



Planning and Execution of the European Union-Assisted Water Supply and Sanitation Projects in Imo State, Nigeria: Constraints, Lessons and Success Factors

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Authors' contributions

This work was carried out in collaboration between both authors. Author NEO designed the study, performed the statistical analysis, and wrote the first draft of the manuscript. Author COE assisted in the study design, supervised the analyses, reviewed the first draft of the manuscript and helped with the revisions. Both authors read and approved the final manuscript.

Original Research Article

Received 25th June 2013
Accepted 26th October 2013
Published 27th November 2013

ABSTRACT

This paper analyses constraints, lessons and success factors, in the planning and execution of the European-Union Micro-Projects Programme on water supply in Imo State, Nigeria. The questionnaire was employed for data collection. From the results, the constraints indicated by the respondents are inadequate community involvement, sourcing of funds, reliance on top-down approach to water project delivery, inadequate distribution of sufficient surface/ground water, inappropriate cost recovery system, irregular functioning of installed facility, and inadequate local built-up capacity. It was also observed that the lessons indicated by the respondents are community involvement process, project delivery process, knowledge of project outcomes/benefits, operation and maintenance of projects, sense of project ownership, process of building capacity, and new project identification. Whereas the success factors indicated by the respondents are; inclusiveness of all socioeconomic groups, equitable sharing of costs and responsibility,

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stimulated timely delivery of project services, sustained achievement of project objectives, guaranteed equitable distribution of project benefits to all socioeconomic groups, promoted sense of project ownership, and stimulated new project identification. The paper concludes that the above factors provide feedback on the effectiveness of the Eu-Mpp6 externally-funded projects and they also provide the basis for formulating strategies for improving development projects in the future.

Keywords: Constraints; water projects, European union, planning.

1. INTRODUCTION

In Nigeria, public water supply started early in the twentieth century in seven towns under the management of the lowest administrative level [1]. In 1950, maintenance of water supply schemes came under the Regional Governments. By 1966, State Water Boards/Corporations had begun to emerge. Today, all the 36 states of the federation and the Federal Capital Territory have Water Boards/Corporations or Public Utilities with their efforts being supplemented, in many cases, by the Local Governments. Federal Government got involved in the management of water resources in 1976 when the Ministry of Water Resources and the eleven River Basin Development Authorities (RBDAs) were created.

The ministry's responsibilities are to: formulate national policies in the development and management of water resources in the country, coordinate the activities of the States in matters of water resources development and management as well as to act as a guarantor to States in matters of external borrowing to fund water projects. The RBDAs, on their part, are to provide bulk water primarily for irrigation [2]. Shortly after in 1981, the United Nations Education Fund (UNICEF)-Assisted Programme in Rural Water Supply and Sanitation (RUWATSSAN) was initiated and implemented. As part of the continued efforts to improve the water supply and sanitation, the Federal Government of Nigeria, in January 2000, launched its National Policy on Water Supply and Sanitation. The main objective of the policy is to provide sufficient potable water and adequate sanitation to all Nigerians in an affordable and sustainable manner. The policy strategy emphasizes participatory investment by all actors: the government, the private sector and the beneficiary community in the provision of water and sanitation [3].

With the creation of old Imo State in 1976, the defunct Imo State Water Corporation inherited forty-five water schemes from the East Central State Water Cooperation with an average production capacity of barely 20 litres daily per person [1]. In recognition of the inadequacy of water supply at that time, a master plan for Regional Water schemes for seven urban areas was proposed. Amongst the seven urban areas then, only three (Owerri, Orlu and Okigwe) are in the present Imo State. Of these three, only Owerri Regional Water scheme was successfully realized and commissioned in 1986. Though the scheme, not only covered communities within 10 kilometre radius from the centre of Owerri urban, it also operated at reduced installed capacity from the original master plan [4]. To date, Imo State Water Board manages 5 major water schemes namely; Owerri Regional Water Scheme, Orlu Township/Eluama Water Scheme, Oguta/Mgbidi Water Scheme, Mbaise/Obowo Water Scheme and Okigwe Urban Water Scheme. Other agencies that have made efforts in the water supply and sanitation sector in the State are; the State Ministry of Public Utilities and Rural Development (MPURD), Imo State Water Development Agency (IWADA) and the United Nations Education Fund (UNICEF). Between 2000 and 2005, the State Ministry of Public Utilities and Rural Development sank 60 boreholes while the Imo State Development

Agency and the United Nations Education Fund, respectively, sank 25 and 123 boreholes [4,5,1]. Further efforts in the State are the World Bank-Federal Government Water Rehabilitation Project launched in November 1992 [4,1] and the recent European Union-Assisted Micro Projects Programme (Eu-Mpp6) initiated in May 2003 [6,1].

