having carried out the same type of work somewhere else.

## INTRODUCTION

The housing sector in the Congo shows remarkable weaknesses in the policy of providing housing for the population. The shortfall in housing needs is certainly due to demographic pressure in highly urbanised cities, but also to a slackening of public authorities in property investment programmes. In most developing countries, the supply offered by the public authorities is insufficient to curb demand, which is rising too fast [1; 2]. The property sector is characterised by a remarkable imbalance in relation to the current rate of housing production. We are therefore witnessing "self-build" in the construction of individual homes, and even other infrastructures. In some countries, this sector accounts for almost 90% of housing production [1; 3; 4; 5]. Depending on the budget available to project owners and the construction techniques used on the various sites, the vast majority of buildings have some concerns about compliance with the rules of the trade. The companies in charge of these projects are categorised as operating in the informal construction sector. The profound changes in the global economy since the economic crisis of 1970, and their negative consequences, are sufficient in themselves to justify the rise of the informal sector. According to *La Porta and Shleifer* [6], a significant proportion of production and trade is informal (between 30% and 40% of total economic activity in poorer countries).

However, it is considered that the emergence of informal activities is essentially explained by the desire to avoid taxation and regulation. [7]. That said, although this is a sector that escapes regulation by official state channels, in the Congo the majority of housing is built in this sector by self-builders and self-developers, using skilled workers known as "masters" or simply "tâcherons", some of whom subsequently become skilled workers in a given housing trade. These are single-storey, two-storey and two-storey houses, with completion times ranging from three (03) to 12 months, or even several years, depending on the customer's income and the way the site is organised. In addition, the private sector offers many jobs in the informal sector, mainly in rural areas. The remainder is divided between semi-urban and urban areas (58% in Brazzaville and 60% in Pointe-Noire) [1]. This sector refers to a range of non-regulatory mechanisms used to carry out studies, supply materials, recruit and pay labour, and finance projects, essentially based on personal savings and tontines (50-60%). According to *Sonia Menguellet et al*, the difficulties in accessing the banking system mean that agents in need of financing turn to family loans or parallel interest-bearing loan systems [8]. The longevity of these buildings in several districts of the city of Brazzaville in Congo has been noted. These "makeshift" houses often last as long on average as those built in the formal sector in accordance with strict building regulations. Others are more than half a century old, and the cost of construction is much lower than in the formal sector.

It is therefore interesting to understand how construction projects are managed by informal companies in the Congo.

## MATERIALS AND METHODS

**Data collection methods:** The data collection method is both qualitative and quantitative. The interview method involves face-to-face interviews between the interviewer and the respondent. This is all the more interesting in that it enables the interviewer to gain a better understanding of the sequence, logic and discourse of the experience of individuals and the interpretations they make, especially as the interviewer relies on a guide that sets out all the questions to be dealt with, as well as their sequence and the way in which they are to be approached. It should be noted that the interviews were carried out at company head offices, base-vies and worksites.

**Sampling:** Given the type of study and in order to ensure that the sample is representative, the method chosen for this study is the quota method [9; 10]. An appropriate choice of quotas can reduce the variance of the estimate and the size of its confidence interval. If applied rigorously, the quota sampling method can be as accurate as random sampling, or even more accurate if the sample size is small [11]. It is in fact very practical for this type of study and allows better control over the characteristics of the sample or identifiers. The sample selected consisted of 30 companies. The survey was conducted in Congo's two main cities (Brazzaville and Pointe-Noire). This was justified by the concentration of the country's activity in these cities. The focus was on project management for the two types of construction that are predominant in the Congolese territory in these sectors: single-storey (F4) and upper-storey (R+1 and R+2) buildings for residential use.

