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Manpower Forecasting and Organisational Effectiveness: An Empirical Assessment of the Akwa Ibom State Civil Service

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Abstract

This study examines the influence of manpower forecasting on organisational effectiveness in the Akwa Ibom State Civil Service, Nigeria. Effectiveness is operationalised as organisational performance, that is, the extent to which the civil service achieves its goals efficiently and delivers expected services. A cross-sectional survey design was adopted. A structured questionnaire measured on a five-point Likert scale, and pilot-tested for internal consistency using Cronbach's alpha, was administered to civil servants in five ministries selected through multistage (stratified and simple random) sampling. A sample of 389 was derived from an accessible population of 13,772 using the Taro Yamane formula. Of 428 questionnaires distributed, 402 were valid for analysis. Data were analysed with descriptive statistics and simple linear regression at the 0.05 level of significance. Respondents generally agreed that manpower forecasting supports organisational performance (grand mean = 4.16 against a criterion mean of 3.00). Regression results showed a significant positive relationship between manpower forecasting and

organisational performance ($R = 0.641$, $R^2 = 0.411$, $F = 278.23$, $t = 16.68$, $p < 0.001$), indicating that forecasting accounted for about 41.1% of the variation in performance. The null hypothesis was therefore rejected. The findings suggest that the state civil service should maintain reliable, regularly updated personnel records and use them to anticipate the number and skill mix of staff it will need.

Keywords: manpower forecasting; human resource planning; organisational effectiveness; organisational performance; public sector; Akwa Ibom State; Nigeria

1. Introduction

Human resources are among the most consequential assets of any organisation, because people convert financial, technological and physical resources into outcomes. For public organisations, whose performance is judged by the consistency of service delivery and responsiveness to citizens as much as by efficiency, the quality and deployment of the workforce is central (Berman et al., 2019; Bratton et al., 2021; Stone et al., 2024). Human resource planning occupies a strategic place in this process. It determines how many employees an organisation needs, with what skills, and when, and it aligns those decisions with organisational strategy rather than leaving staffing to react to shortages as they appear (Mansaray, 2019; Armstrong & Taylor, 2023).

Manpower forecasting is the analytical core of human resource planning. It involves estimating the future number, skills and timing of staff requirements and comparing them with the capacity the organisation already has, so that gaps and surpluses can be addressed before they become operational problems (Ayandibu & Kaseeram, 2020; Durai et al., 2024; Joseph et al., 2024). The resource-based view explains why this matters: human resources contribute to sustained performance when they are valuable and appropriately deployed (Wernerfelt, 1984; Barney, 1991), while human capital theory treats employee skills and knowledge as an investment that yields returns only when matched to organisational need (Schultz, 1961; Becker, 1964). In both perspectives, an organisation that cannot anticipate its workforce needs is poorly placed to use its people effectively.

The public sector adds complications. Political, regulatory, fiscal and administrative constraints shape workforce decisions, and the effectiveness of planning depends on recruitment processes, institutional frameworks and available resources (Berman et al., 2019; Ikyanyon et al., 2020). Studies of Nigerian public institutions link weak workforce planning to understaffing, overstaffing and misalignment between employee skills and institutional needs, with adverse consequences for performance (Etim et al., 2020; Eze et al., 2022; Nwafor et al., 2024; Anaekwe et al., 2025). Inaccurate forecasts can leave units

overloaded and service capacity reduced, or inflate personnel costs without commensurate service gains.

The Akwa Ibom State Civil Service is the main institutional channel through which state policy is converted into public services. Recent studies of the service have drawn attention to performance management, reward administration, succession planning, career development and strategic management as determinants of performance (Edet et al., 2023; Atairet et al., 2024; Umanah et al., 2024; Edem et al., 2025; Ataide et al., 2025). Concerns about inadequate workforce planning, staff shortages and work overload recur in this literature. What is less clear is whether the capacity of the service to forecast its future manpower needs is itself associated with how well it performs.

