

Project Leadership for Sustainable Operational Performance of Water Projects in Nigeria

Olowo, Ope Ayokunle and Adindu, Chinedu Chimdi

Department of Project Management Technology, School of Innovative Technology, Federal University of Technology, Minna, Niger-State, Nigeria.

Corresponding author: opijogerrad09@gmail.com

Abstract

Project leaders are responsible to lead project works, engage project team and maintain project team dynamics throughout a project life. Water Projects are continually being utilized as a strategic means through which communities can access clean water both for domestic and economic uses because water security centers in on quality and sustainable socio-economic development. This study therefore explores the role of pioneer authority on undertaking in achieving sustainable execution of water undertakings in selected North-central Nigeria states and the federal capital territory (FCT). The study seeks to identify project leadership style and functions of project leaders that drives sustainable execution of water undertaking in Nigeria. The study is an investigation that uses questionnaire as research design. Relationship coefficient and multiple regression tools were used for data analysis. The study concludes that the responsibility of project leaders to be accountable is the major function of project leaders that achieves sustainable execution of water undertakings in Nigeria and popularity based ideology is identified as major project leadership style that best achieve sustainable execution of water related projects in Nigeria. Also, this research concludes through examination that cost influencing capacity of water project is significantly affected by time/schedule execution in accomplishing reasonable execution of water project in Nigeria. Furthermore, the research presented that elements of undertaking pioneers and venture leadership style are critical factors in determining sustainable development of water projects. The study recommends exercise of democratic leadership style, while project leaders are to be accountable in their responsibility towards sustainable developmental cost and time performance of water projects.

Keywords: Development; Nigeria; Project leadership; Sustainable performance; Water projects.

Introduction

According to Van den Berg & Danilenko (2017), the Sustainable Development Goals (SDGs) intends to accomplish comprehensive admittance to protected and moderate drinking water and sterilization for everyone by year twenty thirty (2030). Water security is at the center of quality and maintainable socio-economic improvement. Africa is an immense landmass with critical contrasts in institutional arrangement of water areas, admittance to and nature of water assets, and levels of financial advancement across and inside countries (Van den Berg & Danilenko, 2017).

Water is viewed as humankind's generally remarkable and fundamental normal asset to oversee, on account of its value in various capacities with respect to coordinate human utilization, agrarian water system, entertainment, hydropower, mechanical creation,

fisheries, ecological assurance and modern effluents (Federal Government of Nigeria, 2011). Falkenmark & Rockstrom (2014) submitted that water is the life blood of the biosphere. Lots of people have limited access to water resources with countries around the globe having the core goal of providing its citizen with safe, sufficient and sustainable water (Mohammed *et al.*, 2016). Mabogunje (1993) as cited in Damina *et al.* (2016) describes access to basic water infrastructure as an indicator of community well-being.

FAO (2010) reported that there is an irregularity among requested and accessibility of water causing water scarcity. Abaje *et al.* (2009) as cited in Ahile *et al.* (2015) reported that water request as of now surpasses supply in various pieces of the world and more areas are expected to encounter lopsidedness in the nearby future because of expansion in populace. Negoianu & Goldfaid (2008) as cited in Ahile *et al.* (2015) added that by 2030, water request will surpass supply by half in most creating areas of the world. Water shortage is basic essentially in all areas of Nigeria with access to public water supply problematic, irregular and as a rule distant accordingly bringing about high reliance on dangerous advantageous wellsprings of water supply and makes citizens susceptible to water borne diseases (Ocheri, 2006).

