Outsourcing as an Approach for Facilities Management Service Delivery in Social Housing Within A Semi-Arid Climate

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ABSTRACT

Outsourcing is an approach for facilities management (FM) service delivery through external service providers but has however remained relatively unexplored. The purpose of this study is to explore its use as a relevant approach for FM service delivery in social housing within a semi-arid climate. Using a cross-sectional questionnaire survey, ninety (90) questionnaires were administered; and a total of 49 (54%) were retrieved. Data collected were analyzed descriptively and inferentially using frequency and percentages, mean index, and standard deviations with Stata 11.0 statistical tool. Pearson's chi-square test and mean ranking were performed to determine the relationship between respondents' demography and FM sourcing approach. Findings among others reveal that, out of the four types of FM sourcing approaches (In-house, outsourcing, public-private partnership, and total facilities management), outsourcing has been most appropriate and beneficial due to cost reduction, accessibility to skills, expertise, and ideas, making cost transparent, reducing depreciation and obsolescence, and accessibility to new products in order of benefits. In conclusion, the study emphasizes the development of FM strategies and the adoption of outsourcing for FM service delivery in social housing within a semi-arid climate. Therefore, the paper recommends IFMA and other FM professionals launch advocacy on the potentialities of adopting outsourcing for FM service delivery in social housing and the housing sector in general.

Keyword: Facilities Management, FM services, Outsourcing, Social housing, Semi-arid climate, Maiduguri, Nigeria

INTRODUCTION

Outsourcing is an approach for facilities management (FM) service delivery through external service providers. In other words, it is the practice of replacing the in-house sourcing approach with an external service provider to enhance organizational efficiency and effectiveness (Ikediashi, 2018). According to Globe Newswire (2023), the global FM market is dominated by outsourced services that emphasize improving business processes and enhancing facility operations. Plunkett Research (2023) also reported approximately $575 billion in gains through outsourcing by global industry in 2020, substantially on logistics, sourcing, and distribution services; information technology services; and business process outsourcing. Outsourcing is identified to be one of the most widespread business strategies used by organizations due to the benefits it offers (Kurdi et al., 2011). One of the benefits of outsourcing that brought it into the limelight is cost saving by reducing bureaucratic inefficiencies, allowing large organizations and governments to access economies of scale, bypassing costly labour, and competition among service providers (Kurdi et al., 2011; Ranasinghe et al., 2019; Tannor et al., 2021). To gain access to some of these aforementioned perceived benefits, a number of social housing in the developing countries such as Nigeria embraced outsourcing (Goyal and Pitt, 2007; Umeora, 2018; Joseph *et al*., 2021). A

noticeable component of the services outsourced in social housing is FM services that support the occupants and caters for their health and wellbeing.

Conversely, FM services remain a subject of discussion in academia and practice for many years (Ikediashi and Aigbavboa, 2018; Bello *et al*., 2019; Islam et al., 2019; Momoh *et al*., 2021; Nicholas *et al*., 2022; and others). Its accounts for a considerable proportion of organizations' expenses; and are acknowledged as the crucial service category for improving and extending the economic lives of buildings and ensuring the safety of users (Wuni *et al*., 2018; Amankwah *et al*., 2019; Chukwu *et al*., 2020; Tannor *et al*., 2022). Thus, Alabi and Uwaezuoke (2021) grouped FM services into hard and soft services; the former comprises real estate maintenance and management, system operation, energy management, landscaping, design of accommodations, administration, communications, records management, health, and safety (Hinks *et al*., 2003; Atkin and Brooks, 2009). While the latter consists of support services such as cleaning, refuse collection and disposal management, creche management, courier services, security, laundry, and catering, among others (Lai, 2011).

However, researchers (Chotipanich, 2004; May and Pinder, 2008; Atkin and Brooks, 2009; Umeora, 2018; Alabi and Uwaezuoke, 2021) posit that FM services are diverse in their needs and requirements are influenced by the environments and the organizational features. For instance, in an environment such as a semi-arid climate that is bedeviled by extreme weather events due to climate change and variability (Gadzama, 1991; World Meteorological Organization, 2016), other relevant FM services peculiar to such environments, in addition to the conventional FM services remains an essential requirement (Saunders and Phillipson, 2003; Jones *et al*., 2013; Jones et al. 2017). Thus, there is a need for social housing estates to have a proper FM strategy in place for efficient and effective management because the absence of an appropriate FM sourcing strategy causes the gradual setting in of physical, functional, and economic obsolescence (Mclenan, 2004).