According to Tryon and Cookson [7], project is the use of one or more resources e.g. money, labour, material, and equipment during a specified period for the purpose of producing some economic return or output at a later time. Chadenet and King [8] viewed project as an optimum set of investment-oriented actions by means of which a defined combination of human and material resources is expected to cause a determined amount of economic and social development. Project therefore, involves the use of resources during a specified period to develop a facility for the production of goods and services over a longer period of time. In any project undertaking, according to Valadez and Bamberger [9], there is an input-output-effect relationship. Inputs are resources (financial, human and material) necessary to perform project activities with the expectation of producing outputs (goods and services) and achieving the effects of the project. Outputs are specific goods and services which the project is expected to produce from its inputs to achieve the effects. Effects are the outcomes of the use of the output (goods or services) of the project or expressions of the results actually produced as a result of the project, which has been undertaken. Effects may be short-or long-term. Short-term effects usually begin to emerge during the implementation period of a project, while the long-term effects defined as the ultimate changes in the conditions of beneficiaries resulting from the project, emerge some years after project completion.

As observed by Okereke [10], within three years of construction, most rural water projects faced one problem or the other resulting in less than 30 percent performance as against installed capacity, nearly all the water schemes from 10 years old were found to have collapsed, necessitating the construction of new ones. It is a well known fact that the planning of projects heavily rely on quantitative data which may not be available under certain circumstances. Furthermore, they depend on estimates and forecasts which are subject to human error. In addition, projects rely heavily on external advisers with little knowledge of the local environment under which projects will operate. [11]. Salmen [12] also observed that local communities are rarely invited to play constructive roles in the project design.

According to Ezeigbo [13], Oyebande [14], Onugba and Yaya [15], Nwankwoala [16], Okeke and Uzoh [17], rural water and sanitation projects in Nigeria have proceeded inconsistently, suffered from poor co-ordination, poor maintenance culture, poor technical/institutional structure, multiple programmes, lack of data/information for planning, over bearing bureaucratic control by various supervising ministries, lack of professional inputs on projects, lack of community participation, inadequate funding, irregular disbursements of subventions, inappropriate infrastructures as well as lack of adequate quality monitoring and evaluation, lack of clear policy direction, lack of focus in terms of goals and objectives which results in the country's inability to achieve full coverage of the rural population with safe water and improved sanitation services. However, there is the recently planned and executed Eu-Mpp6 water supply and sanitation projects in Imo State, Nigeria for which there may be constraints and lessons learnt or even the revelation of success factors for planning, executing and sustaining similar projects in the future. Thus, this study seeks answers to the following questions:

- a) What constraints featured in the planning and execution of the EU-MPP6 water supply and sanitation projects in Imo State?
- b) What lessons are learnt from planning and executing of the EU-MPP6 water supply and sanitation projects in Imo State?
- c) What success factors are revealed for planning, executing and sustaining similar projects in the future?

2. MATERIALS AND METHODS

2.1 The Study Area

The study area is Imo State, Nigeria. It has a total population of 3,003,653 inhabitants (National Population Census Figs, 2006). It contains 27 Local Government Areas and 306 autonomous communities and has a population density of 568 people per square kilometer. It lies between latitude 4° 45'N and 7° 15' North and longitude 6° 50'E and 7° 25' E. It is bordered on the East by Abia State, on the West by Delta State and River Niger, on the North by Anambra State, and on the South by Rivers State. See Fig. 1. The study area comprises an area of 5,289.48 square kilometers. The hydromorphic soil occupies 3,845 square kilometers (31 percent) of the total land area while the alluvial soil occupies 1,066 square kilometers (8 percent) of the total land area [18,2].