The closest existing evidence leaves this question open. Etim et al. (2020) found a significant positive correlation between manpower planning and organisational effectiveness in a Nigerian federal public bureau, but did not isolate forecasting from other planning activities and did not study the Akwa Ibom State Civil Service. Okon et al. (2022) examined manpower planning and effectiveness at Akwa Ibom State University, a single university rather than the civil service, and likewise treated forecasting as part of a wider planning construct. Eze et al. (2022) reported a positive relationship between human resource planning and performance in the National Human Rights Commission, again at the level of planning as a whole. Reviews of the human resource management–performance link also caution that practices are interrelated and that their effects depend on context (Boon et al., 2019; Pombo & Gomes, 2020). Taken together, the literature supports a general link between planning and performance but offers little context-specific evidence on the distinct contribution of manpower forecasting in a Nigerian state civil service.

This study addresses that gap treating manpower forecasting as a distinct dimension of human resource planning and tests its relationship with organisational effectiveness, operationalised as organisational performance, in the Akwa Ibom State Civil Service. The study was guided by one research question: ***to what extent does manpower forecasting influence organisational effectiveness in the Akwa Ibom State Civil Service?*** It tested this one null hypothesis at the 0.05 level of significance:

H_0: Manpower forecasting has no significant influence on organisational effectiveness (performance) in the Akwa Ibom State Civil Service.

The study contributes in three ways thus, it provides sub-national evidence on a human resource planning practice that is often examined only as part of a broader construct. It offers the state government and civil service leadership an empirical basis for decisions on staffing, recruitment and deployment. And it adds to the strategic human resource management and public administration literature on workforce planning in developing-country public sectors.

2. Literature Review

2.1 Conceptual review

Manpower forecasting: Manpower forecasting is the process of estimating the number and kinds of employees an organisation will need, and the skills and competencies they should possess, over a defined period (Armstrong & Taylor, 2023). It is the demand-and-supply analysis at the centre of human resource planning: forecasts of future requirements are set against the existing workforce so that shortages, surpluses and skill gaps are identified in advance (Ayandibu & Kaseeram, 2020; Durai et al., 2024). Contemporary approaches range from simple ratio and trend methods to analytics and artificial-intelligence-based models (Joseph et al., 2024), but the underlying purpose is unchanged: to replace guesswork in staffing decisions with evidence. Forecasting is influenced by budget limits, attrition through retirement, resignation and transfer, changes in technology, and shifts in the services an organisation is expected to provide. Where it is absent or unreliable, managers are left to make late, reactive decisions on recruitment, deployment and training.

Organisational effectiveness and performance: Organisational effectiveness refers to the degree to which an organisation achieves its goals and uses its resources efficiently in doing so. In private firms it is often expressed through financial results. In public organisations it is judged more broadly, by the consistency and quality of services, the implementation of policy and responsiveness to citizens (Berman et al., 2019). Organisational performance is similarly treated as a multidimensional construct that extends beyond financial results to include operational efficiency, service quality and stakeholder satisfaction, particularly in service-driven organisations (Tom et al., 2026). This study therefore treats effectiveness as organisational performance in the civil service: goal achievement, operational efficiency, workflow and service delivery.

Forecasting and performance: The conceptual link is straightforward. Performance depends on having the right people, in the right numbers, with the right skills, at the right time (Mansaray, 2019). Forecasting is the mechanism that makes this possible. Accurate forecasts allow an organisation to time recruitment, plan training and avoid both overload and idle capacity. Weak forecasts produce understaffed units, surplus personnel costs and skill mismatches that depress performance (Etim et al., 2020; Nwafor et al., 2024). Forecasting is rarely exact, but a reasonable estimate that is revisited regularly still reduces the scale of staffing errors.

2.2 Theoretical framework

This research has three theoretical underpinnings that explain why manpower forecasting should influence performance.

