

# **Performance of Project Implementors Relative to Implementation of Regular Infrastructure Project of the Department of Public Works and Highways, Region-10**

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## **ABSTRACT**

Using the descriptive research design, this study inquired into the relationship between performance of project implementers and status of implementation of regular infrastructure projects of the DPWH-R 10. Performance components of the project implementers were treated as the independent variables in terms of quality assurance, monitoring system, capability of project implementers, and executive and information system. The dependent variables were the status of implementation of the regular infrastructure projects on the dimensions of road construction, bridge, and approach construction, flood control construction, and rehabilitation of roads. The intervening variables were the indicators of organizational factors which were measured in terms of financial resources, manpower services, equipment support, and administrative support. The respondents included forty (40) project engineers, twenty five (25) resident engineers, twenty five (25) material engineers, and ten project (10) engineers of contractors. The data were organized, analyzed and interpreted through the

weighted mean, Pearson correlation coefficients to test the relationship between the independent and dependent variables, and multiple regressions to determine the effects of the intervening variables. The project implementers performed best on the performance indicators in terms of monitoring system and quality assurance. The highest status of the implementation of regular infrastructure projects were road construction, bridge, and approach construction, and rehabilitation of roads. Ironically, flood control construction appeared as the lowest of all infrastructure projects. The provisions of organizational factors were indicated as adequate on administrative support and financial resources but lower in terms of manpower resources and equipment support. A significant positive relationship was established between projects implementer's performance and the implementation of regular infrastructure projects and that relationship was strengthened by the intervening effects of administrative support and financial resources.

**Keywords** - Project Implementors, Implementation, Regular Infrastructure Projects, Organizational Factors, DPWH-R X.

## INTRODUCTION

As a government agency, the Department of Public Works and Highways (DPWH) aims to achieve an effective delivery of high quality service at the optimum utilization of all financial resources available from its program. These mission and objectives are delivered with utmost responsiveness to the expectations of quality public services. Hence, to meet these objectives, DPWH is tasked to implement infrastructure projects of the Government. These are infra-projects which are aimed to support the governments' agricultural and socio-economic conditions which are funded from the National Government, external fund resource, the Government Owned and Controlled Corporation and the Government Financial Institutions. Implementation of these projects is likewise envisioned to propel the needed economic development of an area by providing unhampered managements of goods and services as well as delivery of government and private-initiative extension program.

The implementers bring the manpower involved in the implementation and execution of these projects plays a very important role in giving out a high quality and satisfactory projects and must continue to take its toll in the attainment of

these objectives in providing infrastructure facilities and services responsive to the needs of the Filipino people. Thus, performance of the implementers speaks the quality on status of projects that were given out.

The DPWH is designed as the “states Engineering Construction Arm” responsible for the planning and design, construction and maintenance of infrastructure facilities, particularly highways, roads, bridges, school buildings and the water resources development system.

These goals conform to Ereneta’s Principle which states that public service by the government necessitates the adoption of the delivery of the services themselves that is client-focused. The achievement of these services is normally the measure which the people use to evaluate both the DPWH and the workers inside the organization.

By implementing these projects, the government can achieve more by investing in infrastructure projects that traverse provinces and regions as government spreads development across the country and for services to reach more people.

The researcher, as one of the project engineers of infrastructure projects for Region X, found it necessary to ascertain the progress of infrastructure implementation. The researcher firmly believes that respondents’ ratings on the extent of the status of implementation of these projects will be a mandate for the department to closely monitor and carefully implement projects which have improved in quality and therefore could highly satisfy the public. These projects will speak of how efficient and effective the implementers are in their project execution.