### Survey objectives

#### The survey has the following objectives

- Identify the different project management methods used;
- Identify the advantages and disadvantages of using these methods;
- Identify the difficulties associated with project management;
- Identifying company performance ;
- Evaluating the performance of different planning methods ;

## RESULTS AND DISCUSSION

3.1. Single-storey building for residential use: case of a F4 flat  
Erected on a plot of land of around  $400m^2$ , these F4-type buildings are the most common type of housing in the Republic of Congo, belonging to average families. On average, this type of building occupies half the surface area of the plot, i.e.  $200m^2$ , but recently, these detached houses have also been built on plots of around  $200m^2$ , commonly known as "half plots", occupying on average two-thirds of the surface area of the plot (around  $130m^2$ ). The most striking observation made in the field is that, in the majority of cases, the following methodology is used to determine the schedule of works, the workforce, the number of workers and the preparation of estimates, etc:

- Find out what these companies specialise in;
- Choice of contractor and workforce ;
- Workforce characteristics ;
- Receipt of plans ;
- Site visit ;
- Determining the number of people involved (workers or labourers) ;
- Planning ;
- Drawing up a quotation ;
- Determining the workforce ;
- Determining the method of payment for labour ;
- Monitoring the progress of the work.

**Speciality of the company:** In this sector of activity, the majority of these companies or groups of workers specialise in the building trade. Figure 1 below shows that of the 20 companies selected:

- 100% of the structural work;
- 60.98% are also involved in landscaping;
- 5.26% carry out finishing work.

However, most of these groups evolve in associativity.

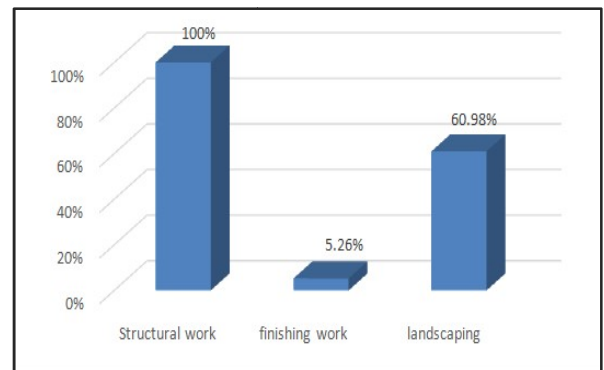


Figure 1. Speciality of these companies

**Choice of main contractor and workforce :** This choice is based more simply on relationships with friends, neighbours or even relatives. Sometimes the client or the developer/manager has to do a little research in the surrounding building sites or in the area where they live to choose the project manager, commonly known as the "Master". In general, these masters have several qualifications: bricklayer, carpenter, tiler, ironworker, formworker, plasterer, etc. But we can group them into two categories:

- The "assistance", made up of family and acquaintances ;
- Professionals, including labourers, skilled workers (masters) and workers trained on the job.

**Characteristics of the workforce :** The workforce in this sector is dominated by young people aged between 18 and 30. Most of these young people have a low level of education (primary school) and no professional qualifications. Their daily or weekly income enables them to meet their daily needs (labourers). In most cases, these labourers are coordinated by very slippery skilled workers. As fathers, in most cases, due to the instability of the methods of paying labour and the uncertainty of the continuity of the work, the owners are obliged to juggle between several sites, while leaving others in the hands of the labourers: this is largely one of the causes of the defects and delays observed on the sites. Apprenticeship or training is done on the job by a worker with more experience or a higher intellectual level. But in some trades (electricity, carpentry, plumbing, metalwork, etc.), it is often difficult to learn on the job without having a sufficiently high intellectual level (technical high school, scientific series of general high school, etc.). A sample of ninety (90) workers was used to produce the histograms shown in Figure 2 below.

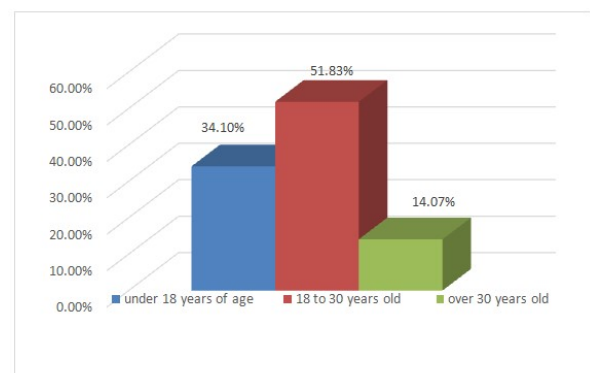


Figure 2. Breakdown of workforce by age group

Figure 2 shows that 51.83% of the workforce is between the ages of 18 and 30, which confirms the findings of the survey on employment in the informal sector in the Congo.