Several attempts have been made in the past to study different aspects of outsourcing FM services in different organizations within different regions of Nigeria. For instance, Gbadegesin and Babatunde (2015) investigated experts' opinion on outsourcing decision in facilities management practice in public Universities in Nigeria. Ikediashi (2014) examined outsourcing of facilities management (FM) services in public hospitals in Nigeria. Ikediashi and Aigbavboa (2018) studied outsourcing of facilities management services delivery in Nigerian universities. Ogunsanya et al. (2019) assessed the barriers to sustainable procurement in the Nigerian construction industry. Chukwu et al. (2020) appraised FM practices with a view to improving service delivery in Nnamdi Azikiwe University Teaching Hospital. Ishiyaku et al. (2020) assessed staff perception on outsourced facilities management services in Dalhatu Araf specialist hospital Lafia, Nigeria. Mohammad (2020) investigated outsourcing and public universities performance in Nigeria. Fayomi et al. (2021) explored real estate outsourcing practice of banks and telecommunication companies in Lagos, Nigeria. However, neither of these studies considers examining the concept of outsourced FM services within the context of social housing in the semi-arid climate of Nigeria. Thus, this study is significant and timely as its outcome will theoretically add to existing knowledge on FM outsourcing in the housing sector and contribute to social housing management. Therefore, this study attempted to determine the appropriateness of the outsourcing approach for FM service delivery in social housing in the study area. This was achieved by investigating outsourcing as an FM strategy for service delivery in social housing within a semi-arid climate. Thus, the first part of this paper is the introduction, followed by a review of extant literature, then the research methodology, including the theoretical framework, the results and discussion, and the conclusion and recommendations.

FM in the housing sector

FM has gained more cognizance and application in almost all the sectors of the economy, such as the housing sector, due to advancements in technology and economic development (Lai, 2011). It assumes an

increasingly important factor in the built environment as it addresses the issues of effective housing management (Joseph, 2021). The necessity to provide coherent environments has made many organizations in the built environment embrace the principles of FM (Zailan, 2000; Joseph *et al.*, 2021). Thus, Mclenan (2004) opined that there is a need for large housing estates to have proper FM in place to maintain them because the absence of an appropriate FM framework causes the gradual setting in of physical, functional, and economic obsolescence. As such, the application of FM tenets in the housing sector of many developed and developing economy is due to the nature of capital outlay in its development (Joseph *et al*., 2021), the running costs involved in its life cycle, and the realization that FM deals with the management of built assets and incorporates services necessary for successful operations of an organization (Umeora, 2018); and the provision of excellent working and living environments for the ultimate satisfaction of the building users (Goyal and Pitt, 2007). Therefore, its ideal the adoption of appropriate sourcing approach to ensure FM services are provided and their ultimate aim of satisfaction is achieved.

FM services

The services common to most facility-managed organizations are categorized into hard and soft FM services (Alexander et al., 2004; Alabi and Uwaezuoke, 2021); the former comprised management and maintenance of the property, systems operation, energy management, landscaping, accommodation planning, administration, communications, records management, health, and safety among others (Hinks et al., 2003; Atkin and Brooks, 2009); the latter according to Lai (2011) entails the management of support services such as cleaning, waste management, security, laundry, and catering. FM services are often found in most organizations regardless of type and size; as such, Chotipanich (2004) provided generic FM services required: facility project management, maintenance and repairs, real estate and property management, planning and programming, space planning and management, building services, and operations, office services, operation administration, and employee support and services. In addition, Then (2004) also categorized the services into behavioral management; operational management; space management; and financial management. Equally, Joseph et al. (2021) identified eight FM services which include projecting a building's identity and image; maintenance planning (equipment, etc.); record-keeping (legal requirements, monitoring, etc.); reducing operational impacts and life cycle cost; responding to complaint and suggestion; Contract and contractor management; energy and water management; enhancing comfort and amenity for facility users.

Conversely, given the above FM service typologies, identifying end-users' FM service requirements in a given organization or environment becomes ideal. For instance, in an environment such as a semi-arid climate that suffers from extreme weather conditions due to climate change and variability, sourcing other relevant FM services in addition to the conventional ones is critical. Such services can be alteration and improvements maintenance services, provision and replacement of facilities that meet thermal requirements and corrosion resistance, and climate information services (Saunders and Phillipson, 2003; Jones *et al*., 2013; Jones *et al*., 2017) planting of trees and shrubs for shelter, and windbreaking, erection and maintenance of perimeter walls and changing openings directions (Mohammed *et al*. 2020) and vaccinations for occupants protection from airborne diseases among others (Meindinyo *et al*., 2017). Although, the provision of such FM services depends on factors such as organizational policy; organizational structure; the stage of organizational development; business processes and operational strategy; corporate culture; and stakeholder interests and priorities (Chotipanich, 2014).