Further justification of the study was conceived because the researcher observed that there could be problems relative to the implementation of infra projects. Specifically, such problems are related to flood control, which obviously were of least priority as witnessed in the aftermath of Sendong and Pablo. It is however, mandated by the President that all infra projects must be extensively implemented by 2016 and that all kinds of protection for public safety are safeguarded. Among these are: right-of-way problems where land and property owners are hesitant to sign permit to enter documents while others do not really give their full support because they accuse the Administration as liars thus preventing the works to be started; physical. Other problems are on the condition of the site like frequent occurrence of heavy rains which can hamper fast and smooth implementation of these projects. In remote areas, peace and order situations make it extremely dangerous, if not possible to work. This causes delay of completion. Differing sub-surface on unforeseen conditions which foreseeable at the time of project

planning also cause some negative effects to project implementation. Immediate release of funds for continuing projects implemented by phase of work is also a very important factor to consider.

## FRAMEWORK

The study was supported by several relevant theories. Kelada's Theory (2007) on Integrating Reengineering and Total Quality provide significant insights to the variables or the performance of project implementers and the implementation of infrastructure projects of DPWH. The theory focuses on the material cooperation of all human resources in order to produce products and services that meet the needs and expectations of customers. In fact, Chanhan, et al. (2010) indicates that reengineering, Total Quality Management (TQM), and customer-focus mind set are components of effective government projects and services. The authors of the theory on customer-mind set stress the reality that providing quality products and services has dramatically changed with the advent of globalization from gradual improvement and implementation of government projects to one demanded by the customers and the public. Customer's expectation and how they are managed determine customer's satisfaction. Quality assurance is, therefore, a determining factor to which customer's requirements and expectations are satisfied (Whiteley and Hessian, 2006).

In addition, quality assurance is a global concern and to be competitive, products and services must be the best for certain customer conditions (Crocher, 2006).

This study was conceptualized on the principle that public service specifically services rendered for the implementation of infrastructure projects should observe certain set of standards to attain high quality projects. These criteria as set forth for purpose of project assessment revolve around the major concepts of economy, efficiency, effectiveness and responsiveness.

The implementations of projects in this study were to commence for calendar year 2007. These infrastructure projects include highway, bridges, and flood control.

The Quality Assurance Program of DPWH specifies Materials Quality Control in Project Implementation. The roles of project implementers in this program are an important aspect. The modern concept of quality control revolves around the task of the contractors' task and that of the DPWH. The contractors' tasks are to regulate, to test, and to inspect procedure, equipment, materials,

and manpower so that the completed facility will comply with the requirements. Meanwhile, the task of DPWH is to verify the contractors' quality control system is functioning; and that the completed structure or part of the structure is of the specified quality.

Anchored on the Quality Assurance Program of DPWH, the study derives the dependent variable which is the level of performance of the DPWH project implementers on the standard parameters of quality assurance, monitoring system, capability and executive and information system.

Executive and information systems are also considered in the assessment of performance of project implementers. Mc Beath(2004) and Hepner (2008) have similar view that information system be made a part of perceptive supervision and manpower planning. In the DPWH, it is expected that the officials and employees periodically undergo reorientation seminar. It is also emphasized that construction supervision is done regularly as part of the executive function. Other pertinent measures of this variable were transparency of all DPWH operations, utilization of information technology, utilization of computerized data base concerning procedures, accountability of DPWH system, and implementation of RA No. 9184 and imposition of administrative sanctions on erring personnel.

Equipment support is an important aspect of DPWH. This is in line with its program and services to attain fast and efficient accomplishment of projects. Infrastructure projects are made possible through the combined resources of labor, equipment and materials to accomplish work thus equipment are to be produced according to the various activities for the completion of the project. Babaylan's study which focuses on Highway District Engineers Office (1998) established the finding that there was an above average degree of provision for utilization of tools, machinery and equipment. Moreover, administrative support is considered an integral organizational factor which is assumed to affect the extent of implementation of the infrastructure projects of DPWH. Administrative support is an essential measure of an organization since it plays a key indicator of successful operation in the effective utilization of human and physical resources. Broadwell and House (2006) administrative support is imperative in supervising technical and professional people. According to Nigro and Nigro (2002), administration is a cooperative group effect in a public and private setting. The common factor is cooperation and in a group cooperative effort, support is not only expected from the subordinates but should emanate from the management as well. French (2004) stressed that the level of administrative support to organization structure and processes are the foundations of organizational effectiveness.