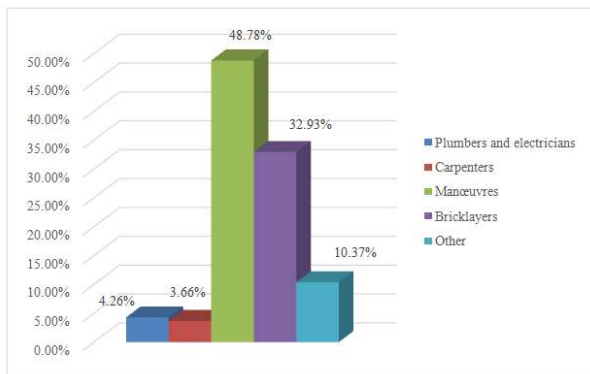


Figure 3. Breakdown of workforce by trade

Figure 3 shows that 48.78% of this sector is made up of labourers. This is justified by the fact that these labourers have no qualifications and carry out tasks following the instructions of skilled workers as helpers on the site. Generally speaking, there are not many training structures geared towards apprenticeships in the construction trades. A handful of trade schools are unable to provide training for all these young people with no qualifications. As a result, they are forced to work alongside skilled workers as labourers, learning on the job and gaining experience on building sites so that they can become skilled workers. This is without obtaining a training certificate justifying the speciality. There are still a lot of labourers because of youth unemployment. The fewest are carpenters (3.66%) because of the complexity of their trade. Most workers don't like working at height from start to finish. They prefer to specialise in a trade that does not expose them to potential accident risks. This may explain the low percentage of carpenters building houses in the informal construction sector.

**Drawing up and acceptance of plans :** Plans are drawn up by draughtsmen, civil or building engineers and architects. However, there is also a small handful of skilled workers who sometimes try their hand at the job, having gained some experience working alongside an architect or engineer. More often than not, the owner or client already has a plan drawn up by the latter and gives it to the workman (Maitre) to carry out. It should be pointed out that, in some cases, the owner often tries to draw up a draft of the plans that he has the workmen execute, himself playing the role of site controller. The histogram in Figure 4 shows that 54.10% of plans are drawn up by non-architects by training. This can be explained by the fear of facing the colossal bill of an architect following the drawing up of a plan. In order not to spend too much money, developers of construction projects find ways of avoiding having to deal with architects. When they do consult an engineer, it's with the intention of convincing him to study and ensure the proper execution of the project, using all his know-how.

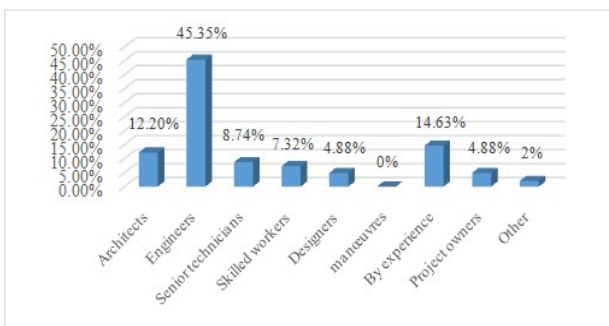


Figure 4. Drawing up plans

**Site visit :** Once the workman has received the plans for the work to be carried out, he first visits the site reserved for the work in order to get a general idea of the nature of the land, the environment of his future workplace, the drinking water and electricity supply, and the supply of materials and equipment before drawing up the estimates. To this end, the worker takes a good look at the nature of the site, i.e. steeply sloping ground, gently sloping ground, stable ground, marshy ground, sandy ground, etc. Figure 5 illustrates the worker's prior request to visit the site before mobilising his resources. This site visit determines the complexity of the work and enables the worker to assess the size of the workforce, both for the foundation and the entire structure, and to estimate a reasonable schedule.