In the study area, rainfall generally commences in March or April. The peak of the rainy season is in July and September, with a short, slightly drier spell called the "August break" or little dry season, occurring in the intervening period. The spell is usually associated with the presence of temperature inversion at an altitude of 1,500 to 2000 meters, lasting for 2 to 3 weeks, and characterized by intermittent rainfall rather than the regular tropical downpour. The rainfall in this period is consequently lower than in June, July and September. Mean annual rainfall ranges from 2,000-2,500 millimetres/year, while the mean annual temperature over most of the study area is about 27°C. The greater part of the study area is flat and low-lying. The main streams draining the state are Imo, Otamiri, Njaba and Urasi rivers. Four main geological regions can be distinguished in the study area. These are the Niger River Plain and Delta, the Coastal Plain, the Plateau Escarpment, and the Cross River Basin. In the study area there is a heavy reliance on both surface water and ground water. Between 2003 and 2008, a total of 88 EU-MPP6 water borehole projects were initiated and completed in the state as shown in Fig. 2.

2.2 Data Collection and Data Analysis

The survey method was employed in this study to select the target population and to get the desired responses on the Eu-Mpp6 water supply and sanitation projects. The research population included 580 households where the Eu-Mpp6 water supply and sanitation projects were initiated and completed, members of staff of the Eu-Mpp6 water supply and sanitation projects; and the Eu-Mpp6 project managers. Data for the study were collected from the primary sources.

There are 301 communities in 27 Local Government Areas of Imo State. Between 2003 and 2008, a total of 88 Eu-Mpp6 water supply and sanitation projects were executed in various communities across the 27 Local Government Areas of Imo State [6]. The study adopted a multi-stage stratified random sampling approach in selecting subjects for the study. The 27 Local Government Areas are taken as clusters. The 27 Local Government Areas form the

first sample frame from which 44% of the Local Government Areas, representing 12 Local Government Areas of Imo State were randomly selected. In each of the randomly selected 12 Local Government Areas, communities where the Eu-Mpp6 water supply and sanitation projects were initiated and completed were identified. The list of these communities formed the second sample frame from which 50% of the communities, representing 29 communities were randomly selected.

