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RESEARCH ARTICLE

## Critical success factors for managing post-disaster reconstruction projects: the case of Angola

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### Abstract

Although some studies have been carried out on project management of “typical” construction projects, little work has been done on what makes Post-Disaster Reconstruction Projects (PDRPs) successful. This paper analyses the Critical Success Factors (CSFs) for implementation of PDRPs in Angola. The paper adopted a survey and interviews. Data was collected from project participants within the ministry of planning, provincial government office of planning and local government in Angola. A questionnaire with closed questions was completed by 130 survey respondents. Semi-structured interviews were conducted with 7 practitioners selected through purposive sampling. The findings indicate that adequate funding, effective planning, competent project managers, good communication, the active involvement of stakeholders, good written contract, political stability, less bureaucracy in the reconstruction process, economic stability and sufficient resources are the CSFs. The findings further revealed that, there are no differences in the responses between the groups especially between managers and consultants and between contractors and consultants. The findings strongly suggest that CSFs are key resources and skills that determine the successful implementation of a project in terms of its direction and benefits and proposes that stakeholders and project managers

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should consider these factors for best practices when managing PDRPs. Since PDR is context specific, countries with the same economic status, environment and post-disaster event may benefit from the results. Hence, the study offers new insights to gain an understanding of the CSFs that contribute to best PDR practices.

## Keywords:

**Angola, critical success factors, post-disaster reconstruction projects, project management and public projects.**

## Introduction

Critical success factors (CSFs) are key building blocks for the success of any project. They are considered as key resources and skills hence project management practices to meeting the requirements of a project in terms of processes and project outputs. Implementation of Post-Disaster Reconstruction Projects (PDRPs) has been ineffective and their intended outcomes have not been achieved (Bilau, Witt and Lill, 2018; Vahanvati and Mulligan, 2017). Although PDRPs differ from typical projects in terms of dynamics, hugeness and complexity, researchers contend that PDRPs have been ineffective due to management issues (Bilau and Witt, 2016; Bilau, Witt and Lill, 2018). One challenge is that of balancing time and quality in order to deliver the desired project outcome. Another problem is that of allocating capital and resources in a short period of time to complete a project when there has been no proper planning and coordination (Rui, 2017). The authors argue that implementing organizations need to adequately address and manage these issues for the effective delivery of reconstruction projects. They can only be addressed by focusing on what are the best management practices which are called by Bilau and Witt (2016) success factors. These factors in a post-disaster environment are important as they ensure the sustained or improved process of running projects of an organization in positioning itself in the situation it is in. Their importance cannot be over-emphasized as they give the direction an organization is to take in reaching its objective and serving the interests of the affected communities as well as other key stakeholders of the post-disaster recovery process (PMI, 2005). Success factors in PDRPs are important for improving communities' physical, social, environmental and economic conditions, including recovery activities that create a resilient community.

Although there have been studies on Post-Disaster reconstruction (PDR) with suggestions to improve post-disaster practices to recover from disaster (Ismail, *et al.*, 2014; Ophiyandri, *et al.*, 2013), yet each one of these has focused on PDR in their context, which has led to the identification of CSFs in a post-disaster environment. Most of studies on PDRPs were conceptual and a few with empirical data focused on success factors for PDRPs. Furthermore, some of the researches on success factors focused on International Organizations (INGOs) as implementing agency with different contexts (Hayat, Haigh and Amaratunga, 2019). Very little research has been carried out on PDR focusing on management of public projects (Steinfort and Walker, 2007; Ismail *et al.* 2014) and the CSFs for PDR (Ophiyandri *et al.* 2013; Sadiqi, Coffey and Trigunarsyah, 2013). Some of the CSFs seem to dominate in many researches i.e. adequate funding, effective planning and competent project managers (Sadiqi, Coffey and Trigunarsyah, 2013; Bilau, Witt and Lill, 2018), analyzing the critical factors in an unexplored context like Angola is important. Authors contend that the most important project management-related problem is lack of knowledge about the project management

best practices in post-disaster environments (Hayat, Haigh and Amaratunga, 2019; Ismail, *et al.*, 2014). Some authors acknowledge that some major development projects have failed due to the mismatch between the project aims and techniques used for their realization (Crawford, Langston and Bajracharya, 2012). The fact that success factors do exist in other studies and contexts may not necessarily contribute to the successful delivery of PDRPs in Angola. Therefore, there is a need to explore CSFs in PDRPs to learn from the projects they are involved in and their success, as they differ from one project environment or country to another.

The infrastructure in Africa is considered unreliable and expensive due to factors that are holding back development. These factors are the lack of skilled labour, corruption and for inefficient project management practices (KPMG, 2013). Additionally, Bilau and Witt (2016) have presented management issues that have resulted in poor quality and inefficient delivery of PDRPs. These factors are no exception in countries which have been going through civil wars like Angola. Angola is considered because it is a recovering economy and a post-disaster country due to the civil war (1975 – 2002) that destroyed most of its economic infrastructure, production and labour pool for more than 27 years. In Angola, the decades of internal strife have resulted in the destruction or deterioration of physical infrastructure, compromising the country's social and economic cohesion, and its regional integration agenda (ADB, 2011). Managing projects in the post-disaster environment requires paramount attention to accelerate the process and improve the human settlement environment (Karunasena and Rameezdeen, 2010; Rouhanizadeh, Kermanshachi and Dhamangaokar, 2019). Consequently, there is need to explore CSFs in PDRPs, as they can have an impact on the successful delivery of reconstruction projects.