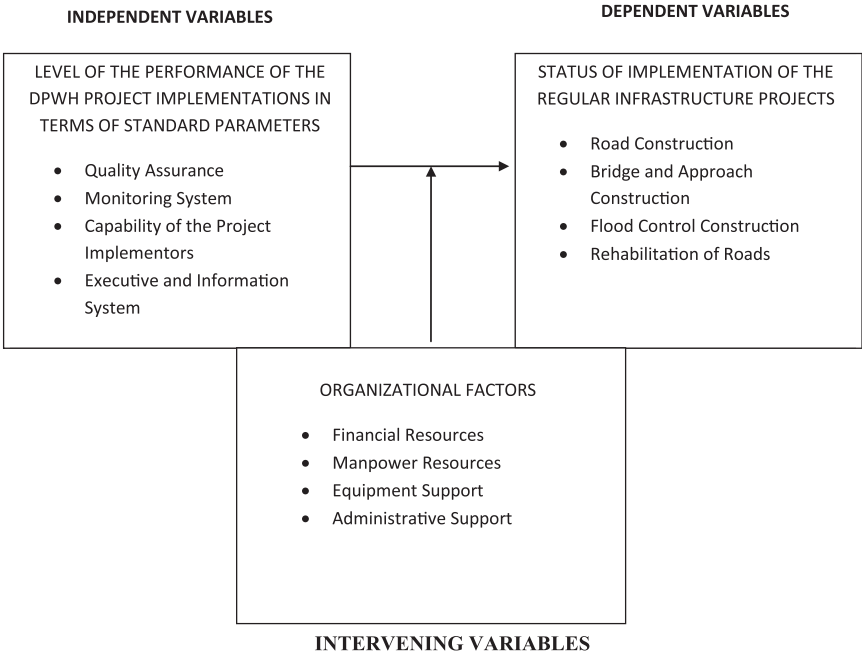


Figure 1. Schema of the Study Illustrating the Interplay of the Independent, Dependent and Intervening Variables

### OBJECTIVES OF THE STUDY

This study aimed at determining (1) the level of performance of the DPWH project implementers in term of: Quality Assurance, Monitoring System, Capability of the Project Implementers’, and Executive and Information System, (2) implementation of the regular infrastructure projects in terms of: Road Construction, Bridge and Approach Construction, Flood Control Construction, and Rehabilitation of Roads, (3) adequate are the provisions of the following organizational factors: Financial Resources, Manpower Resources, Equipment Support, and Administrative Support, (4) the significant relationship between the performance of project implementer’s and the implementation of regular infrastructure projects of DPWH, and (5) intervening effect of the organizational factors to the relationship between performance of project implementers and the implementation of regular infrastructure projects of DPWH.

## METHODOLOGY

This study utilized the descriptive-correlation method of research. This method was used because it sought to determine the performance of project implementers in relation to the status of regular infrastructure projects implemented by the DPWH-X. Kumar (2006) explained that a descriptive research design explores or finds a new truth on existing phenomenon. The truth may ascertain increase quantity of knowledge, a new generalization and increased insights into factors which are operating, a discovery of facts and a more accurate formulation of the possible problems encountered which are to be solved. It also deals with causative phenomena of two or more variables of interest.

The respondents of the study were composed of 40 project engineers, 50 resident engineers who are directly assigned in the planning, design, implementation and monitoring of the regular infrastructure projects of DPWH Regional Office 10 and 10 construction contractors directly responsible for the construction of infrastructure projects. Table 01 shows the distribution of the respondents by classification. No sampling procedure was employed because all of the concerned engineers are included in the study. The main reason in choosing the specified group of the respondents was they are competent to adequately the listed questions because they are directly involved in the implementation, construction, and monitoring of the regular infra projects of DPWH-RO X.