Outsourcing of FM services

FM services are procured in-house by a team of employees and resources engaged by the organization (Barret and Baldry, 2003; Atkin, 2003) or through outsourcing, public-private partnership, and total FM by an external service provider that performs FM role for the organization (Atkin, 2015; Moktar and Myeda, 2022; Alhassan et al., 2023). The in-house and outsourcing approaches are the two common strategies for

providing FM services (Alhassan et al., 2023). These approaches have benefits and limitations (Moktar and Myeda, 2022). For instance, an in-house approach associated with an absence of security risk and threat to confidentiality (Alexander et al., 1996; Adhikari et al., 2019); organizations market performance (Adhikari et al., 2019); higher energy efficiency (Gansmo, 2013); user satisfaction (Gansmo, 2013; Shin et al., 2017); allows for innovation on the part of the FM team, prevents redundancies, and reduces overdependence on external service providers (Tannor et al., 2022). While in-house limitations are inaccessibility to professional, expert, and high-quality services (Alexander et al., 1996; Atkin and Brookes, 2015); higher costs for organizations (Toyauova, 2012; Ikediashi, 2015; Amos and Gadzekpo, 2016; Lok et al., 2021; Tannor et al., 2021); absence of competitive advantages to organizations (Amos and Gadzekpo, 2016, Ikediashi, 2014); low efficiency and productivity in the non-core business process (Alexander et al., 1996).

On the other hand, outsourcing is a management framework to improve organizational efficiency and effectiveness by turning over complete management and decision-making authority of service delivery to an external service provider (Ikediashi and Aigbavboa, 2018). Hence outsourcing is contracting out to obtain services or products from an outside provider instead of having them provided by in-house resources (Adegoke and Adegoke, 2013; Ikediashi and Aigbavboa, 2018). Outsourcing as a sourcing approach offers a range of benefits which include; higher quality of service; Lower cost of services in the long term; Specialist expertise and skills that are not available in-house; and Managers have more time to concentrate on higher priorities (Alexander, 1996; Barrett and Baldry, 2003; Kakabadse and Kakabadse, 2001; Hassanain and Al-Saadi, 2005). Other advantages are achieving best practices; providing more creativity and innovation to improve the process; and speeding up the delivery process (Alexander, 1996). Other benefits are organizational efficiency and performance (Ikediashi *et al*., 2015); enhancement of organizations' competitiveness (Alhassan *et al*., 2023); offering best practices, improved cost discipline skills of managers (Kakabadse and Kakabadse, 2001); flexibility in responding to market trend (Kurdi *et al*., 2011; Cigolini et al., 2009; Wickramasinghe *et al*., 2019; Okoro et al., 2020) facilitate efficiency gains and cost-effectiveness; offers solutions to demand and challenges; reduces empire-building; and reduced total operating costs (Barrett and Baldry, 2003).

Furthermore, Lindholm (2005) identified the following drivers of outsourcing; the need to restrict own activities, increase flexibility and profitability, solve capacity problems by shifting to an outside supplier, cost transparency, reducing cost, gaining access to knowledge, and restricting own investments in staff/or capital goods, competition, and insufficiency in own resources. Others are the retirement of in-house personnel, mixing direct labour with external contractors, quality services and customer satisfaction, the fashion trend of privatization, requirements for special skills, adjustments for work fluctuations, and the need for specialist equipment. Although outsourcing also has shortcomings, Lok *et al*. (2018) identified poor service quality, security concerns, and lack of experience as limitations to outsourcing. Others are perceived loss of control; transaction cost; monitoring cost; security risks/threat to confidentiality; loss of in-house skills/expertise (Barrett and Baldry, 2003); hidden costs; possible contract breach; losing control over outsourced activities; ambiguous terms and conditions; and lack of cohesiveness amongst team members (Dekkers, 2011; Driedonks *et al*., 2014; Okoro *et al*., 2020). Nevertheless, the growing complexity in FM practice taking a strategic decision to bring in competent external service providers to manage FM portfolios of organizations to enable them to focus on their core areas of competitive advantage remains pertinent.

Theoretical framework

This study is premised on the resource-based view theory (RBV), which postulates that when an organization is deficient in valuable resources and expertise/skills to carry out a task effectively, it should be sourced from an external vendor with the resources to carry out that task (Perunovic and Pedersen, 2007; Zhang, 2017). Therefore, an organization outsources the services it lacks or the resources or capabilities to complete a task internally. For example, Housing Corporations (managers of social housing in Nigeria)

often need to outsource the maintenance of building structures and the provision of facilities due to a lack of in-house skills/expertise. The RBV proposed that organizations such as the Housing Corporation access resources through outsourcing to obtain mutual advantage and cater to occupants' satisfaction. This theory was traced to Wernerfelt (1984) and assumed popularity with the work of Barney and Hesterly (1996). According to Vaxevanoua and Konstantopoulosa (2015) the theory assumes that there can be distinctions in the resource base and skill base of organizations. Hence, an effective combination of such resources results in a competitive advantage. This theory has buttressed several studies in established literature that proposed outsourcing as the appropriate sourcing approach to FM service delivery. For instance, Alhassan *et al.* (2023) assessed the facilities management sourcing approaches in hotels in Ghana using the RBV theory and found out that outsourcing decisions in several hotels in Ghana were predominantly guided cost, core business, absence of in-house skills/expertise and the hotel size. Similarly, Vaxevanoua and Konstantopoulosa (2015) found RBV theory relevant in the preparation and selection stages of the outsourcing process. Tayauova (2012) examined the advantages and disadvantages of outsourcing practices of Kazakhstan banks using RBV and contend that outsourcing is the ideal sourcing strategy for FM services in the banking industry.