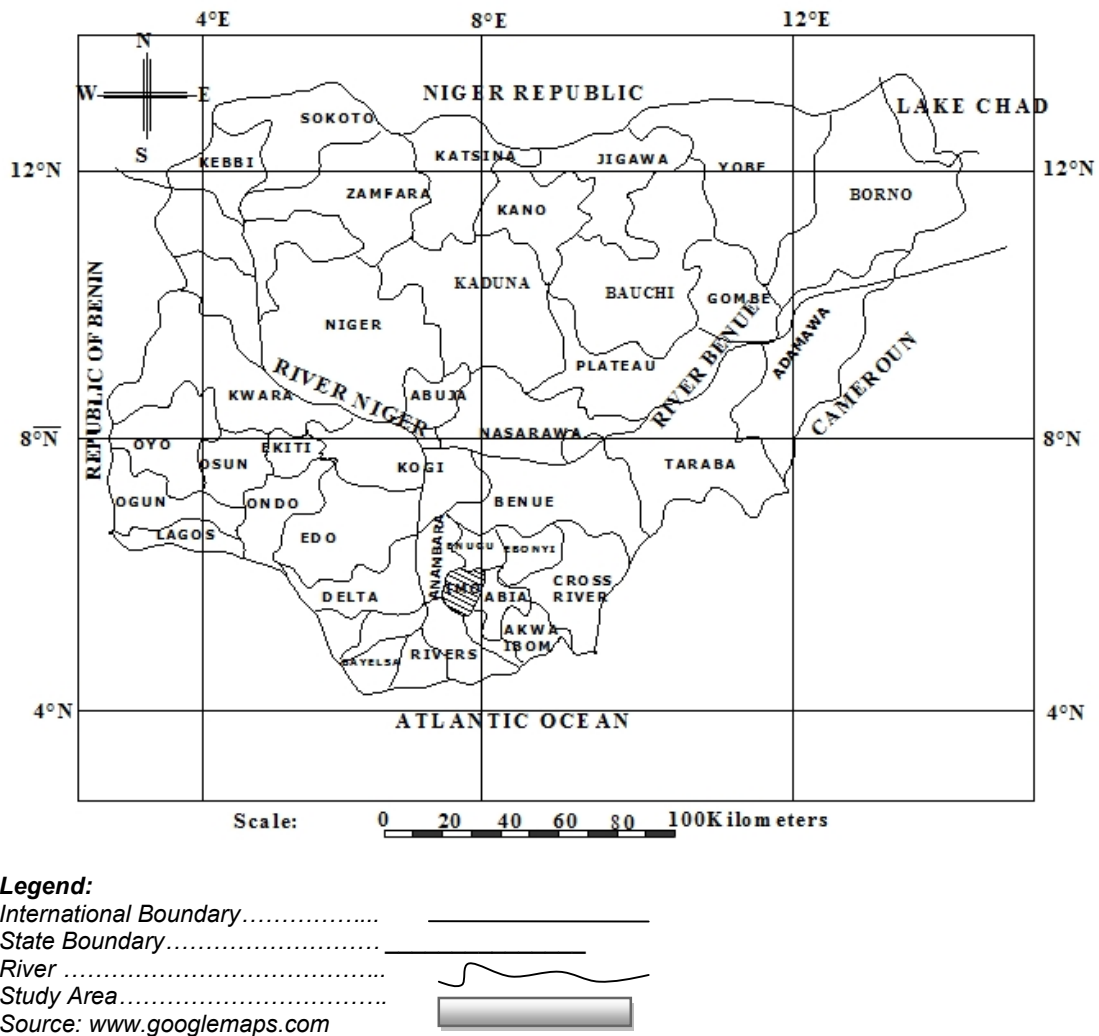
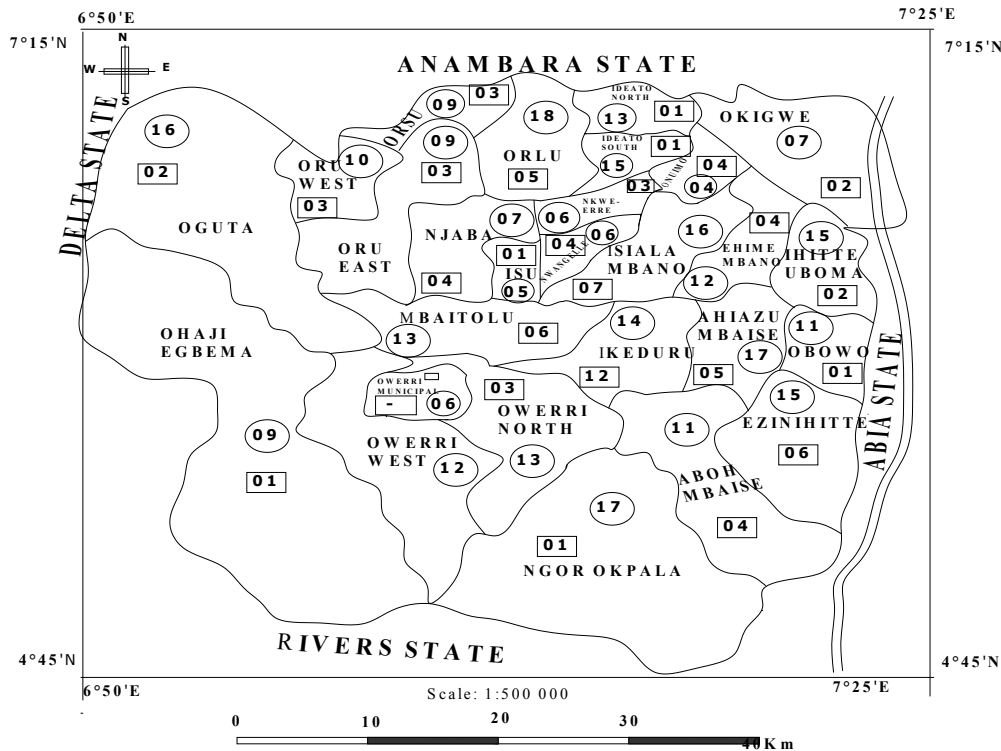


Fig. 1. Map of Nigeria showing the study area in its national context



Legend:

- State Boundary..... —————
- Local Government Area Boundary..... —————
- State Capital..... — []
- Express Way..... —————
- Number of Project in Local Government Areas..... []
- Number of Communities in Local Government Areas..... []

Source: www.googlemaps.com and Author's Survey, July- September, 2011

Fig. 2. Map of Imo State Showing the Local Government Areas

The technique of the random sampling method employed is the fish-bowl technique [19]. The names of the 27 Local Government Areas are written on pieces of paper, rolled into paper balls and mixed thoroughly in a container from where the 44 percent of the Local Government Areas are blindly drawn. The same procedure was employed in selecting the 50% of the communities. In terms of the selection of the respondents, the randomly selected 29 communities served as the third sampling frame from which stratified sampling method was employed to draw out 20 households from each of the communities. Stratified sampling method was adopted to take care of the heterogeneous and the amorphous nature of the population of study. In terms of geographical spread, the study covered randomly selected 580 households from randomly selected 29 communities which benefited from the Eu-Mpp6 water supply and sanitation intervention in of Imo State.