## Theory and practice literature

Project management is an indispensable management tool for the successful operation of projects of any business or organization in a post-disaster/conflict environment. From the strategic management perspective, the public sector is seen as an organization while projects are viewed as temporary undertakings with a beginning and an end. They are systems that when fully completed contribute to the success of organizations. This is only possible if the ongoing reconstruction project process considers the capabilities, constraints and the environment they are in so that lasting benefits are realized and improvements made (Vahanvati and Mulligan, 2017). Although various theories and principles have been designed to guide commercial undertakings, the public sector also needs them. There are several ways that can help change how Non-Government Organizations (NGOs) and governments approach PDRPs. Based on the unique nature of construction industry activities, it is important to consider strategic management theories because of their strategic objectives. Consequently, the theories and concepts of strategic management relate to the humanitarian mind-set and sector organizations. This paper focuses on one of the main views of strategy, the Resource-Based View (RBV), which assumes that organizations should innovatively use their internal resources and skills to deal with the external environment (Barney, 1991; Vahanvati and Mulligan, 2017). This means internal resources for implementing PDRP should be used effectively and transformed appropriately to address the external factors, which will ensure an organization's or project success.

From the RBV, to be competitive, organizations as business entities should consider success factors in their DPRPs. CSFs are regarded as a description of the major skills and resources required for a given project. These factors should be used in decision making by key project

managers to improve efficiency and effectiveness in project delivery. They should be considered during project planning when developing planning tools and during construction phase, which help the organization gain a competitive edge. Internal resources and skills are used as inputs, which help project managers to structure their thoughts. They put more emphasis on improving quality and decision-making skills because the end-product depends on them. The RBV further acknowledges the way in which project managers tackle tasks and solve problems in order to avoid cost and time overruns while adhering to specified project quality. In other words, it provides a better understanding of the best practices of project management, and how these shape and influence project delivery in a PDR environment. It advocates that sustainable competitive advantage is created when competitors cannot duplicate a unique resource or service provided by a firm (Barney, 1991). The RBV or theory further suggests that for a firm to be competitive, it must create a strategic or unique position within its market and embed distinctive resources to maintain that position (Vahanvati and Mulligan, 2017). As Barney (1991) maintains, resources “*must be valuable, rare, and difficult or costly to imitate, without an easy or direct substitute available if they are to yield sustainable competitive advantage*”. Since PDRPs are unique projects with a lot of dynamics, uncertainties and complexities, they should be managed with a high level of coordination and innovation. The skills, competencies and capabilities for managing PDRPs must be unique to realize the desired outcome.

#### KEY SUCCESS FACTORS AND COMPETITIVE ADVANTAGE: THE EXTENDED VIEW

The extended view believes that key success factors incorporate a description of both the market and planning tool. Due to its peculiarity, Angola needs quality inputs that are created through decision making and available resources. Resources and skills are critical for the successful implementation of PDRPs. Therefore, when a valid description of the market and CSFs is used by project participants, it may result in the efficient delivery of PDRP.

#### SUCCESS FACTORS FOR PDRPS

Numerous success factors for PDRPs have been determined, although it is evident that these factors differ from one project environment, country or region to another, even at the global level. Consequently, Ahmed (2011) is of the view that “the criteria used for assessing success can be inconsistent because as yet there is no globally accepted standard or guideline in this field”. It is assumed that each country depending on its environmental conditions and the nature of the projects would have its own success criteria or factors. Some authors have tried to find out what causes the failure of PDRPs. For example; research stressed that the current approach to PDR management is mostly from the point of view of the built environment discipline and not that of the management discipline, probably because of the nature of reconstruction of the projects involved in rebuilding houses, and repairing the infrastructure and damage to the built environment (Norling, 2013). The term “management” in the built environment-related profession is mostly associated with project and construction management, which is unable to deal with the complexities and uncertainties of larger reconstruction projects involving non-physical factors/tasks and the management of people. The management of people and organizations is radically different from normal engineering processes, leading to failure (Enshassi et al., 2017). Additionally, Bilau and Witt (2016) identified management issues, which include the quality of human resources, workmanship and management, monitoring and control, coordination and communication and financial management. They said that failure to manage them may result in the poor delivery of PDRPs.