The context of study

Maiduguri, the study area (see Figure 1), is the capital of Borno State, and a city in the semi-arid climate of Nigeria. It covers a total area of 543 km^2 and lies between latitudes 11° 40° N and 11° 44° N and longitude 13° 05° E and 13° 14° E and is about 350m above sea level; its spatial position and altitude lie within Lake Chad Basin Formation, on 320 mean sea levels (Mshelia *et al.*, 2023).

Figure 1. Map of Nigeria showing Maiduguri (Adapted from Encyclopaedia Britannica, 2013)

There are over 5,000 varied units designed in the existing stock of social housing found within and outskirts of Maiduguri, which is the highest concentration in the whole of the semi-arid climate of Nigeria, allocated to low-income earners. Maiduguri is among the growing urban areas in the semi-arid climate and is closer to the Bilma Plain in the Niger Republic and the Chad Basin, which are the two sources of dust (McTainsh and Walker, 1982). It is also well documented in the extant literature (Gadzama, 1991) that due to it open and flat topography, there is an uninterrupted incursion of the larger size of dust particles and a high concentration of settled dust; a phenomenon referred to Harmattan.

RESEARCH METHODOLOGY

To explore the appropriateness of outsourcing for FM service delivery in social housing within semi-arid of Nigeria, the study employed a quantitative research strategy. The quantitative methodology provides precise and trustworthy measurements in statistical analysis (Creswell, 2018). This study adopted a quantitative

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approach to achieve the objectives and began with theories underpinning the study. This aided in identifying the variables used to design the survey questionnaire. The questionnaires were validated by two senior academic researchers and FM practitioners/managers in the study area that are also members of International Facilities Management Association (IFMA) Nigeria chapter; and later through a pilot study. Ninety (90) questionnaires administered; and a total of 49 (54%) were retrieved. The questionnaire approach as an instrument for data collection has many advantages, which include the acquisition of responses in a regular manner, permitting easy analysis, reducing bias, and it is faster and more convenient to gather appropriate information from a large number of respondents (Creswell, 2018). It also offers higher response rates for studies in the Built Environment in developing countries such as Nigeria (Olaleye, 2000). Respondents were selected using both simple and purposeful random sampling method to minimize bias.

The analysis is based on the usable number of completed forty-nine (49) questionnaires retrieved. Data collected were analyzed descriptively and inferentially using frequency and percentages, mean index, and standard deviations with Stata 11.0 statistical tool. Pearson's chi-square test and mean ranking were performed to determine the relationship between respondents' demography and FM sourcing approach.

ANALYSIS AND FINDINGS

The analysis is based on the usable number of completed forty-nine (49) questionnaire retrieved.

Demographic characteristics of respondents

The descriptive statistics of the demographic information of respondents are presented in Table 1 and 2.

Table 1. Cross-tabulation of professional affiliation and qualification of respondents

Qualification										
	HND		BSc		MSc		PhD		Total	
Professional Affiliation	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
Facilities Management	1	11	16	60	11	50	1	20	29	46
Estate Surveying & Valuation	5	56	2	7	3	13	4	80	14	22
Civil Engineering	0	0	5	19	1	5	0	0	6	10
Architecture	0	0	0	0	5	22	0	0	5	8
Quantity Surveying	1	11	2	7	0	0	0	0	3	5
Building Engineering	1	11	2	7	1	5	0	0	4	6
Urban and Regional Planning	1	11	0	0	1	5	0	0	2	3
Total	9	100	27	100	22	100	5	100	63	100

The results (Table 1) show an uneven distribution among respondents concerning professional affiliation and qualifications skewed toward a BSc, as 16 (60%) respondents out of the 27 respondents are holders of a BSc. The results show that 27 respondents have a BSc, followed by holders of Master's degrees (22), while the remaining 9 and 5 are holders of Higher National Diplomas (HND) and Ph.D. The number of Ph.D. holders is one for FM, as against four respondents for Estate Surveying and Valuation. Although, respondents with FM background are highest with 29 (46%) and eleven out of 22 with Master's degree compared to other respondents with different professional affiliations. This result shows that the respondents have the required experience and knowledge about FM, thus indicating reliability in their judgments and opinions about FM service-sourcing approaches. Similarly, many respondents were directly responsible for

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coordinating the management of estates and properties and FM services provision.