Two sets of questionnaire were designed and utilized. The first set of questionnaire was designed for households in the study communities. The second set was designed for key staff of the European Union Micro Projects Program. The first set of questionnaire contained

question items relating to socio-economic characteristics of the households. The questionnaire also contained question items relating to the involvement of the communities in the planning and execution of the Eu-Mpp6 water supply and sanitation projects, constraints associated with the planning and execution of the projects, lessons learnt in planning and executing the projects in the communities, as well as the success factors attributed to the process of planning and executing the projects. The second set of questionnaire contained question items relating to project rules of the Eu-Mpp6 water supply and sanitation projects. The study was conducted from 2005 to 2011. This period covered the gestation and the manifestation period of the intervention (the project). Descriptive statistics such as frequency distribution, percentages, category scores and rank scores were used to analyze the data from the field survey.

3. RESULTS AND DISCUSSION

3.1 Constraints in the Planning and Execution of the Eu-Mpp6 Water Supply and Sanitation Projects

The respondents were asked to indicate the constraints which featured in the planning and execution of the Eu-Mpp6 water supply and sanitation project in the communities. The constraints indicated by the respondents were inadequate community involvement, sourcing of funds, reliance on top-down approach to water project delivery, inadequate distribution of sufficient surface/ground water, inadequate consensus building, inappropriate cost recovery system, irregular functioning of installed facility, inadequate local built-up capacity, and lack of project maintenance structure. See Table 1.

Table 1. Constraints in the Planning and Execution of the Eu-Mpp6 Water Supply and Sanitation Projects

Constraints	% Response		
	High	Average	Low
Inadequate Community Involvement	74.4	16.8	8.8
Inadequate Funding	80.3	8	11.7
Reliance on Top-Down Water Project Delivery	26	63.5	10.5
Inadequate Distribution of Sufficient Surface/ Groundwater	19.8	67.7	12.5
Inadequate Consensus Building	79	16.4	4.6
Inappropriate Cost Recovery System	43.7	21	35.3
Irregular Functioning of Installed Facility	71.7	14.5	13.8
Inadequate Local Built-Up Capacity	76.7	16.6	6.7
Lack of Project Maintenance	77.6	16.9	5.5
Overall Average Percentage Response	61	27	12

*Percentage response to give high, average or low rating for different tasks.

Number of Sampled Households =580

Source: Field Survey, July-September, 2011

From the Table, the planning and execution of the Eu-Mpp6 water supply and sanitation projects was constrained by the factors of inadequate community involvement, sourcing of funds, irregular functioning of installed facility, inadequate local built-up capacity, and lack of project maintenance structure. This agrees with the report of Bamberger [20,21] that the involvement of beneficiary population in the planning and execution of water supply and sanitation projects is a requirement which provides a dimension which goes beyond project execution, access, benefit sharing, smoother flows of project services, and minimized costs and delays to the ultimate goal of guaranteeing project effectiveness and sustainability.

3.2 Lessons from the Planning and Execution of the Eu-Mpp6 Water Supply and Sanitation Projects

The respondents were asked to indicate the lessons learnt in the planning and execution of the Eu-Mpp6 water supply and sanitation project in the communities. The lessons indicated by the respondents were community involvement process, consensus building process, process of sharing costs and responsibility, project delivery process, knowledge of project outcomes/benefits, operation and maintenance of projects, sense of project ownership, process of building capacity, and new project identification. The distribution of the responses of respondents is shown on Table 2.

Table 2. Lessons from the Planning and Execution of the Eu-Mpp6 Water Supply and Sanitation Projects

Lessons	% Response		
	High	Average	Low
Community involvement	28.6	60.4	11
Consensus Building Process	29.7	59.1	11.2
Sharing of Cost and Responsibility	78.1	15.5	6.4
Project Delivery Process	21.6	11.9	66.5
Knowledge of Project Outcomes/Benefits	51	35.4	13.6
Operation/Maintenance of Projects	35.2	36	28.8
Sense of Project Ownership	21.6	7	71.4
Local Capacity Building Process	16.9	33.6	49.5
New Project Identification	3.1	14	82.9
Overall Average Percentage Response	32	30	38

**Percentage response to give high, average or low rating for different factors.*

Number of Sampled Households =580

Source: Field Survey, July-September, 2011

From the data, it is inferred that the planning and execution of the Eu-Mpp6 water supply and sanitation projects introduced a learning process approach where involvement process, consensus building process and process of sharing cost and responsibility played major roles. In other words the involvement of the communities in the planning and execution of the projects through consensus building and sharing of costs and responsibilities are activities connected to the achievement of the objectives of the Eu-Mpp6 projects [20, 21].