The research instrument used in the study was an adopted questionnaire from the DPWH 2004 Standard Specification Manual, RA 9184- Standardization and Regulation of the procurement activities of the Government, and Standard Project Monitoring Report Questionnaire containing specified indicators based on the monitoring control report of the Department. The first part of the questionnaire elicited data on the performance of the project implementers in terms of standard parameters on the dimensions of quality assurance, monitoring system, capability of project implementers, and executive and information system. The second part delved into the status of implementation of the regular infrastructure projects in terms of road construction, bridge and approach construction, flood control construction, and rehabilitation of roads. The third part ascertained the adequacy of organizational factors on the dimensions of financial resources, manpower resources, equipment support, and administrative support.

The content validity was ascertained and judged by experts, such as: a project engineer, a division chief, a statistician, district engineer, and the panel of examiners during the proposal was highly reliable.

Permission to conduct the study was sought and approved by the Regional Director of DPWH Regional Office X. The researcher personally administered the questionnaires to the respondents in the field areas. She also conducted a series of conference/focus group discussion of respondents and also made series of consultation with higher management to solicit insights, views and perceptions both from the government and contractors’ side. The Pearson Correlation Coefficient was used in testing the null hypothesis on the relationship between the performance of project implementers and the regular infrastructure projects of DPWH. Meanwhile, the intervening effects of the organizational factors to the relationship between the performance of project implementers and status of implementation of infra projects were tested through the multiple regression analysis. The alpha level was set at .05.

**RESULTS AND DISCUSSIONS**

**Objective 1. The level of performance of the DPWH project implementers in term of: Quality Assurance, Monitoring System, Capability of the Project Implementers’, and Executive and Information System**

Table 1. The level of performance of the DPWH project implementers in terms of quality assurance

Quality Assurance	Mean	Standard Deviation	Verbal Description
Conformity of construction materials with standard specification requirements.	3.46	0.503	Very Good
Compliance of construction process with approved plans and specifications.	3.46	0.613	Very Good
Compliance to the provision of Material Quality Control	3.34	0.626	Very Good
Provision of adequate testing capability of laboratories	3.12	0.659	Good
Compliance to the provision of pertinent Department Order by all implementing offices on Construction Procedures	3.34	0.519	Very Good
Overall	3.34	0.584	Very Good



Table 1 presents the level of performance of the DPWH project implementers in terms of quality assurance. The overall mean value of 3.34 indicated that the parameter of quality assurance was very good. Two standard parameters were rated very well, namely: conformity of construction materials with standard specification requirements (3.46) and compliance of construction process with approved plans and specifications (3.46) and compliance. The key concepts of these two high levels of performance are standard specifications and compliance of construction process. Based on the key indicators on quality assurance, it was discerned that the project implementers ensured compliance and minimized neglect of requirements of the constructions specifications. An interview with the project implementers revealed that they adhered to the guidelines of the DPWH on Materials Quality Control in Project Implementation on the so-called Quality Assurance Program of DPWH. In order to achieve the expected goal of the quality assurance, the project implementers inspected thoroughly the procedures, equipment's, materials and manpower to ensure that the completed projects really complied with the requirements.

An analysis as shown in Table 1 indicates that the provision of adequate testing capability of laboratories was only assessed "good" with the lowest mean value of 3.12. This was rated lowest among the indicators of quality assurance because the laboratory testing of some construction materials like steel, aggregates, and cement is done only in the regional office. Other materials to be tested like painting and studs are to be tested in the central office. In reality, only beam samples and of PCCP can be tested in a few district offices. As a result, it caused delay of quality check of the projects and also a delay in the collection of billings of contractors aside from the fact that in the regional office there are many projects which are beyond what were budgeted.