80% of occupants in Nigeria are in need of admittance to improved drinking water infrastructure, according to a review directed by the Federal FMWR in 2008 (Ezenwaji *et al.*, 2014). World pioneers concurred that water is a significant piece of the center advancement plan for the 21st century and have dedicated to longing focuses for developing admittance to water administrations (Sumila *et al.*, 2005). Water Projects are continually being utilized as a strategic means through which communities can access clean water both for domestic and economic uses (Warui, 2017). A project comprises of relative events that must be implemented in a coherent arrangement in order to attain a well-defined goal, which usually addresses the needs of individuals in a specific community (Warui, 2017). Project managers play a key role in project success. Moira (2019) pointed that project organizers and directors play the major part in arranging, executing, observing, controlling and shutting projects. Ankit (2018) pointed that project leaders are responsible to lead project works, engage project team and maintain project team dynamics throughout a project life. Ishaku *et al.* (2011) advocated the need for a world-view move to imaginative approaches which incorporate appropriate administration coordination due to the reality that supply of water barely meets people's water need. Therefore, this study explores project leadership for refocusing Nigeria towards achieving sustainable execution of water undertakings in the 21st.

Problem Statement

High number of Africa countries lack sufficient water resources for meeting reasonable per capital and per time water needs of its developing populace. Swaminathan, (2001) as cited in Ahile *et al.* (2015) reported that less than ten nations have almost 60% of universally available water in this manner, proposing biased dispersion of water universally and

broadly, showing the shortage of water asset to which there are needs for water supply projects. Water projects failure have driven numerous nations to shortage of water which influences all social and economic activities that in turns undermines the manageability of the characteristic asset base. Ahile *et al.* (2015) pointed that insufficient number of water projects has generally sum to water shortage in many African state and there exists insufficient project investment in water sector. Also, where water project existed, water availability and maintenance is flighty and conflicting. Musemwa (2008) as referred to in Mukuhlani & Mandlenkosi (2014) reported, water supply projects within decades to now have little or no impact on the people. Ndabula & Jidauna (2010) attributed insufficient water resource problem in many part of Nigeria to recurring leadership neglects. Many water management experts concurred that helpless admittance to water supply is frequently a consequence of helpless strategies and executive practices, for example, absence of authority structure (Sumila *et al.*, 2005).

Objectives of the study

1. Identify project leadership style that achieves sustainable performance of water projects.
2. Examine functions of project leaders that best achieve sustainable performance of water projects.
3. Identify the connection between project administration styles, elements of undertaking initiative and economical execution of water projects.

Literature Review

Water/Water Projects

Water is a characteristic asset of basic significance, a fundamental need that has become the predominant developmental need for most nations particularly in the developing portions of the world, major necessity of life with no substitute and its profoundly expected to facilitate the existence of economic exercises like agribusiness, mining, food creation and for keeping up solid biological systems (Ahile *et al.*, 2015). Adie *et al.* (2018) posited that the rising significance of water for human and national development cannot be overemphasized; water is generally classified as resource with lots of value socially, culturally, environmentally, and economically, most living organism requires clean drinking water for survival, agricultural practices and food provision and supply are critically dependent on water availability and water plays a key strategic role in sustaining human life, promoting development, and maintaining human environment. Aribigbola (2010) posited that the effect of water project in Nigeria has led to many urban and rural dwellers resorting to obtaining water from unsafe sources such as hand dug shallow wells, rivers etc. which are often contaminated and leading to increase in public health disease outbreaks. Water resource sector area undertakings can be extensively classes into the accompanying seven (7) regions: Distribution and water cleanliness projects, water storage projects, water movement and agricultural need projects, water creation and hazard control projects,

water management and advancement projects, water region development projects and general water infrastructure Projects (Federal Government of Nigeria, 2011). Ayanni (2006) maintained that advancing admittance to water benefits and administration of hydrology assets contribute generously to financial development through expanded business efficiency and advancement. Improved water infrastructure projects and hydrology asset board are fundamental and essential condition for financial turn of events and development for many developing nations (Okereke, 2000; Ofuoku, 2001).

Project Leadership

Strider (2002) submitted that project authority deals with the capacity to direct project groups in most impressive way to accomplish project target. Task authority initiatives have effect on improving task by lessening vulnerability and intricacy related with project pursuit (Birkinshaw *et al.*, 2008). Task supervisors are answerable for driving activities in different angles to the general achievement of an undertaking, including cost, time taken, quality and security prerequisites (Edum-Fotwe & McCaffer, 2000). Kloppenborg *et al.* (2003) posited that task authority must be confronted with assortment of errand, staff and responsibility circumstances which are more mind boggling in projects than on-going tasks because of activities outstanding requests of their brief nature and exceptional results. The duties of task supervisors incorporate assembling and appropriating data, driving, arranging, planning, directing and controlling task groups (Burghardt, 2002).