3.3 Success Factors in the Planning and Execution of the Eu-Mpp6 Water Supply and Sanitation Projects

The respondents were asked to indicate the success factors attributed to the planning and execution of the Eu-Mpp6 water supply and sanitation projects in the communities. The success factors indicated by the respondents were; involvement of all socioeconomic groups, equitable sharing of costs and responsibility, guaranteed built-up capacity, stimulated timely delivery of project services, sustained achievement of project objectives, guaranteed equitable distribution of project benefits to all socioeconomic groups, delivery of sustainable water supply and sanitation project, promoted sense of project ownership, and stimulated new project identification. The distribution of the responses of respondents is shown on Table 3.

Table 3. Success Factors in the Planning and Execution of the EU-MPP6 Water Supply and Sanitation Projects

Success factor	% Response		
	High	Average	Low
Inclusive of all Socioeconomic Groups	30.4	40.3	29.3
Equitable Sharing of Cost/Responsibility	76.6	15.9	7.5
Guaranteed Built-Up Capacity	19.3	33.6	47.1
Stimulated Timely Delivery of Project Services	36.9	42.4	20.7
Sustained Achievement of Project Objectives	31.9	46.2	21.9
Guaranteed Equitable Distribution of Project Benefits	19.5	42.8	37.7
Delivery of Sustainable Water And Sanitation Projects	31.4	39.6	29
Promoted Sense of Project Ownership	3.7	11	85.3
Stimulated New Project Identification	2.4	65.7	31.9
Overall Average Percentage Response	28	38	34

**Percentage response to give high, average or low rating for different factors assumed to be useful to get successful results.*

Number of Sampled Households =580

Source: Field Survey, July-September, 2011

From the foregoing, the equitable sharing of costs and responsibilities is the most preponderant success factor in the planning and execution of the Eu-mpp6 projects. This is followed by the involvement of all socioeconomic groups, guaranteed built-up capacity of the communities, stimulated timely delivery of project services, sustained achievement of project objectives, guaranteed equitable distribution of project benefits to all socio-economic groups and delivery of sustainable water supply and sanitation project. This success of result in turn promoted the sense of project ownership and stimulated new project identification.

4. CONCLUSION

The constraints, lessons, and success factors provide the feedback on the effectiveness of the Eu-Mpp6 water projects. Before the intervention of the Eu-Mpp6 projects in Imo State, large numbers of communities have been without access to functional facilities which promote hygienic disposal of human waste. In addition, many communities witnessed

incessant breakdown of water pumping machines and maintenance of such facilities by the implementing agencies was rarely done. At the household level, women and children were the first to suffer when systems break down as they spent much time every day in search of water. The attendant socio-economic effects of this condition loomed over many communities, as water remained hardly adequate to meet the ever-increasing demand for sanitation.

However, the situation in Imo State in the aftermath of the Eu-Mpp6 water supply and sanitation projects reveals improvements. This is because results of the study imply that the planning and execution of the Eu-Mpp6 water supply and sanitation projects was characterized by flexible community-involvement approach, built-up capacities of the communities, strong sense of community ownership of the projects, efficiency in operation, functioning and maintenance of the project facilities, and the integration of community-based organizations.

On the other hand the success factors indicated in this study provide the basis for formulating strategies for improving similar water and sanitation projects in the future. The community-involvement strategy and the built-up capacities of the communities create opportunities in funding and provision of the water supply and sanitation services to keep pace with the rapid growth in communities. In addition, the utilization of community-based organizations by the project further improves and facilitates collective and individual efforts in delivering sustainable water supply and sanitation projects and improved services in communities.

Based on the planning and execution of these Eu-Mpp6 water projects, the operation, functioning and maintenance of the installed Eu-Mpp6 water supply and sanitation facilities in the benefitting communities will not be at great risk overtime, because a practical, functional and holistic framework is imperative for an enduring and sustainable water and sanitation future for rural people.

ACKNOWLEDGEMENT

We give thanks to the anonymous reviewers who would make constructive comments and insightful suggestions.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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