Several authors have identified the factors that significantly determine project management success in reconstruction projects. In this section a comprehensive review of the literature on success factors is conducted and summarised in Table 1. Research work had different sets of factors that contribute to the successful management of PDRPs, which include resource availability for reconstruction (Chang, Wilkinson and Brunson, 2010), proper planning, coordination among the contractors (Bilau and Witt, 2016), active stakeholder participation, the recovery agency's link with communities, community participation during the recovery process, and agency supervision during reconstruction (Hidayat and Egbu, 2010). Ophiyandri et al. (2013) found twelve factors that were considered for project success. In addition, an extensive literature review carried out by (Ahmed 2011) on post-disaster permanent housing reconstruction in developing countries found that several factors contribute to success in post-disaster reconstruction. According to Hidayat and Egbu (2010), some critical success factors that are inputs to the management system that lead directly or indirectly to the success of a project should be taken into consideration, in order to have a successful PDRP. They concluded that the coordination of organizations and the availability of financial and human resources are important for the success of a reconstruction project. A detailed case study on a tsunami carried out by Moe and Pathranarakul (2006) identified ten CSFs that must be carefully taken into consideration in managing disaster-related public projects in Thailand through the project life cycle. In addition, Kim and Choi (2013) provide insights into the factors that influence the life cycle of rebuilding projects after a flood. Ahmed (2011) argued that the factors contributing to success could be different depending on the nature of the disaster or PDRP. The literature clearly indicates that most studies identified CSFs in their environment, e.g. tsunamis, earthquakes, hurricanes and floods, where the post-disaster environment is different from that of armed warfare/ conflict in Angola. It should be noted that Angola differs from the physical impacts of disaster resulting from natural phenomena. Furthermore, most studies identified the CSFs for project management of international organizations, NGOs and housing projects driven by owners. This study focuses on CSFs as the existing factors may not necessarily contribute to the efficient delivery of PDRPs in Angola. The CSFs extracted from the literature are summarised in Table 1.

Table 1 summary of Critical Success Factor (CSFs) for managing PDRPs

| S/N | Critical success factor  | Authors  |
|-----|--|--|
| 1   | Support from top management                                      | Ophiyandri <i>et al.</i> , 2013; Steinfert and Walker, 2007  |
| 2   | Appropriate project coordination                                 | Ophiyandri <i>et al.</i> , 2013; Moe and Pathranarakul, 2006   |
| 3   | Less bureaucracy in the reconstruction process                   | Ophiyandri <i>et al.</i> , 2013; Moe and Pathranarakul, 2006; Kim and Choi, 2013; Steinfert and Walker, 2007 |
| 4   | Appropriate consultation with key stakeholders and beneficiaries | Ophiyandri <i>et al.</i> , 2013; Patel and Hastak, 2013  |
| 5   | Learning from previous experience                                | Ophiyandri <i>et al.</i> , 2013; Moe and Pathranarakul, 2006; Fengler, Ihsan and Kaiser, 2008                |

Table 1 continued

| S/N | Critical success factor                             | Authors   |
|-----|---|---|
| 6   | Good communication                                  | Ophiyandri <i>et al.</i> , 2013; Moe and Pathranarakul, 2006; Kim and Choi, 2013; Ismail, Majid and Roosli 2017 |
| 7   | Manageable size and complexity of project           | Ophiyandri <i>et al.</i> , 2013; Steinfors and Walker, 2007   |
| 8   | Active Community / stakeholders engagement          | Ophiyandri <i>et al.</i> , 2013; Karunasena and Rameezdeen, 2010; Enshassi <i>et al.</i> , 2017                 |
| 9   | Government support /support from top management     | Ophiyandri <i>et al.</i> , 2013; Ahmed, 2011; Enshassi <i>et al.</i> , 2017                                     |
| 10  | Political stability                                 | Ahmed, 2011; Steinfors and Walker, 2007   |
| 11  | Economic stability                                  | Ophiyandri <i>et al.</i> , 2013; Ahmed, 2011; Sospeter, Rwelamila and Matiku, 2019                              |
| 12  | Skilled and sufficient Resources                    | Norling, 2013; Moe and Pathranarakul, 2006  |
| 13  | Effective project planning                          | Ismail <i>et al.</i> , 2014; Hidayat and Egbu, 2010   |
| 14  | Competent Project managers and teamwork             | Moe and Pathranarakul, 2006; Kim and Choi, 2013; Steinfors and Walker, 2007                                     |
| 15  | Planning, and stakeholder commitments               | Moe and Pathranarakul, 2006; Steinfors and Walker, 2007   |
| 16  | Effective monitoring and Control                    | Kim and Choi, 2013; Ismail <i>et al.</i> , 2014   |
| 17  | Good tendering method                               | Hayat, Haigh and Amaratunga, 2019; Steinfors and Walker, 2007   |
| 18  | Good written contract                               | Bilau, Witt and Lill, 2018; Belassi and Tukel, 1996   |
| 19  | Less negative influence on the physical environment | Ismail <i>et al.</i> , 2014; Kim and Choi, 2013   |
| 20  | Use of IT technology                                | Enshassi <i>et al.</i> , 2017; Patel and Hastak, 2013   |

Adopted and modified from (Ismail *et al.*, 2014).

## Methodology

The study focused on gaining insights into CSFs in PDRPs. The study was descriptive in nature as it sought to analyse CSFs for post-disaster/conflict reconstruction projects in the Angolan public sector. The descriptive approach was particularly useful for establishing the factors that shed light on CSFs in the management of PDRPs in the Angolan public sector. A survey and interviews were used to collect data and analyse social interactions (Creswell and Creswell, 2018). Explanatory sequential mixed research approach was used because interviews were conducted after the survey to further explain the survey results. The mixed