Table 2. Cross-tabulation of professional affiliation and years of service of respondents

	Years of Service											
	1-5		6-10		11-20		21-30		>30		Total	
Professional Affiliation	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%	Freq	%
1	9	60	9	53	11	55	0	0	0	0	29	46
2	4	26	4	23	2	10	2	32	2	40	14	22
3	1	7	2	12	2	10	1	17	0	0	6	10
4	0	0	1	6	2	10	1	17	1	20	5	8
5	1	7	1	6	1	5	0	0	0	0	3	5
6	0	0	0	0	2	10	1	17	1	20	4	6
7	0	0	0	0	0	0	1	17	1	20	2	3
Total	15	100	17	100	20	100	6	100	5	100	63	100

Note: 1 (Facilities Management); 2(Estate Surveying & Valuation); 3(Civil Engineering); 4 (Architecture); 5 (Quantity surveying); 6 (Building Engineering); and 8 (Urban and Regional Planning)

Similarly, with regards to respondents' years of experience (see Table 2), those whose years of corresponding 20 (32%) of the sampled population. This is followed by 6-10 and 1-5 years brackets with a frequency of 15 (24%) and 6 (10%), while respondents above 30 constitute the least with a frequency of 5 or 8%. However, possible reasons for the 11-20 years' experience brackets could be because, until now, only a few higher institution of learning offers FM as a first degree in Nigeria (Olaniyi, 2017). Although, given the interdisciplinary nature of the profession, graduates from the other built environment disciplines are also involved in FM practice (Oladokun, 2012). Years of service above thirty years are respondents affiliated with Estate Surveying and Valuation, Architecture, Building Engineering, and Urban and Regional Planning. This supports the assertions by researchers on the stage of development of FM, particularly in developing countries such as Nigeria.

FM sourcing approaches

The results of the categories of FM services (as extracted from the established literature) cum the selected sourcing approach by respondents are presented in Table 3.

Table 3. FM sourcing approach for FM service categories

	In-house		**Outsource**		**PPP**		**Total FM**	
FM services	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**	**Freq.**	**%**
Maintenance and repairs								
Maintenance of building structure/fabrics	14	29	23	47	7	14	5	10
Maintenance of drainage system	13	27	22	45	5	10	9	18
Road network maintenance	10	20	18	37	8	16	13	27
Streetlight maintenance	9	18	25	51	6	12	9	18
Maintenance of perimeter walls	20	41	17	35	7	14	5	10
Alteration and improvements maintenance	13	27	27	55	6	12	3	6

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Mechanical & Electrical Maintenance	14	29	24	49	5	10	6	12
Building services and operations								
Sewage collection and disposal	12	24	25	51	8	16	4	8
Refuse collection and disposal	16	33	22	45	5	10	6	12
Fire prevention service	9	18	27	55	9	18	4	8
Water supply service	14	29	23	47	9	18	3	6
Electricity supply service	17	35	21	43	6	12	5	10
Environmental management services								
Green space management service	10	20	29	59	7	14	3	6
Wind breaking and landscaping services	12	24	27	55	5	10	5	10
Pest control/Fumigation services	13	27	19	39	11	22	6	12
Support services								
Health and safety	13	27	25	51	6	12	5	10
Security	17	35	23	47	4	8	5	10
Mail/Courier service	12	24	26	53	6	12	5	10
Helpdesk/reception	9	18	25	51	12	24	3	6
Cleaning and Housekeeping	16	33	22	45	7	14	4	8
Laundry	11	22	36	73	1	2	1	2

From the results (in Table 3) of the FM sourcing approach for maintenance and repairs category, outsourcing is the most appropriate except for maintenance of perimeter walls that calls for in-house (41%) as against 35% for outsourcing. Similarly, regarding building services and operations, outsourcing remains the ideal sourcing approach for all the FM services under this category. Regarding environmental management services, the results indicated that outsourcing is pertinent for sourcing FM services, such as green space management (59%), windbreaking and landscaping services (55%), and pest control/fumigation services (39%). In the provision of support services, the results reveal that the outsourcing approach is relevant for sourcing health and safety (51%), security (47%), and mail/courier service (53%); others are helpdesk/reception (51%), cleaning and housekeeping (45%), and laundry (73).

Meanwhile, the results indicated the appropriateness of the outsourcing approach, as against in-house,public-private partnership, and total FM. This finding is not unconnected with past studies in established literature on the advantages of outsourcing to provide FM services; for instance, Ikediashi et al. (2014) noted that outsourcing FM services is a way of instilling flexibility which has the potential for strategic focus of the organization. Adedayo and Ayodeji (2015) also avowed that organizations focus primarily on their core business and rely on outsourcing for support services.

Similarly, Ikediashi (2015) averred that most government agencies, corporations, and non-governmental organizations in developing countries such as Nigeria have realized that outsourcing is relevant in providing services and management functions. More so, Poor et al. (2019) posit that many organizations prefer to outsource FM services for better results and efficiency and to focus on their core activities. In addition, the outsourcing approach, as asserted by Tannor et al. (2021) and Alhassan et al. (2023), has become the ideal sourcing approach to help improve facilities' standards, satisfaction, and value and enhance organizations' competitiveness.