Table 2. The level of performance of the DPWH project implementers in terms of monitoring system

Monitoring System	Mean	Standard Deviation	Verbal Description
Conformity of construction materials with standard specification requirements.	3.60	0.534	Very Good
Compliance of construction process with approved plans and specifications.	3.64	0.525	Very Good
Compliance to the provision of Material Quality Control	3.64	0.562	Very Good

Provision of adequate testing capability of laboratories	3.44	0.674	Very Good
Compliance to the provision of pertinent Department Order by all implementing offices on Construction Procedures	3.12	0.520	Good
Overall	3.49	0.563	Very Good

Table 2 shows the level of performance of the DPWH project implementers in terms of monitoring system which was rated “very good” as disclosed by the overall mean of 3.49. Several items obtained the highest level of performance. These included regular monitoring and assessment activities to determine the extent of completion of the construction process (3.64), monitoring to check the performance of implementing offices (3.64). A monitoring system is in place to track slippages of project accomplishment (3.60); and monitoring is in place to determine unacceptable performance and present acceptable measures (3.44). The main purpose of monitoring is to identify the flow and direction of the construction projects and how well the implementers are performing their tasks. In the conduct of monitoring, the DPWH project implementers explained that were making a follow through on the aspects of the completion project and the implementing officials’ performance. They commented that the monitoring team ensures that the projects are implemented according to plans and specification. The findings on dimensions of monitoring were affirmed by the theories of Covey (2001) and the works of Gellerman (2003) that any system of quality monitoring is preventive and that effective prevention involves monitoring of work flow and the behavior of people at work. The DPWH project implementers wanted to detect any potential problems of completion before they happen.

Table 3. The level of performance of the DPWH project implementers in terms of capability of the project implementers’

Capability of Project Implementation	Mean	Standard Deviation	Verbal Description
Hiring of contractors with complete equipment, machineries and manpower.	3.18	0.690	Very Good
Sufficient skills of Project Engineer/Inspectors from PMOs, ROs, and DEOs to finish a project on time	3.42	0.641	Very Good

Capability of contractors, consultants and Materials Engineers to provide quality construction materials of project implementation.	3.06	0.585	Very Good
Capability of accreditors to provide reliable results of private testing laboratories and batching plants.	3.04	0.533	Very Good
Continuous training for all Project Engineers/ Inspectors, PMOs, ROs, and DEOs.	3.00	0.670	Good
Accreditation of Project Engineer/Inspectors and Material Engineers of Contractors and Consultants	3.20	0.606	
Values and Ethical Orientation Programs are conducted regularly.	2.82	0.481	
Overall	3.10	0.600	Very Good

Table 3 reveals the level of performance of the DPWH project implementers in terms of capability of project implementation which was only rated “good” as shown by the overall mean of 3.10. There was only one item which was assessed “very good” with a mean value of 3.42 and that pertains to the sufficient skills of Project Engineers/Inspectors from PMOs, ROs, and DEOs to finish a project on time. The findings implied that the Project Management Office, Regional Office, and District Engineering Office coped with the time element in finishing a project. All projects implemented must be finished on time as indicated in the expected date or schedule of completion. According to the project implementers themselves, the persons/personnel involved in the implementation of projects in the DPWH are engaged in work coordination to avoid delayed completion of projects. This was so because the implementation of projects is a joint effort of the PMO, Regional Office, and District Engineering Offices. Dale (2008) and Newman and Warren (2007) provided support to the finding of the study by emphasizing the importance of time management. The concept of time management specifies that if the projects/activities are properly planned and coordinated the objectives can be attained as scheduled.