method was used to generate more incisive and robust findings on the project management practices that can contribute to and improve PDR activities. Angola has 18 Provinces and 157 Municipal Governments. The research focused on Luanda province, which was selected as the study area because Luanda is the capital of Angola, had suffered severe damage due to the civil war and had almost 80% of all PDRPs. The pilot study was done to determine a list of DPR projects as sample frame in which 350 was determined to be the population. A multi-stage sampling approach where the projects were first purposively selected followed up by another purposive selection of the respondents from the selected projects was adopted. Non-probability sampling hence purposive sampling techniques were used to select the subjects to be included in the study, based on their knowledge of the phenomenon (Saunders, Lewis and Thornhill, 2016). The second reason for using the purposive sampling was deemed appropriate because the sample was hand-picked based upon the researchers' first-hand knowledge of the indigenous construction firms (Rowley, 2014) a decision supported in previous post disaster recovery studies such as Ophiyandri *et al.* (2013) in Sri Lanka. The sample size was 150 projects and respondents from the central, provincial and municipal governments that have been involved in the reconstruction projects were selected from Table 2. The study purposely selected reconstruction projects that have been completed in the last five years or running for at least five years and in the final stages. Interviews were conducted after the survey to provide a better understanding of prevailing success factors on the ground and complimented the results obtained in the questionnaire (Yin, 2014). For example, the general question was: in a post-disaster reconstruction project, taking into consideration the different phases, i.e. planning and construction, could you please tell what critical factors most affect the success of project and why? Criteria for selection of interviewees were; worked for more than 5 years in reconstruction projects, managed at least one successful PDR project. The size of the sample was 8 for interviews and was selected from Table 2 (Yin, 2014). Out of 8 interviews, 7 were reached and their results are presented in Table 6. The techniques were considered suitable because selection of respondents was based on their ability to provide relevant information on CSFs for managing PDRPs. The PDR process is viewed from the construction project management perspective, thus respondents for this research were construction project stakeholders, which in the Angolan context consists of contractors, consultants and the local government (as project owner or client). For example, four groups of respondents identified are indicated in Table 2 and respondents were purposively selected from them. Questionnaires were emailed to 80 respondents and 120 were hand delivered and administered by 3 research assistants. Correspondingly, previous research on the subject matter was perused. The questionnaire contained active and attribute variables. Twenty success factors extracted from the literature formed a list of factors in the questionnaire for respondents to rate using active variables (1 (Not critical at all), 2 (Less critical), 3 (Fairly critical), 4 (Critical), 5 (Very critical)). Out of 200 questionnaires, 53 were returned through email and 77 were collected by the research assistants, equating to 130. All 130 were adequately filled in for analysis. The data was cleaned and analyzed using IBM SPSS 21, from which measure of central tendency, mean, median and standard deviation was used. Consequently, one sample statistics and t-test were used to ascertain significant PDRP success factors and analysis of variance was used to determine the differences between groups of respondents. In order to ascertain whether these differences were significant, post-hoc comparisons using the Turkey HSD test were conducted. Chileshe and Yirenyi-Fiango (2011) used a similar approach to assess the perception of threat risk frequency and impact on construction projects by different stakeholders in Ghana. Qualitative data was used to compliment the survey findings and was analyzed by content

analysis. The themes used in this study were developed from survey results with the exceptions of the 3 emerged themes. It was important in order to better explain, validate and or rectify the survey results. The narratives or quotes from the participants matched the themes to enable connection between the theme and current knowledge.

**Table 2** Public Sector Groups and Number of projects involved in Post-disaster Reconstruction Projects purposively selected for semi-structured Interviews and survey

| Participants                    | Central Government Department | Provincial Governments | Municipal or Local Governments | Total      |
|---------------------------------|-------------------------------|------------------------|--------------------------------|------------|
| National Officials or Directors | 13                            | 0                      | 0                              | 13         |
| Consultants                     | 10                            | 14                     | 0                              | 24         |
| Contractors                     | 13                            | 25                     | 50                             | 88         |
| Managers or coordinators        | 0                             | 25                     | 200                            | 225        |
| <b>Total</b>                    | <b>36</b>                     | <b>64</b>              | <b>250</b>                     | <b>350</b> |

## Presentation of results

### PROFILE OF QUESTIONNAIRE RESPONDENTS

Most respondents had obtained a Diploma (35%), while 32% had obtained a degree and above, of whom 69% were male and 31% were female. Most respondents (31.0%) of the respondents are drawn from the provincial government, followed by local government (23.0%). The proportion of the respondents in terms of functions was: The majority (46 %) were project managers followed by construction managers (19%). The majority (46%) as having considerable experience in the project management role of the industry (6-10 years), followed by those with more than 1 year, but less than 5 years of experience (38%). Only 1 individual (1%) had 16 – 20 years of experience. Four (3%) respondents had 11 - 16 years of experience in managing reconstruction projects. It is correct to say 64% has been involved in PDRPs for more than 1 year, which gives the confidence in reliability of the results.

### PROFILE OF THE INTERVIEWEES

This research conducted 7 semi-structured interviews out of 8. The target was set for conducting 8 interviews, but it was not reached. Three of the interviewees were female and four were male, aged between 35 and 50. They all had at least an undergraduate degree with five respondents having obtained a master's degree and two a PhD. Seven interviewees were senior managers in the three mentioned organizations: Entity within Ministry of Planning (EMP), Entity within Provincial Government Office of Project Planning (EPGOPP) and Entity within Local Government (ELG). As managers, they were responsible for determining and managing accomplishment of the project. Their influence on the projects was significant. Furthermore, all project team members and team leaders reported to them and took directions



from them. All three project organizations involved in reconstruction and development projects were in the public sector. During reconstruction projects most of their efforts were focused on project management.