Execution of Water Activities

Task execution can be estimated and assessed utilizing countless execution pointers that could be identified with different measurements like time, cost, quality, customer fulfillment, customer changes, business execution and stakeholder's security (Cheung *et al.*, 2004). Hill *et al.* (2010) pointed that project execution investigation is that part of project undertaking that looks at arranging task occasions and results with genuine task occasions and results essentially in relation with cost, time taken and asset usage. Other fascinating method of assessing project execution is first through a set that is identified with the proprietor, clients, partners and the overall population; the gatherings of individuals, who will take a gander at project execution from the full scale perspective. Van den Berg & Danilenko (2017) presented that great execution of water undertaking can be characterized as a water facility that give water and wastewater benefits that are effective, reasonable, economical and with a base conformity to water needs. A functioning water facility is a facility that can give top notch water or wastewater benefit to its clients in a maintainable way. Van den Berg & Danilenko (2017) posited that high conforming water facility have components of good monetary and operational execution also, providing all-inclusive access to water and wastewater benefit in moderate manner.

Theories of Leadership

- i. Trait Theory: Intan *et al.* (2015) posited that administrators are seen through the characteristics or qualities of authority that has been granted. The thought behind the trait hypothesis is that powerful pioneer administrators share basic characteristics. It successfully accepts that pioneer's administrators are conceived not made.
- ii. Situational or contingency Theory: Situational leadership accepted that compelling pioneer administrators receive certain ideas or practices. Intan *et al.* (2015) posited that there existed four authority styles in situational leadership hypothesis; high assistance with low relativism, high errand with high relativism, low undertaking with high relativism and low assignment with low relativism.
- iii. Behavioral Theory: Behavioral hypothesis believes that pioneer authorities are answerable for molding a climate that enables devotees to acknowledge explicit undertakings. Also, pioneer authorities can oversee or conduct subordinate behavior through organizing forerunners and results of conduct.

Leadership Styles

Leadership ideology centers on conducts and clarifies how pioneer authorities join errand and relative practices to impact subordinates in their endeavors to arrive at an objective.

- i. Absolutist ideology (Autocratic Leadership): is a style that centers on leaders holding all authority, responsibility, decisions and conveys them to team groups and anticipate exact execution.
- ii. Democratic Leadership: is a leader ideology where contributions such from colleagues and companions are thought of and are high rated. The popularity based (democratic) pioneer authority holds last duty, yet the individual in question is known to assign position to others who decide activities. Popularity based leadership style is quite possibly the best sorts which leads to high efficiency (Gadirajurrett *et al.*, 2018).
- iii. Laissez-faire Leadership: deals with situation where leaders hands-off and permit bunch of individuals to settle on choices. Free enterprise leadership initiative offers position to workers. Free enterprise authorities have a hands-off approach where team groups are completely self-coordinated in their exercise.
- iv. Transactional (Value-based) Leadership: deals with leaders putting together assumptions and guidelines that expand the effectiveness and efficiency of undertaking of team groups. Additionally, pioneer's authority includes a trade cycle whereby supporters get prompt, unmistakable prizes for completing the pioneer's requests.
- v. Transformational (Groundbreaking) ideology: deals with motivating and upgrading profitability and effectiveness through correspondence and high perceiving ability. Groundbreaking authority improves inspiration, resolve and execution of supporters through an assortment of instruments. The incredible estimation of a

groundbreaking initiative style is the degree of responsibility and excitement it evokes from the group.

- vi. Charismatic (Alluring) Leadership: focus around the task objectives and group improvement. Alluring authority includes change of supporters through esteem frameworks and convictions.

Functions of Project Leaders

Ankit (2018) posited that a project leader is liable for setting assumptions for team groups, set the focus position for team groups during undertaking activities, go about as difficulty eliminator of task, liable for peaceful settlements, answerable for reviewing group execution, add value to projects, recognizing efforts of team members, ensures team rewards and ensure the team stay focus on the project goal.