Resource-based view (RBV): The RBV holds that resources which are valuable, rare and difficult to imitate can sustain superior performance (Wernerfelt, 1984; Barney, 1991). Applied to human resources, the theory implies that a workforce contributes to performance only if it is acquired, organised and deployed in line with organisational needs (Collins, 2021; Gerhart & Feng, 2021; Chadwick & Flinchbaugh, 2021). Manpower forecasting is the planning step that identifies which human resources are required, so it determines whether the organisation holds the right workforce capability at all.

Human capital theory: Human capital theory regards employee knowledge and skills as capital in which organisations and society invest for productive returns (Schultz, 1961; Becker, 1964). The returns depend on investing in the right skills for the right roles. Forecasting supplies the information on which skills will be needed, so it guides recruitment and development spending and reduces the risk of investing in capabilities the organisation cannot use.

Systems theory: Drawing on the general systems perspective associated with Ludwig von Bertalanffy, systems theory views an organisation as a set of interdependent parts that interact with each other and with their environment. In a civil service, ministries depend on staffing inputs to produce services, and changes in policy, budgets and the labour market alter what is required. Forecasting works as the scanning and feedback function that keeps staffing inputs aligned with changing demands, so that failures in one part of the system do not spread to others.

In all, the theories give a coherent expectation as RBV explains why the workforce matters, human capital theory explains why the skill content of the forecast matters, and systems theory explains why anticipating change keeps the whole organisation functioning. All three predict a positive relationship between forecasting and performance, which grounds the hypothesis the researcher will be testing.

2.3 Empirical review

Evidence from Nigeria consistently associates workforce planning with better organisational outcomes, though rarely at the level of forecasting alone. Etim et al. (2020) used primary and secondary data from a federal public bureau and reported a significant positive correlation between manpower planning and organisational effectiveness, concluding that systematic planning strengthens the capacity of public bodies to meet their responsibilities.

Their study, however, treated planning as a single construct and did not examine the Akwa Ibom State Civil Service.

Okon et al. (2022) examined manpower planning and effectiveness at Akwa Ibom State University using a descriptive survey of 302 respondents drawn from a population of 1,225 with the Taro Yamane technique. Staff-mix utilisation had a significant positive effect on productivity, while work-life balance, climate and incentives showed negative effects, leading the authors to recommend sustained training and motivation alongside planning. The setting was a university rather than the civil service, and forecasting was not analysed separately.

Eze et al. (2022) studied human resource planning and performance in the National Human Rights Commission and found a positive relationship, suggesting that deliberate anticipation and management of staffing needs improves institutional effectiveness. The findings relate to a federal commission and to planning as a whole. Anaekwe et al. (2025) examined manpower planning and organisational performance in the Anambra State Ministry of Environment over 2018–2022, providing sub-national public-sector evidence in a setting close to the present one, but again without distinguishing forecasting from other planning activities.

Makhanya (2024) offers a conceptual and analytical perspective as his study found that staff perceived the human resource system as unsuccessful where human capital needs were not integrated with organisational goals, and argued that forecasting must cover skills as well as headcount. Its conclusions were not tested with primary data on the independent effect of forecasting on performance.

Broader reviews add a caution. Human resource practices operate as interrelated systems, and their association with performance depends on context (Boon et al., 2019; Pombo & Gomes, 2020). This is a reason to test forecasting specifically in the institutional setting where policy will be applied, rather than assuming results from other organisations carry over (Ikyanyon et al., 2020). While the theories predict, and Nigerian studies broadly support creating a positive link between workforce planning and organisational performance, three limitations remain. First, most studies measure manpower planning as a whole, so the specific contribution of forecasting cannot be separated. Second, the Akwa Ibom evidence on planning comes from a single university, and Akwa Ibom civil service studies have focused on other practices such as rewards, succession planning and career development (Edet et al., 2023; Atairet et al., 2024; Edem et al., 2025). Third, the available conceptual work on forecasting has not been matched by survey-based tests in the state civil service. This study fills these gaps by testing the effect of manpower forecasting on organisational performance using primary data from the Akwa Ibom State Civil Service.