## PRESENTATION OF RESULTS AND ANALYSIS

The respondents to the survey were asked to rate the criticality of factors on a scale of 1 (not critical at all) to 5 (very critical). This section presents results from questionnaires and interviews.

## FINDINGS FROM THE QUESTIONNAIRES RANKING OF CSFS FOR MANAGING PDR PROJECTS

Table 3 shows the results of mean score analysis and one-sample *t*-tests of the 20 CSFs for managing PDRPs. Based on the mean score (MS) and ranking in Table 3, the study found twelve success factors as emerged from the questionnaires. Adequate funding was the highest ranked factor based on the overall sample (MS = 4.75), effective planning was the second ranked factor for managing DPRPs with mean score (4.70), competent project managers was the third ranked with mean score (4.69), good communication ranked fourth with mean score (4.66), sufficient resources was the fifth ranked based on the overall sample (mean = 4.62), good tendering method with mean score (4.42), active involvement of stakeholders with mean score (4.40), political stability with mean score (4.26), good written contract with mean score (4.20), learning from previous experience with mean score (4.10), skilled and sufficient project team with mean score (4.08) and support from top management with mean score (4.05). All these twelve factors were between 4.05 and 4.75 and according to the Likert scale ( $MS \geq 4$ ) are generally agreed critical factors. Additionally, looking at Table 4, rest of the factors were between 3.60 and 4.00 mean scores. Looking closely at Table 3, results of One-Sample Test indicated that most of success factors were significant such as economic stability ( $t(129) = 4.228, p = 0.00 < 0.05$ ), good written contract ( $t(129) = 2.005, p = 0.00 < 0.05$ ), learning from previous experience ( $t(129) = .401, p = 0.020 < 0.05$ ), active involvement of stakeholders/community ( $t(129) = 4.221, p = 0.020 < 0.05$ ), effective project planning ( $t(129) = -1.347, p = 0.024 < 0.05$ ), adequate funding ( $t(129) = -2.532, p = 0.025 < 0.05$ ), competent project Managers ( $t(129) = -.144, p = 0.026 < 0.05$ ), good communication ( $t(129) = -.306, p = 0.031 < 0.05$ ), sufficient resources ( $t(129) = 1.265, p = 0.032 < 0.05$ ) and less bureaucracy in the reconstruction process ( $t(127) = 2.156, p = 0.036 < 0.05$ ).

Table 3 Descriptive statistics and t- Test

|                            | t      | df  | Test Value = 4  |                 | Mean | Ranking |
|----------------------------|--------|-----|-----------------|-----------------|------|---------|
|                            |        |     | Sig. [2-tailed] | Mean Difference |      |         |
| Adequate funding           | -2.532 | 129 | .025            | -.360           | 4.75 | 1       |
| Effective project planning | -1.347 | 129 | .024            | -.100           | 4.70 | 2       |
| Competent project manager  | -.144  | 129 | .026            | -.020           | 4.69 | 3       |
| Good communication         | -.306  | 129 | .031            | -.040           | 4.66 | 4       |
| Sufficient resources       | 1.265  | 129 | .032            | .140            | 4.62 | 5       |

Table 3 continued

|   | Test Value = 4 |     |                 |                 |      |         |
|---|----------------|-----|-----------------|-----------------|------|---------|
|   | t              | df  | Sig. (2-tailed) | Mean Difference | Mean | Ranking |
| Good tendering method                               | .948           | 128 | .348            | .120            | 4.42 | 6       |
| Active involvement of stakeholders/community        | 4.221          | 129 | .020            | .400            | 4.40 | 7       |
| Political stability                                 | 5.039          | 129 | .150            | .460            | 4.26 | 8       |
| Good written contract                               | 2.005          | 129 | .000            | .240            | 4.20 | 9       |
| Learning from previous experience                   | .401           | 129 | .002            | .060            | 4.10 | 10      |
| Skilled and sufficient project team                 | .682           | 129 | .498            | .080            | 4.08 | 11      |
| Support from top management/parent company          | .000           | 129 | 1.000           | .000            | 4.05 | 12      |
| Appropriate project coordination                    | -.489          | 128 | .057            | -.060           | 3.94 | 13      |
| Economic stability                                  | 4.228          | 128 | .000            | .420            | 3.92 | 14      |
| Adequate consultation                               | -.670          | 129 | .601            | -.100           | 3.90 | 15      |
| Less bureaucracy in the reconstruction process      | 2.156          | 127 | .036            | .260            | 3.86 | 16      |
| Effective project monitoring and control            | -1.498         | 129 | .131            | -.180           | 3.82 | 17      |
| Less negative influence on the physical environment | 1.969          | 129 | .055            | .220            | 3.68 | 18      |
| Manageable size and complexity of project           | .000           | 126 | 1.000           | .000            | 3.64 | 19      |
| Use of technology and IT                            | 1.399          | 129 | .168            | .220            | 3.60 | 20      |

Table 4 presents the results of Analysis of Variance (ANOVA) between different functions of respondents within organizations. The results show that there is a statistically significant difference in the mean critical success factors between the different functions of the respondents within organizations. Since presenting results for all the factors will unduly increase the length of the paper “Adequate funding, effective project planning, competent project manager, sufficient resources and economic stability” have been presented as reference.