A pioneer authority is entrusted with settling on basic choices in regards to undertaking task (Asma, 2018). Chititoor (2012) as cited in Asma (2018) posited that any cycle that must be directed or taken in a specific point of an undertaking must have the endorsement of the pioneer authority as the leader of the undertaking. Undertaking pioneers are responsible for the whole undertaking plan, expenses, timetable and quality.

Study Methodology

The investigation is a review research with research design involving structured questionnaires to solicit the views of various respondents with water undertaking knowledge. The study’s respondents were selectively chosen from some North-central Nigeria states of Niger, Nassarawa, Kogi, and the Federal capital territory (FCT) from a study population of 150 Water project practitioners across the states, 109 population size was acquired utilizing Taro Yamane recipe. Data obtained from the study respondents was analyzed using both relationship coefficient and multiple regression tools.

Results and Analysis

Table 1: Information on distributed and recovered questionnaires for the Study

Shared Questionnaires	Recovered Questionnaires	Recovered Percentage (%)	Unrecovered Percentage (%)
109	101	93%	7%

Source: Field study (2019)

The information on Table 1 indicated the copies of shared and recovered questionnaires. 101 copies of questionnaires were distributed. 8 copies of shared questionnaire were unaccounted for which add up to 7% where 101 copies of questionnaires were recovered from respondents which sum up to 93% of the observed population of respondent. 93% response rate from respondents gives a good account of administered questionnaire.

Table 2: Demographic Statistics

Demographics	Categories	Frequency	Percent
Gender	Male	79	78%
	Female	22	22%
Education Level	PhD/M.Sc./MTech	17	17%
	B.Sc./B.Tech	29	29%
	HND/OND	50	50%
	SSCE	5	5%
Age bracket in Years	Below 30	13	13%
	31 to 44	49	49%
	45 to 54	34	34%
	55 Above	5	5%
Designation/Job position	Project Manager	11	11%
	Engineer/Suppliers	41	41%
	Geo/ Water scientist	21	21%
	Others	28	28%
Type/Nature of water project	Water supply & irrigation	45	45%
	Water Storage	24	24%
	Water quality & drainage	15	15%
	Others	17	17%

Source: Field study (2019)

Table 2 shows demographic statistics with a total of 101 valid responses obtained from individuals of which majority of the gender population were males (79)78% and (22) 22% were females.

Most of the respondents had HND/OND and B.sc/B.Tech educational level at (50) 50% and (29) 29% respectively; a good number had PhD/M.Sc/M.Tech educational level at (17) 17% whereas; small proportion of (5)5% respondents had SSCE level of education. (13) 13% of respondents are below 30 years, (49) 49% of respondents were between 31 to 44 years, (34) 34% of respondents are within 45 to 54 years and (5) 5% of respondents are 55 years and above. For respondents Job position; 41% of respondents are engineers and suppliers. 28% of the respondents belong to the categories of Other Job position. 21% of respondents belong to the category of Geo/Water physicists and scientists while 11% are Project Managers. For respondent's water project types; 45% were for water supply & irrigation projects, 24% were for water storage & irrigation projects, 15% were for water quality & drainage and 17% for others types of project.