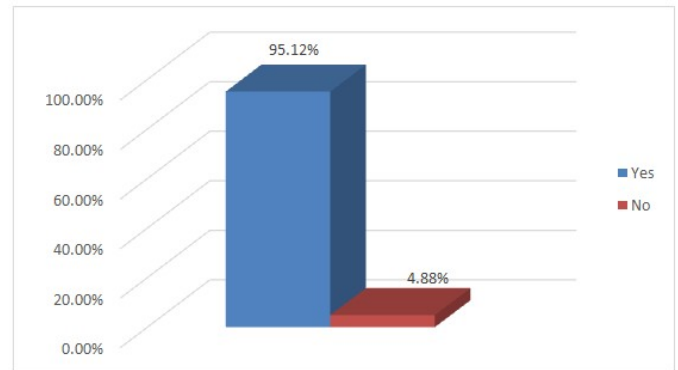


Figure 5. Site visit

**Determining the number of workers :** The number of workers is determined in relation to the workforce available to carry out the task in question. However, it should be noted that for the construction of a single-storey F4 building, we need between six (06) and nine (09) workers, distributed as follows:

- One (01) master mason and one assistant or labourer;
- One (01) master formworker and his assistant or labourer;
- One (01) master carpenter and his assistant or labourer.

Plumbers and their assistants, painters and their assistants, tilers and their assistants, glaziers, etc., should also be included in the secondary trades. However, it should be noted that a master mason may also be a bricklayer, ironworker, carpenter, tiler and formworker.

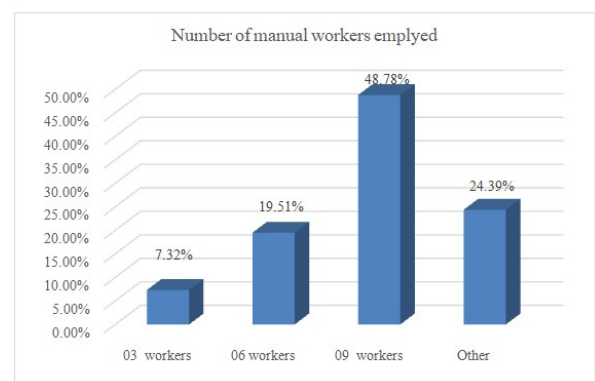


Figure 6. Number of workers required for a single-storey F4 project

**Determining the works schedule :** The work schedule is determined experimentally, as shown in Figure 7, by the foreman (Maitre). It also depends on the workforce selected when the contract was signed, the complexity of the work and the availability of equipment and materials on the site. In short, it all depends on how the funds are allocated to the site for the purchase of equipment, materials and the payment of labour during the execution of the work. In this type of work, when labour is undervalued, the master builder is obliged to work alone, sometimes with just one labourer, to maximise his profit to the detriment of the work schedule.

And sometimes, to make ends meet, he has to combine several sites, spreading the schedule from one site to several. This voluntary extension of the schedule by the project manager may also be due to a lack of confidence on the part of the project owner in the project manager's ability to continue the work. The latter often fears that the work will stop spontaneously due to a lack of funding. This results in the project manager taking a technical leave of absence. The works will take a maximum of six (06) months to complete, provided there are no financial difficulties and there are no meteorological hazards.