Table 4 Analysis of Variance (ANOVA) between different functions of the respondents within organizations

|                  |                | Sum of Squares | df | Mean Square | F     | Sig. |
|------------------|----------------|----------------|----|-------------|-------|------|
| Adequate funding | Between Groups | 10.298         | 3  | 3.433       | 3.353 | .021 |

Table 4 continued

|                            |                | Sum of Squares | df  | Mean Square | F      | Sig. |
|----------------------------|----------------|----------------|-----|-------------|--------|------|
|                            | Within Groups  | 129.002        | 126 | 1.024       |        |      |
|                            | Total          | 139.300        | 129 |             |        |      |
| Effective project planning | Between Groups | 37.274         | 4   | 9.318       | 11.868 | .000 |
|                            | Within Groups  | 98.149         | 125 | .785        |        |      |
|                            | Total          | 135.423        | 129 |             |        |      |
| Competent project manager  | Between Groups | 12.093         | 4   | 3.023       | 3.254  | .014 |
|                            | Within Groups  | 116.130        | 125 | .929        |        |      |
|                            | Total          | 128.223        | 129 |             |        |      |
| Sufficient resources       | Between Groups | 35.146         | 4   | 8.787       | 13.916 | .000 |
|                            | Within Groups  | 78.923         | 125 | .631        |        |      |
|                            | Total          | 114.069        | 129 |             |        |      |
| Economic stability         | Between Groups | 8.176          | 4   | 2.044       | 1.980  | .102 |
|                            | Within Groups  | 129.055        | 125 | 1.032       |        |      |
|                            | Total          | 137.231        | 129 |             |        |      |

Table 5 presents the results of post-hoc comparisons using the Turkey HSD test for the critical success factors where there were significant differences. Since presenting results for all the factors will unduly increase the length of the paper “Good written contract” has been presented as reference.

Table 5 Turkey HSD Table of Post-hoc Tests on the CSFs for managing PDR Projects among respondents in different functions within organizations

| Dependent Variable    | (I) Functions within Org. | (J) Functions within Org. | Mean Difference (I-J) | Std. Error    | Sig.        | N  |
|-----------------------|---------------------------|---------------------------|-----------------------|---------------|-------------|----|
| Good written contract | Managers                  | Construction              | -.26316               | .27394        | .772        | 60 |
|                       |                           | Consultants               | <b>-.70285*</b>       | <b>.26426</b> | <b>.043</b> |    |
|                       |                           | client/owner              | .00632                | .29674        | 1.000       |    |

Table 5 continued

| Dependent Variable | (I) Functions within Org. | (J) Functions within Org. | Mean Difference (I-J) | Std. Error | Sig.  | N  |
|--------------------|---------------------------|---------------------------|-----------------------|------------|-------|----|
|                    | Construction              | Managers                  | .26316                | .27394     | .772  | 24 |
|                    |                           | Consultants               | -.43969               | .21170     | .166  |    |
|                    |                           | Client/owner              | .26947                | .25107     | .706  |    |
|                    | Consultants               | Managers                  | .70285*               | .26426     | .043  | 26 |
|                    |                           | Construction              | .43969                | .21170     | .045  |    |
|                    |                           | Client/owner              | .70917*               | .24047     | .020  |    |
|                    | Client/owner              | Managers                  | -.00632               | .29674     | 1.000 | 20 |
|                    |                           | Construction              | -.26947               | .25107     | .706  |    |
|                    |                           | Consultants               | -.70917*              | .24047     | .020  |    |

\*. The mean difference is significant at the 0.05 level.

## FINDINGS FROM THE INTERVIEWEES

Thirteen themes emerged from the interviews, which are presented in Table 6.

Table 6 Critical Success Factors from the interviews (All Public Sector Entities)

| Success Factors - All Public Sector Entities (n=7 out of the sample N=8) | No of participants |
|--|--------------------|
| Communication  | 2                  |
| Coordination   | 5                  |
| Good planning  | 7                  |
| Project management   | 6                  |
| Leadership   | 3                  |
| Integrity  | 1                  |
| Stakeholder involvement  | 4                  |
| Material availability  | 2                  |
| Teamwork   | 1                  |
| Supervision (learning from previous experience)                          | 2                  |
| Human resources  | 6                  |
| Equipment  | 2                  |

Table 6 presents success factors from the interviews. During the interviews, the participants were asked to explain the critical factor and how it affects PDRPs. Twelve themes emerged from the interviews which showed that all 7 interviewees mentioned 'good planning' as a critical success factor. Another important factor was project management, as mentioned by

six out of seven interviewees. A project manager indicated that good project management is critical for the success of a project. Six interviewees considered 'human resources' to be a critical factor. Four interviewees mentioned stakeholders' involvement as being critical for the success of a project. Four interviewees stated that 'coordination' was critical for the success of reconstruction projects. Another interesting theme that emerged from the interviews is 'integrity' of the personnel involved in reconstruction projects, which was found to be critical for project success.