Conversely, following the respondents' opinions on the relevant sourcing approach, a normality test was conducted and the results indicated a significant value of less than 0.05 for the twenty-one (21) variables

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(see Table 6.13); this shows a non-normal distribution as it is less than the *p*-value of 0.05 (P<0.05) threshold. Thus, based on this outcome, a non-parametric test was used (Pallant, 2016; Field, 2017). Thus a Pearson's chi-square test was carried out to determine the influence of the demographic characteristics of respondents on the types of sourcing approaches (Bortolini and Forcada, 2019; Mohammed *et al*., 2020). Thus, the association between FM service approach and the demographic characteristics of respondents was determined using the Pearson chi-square test (see Table 4).

Table 4. Relationship between demographic characteristics and the selected sourcing approach

	Professional Affiliation		**Qualification**		**Years of service**	
Code	***?2***	***P*-value**	***?2***	***P*-value**	***?2***	***P*-value**
FM1	31.899	0.023	9.437	0.398	15.781	0.201
FM2	34.502	0.011	9.183	0.421	16.631	0.164
FM3	20.199	0.322	7.884	0.546	8.208	0.769
FM4	33.252	0.016	13.297	0.150	9.253	0.680
FM5	21.563	0.252	17.823	0.037	10.992	0.530
FM6	30.219	0.035	16.208	0.063	10.313	0.589
FM7	18.655	0.413	5.664	0.773	14.624	0.263
FM8	34.241	0.012	7.102	0.626	8.521	0.743
FM9	18.390	0.430	9.149	0.424	15.206	0.196
FM10	13.483	0.762	5.707	0.769	8.185	0.771
FM11	19.469	0.363	6.123	0.728	12.506	0.429
FM12	16.426	0.563	10.129	0.340	11.440	0.492
FM13	35.838	0.007	17.327	0.044	4.983	0.959
FM14	32.698	0.018	15.142	0.087	14.827	0.251
FM15	23.752	0.163	20.287	0.016	19.486	0.071
FM16	13.781	0.743	7.903	0.544	12.951	0.393
FM17	32.681	0.018	20.548	0.015	7.903	0.793
FM18	13.905	0.735	12.310	0.196	8.749	0.724
FM19	19.801	0.344	8.009	0.533	11.676	0.472
FM20	16.826	0.535	10.215	0.333	21.281	0.046
FM21	18.061	0.452	14.269	0.113	6.620	0.886

*Note: $?^2$= Chi-square; P-value = Probability/Significance level; degree of freedom (df) for professional affiliation = 18; df for qualification = 9; df for years of service = 12

The results (Table 4) showed a statistically significant relationship between respondents' professional affiliation and the type of FM sourcing approach for maintenance of building structure/fabrics (FM1) (*?2* [18] = 31.899, P = 0.023) and maintenance of drainage (FM2) (*?2* [18] = 34.502, P = 0.011). Others include streetlight maintenance (FM4) (*?2* [18] = 33.252, P = 0.016) and alteration and improvement maintenance (FM6) (*?2* [18] = 30.219, P = 0.035). However, FM sourcing types under this category that have no

statistically significant relationship with professional affiliation are road maintenance (FM3) (*?2* [18] = 20.199, P = 0.322), maintenance of perimeter walls (FM5) (*?2* [18] = 21.563, P = 0.252) and mechanical and electrical maintenance (FM7) (*?2* [18] = 18.655, P = 0.413). While concerning respondents' qualifications, only the type of FM sourcing for maintenance of perimeter walls is statistically significant with *?2* [9] = 17.823, P = 0.037. Similarly, despite the spread of years of service of the respondents across different professional affiliations and qualifications, the type of FM sourcing approach for the maintenance and repair category has no statistically significant relationship with respondents' years of service.

Moreover, the Pearson chi-square results showed a non-statistically significant relationship between respondents' demographic characteristics and the type of FM sourcing approach for building services and operations except sourcing approach for sewage collection and disposal (FM8) (*?2* [18] = 34.241, P = 0.012) and professional affiliation. In the category of environmental management services however, the results indicated a statistically significant relationship between respondents' professional affiliation and qualification and the type of FM sourcing approach for green space management service (FM13) with *?2* [18] = 35.838, P = 0.007; and *?2* [9] = 17.327, P = 0.044). Similarly, the results also revealed a non-statistically significant relationship between respondents' demographic characteristics and the type of FM sourcing approach for FM support services except sourcing approach for security (FM17) (*?2* [18] = 32.681, P = 0.018) and professional affiliation; and security with qualification (*?2* [9] = 20.548, P = 0.015); and cleaning and housekeeping (FM20) and years of service (*?2* [12] = 21.281, P = 0.046).