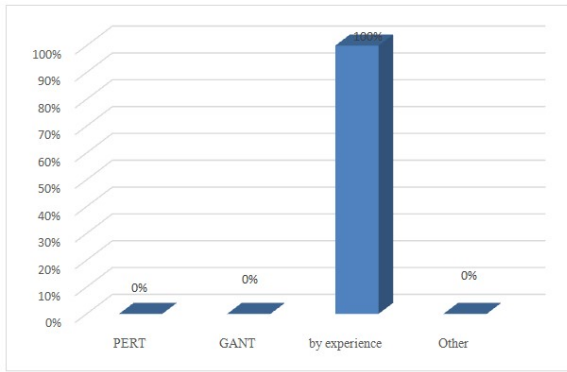


Figure 7. Planning methods

**Drawing up work specifications:** On the one hand, the estimate is drawn up by the lead worker, commonly known as the "Master", who has professional experience in this field, having worked alongside an architect or engineer, or having carried out the same type of work somewhere else. It is often found that the estimate is either underestimated or overestimated. But he prefers to estimate stage by stage (foundation, elevation, roofing, etc.) or in relation to the progress of the work to reduce the margin of error. In some cases, it is drawn up by a foreman with on-the-job experience and a high level of technical knowledge (Bac D, Bac C, Bac F4, BET, etc.). This estimate is often correct, with a margin of error of around 10%. This type of worker is capable of assessing all the building's structural work. In this sector of activity, we found that the majority of estimates were drawn up on the basis of experience (82.66%), as shown in Figure 8, by estimating a certain quantity of materials at the start of the work and purchasing the rest as the work progressed. Materials are often purchased on a weekly basis, whenever the need arises.

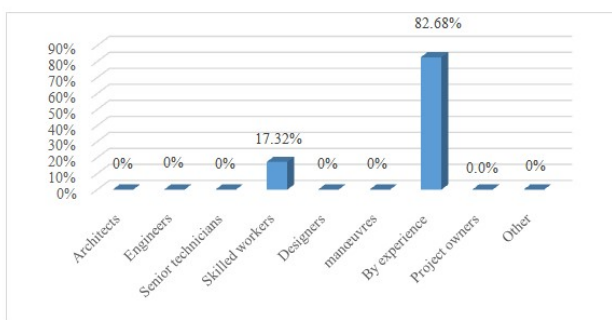


Figure 8. Drawing up a quotation

**Determining the cost of labour :** After the site visit, the worker assesses at a glance the complexity of the work, the site environment, the working conditions (availability of drinking water, electricity, etc.), the conditions for storing materials and the arduousness of the work. At the end of this stage, he estimates the cost of the first job and determines his labour rate on the basis of all these aspects, taking into account the purchase price of the materials. The amount of labour dictated by the worker is often revised downwards by the customer, but the worker takes into account the 30% of the purchase price of the materials, which is the most reasonable amount for labour. On the other hand, this amount can be revised upwards by adding a coefficient due to the arduousness of the task, or sometimes revised downwards to less than 30% of the purchase price of the materials on

the basis of the relationship between the two parties (friendly, family or professional). Sometimes, the labour is estimated by a worker who is less experienced, has a low intellectual level (40.49%) or even no level at all (38.66%), as shown in Figure 9. In this case, these workers often tend to ask for an additional 20 to 30% of the initial amount to be added before the end of the task, if they realise that they had undervalued this labour. In short, in addition to the above, labour is a random variable set by the project owner according to fluctuations in the financial environment and the social level of the project owner. With :

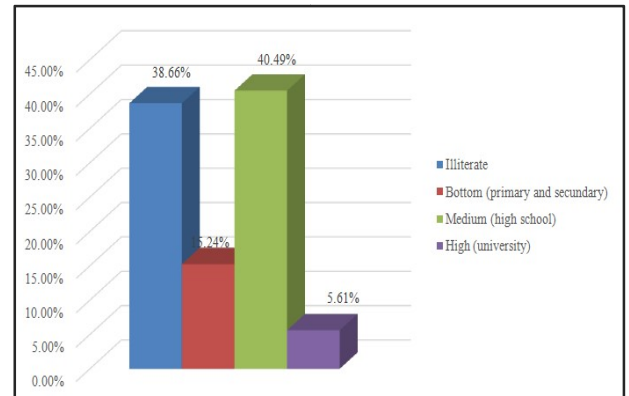


Figure 9. Intellectual level of stakeholders

- A: Complexity of the task ;
- B: 30% of the purchase price of the materials ;
- C: 40% of the purchase price of the materials ;
- D: 20 to 25% of the purchase price of materials ;
- E: From experience ;
- F: Friendly or collegial relationship ;
- G: Economic environmen