## Discussion of the findings

The results of the data analysis presented in the previous sections show that only 12 ranked out of the 20 identified success factors are regarded as critical success factors. The top 8 high ranked success factors are significant and the rest are not significant. This explains that there are many success factors for managing PDRPs. The following subsections present a brief discussion of factors in the top ranking. These factors are all needed at the early stage of the project through to the completion phase. Some of these factors were revealed in previous studies, implying that they exist in other countries.

*Adequate funding* is the highly ranked CSF and statistically significant ( $t(129) = -2.532, p = 0.025 < 0.05$ ). The factor has been previously ranked higher as a CSF for reconstruction projects by other researchers (Ophiyaandri *et al.* 2013). For example, Norling (2013) consistently noted that, funding is needed by the contractor to mobilize the site and procure all the necessary materials, tools, plant and equipment needed at the site. The implication of this finding is that the Angolan public sector needs to take funding into consideration as the availability or shortage can greatly contribute either to promote or reduce the capacity of organizations to implement PDR projects.

*Effective planning* is the second highly ranked CSF and statistically significant ( $t(129) = -1.347, p=0.024 < 0.05$ ). The factor has been supported by interview finding. Participant R04-EMP stated:

*"The most important factor in my view is good planning. Difficulties with [construction] materials are reasonable on a project, but as long as there is good planning, I guess there will be no problem, the project will be a success. But if planning is not good, I doubt the project will be a success because at the end there will be an addendum or contract termination."*  
(R04-EMP)

Good planning will prevent unnecessary delays in activities which may have cost and time implications. Other authors support that, effective planning on large infrastructure projects can greatly contribute to a timely procurement process, proper preparation and package of the project and realistic implementation schedule (Ismail *et al.*, 2014)). This finding is consistent with the study by (Hidayat and Egbu, 2010), which reported that good planning is all what is needed for successful completion of PDRPs. It ensures that with good planning the reconstruction process is on track. During planning, problem areas that may hinder the achievement of project outcomes are identified and a potential course of action is put in place before it is too late.

*Competent project managers* is the third highly ranked CSF and statistically significant ( $t(129) = -.144, p=0.026 < 0.05$ ). As appreciated by other authors, Rwelamila (2007) assert that competent project managers are needed at this stage to completion of the project to help

improve the delivery of PDRPs by agencies or NGOs. The early stage of the project needs competent project managers and not accidental project managers as stated by (Rwelamila and Purushottam, 2012). They should not be appointed as project managers because they have a qualification in the same field as the project's core business. They should be appointed because they have the competence and appropriate skills for leading the project until it is completed. Not employing competent people in the process, as a result of limited capacity has also been identified among the barriers to post disaster recovery (Rouhanizadeh, Kermanshachi and Dhamangaonkar, 2019). Whilst the focus of that study might have been on challenges, addressing those factors could be constituted as CSFs. The factor is supported by interview findings. It was asserted by a participant that;

*“Project managers who can master the field of successful reconstruction projects. Project managers who understand the work, which is the “up” and “down” approach. The ‘up’ means he is coordinating with the consultant and the owner. ‘Down’ means he should have a good relationship with the site engineer and foreman. So, the project manager’s job is very strong here, so many duties. It is the PM who I think can be relied upon for the quality and success of the project”.* (R02-EPGOPP).

The respondent argued that project managers should have appropriate skills that include the ability to work with top and lower management in reconstruction projects. At this stage project manager are needed not only to identify clear objectives, ensure transparency and provide good communication, but also to give the right direction for the project. This finding is consistent with a study by (Akotia and Opoku, 2018; Kim and Choi, 2013), who affirm that project managers are crucial because they are the ones who translate clients' needs and put project requirements into practice. These factors are crucial for the whole construction process of a project.

*Good communication* is the fourth ranked CSF and statistically significant ( $t(129) = -.306$ ,  $p=0031 < 0.05$ ). In the post-disaster environment, where there is great uncertainty, requiring the rapid reaction of multiple stakeholders and adaptability when dealing with large-scale complex projects, proper communication and coordination among these stakeholders are of critical importance. The factor is appreciated by a participant assert:

*“Improving communication can enhance trust and coordination between project managers and coordinators, as well as between project owners and managers”.* (R01-EMP).

The significance of this success factor is consistent with a study by (Norling, 2013) who state that “communication systems” should be well managed for the rapid, accurate, reliable and up-to-date transmission of information about the PDR project. It is further affirmed by researchers that maintaining and enhancing effective mechanisms of social and communication interaction between organizations can help to avoid overlaps and wasting time and materials and financial resources (Fengler, Ihsan, and Kaiser, 2008). Communication and coordination have a direct influence on the other goals of PDRPs, such as transparency, accountability, participation and mitigation of corruption.

*Active involvement of stakeholders and community engagement* was the fifth ranked CSF statistically significant ( $t(129)$ ,  $p=0.020 < 0.05$ ). This factor was equally ranked higher by (Crawford, Langston and Bajracharya, 2012), the recovery agency's link with communities and community participation during the recovery and reconstruction process (Hidayat and Egbu, 2010). One of the participants explains:



*"I think the most decisive is our relationship with the community, as users. Because if the contractor or consultant works with the contractor for a limited period and the contractor works during a contract term that we have set. So, the point is don't let problems exist in the community. There should be intensive communication with the public, and socialization (of our work) with the community. Most of our programmes are successful because of the focus on the community."* (R03-ELG).