Table 3: Correlation Coefficient result for construct measures

Construct	Decision Making	Team Mgt.	Solving Problem	Conflict Resolution	Accountability.	Change Mgt.	Autocratic L. s.	Democratic L. s.	Laissez-faire l. s.	Transactional l. s.	Transformational l. s.	Charismatic l. s.	Time performance	Cost performance.
Decision Making	1.000													
Team Mgt.	0.882	1.00												
Solving Problem	0.855	0.85	1.000											
Conflict Resolution	0.838	0.91	0.920	1.000										
Accountability	0.794	0.74	0.877	0.859	1.000									
Change Mgt.	0.816	0.88	0.878	0.939	0.840	1.000								
Autocratic l. style	0.853	0.90	0.902	0.971	0.873	0.931	1.00							
Democratic l. style	0.813	0.84	0.900	0.927	0.871	0.918	0.94	1.000						
Laissez-faire l. s.	0.818	0.87	0.875	0.936	0.843	0.932	0.93	0.963	1.000					
Transactional l. s.	0.842	0.92	0.885	0.948	0.855	0.972	0.94	0.932	0.947	1.000				
Transformational l. s.	0.828	0.87	0.892	0.939	0.841	0.979	0.94	0.931	0.940	0.953	1.000			
Charismatic l. s.	0.902	0.92	0.912	0.924	0.821	0.908	0.90	0.888	0.899	0.914	0.903	1.000		
Time performance	0.759	0.77	0.890	0.891	0.888	0.874	0.90	0.907	0.879	0.879	0.887	0.819	1.000	
Cost performance.	0.671	0.63	0.746	0.727	0.825	0.814	0.74	0.803	0.791	0.822	0.798	0.692	0.857	1.000

Source: Field Study (2019)

Table 3 above shows Pearson correlation coefficient of variables under study. The correlation coefficient result shows that all relationships between dependent and independent variables are significantly correlated. Table 3 result shows the following information; that the strongest relationships between Time/schedule execution of water undertaking and functions of project leaders exist in conflict resolution responsibility ($r=0.891$), problem solving responsibility ($r=0.890$) and accountability responsibility ($r=0.888$).

Also, the strongest relationships between Time/schedule execution of water undertaking and project leadership style exist in democratic leadership style ($r=0.907$) and Absolutist authority ideology ($r=0.904$).

Furthermore, the strongest relationships between cost execution of water undertaking and functions of project leader exist in accountability responsibility ($r=0.825$) and management of change responsibility ($r=0.814$). Also, the strongest relationships between cost execution of water undertaking and project leadership style exist in transactional leadership style ($r=0.822$) and democratic leadership style ($r=0.803$).

Strong correlation exists between cost undertaking of water project in relationship with time undertaking factor of water execution ($r=0.857$).

Table 4: Linear Regression Result for Time/Schedule undertaking of water execution

RESULT									
<i>Regressed Statistics</i>									
Multiple R	0.9291								
R Square	0.8631								
Adjusted R Square	0.8603								
Standard Error	0.3657								
Observations	101.0000								
ANOVA									
	Df	SS	MS	F	Significance F				
Regression	2.0000	82.6566	41.3283	309.0375	4.75456E-43				
Residual	98.0000	13.1058	0.1337						
Total	100.0000	95.7624							
	Coefficients	Standard Error	t-Statistic	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%	
Intercept	-0.686	0.287	-2.391	0.019	-1.256	-0.12	-1.256	-0.12	
Accountability	0.568	0.106	5.362	0.000	0.358	0.779	0.358	0.779	
Democratic	0.434	0.060	7.267	0.000	0.315	0.552	0.315	0.552	

Source: Field Study (2019)

Multiple-Linear regression analysis was performed on project leadership style and functions of project leaders with the view to measure their individual contributions towards achieving sustainable developmental time/schedule execution of water undertaking.

In table 4, regression model shows R square= 0.8631 that is 86.31% of the changes in time/schedule execution of water undertaking can be jointly explained by project leadership style and functions of project leaders. Table 4 shows that F= 309.0375, coefficient= -0.686, p value= 0.019, indicated the presence of a quantifiable correlation in between pioneer

authority ideology, functions of pioneer authority and time/schedule undertaking of water execution.

Table 4 indicated a positive and visible correlation on Democratic Authority Ideology with time/schedule execution of water undertaking with coefficient= 0.434, t stat= 7.267, P value= 0.000 which is <0.04). This represent that there will be a change in time/schedule undertaking of water execution by 0.434, once a unit change in Democratic leadership style is implemented.

Also, in table 4 regression results show positive and high significant relationship between Accountability function of a project leader and time/schedule undertaking of water execution (coefficients= 0.568, t stat= 5.362, P figure= 0.00000 <0.04).