3. Methodology

3.1 Research design

The study adopted a cross-sectional survey design. The design suited the aim of the study, which was to obtain standardised responses from a large number of serving civil servants on existing manpower forecasting practice and its perceived relationship with organisational performance at a single point in time, and to subject those responses to descriptive and inferential analysis. Data were collected from respondents within the study period rather than from the same respondents over several years.

3.2 Population, sample size and sampling technique

The population comprised serving staff of the Akwa Ibom State Civil Service in the state's ministries, departments and agencies. Employees of political office holders, local government councils, private organisations and state-owned universities were excluded. The sampling frame was the accessible official staff-strength figure of 13,772 civil servants, which is the most recent complete figure available from the state's official manpower source.

The sample size was determined with the Taro Yamane formula, $n = N / (1 + N(e)^2)$, at a 5% sampling error:

$n = 13,772 / (1 + 13,772 \times 0.0025) = 13,772 / 35.43 \approx 389.$

A multistage procedure combining stratified and simple random sampling was used. Ministries, departments and agencies were first grouped into general administrative units; respondents were then allocated to strata in proportion to estimated staff numbers; and simple random sampling from the sampling lists supplied by the selected institutions was applied at the final stage. Five ministries were selected, as shown in Table 1.

Table 1: Distribution of the minimum sample across selected ministries

S/N	Ministry	Respondents
1	Ministry of Science and Digital Economy	77
2	Ministry of Local Government and Chieftaincy Affairs	78
3	Ministry of Information	78
4	Ministry of Health	78
5	Ministry of Education	78
	Total	**389**

Source: Authors' compilation, 2026.

To allow for non-response and incomplete returns, 428 questionnaires were distributed. Of these, 410 were returned (95.8% of those distributed) and eight were excluded for substantial omissions, leaving 402 valid questionnaires (93.9% of those distributed) for analysis.

3.3 Instrument and data collection

Primary data were collected with a structured questionnaire in two sections. Section A captured respondents' demographic characteristics. Section B contained statements on the study variables, to which respondents answered on a five-point Likert scale: Strongly Agree (5), Agree (4), Undecided (3), Disagree (2) and Strongly Disagree (1). Manpower forecasting was assessed through statements on the extent to which the civil service anticipates future staff requirements, the adequacy of the current workforce, expected personnel shortages, and the ability to match manpower needs to organisational needs. Organisational performance was assessed through indicators of the achievement of organisational objectives, efficiency in the use of human resources, the quality and timeliness of service delivery, employee productivity, and the perceived performance of the civil service in its institutional role. Responses to the items for each construct were combined into composite scores for the regression analysis. Secondary sources, including government publications and official policy documents, were used only to provide background on the civil service and were kept separate from the survey data used in the statistical tests.

3.4 Validity and reliability

Content and face validity were established by submitting the questionnaire to the researcher's supervisor and other experts in human resource management, public administration and research methodology. They reviewed the wording, the relevance of each item, the coverage of each construct and the suitability of the response format, and ambiguous or poorly aligned items were revised or removed. Internal consistency was assessed in a pilot test with respondents similar to the study population but not included in the sample, using Cronbach's alpha. A coefficient of 0.70 or above was taken as acceptable.

3.5 Method of data analysis and decision rule

Demographic characteristics and item responses were summarised using frequencies, percentages, means and standard deviations. Item and scale means were compared with a criterion mean of 3.00, the midpoint of the five-point scale, so that a mean above 3.00 indicated agreement. The hypothesis was tested using simple linear regression of organisational performance on manpower forecasting:

$OP_i = \beta_0 + \beta_1 MF_i + \varepsilon_i$

where OP_i is the organisational performance score of respondent *i*, MF_i is the manpower forecasting score, β_0 is the constant, β_1 is the regression coefficient and ε_i is the error term. The correlation coefficient (R), coefficient of determination (R^2), adjusted R^2, F-statistic and t-statistic were reported, and the usual regression assumptions of linearity, independence, normality of residuals and homoscedasticity were examined. The decision rule was to reject the null hypothesis if the p-value was below the 0.05 level of significance (95% confidence level), and otherwise to fail to reject it.