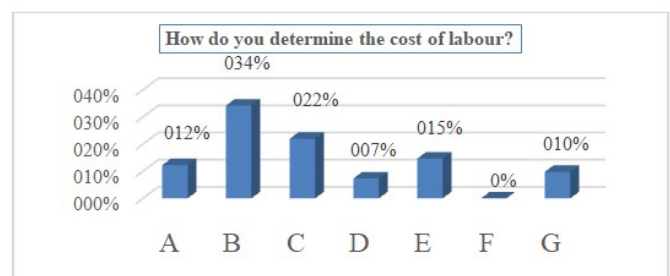
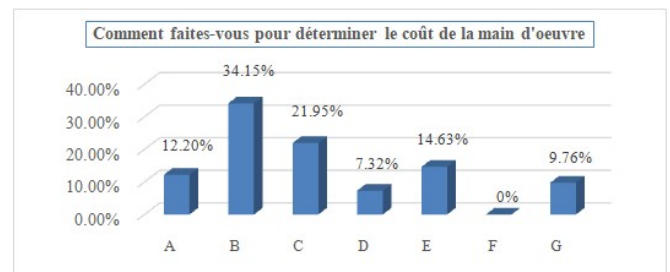


Figure 10. Determining the workforce

**Causes of spontaneous delays by site workers :** During the course of our survey, we noted that on the same site, during the week, the number of workers sometimes varied from six to zero. Figure 11 explains the causes of these spontaneous and repeated absences of workers from the site. Figure 11 clearly shows that 56.09% of these spontaneous absences were due to labour, followed by uncertainty about the continuity of the work (24.39%). Despite the amount of labour agreed by both parties to carry out the assigned task, the worker is still dissatisfied, as Figure 12 shows. Only rarely (85%) does the labour allow him to meet his needs.

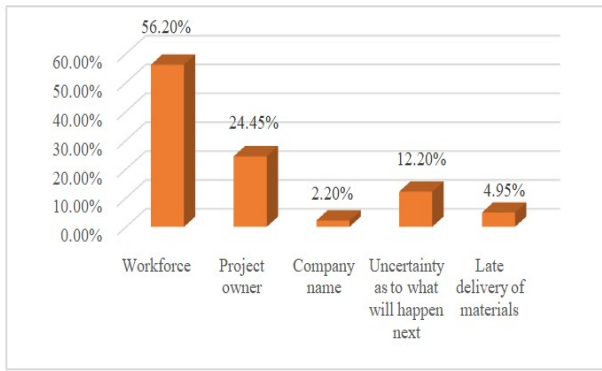


Figure 11. Spontaneous delays by site workers

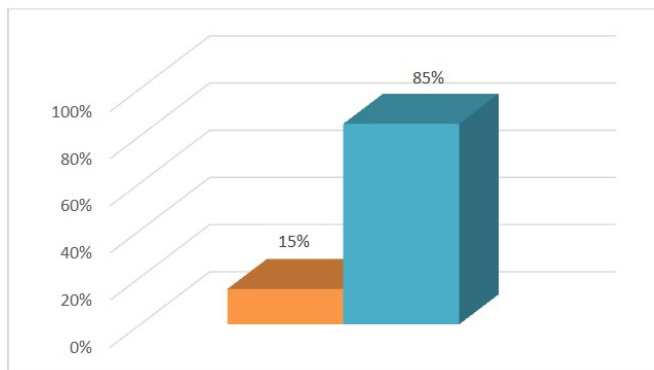


Figure 12. Workers' satisfaction with the cost of labour

**R+1 and R+2 residential buildings:** The construction of multi-storey houses is becoming increasingly common in the Republic of Congo. Erected on a plot of land of around  $200m^2$  for the most part, these R+1 and R+2 buildings belong to more or less well-off individuals. On average, these buildings take up two-thirds of the surface area of the plot ( $130m^2$ ).<sup>2</sup> Our site survey revealed that the management approach to this type of work is almost the same as for single-storey houses, except that the work schedule is becoming more complex because of the additional tasks and the number of workers involved. The number of workers has almost doubled, from six (06) to an average of ten (10) or twelve (12):

- A master formworker with two assistants;
- A master scrap dealer with two assistants;
- A master mason with two assistants;
- Three manoeuvres.