Other post-disaster related studies such as Ophiyandri *et al.* (2013) have identified community and stakeholder engagement among the CSFs of community-based post-disaster housing reconstruction projects (CPHRP) during the pre-construction in Indonesia. The finding is also consistent with other authors (Ahmed, 2011; Karunasena and Rameezdeen, 2010). Involvement of communities is essential because, they are the first respondents after the disaster. They also have a good knowledge of the culture and other requirements in the reconstruction process. Others CSFs as appreciated by authors are; *learning from previous experience* ( $t(129) = .401, p=0.020 < 0.05$ ) (Bilau, Witt and Lill, 2018), *support from top management* (Ophiyandri *et al.*, 2013; Ahmed, 2011), *sufficient resources and economic stability* ( $t(129) = 4.228, p=0.00 < 0.05$ ), (Ophiyandri *et al.*, 2013; Ahmed, 2011).

After further analysis of post hoc, 2 CSFs were statistically significant. These are: good written contract and less bureaucracy.

*Good written contract* was highly ranked and statistically significant ( $t(129) = 2.005, p=0.00 < 0.05$ ). the factor is also appreciated by (Hayat, Haigh and Amaratunga, 2019) as a CSF. There were significant differences ( $p = 0.043 < 0.05$ ) between managers and consultants and between consultants and contractors ( $p = 0.045 < 0.05$ ) regarding the CSF of good written contract. Managers ranked this CSF 0.043, whereas the consultants ranked it 0.045 with a mean difference of 0.70285. This suggest that project Managers and consultants hold consistent views on 'good written contracts as evidenced by almost similar p value scores attributed to this critical success factor. The findings show significant different because Managers would perceive 'good written contract' as being less likely than consultants since Managers are part of implementing agency and would not be in a position to assess it effectively compared to consultants or contractors. So, the finding of good contract and effective policies on management of fund are consistently supported for the effective delivery of reconstruction projects (Bilau, Witt and Lill, 2018). Normally, proper work contract is signed before the construction starts. If well prepared, it facilitates the operation, reduces bureaucracy and increases integrity because every party of the contract is responsible to the process. It may also prevent some issues that may require the use of legislation or policies for PDRPs. Proper signed contract may have positive impact from the early stages of construction and goes beyond the completion phase.

Less bureaucracy appears to be a significant success factor ( $t(127) = 2.156, p=0.036 < 0.05$ ). The finding further revealed that, there were significant differences ( $p = 0.005 < 0.05$ ) between managers and consultants and between consultants and clients ( $p = 0.002 < 0.05$ ) regarding the CSF of less bureaucracy. Managers ranked this CSF 0.005, whereas the consultants ranked it 0.002 with a mean difference of -0.79715. This finding imply that contractors are concerned with a smooth flow of construction activities. Since Government is an implementing agency, there may be unnecessary bureaucracy in approving variations as well as addendum for extension of time (Kim and Choi, 2013). As a result, the project manager may fail to determine the direction of a project from early to completion hence delays and cost overruns as these stages are dependent on each other during the reconstruction process. It implies that reconstruction process may not be successful if there is bureaucracy.

Furthermore, only one factor in the ANOVA-post hoc analysis shows that there is a statistically significant difference in the mean critical success factors between the different functions of the respondents within organizations. This implies that the combined p value of more CSFs is  $> 0.05$  hence there is no difference in the response between groups of project managers, contractors, clients and consultants.

## Conclusion and implications

This study sought to determine critical success factors for managing PDRPs in Angola. 9 out of 20 success factors were determined through One Sample statistics and t-Test. The findings assert that adequate funding, effective planning, competent project managers, good communication, active involvement of stakeholders/community, good written contract, sufficient resources, economic stability, learning from previous experience and support from top management are critical success factors. The findings further revealed that only good written contract and active involvement of stakeholders in the Turkey HSD post hoc test results had significance difference in responses within groups of project managers, consultants, contractors and clients. It shows that, there is no statistically significant difference in the mean of CSFs between the different functions of respondents within organizations. This implies that there are no differences in the responses between the groups especially between managers and consultants and between contractors and consultants. The findings strongly suggest that CSFs as management inputs have the potential to determine the direction of a project and influence its efficient and effective implementation in terms of its benefits, delivery and sustainability. The study results are useful to project teams (project managers and key stakeholders) as they provide project management best practices to curb the PDR situation. Project teams will need to observe and consider them as they significantly influence the successful implementation of PDRPs.

## CONTRIBUTION AND LIMITATION OF THE STUDY

Although some studies have been carried out on project management of “typical” construction projects, little work has been done on what makes public PDRPs successful. One of the main contributions of this study lies in the identification of an ordered grouped set of CSFs for managing post-disaster reconstruction projects in Angola. Another significant contribution of this paper is that it sheds light and provides insights on the understanding of the CSFs that contribute as inputs to best practices for managing PDRPs in Angola, an area previously under-researched. The findings can be used by key project stakeholders to ensure success as they provide the understanding of the best practices in this environment that requires the coordinated efforts of all key project stakeholders. Since PDR is context specific, countries with the same economic and political status, reconstruction policies and severity of the post-disaster event may benefit with the results.

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