4. Results and Discussion

4.1 Respondent profile

Table 2 summarises the 402 valid respondents. Male respondents formed the larger share (56.7%), but women were substantially represented (43.3%). Most respondents were in the middle and senior age groups, held post-secondary qualifications (73.6% held an HND or B.Sc), and had considerable service experience, with 64.5% having served for ten years or more. The sample was therefore well placed to give informed views on staffing practice in the civil service.

Table 2: Socio-demographic characteristics of respondents (N = 402)

Variable	Category	Percentage (%)
Gender	Male	56.7
	Female	43.3
Age	Under 21 years	2.0
	21–34 years	23.9
	35–44 years	31.8
	45–54 years	28.1
	55 years and above	14.2
Qualification	Primary six	1.0
	GCE/SCE	5.7
	OND/NCE	15.2
	HND/B.Sc	73.6
	Others	4.5
Years of experience	Less than 1 year	3.0

	3–5 years	12.9
	6–9 years	19.7
	10–14 years	27.9
	15 years and above	36.6

Source: Field survey, 2026.

4.2 Perceptions of manpower forecasting and organisational performance

Table 3 reports responses to the four items on manpower forecasting. Mean scores ranged from 4.07 to 4.20, and the aggregate mean of 4.16 (SD = 1.00) is well above the criterion mean of 3.00, indicating general agreement that manpower forecasting supports organisational performance. Agreement was strongest on the item that forecasting facilitates desired performance because of the indispensable role employees play in daily operations resulting in mean of 4.20, and on the item that efficient forecasting leads to performance with the mean of 4.19. Respondents also agreed that failing to estimate future needs leads to last-minute and often inappropriate decisions (mean = 4.07), and that forecasting involves determining both the number and type of employees required (mean = 4.18). Standard deviations close to 1.00 show that responses were fairly consistent around the means.

Table 3: Responses on manpower forecasting (N = 402)

Item	SA	A	U	D	SD	Mean	SD
1. Efficient forecasting leads to organisational performance	196	143	27	22	14	4.19	1.01
2. Failure to estimate future needs leads to last-minute, often inappropriate decisions	181	151	29	27	14	4.07	1.03
3. Forecasting facilitates desired performance because employees are indispensable to daily operations	189	149	31	22	11	4.20	0.98
4. Forecasting determines the size and type of employees required for effective performance	185	151	30	24	12	4.18	0.99
Aggregate	751	594	117	95	51	**4.16**	**1.00**

Source: Field survey, 2026. SA = Strongly Agree, A = Agree, U = Undecided, D = Disagree, SD = Strongly Disagree. Criterion mean = 3.00.

4.3 Test of the hypothesis

H_0: Manpower forecasting has no significant influence on organisational effectiveness (performance) in the Akwa Ibom State Civil Service.

Table 4: Simple linear regression of organisational performance on manpower forecasting

Statistic	Value
R	0.641
R^2	0.411
Adjusted R^2	0.410
Standard error of the estimate	0.521
F-statistic	278.23
t-statistic	16.68
Standardised coefficient (β)	0.641
Significance (p)	< 0.001
N	402

Dependent variable: organisational performance. Source: Field survey, 2026.

The relationship between manpower forecasting and organisational performance was positive and statistically significant ($\beta = 0.641$, $t = 16.68$, $p < 0.001$; $F = 278.23$). Manpower forecasting explained about 41.1% of the variation in organisational performance. Since the p-value is below 0.05, the null hypothesis is rejected: manpower forecasting has a significant positive influence on organisational effectiveness in the Akwa Ibom State Civil Service.

4.4 Discussion

The results show that where respondents rated manpower forecasting more favourably, they also rated organisational performance more favourably, and the association is strong for survey data of this kind. An R^2 of 0.411 means that forecasting accounts for a large share of the variation in performance but not all of it. The remaining 58.9% reflects other factors, including the other human resource planning practices which may include recruitment, training, redeployment, compensation, career advancement and work evaluation, etc. and wider institutional conditions.