This number of participants is not exhaustive. However, it can be reduced or increased depending on the complexity of the work and the cost of labour. It should be noted that during the pouring of load-bearing elements or other work packages on the site that require more workers, all the above participants work together and even young people living in the vicinity of the site are involved in the work for a fixed fee. For secondary works, painters, glaziers, tilers, etc. are added to this list. The site is monitored by a technician or engineer, who often has a family or friendly relationship with the project owner.

## CONCLUSION

Statistical data from the survey show that :

- Companies or groups of workers in the informal sector plan their projects empirically, based on professional experience and trial and error;
- Most of these companies specialise in structural work;
- This sector is dominated by manual workers with a low level of education;
- People working in this sector are divided into two groups: assistance (family and acquaintances) and professionals (skilled workers, labourers and workers trained on the job).
- The foreman is not involved in the purchase of materials or equipment for the project; he is only concerned with his own labour;
- The labour issue is still complex;
- Most plans are drawn up by people who do not have the same expertise as an engineer, architect, draughtsman or technician;
- The projects are largely financed by the project owner itself.

In short, in addition to financial problems and natural phenomena (weather, erosion, etc.), the instability of the workforce and the lack of assurance on the part of the builder with regard to the continuity of the work contribute in large part to the delays regularly observed in the informal construction sector.

## REFERENCES

- Destin Gemetone Etou, Christian Tathy, Sorel Gaël Dzaba-Dzoulou, Rodrigue Armel Patrick Okemba, Narcisse Malanda, Paul Louzolo-Kimbembe. The dysfunctions of construction project management in developing countries: The case of the Republic of Congo. American Journal of Engineering Research (AJER), Vol-10 (12) -issue-12-2021, p.202-207.
- Lachambre M. Plaidoyer pour un Nepad "Logement" en Afrique, Villes en Développement, Bulletin de la Coopération française pour le développement urbain, l'habitat et l'aménagement spatial, No. 56, June 2002, p. 6-7.
- Delis Philippe, Girard Christian, De Maximy René et al. Economie de la construction à Kinshasa, Paris: L'Harmattan, 1988, 125 p.
- Blondin P., Mouna Kigue D., Vo Thanh T. Typologie et coût de construction à Douala, Centre d'Édition et de Production pour l'Enseignement et la Recherche, 1988, Yaoundé, Cameroon.
- Pettang C. Éléments d'optimisation de la production d'un habitat urbain au Cameroun, Presses Universitaires de Yaoundé, 1999, 183 p.
- Rafael La Porta, Andrei Shleifer, Informality and Development, Journal of Economic Perspectives, Vol.28, No. 3, 2014.
- Idrissa M. Ouédraogo, Governance, corruption and the informal economy, Modern Economy, vol.8 No.2, February 24, 2017.
- Sonia Mengueli, Cécile Perret, Belaïd Abrika. At the crossroads of the formal and the informal: businesses created by the National Youth Employment Support Agency scheme in the Wilaya of Tizi-Ouzou. 2014. halshs-01094747Bréchon, 2010.
- Pierre Bréchon, Echantillon aléatoire, échantillon par quotas : les enseignements de l'enquête EVS 2008 en France. Presentation at the Francophone Conference on Surveys, Tangiers, March 2010.
- Desabie, J. Méthodes empiriques d'échantillonnage, Revue de statistique appliquée, tome 11, No1, 1963, p.5-24.
- Séraphin Mouzoun, Écologie et connaissances ethnozoologiques du porc-épic à crête (*Hystrix cristata* Linnaeus, 1758) dans les réserves de biosphère de la Pendjari et du W du Bénin. Zoologie des vertébrés, University of Abomey-Calavi (Benin), 2018.

\*\*\*\*\*