Table 4. The level of performance of the DPWH project implementers in terms of capability of executive and information system

Executive and Information System	Mean	Standard Deviation	Verbal Description
DPWH officials and employees are periodically undergoing reorientation seminar.	3.04	0.668	Good
Construction supervision of all DPWH infrastructure projects is done regularly.	3.72	0.453	Very Good
Transparency of all DPWH operation is being implemented.	3.64	0.525	Very Good
Use of information technology is being maximized.	3.18	0.388	Good
Utilization of computerized data base concerning construction procedure is maximized.	3.06	0.511	Good
Accountability of DPWH System is being ensured.	3.44	0.540	Very Good
Personnel involved in the processing of payment to contractors in the use of N are being trained.	3.36	0.525	Very Good
IRR-A of RA 9184 is strictly implemented.	3.44	0.540	Very Good
Administrative sanctions on erring personnel are being imposed.	3.12	0.627	Very Good
Overall	3.33	0.530	Very Good

Table 4 shows the level of performance of the DPWH project implementers in terms of executive and information system which was assessed as “very good” as shown by the overall mean of 3.33. The dominant activity was regular construction supervision of all DPWH infrastructure projects (3.72). This was closely followed by transparency of all DPWH operations (3.64). In the DPWH, construction supervision is a must. As builders of the country’s infrastructures, assigned works/projects are really supervised. Although the projects are done by autonomous works tasking, however supervision is necessary not only as a part of monitoring advocacy but giving and assessing work direction. The project implementers and contractors showed a similar idea that the transparency of infrastructure projects is exposed the public. In the actual scenario, all constructed projects are announced publicly.

Meanwhile, transparency of all projects implemented is observed by the DPWH. Billboards are displayed near the specific location of the project implemented for the public to see and be aware of; the billboards contain information on the type of project, budget allocation, and expected date of completion.

**Objective 2. Implementation of the regular infrastructure projects in terms of Road Construction, Bridge and Approach Construction, Flood Control Construction, and Road Rehabilitation**

Table 5. Status of implementation of road construction

Road Construction	Mean	Standard	Verbal Description
Earthworks			
Clearing and Grubbing	3.60	0.494	Fully Implemented
Excavation and Embankment	3.46	0.578	Fully Implemented
Removal of Obstructions	3.32	0.713	Fully Implemented
Sub-grade Preparation	3.44	0.577	Fully Implemented
Overhaul	3.14	0.606	Moderately Implemented
OVERALL	3.39	0.593	Fully Implemented
Base and Sub-base Course			
Aggregate Base Course	3.56	0.611	Fully Implemented
Aggregate Sub-base Course	3.52	0.614	Fully Implemented
Crushed Aggregates Base Course	3.26	0.599	Fully Implemented
OVERALL	3.45	0.608	Fully Implemented
Surface Course			
Aggregate Surface Course	3.50	0.580	Fully Implemented
Bituminous Prime Coat	3.44	0.577	Fully Implemented
Bituminous Tack Coat	3.42	0.574	Fully Implemented
Bituminous Concrete surface Course	3.42	0.609	Fully Implemented
Cement Concrete Pavement	3.64	0.598	Fully Implemented
OVERALL	3.48	0.587	Fully Implemented
Miscellaneous Structures			
Pipe culverts, storm drains and under drains	3.48	0.614	Fully Implemented
Manholes, inlets and catch basins	3.50	0.544	Fully Implemented
Riprap and Grouted Riprap	3.44	0.540	Fully Implemented
Stone Masonry	3.36	0.562	Fully Implemented
Gabions	3.24	0.624	Moderately Implemented
Curbs and Gutters	3.42	0.641	Fully Implemented

Sidewalks	3.50	0.544	Fully Implemented
Guard nails	3.50	0.501	Fully Implemented
OVERALL	3.44	0.562	Fully Implemented
GRAND MEAN	3.44	0.523	Fully Implemented

Table 5 illustrates the status of implementation of the regular infrastructure projects in terms of road construction. These infrastructure projects are composed of earthworks, base and sub-base course, surface course, and miscellaneous structures. All of these projects were fully implemented as shown by the overall mean of 3.39 for earthworks, 3.45 for base and sub-base course, 3.48 for surface course, and 3.49 for miscellaneous structures.