Table 5. Benefits for FM sourcing approaches

	In-house		**Outsourcing**		**PPP**		**Total FM**	
Code	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**	**Mean**	**Std. Dev.**
B01	1.816	1.349	4.449	1.081	2.306	0.918	2.286	0.913
B02	1.653	0.830	1.653	0.991	2.327	1.107	1.816	1.131
B03	1.735	1.151	1.939	0.922	2.367	1.236	2.735	1.132
B04	1.857	1.208	4.224	1.327	1.755	0.947	2.653	1.200
B05	2.020	1.266	4.020	1.090	2.653	1.110	2.653	1.217
B06	2.347	0.597	3.837	1.313	2.837	0.874	2.265	1.255
B07	2.020	1.181	4.449	0.580	2.878	0.881	2.000	1.118
B08	2.184	1.318	3.755	1.331	2.286	1.399	2.061	0.944
B09	2.408	1.273	3.551	1.487	2.796	1.154	2.673	1.144
B10	2.082	1.205	4.367	0.636	2.980	1.010	2.551	0.709
B11	2.082	1.455	4.061	1.265	1.796	1.060	1.551	0.709
B12	3.755	1.031	2.755	0.902	2.857	0.577	2.082	0.997
B13	1.857	1.275	3.388	1.367	3.490	0.711	3.224	0.941
B14	2.408	1.368	4.041	0.889	3.184	1.034	1.878	0.881
B15	1.816	0.697	4.163	0.717	1.898	0.918	3.796	1.384
B16	4.224	0.941	1.694	0.713	1.633	0.566	1.898	1.104
B17	3.857	1.258	2.041	1.040	2.265	0.605	1.633	0.668
B18	4.163	0.943	2.694	0.742	3.714	0.764	2.082	1.470
B19	1.469	0.581	4.327	1.107	3.469	0.581	3.347	0.561
B20	1.796	0.957	3.735	1.483	3.265	0.531	4.102	0.714
B21	1.694	0.585	4.388	0.996	3.204	0.790	3.449	0.614

B22	1.490	0.794	4.469	0.868	3.796	0.539	2.755	0.662
B23	1.612	1.169	4.347	0.969	3.857	0.612	2.878	0.781
B24	2.694	0.466	4.510	0.869	3.306	0.619	2.816	0.882
B25	1.653	0.663	4.224	0.896	2.367	0.698	2.265	0.670
B26	1.857	0.540	3.959	0.576	2.061	0.556	3.306	0.652
B27	1.000	0.000	4.245	1.437	3.347	1.234	3.571	1.173
B28	4.265	0.785	3.286	0.764	2.429	0.791	2.918	0.954
B29	2.102	0.743	3.327	1.162	2.571	0.736	3.020	0.595
B30	3.633	0.906	2.898	1.177	2.122	0.564	2.898	1.229
B31	4.000	0.004	2.184	1.185	2.327	1.107	1.755	0.902
B32	2.816	0.972	3.714	1.568	3.837	0.590	2.837	1.313
B33	3.857	1.000	3.571	1.458	2.653	0.830	3.429	1.323

*Note: B0-B04 = Cost-related benefits; B05-B07 = Time-related benefits; B08-B20 = Strategy-related benefits; B21-B25 = Innovation-related benefits; B26-B28 = Quality-related benefits; and B29-B33 = Service-to-community-related.

From the results of FM sourcing approach benefits shown in Table 5, the outsourcing approach is the most beneficial sourcing approach concerning cost-related benefits, which include making cost transparent (B01), reducing investments in assets (B02), reducing invested capital (B03), and achieving cost reduction (B04), with mean scores of M = 3.524, SD = 1.635; M = 3.714, SD = 1.361; M = 3.333, SD = 1.586; and M = 3.476, SD = 1.635. The least in terms of benefit is in-house, with mean scores less than 2.100 for all the cost-related benefits. Similarly, results of time-related benefits of the sourcing approaches, which comprised of enhancing timely delivery of service (B05), avoidance of delay in acquiring tools and techniques (B06), and reducing depreciation and obsolescence (B07), outsourcing approach is the most beneficial sourcing approach with mean scores of M = 3.190, SD = 1.645; M = 3.524, SD = 1.533; and M = 3.921, SD = 1.406. Moreover, the strategy-related benefits are the third category containing thirteen benefits. The results show in-house sourcing approach is beneficial as it offers accessibility to a comparison of the performance of sourcing strategies [B12] (M = 2.905, SD = 1.500); absence of security risk [B16] (M = 3.635, SD = 1.484), absence of confidential leakages [B17] (M = 3.397, SD = 1.530) and accessibility to effective mentoring of staff [B18] (M = 3.857, SD = 1.401). On the other hand, the remaining nine benefits under this category are associated with outsourcing, as indicated by higher mean scores. The results of the innovation-related category also indicated outsourcing as the most beneficial among the other types of approaches, given the mean scores. For instance, accessibility to a new product [B21] (M = 4.032, SD = 1.332); accessibility to skills, expertise and ideas [B22] (M = 4.032, SD = 1.332); accessibility to services and technologies [B23] (M = 4.143, SD = 1.162); stimulating innovation among personnel [B24] (M = 3.968, SD = 1.295); and enhancing quicker response to new needs [B25] (M = 4.175, SD = 1.185 respectively. Likewise, the results for quality-related benefits revealed outsourcing is more beneficial in terms of improving performance standards [B26] (M = 4.175, SD = 1.115), improving the quality of service to occupants [B27] (M = 4.143, SD = 1.229) and improving trust between BSHC and occupants [B28] (M = 3.365, SD = 1.311).