This put forward as a fact that unit changes in accountability function of a project leader will achieve sustainable developmental time/schedule undertaking of water execution by 0.568 units.

Therefore, a multiple linear regression equation shows the correlation in project leadership styles, function of project leaders for achieving sustainable developmental time/schedule undertaking of water execution as thus:

$$(Y) = 0.434(\text{Democratic leadership style}) + 0.568(\text{Accountability function of Project leaders}) + (-0.686).$$

Table 5: Linear Regression Result for Cost execution of water undertaking

RESULT					
<i>Regression Statistics</i>					
Multiple R	0.868				
R Square	0.754				
Adjusted R Square	0.749				
Standard Error	0.459				
Observations	101.00				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	2.000	63.155	31.58	150.17	1.43848E-30
Residual	98.000	20.608	0.210		
Total	100.000	83.762			

	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%	Lower 95.0%	Upper 95.0%
Intercept	-0.215	0.346	-0.622	0.536	-0.902	0.472	-0.902	0.472
Accountability	0.396	0.142	2.778	0.007	0.113	0.678	0.113	0.678
Time performance	0.550	0.102	5.382	0.000	0.347	0.752	0.347	0.752

Source: Field Study (2019)

Multiple-Linear regression analysis was performed on project leadership style and functions of project leaders with the view to measure their individual contributions towards achieving sustainable developmental cost performance of water projects.

In table 5, regression model shows R square= 0.754 that is 75.4% of the changes in cost execution of water undertaking can be jointly explained by project leadership style and functions of project leaders. Table 5 shows that F = 150.167, coefficient = -0.215, p value= 0.536, indicated significant relationship between project leadership style, functions of project leaders and cost execution of water undertaking.

Table 5 shows significant relationship between Cost execution of water undertaking and time/schedule execution of water undertaking with coefficient t= 0.550, t statistics = 5.382 with P value = 0.000 which is <0.05). This implies that a unit change in time/schedule execution of water undertaking will affect cost execution of water undertaking of water projects by 0.550 units.

Also, in Table 5 regression result shows positive and high significant relationship between Accountability function of a project leader and cost execution of water undertaking (coefficients = 0.396, t stat = 2.778, P figure = 0.006<0.05). This submitted the influence a point change in accountability function of a project leader will achieve sustainable developmental cost execution of water undertaking by 0.396 units.

Therefore, multiple regression equation expresses the correlation between function of project leaders for achieving sustainable developmental time/schedule and cost execution of water undertaking as $(Y) = 0.396$ (Accountability function of Project leaders) + 0.550 (Time/schedule undertaking of water execution) + (-0.215) .

Conclusion

This study explores project leadership for refocusing Nigeria and by extension African continent towards achieving sustainable execution of water undertaking in the 21st century with the objectives of identifying project leadership style that achieves sustainable execution of water undertaking, examine functions of project leaders that best achieve

sustainable execution of water projects also, identify position view on undertaking pioneer authority ideology (Project leadership style), functions of undertaking leadership and sustainable performance of water projects.

The study concludes that functions of project leaders and project leadership style are critical in determining sustainable development performance of water projects. Accountability responsibility of project leaders was found to be the project leadership function with the greatest influence in achieving sustainable execution of water undertaking in Nigeria.

Popularity based pioneer authority is the major project leadership style with noteworthy impacting ability to accomplish manageable execution of water project in Nigeria.

The examination likewise reasons that cost execution of water project is altogether impacted by time/plan execution of water project towards accomplishing manageable execution of water project in Nigeria. Therefore, project leaders should be more accountable to water project activities by maximizing democratic leadership style to achieve sustainable performance in terms of cost and time/schedule in Nigeria.

Recommendations

The examination prescribes that for water activities to perform better in Nigeria:

- Democratic leadership (vote based initiative) style should be exercised.
- Project leaders (task pioneers) should be more responsible in their obligation towards practical execution of water projects.

Similar studies should be carried out in other aspect of water projects, so that a more standardized list of factors can be arrived at to enhance execution of water undertaking in Nigeria; as this will lead to fewer water project failures hence, less wastage of funds and more access to water.

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