The finding agrees with Mansaray's argument that human resource planning improves performance by making sure the right people are available at the right time and place (Mansaray, 2019). It also supports the public-sector evidence reviewed earlier. Etim et al. (2020) found a positive link between manpower planning and effectiveness in a federal

bureau, Eze et al. (2022) found one between human resource planning and performance in a federal commission, and Okon et al. (2022) and Anaekwe et al. (2025) reported related results for a state university and a state ministry. The present study adds that the link holds when manpower forecasting is examined as a distinct practice in a state civil service, rather than as part of a general planning construct.

The item results also give substance to the concern in the literature that forecasting must cover skills as well as numbers (Makhanya, 2024). Respondents agreed strongly that forecasting determines both the size and the type of employees needed (mean = 4.18), and that its absence leads to late and poorly judged decisions (mean = 4.07). In the civil service setting, this points to forecasting shortcomings showing up as staffing shortfalls, mismatches between posts and skills, and delayed responses to new demands.

The findings are consistent with the three theories. In resource-based terms, forecasting helps ensure the service holds workforce capabilities that match its tasks (Barney, 1991; Collins, 2021). In human capital terms, it directs investment toward the skills that will be needed (Becker, 1964). In systems terms, it works as the early-warning function that keeps staffing inputs aligned with changing policy, budget and labour-market conditions. The study's data cannot separate these mechanisms, but the direction of the result matches what each theory predicts.

Two interpretive cautions apply. First, the data are cross-sectional and perceptual, so the results show a strong association in respondents' assessments rather than proof of cause and effect. Second, as the regression includes only forecasting, the 41.1% share should not be read as forecasting's unique contribution once other planning practices are taken into account.

5.1 Conclusion

This study examined the influence of manpower forecasting on organisational effectiveness, operationalised as organisational performance, in the Akwa Ibom State Civil Service. Survey data from 402 civil servants showed general agreement that forecasting supports performance (aggregate mean = 4.16 against a criterion mean of 3.00), and regression analysis showed a significant positive relationship ($R = 0.641$, $R^2 = 0.411$, $p < 0.001$). The null hypothesis was rejected. The civil service's capacity to anticipate how many staff, and with what skills, it will need is therefore closely associated with how well it is perceived to perform.

5.2 Recommendations

Based on the findings, the study recommends the following:

i. The Akwa Ibom State Civil Service should keep complete and current staff records covering numbers, grades, skills, locations and retirement dates, and use them as the basis for projecting future staffing needs.

ii. Forecasts should state the competencies required, not only the number of posts, so that recruitment, training and deployment can be targeted at identified gaps.

iii. Annual and medium-term manpower forecasts should feed directly into recruitment plans and personnel budgets, so that appointments follow identified needs and not late, reactive decisions.

iv. Human resource and planning units in ministries should receive training in workforce planning methods, including basic workforce analytics, and should review forecasts periodically against actual staffing outcomes.

5.3 Limitations and suggestions for further research

Several limitations should be borne in mind. The data are cross-sectional and drawn from respondents' perceptions, so the findings indicate association rather than established causation, and common-source bias cannot be excluded. The sampling frame of 13,772 civil servants came from official manpower publication and may not match the current headcount. The sample covered five ministries, which limits generalisation to other ministries, other states and other parts of the public sector. The hypothesis was tested with a single-predictor regression, so the contribution of forecasting alone, net of other human resource planning practices, was not estimated.

Future research could (i) estimate a multiple regression that includes forecasting alongside recruitment, training, redeployment, compensation, career advancement and work evaluation; (ii) use longitudinal designs to test the direction of the relationship; (iii) combine survey data with objective workforce and performance records, such as vacancy rates, forecast accuracy and service-delivery indicators; and (iv) replicate the study in other states and sectors, supplemented by interviews with human resource managers.

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