Furthermore, in the service-to-community-related benefits, the results indicate outsourcing as the most beneficial sourcing given the high mean scores. For instance, improving stakeholders' satisfaction [B29] has M = 4.032, SD = 1.092; and improving occupants' relation [B30] with M = 3.508, SD = 1.134. Others are improving labour relations [B31] (M = 3.127, SD = 1.420); enhancing corporate social responsibility of the BSHC [B32] (M = 3.540, SD = 1.446); and employment opportunities for the local community [B33] (M = 3.730, SD = 1.405).

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However, given the appropriateness of the outsourcing approach and as the most beneficial approach, the benefits of outsourcing are thus presented in Table 6 in order of importance (ranked).

Table 6. Ranked outsourcing benefits

Code	Benefits	Mean	Std. Dev.	Rank
B04	Achieving cost reduction	4.510	0.869	1st
B22	Accessibility to skills, expertise and ideas	4.469	0.868	2nd
B01	Making cost transparent	4.449	1.081	3rd
B07	Reducing depreciation and obsolescence	4.449	0.580	4th
B21	Accessibility to new products	4.388	0.996	5th
B10	Increase flexibility	4.367	0.636	6th
B23	Accessibility to services and technologies	4.347	0.969	7th
B19	Improving the Corporation's ability to change and growth	4.327	1.107	8th
B27	Improving quality of service to occupants	4.245	1.437	9th
B24	Stimulating innovation among personnel	4.224	1.327	10th
B25	Enhancing quicker response to new needs	4.224	0.896	11th
B15	Minimizing size of Housing Corporation personnel	4.163	0.717	12th
B11	Handling varying demand more effectively	4.061	1.265	13rd
B14	Sharing of risks	4.041	0.889	14th
B05	Enhancing timely delivery of service	4.020	1.090	15th
B26	Improving performance standard	3.959	0.576	16th
B06	Avoidance of delay in acquiring tools and techniques	3.837	1.313	17th
B08	Focusing on core competencies	3.755	1.331	18th
B20	Reduced vacancies and redundancy	3.735	1.483	19th
B32	Enhancing corporate social responsibility	3.714	1.568	20th
B33	Employment opportunities for local communities	3.571	1.458	21st
B09	Enhancing strategic positioning	3.551	1.487	22nd
B13	Moving with privatization trend	3.388	1.367	23rd
B29	Improving on stakeholders' satisfaction	3.327	1.162	24th
B28	Improving mutual trust between organization and occupants	3.286	0.764	25th
B30	Improving occupants' relation	2.898	1.177	26th
B12	Access to comparison of performance of sourcing strategies	2.755	0.902	27th
B18	Accessibility to effective mentoring of staff	2.694	0.742	28th
B31	Improving labour relations	2.184	1.185	29th
B17	Absence of confidentiality leakages	2.041	1.040	30th
B03	Reducing invested capital	1.939	0.922	31st
B16	Absence of security risk	1.694	0.713	32nd
B02	Reducing investments in assets	1.653	0.991	33rd

CONCLUSION

The study examined the strategy for FM service delivery in social housing within a semi-arid climate. It involved a questionnaire survey to ninety (90) respondents representing FM professionals/academics and academics. Their responses were analyzed using descriptive statistics and Pearson's chi-square test. Findings reveal that, out of the four identified sourcing approaches in extant literature (In-house, outsourcing, public-private partnership, and total facilities management), outsourcing has been most appropriate and beneficial. The finding indicated that achieving cost reduction, accessibility to skills, expertise, and ideas, making cost transparent, reducing depreciation and obsolescence, and accessibility to new products are the top-ranking benefits of outsourcing. Findings also reveal no statistically significant relationship between the respondents' demography and the selection of the appropriate sourcing approach. In conclusion, the study emphasizes the development of FM strategies and the adoption of outsourcing for FM service delivery in social housing within a semi-arid climate. Thus, there is a need for IFMA and other FM professionals to launch advocacy on the potentialities of adopting outsourcing for FM service delivery in the housing sector.

Meanwhile, the finding indicated practical implications for FM service delivery in social housing in the semi-arid climate and research. In terms of research, the study provides the appropriate sourcing approach for FM service delivery in social housing in the study area. This study is part of an ongoing Ph.D. study on the FM service framework for social housing estates in the semi-arid climate of Nigeria. The study can be conducted in other environments apart from the semi-arid climate.

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