On earthworks infrastructure, the highest extent of implementation was clearing and grubbing (3.60 or fully implemented) and the lowest was overhaul (3.14 or moderately implemented). Clearing and grubbing is a scope of work which consists of removing and disposing all vegetation and debris prior to excavation of earth for road construction. The main reason why clearing and grubbing is fully implemented is that excavated earthworks must not be mixed with leaves, grasses, roots, and other dirty materials or road wastes.

On base and sub-base course, the highest level of implementation was on the aggregate base course (3.56) and the lowest was on crushed aggregate base course (3.26). Base course is the wearing structure which is directly beneath concrete. Wearing structures are disruptive pavement. Hence, remedies to repair underneath concrete pavement needed immediate full implementation before the condition of base course to turn out to be worst and beyond repair.

Among the manifestations of surface course, the highest status of implementation was cement concrete pavement (3.64). Meanwhile, bituminous prime coat and bituminous tack coat indicated the lowest rating (3.42). Concrete pavement was the highly prioritized item in the surface course because it is very durable and the life of the structure is longer. In pavement concreting, there is an assurance of quality because it can be tested by varied methods of quality test. However, bituminous tack coat and surface obtained the lowest implementation because as of the present time the establishment of road projects using asphalt is not anymore advised due to non-durability of the structure. Aside from the durability problem, in asphalt roads, there is no assurance of quality because testing requirements are limited.

Table 6. Status of implementation of bridge and Approach Construction

Bridge and Approach Construction	Mean	Standard Deviation	Verbal Description
Conformance to proper procedure of piling and railings	3.58	0.574	Fully Implemented
Strengthening Timber Structures	3.14	0.639	Moderately Implemented
Reinforcing Metal Structures, Steel and Structural Concrete	3.50	0.505	Fully Implemented
Pre-stressed Concrete Structures	3.72	0.453	Fully Implemented
Concrete Structures	3.62	0.490	Fully Implemented
Construction of Steel Bridge	3.40	0.534	Fully Implemented
Provision of Quality Paints	3.14	0.729	Moderately Implemented
Structural Excavation Safety	3.18	0.595	Moderately Implemented
OVERALL	3.41	0.564	Fully Implemented

Table 6 presents the status of implementation of bridge and approach construction which was rated to a full extent as revealed by the overall mean of 3.41. The full implementation of these infrastructure projects indicated the highest emphasis on prestressed concrete structures (3.72) and concrete structures (3.72). At present, all constructed bridges use prestressed in guiders and piles. These materials are proven durable and the performance in terms of quality is high. Prestressed concrete structures were easier and more readily at ease when they were installed. In an interview with the contractors, they explained that when the schedules of completion have to be done on time and in emergency cases, prestresses concrete structures are readily available as needed.

Table 7. Status of implementation of Flood Control Construction

Flood Control Construction	Mean	Standard Deviation	Verbal Description
Riprap and Grouted Riprap	3.44	0.540	Fully Implemented
Dredging and Structure Excavation	2.92	0.665	Moderately Implemented
Channel Excavation	2.92	0.528	Moderately Implemented
Filling and Embankment	3.26	0.559	Fully Implemented
Stone Masonry	3.34	0.478	Fully Implemented
Gabions	3.48	0.505	Fully Implemented

Filter Fabric	3.06	0.585	Moderately Implemented
Steel Piling	3.36	0.525	Fully Implemented
Reinforcing Steel	3.58	0.498	Fully Implemented
Structural Concrete	3.66	0.478	Fully Implemented
OVERALL	3.30	0.536	Fully Implemented

Table 7 indicates the status of implementation of flood control construction with an overall mean of 3.30 or fully implemented. The full implementation of flood control infrastructure was strengthened by structural concrete (3.66) followed by reinforcing steel (3.58). For the past several years, floods frequently occurred in Region 10. Due to this natural calamity, the objective of the DPWH is to implement flood control structures which are strong and durable. The durable materials which can resist high current of water are concrete and reinforcing steel. Flood control materials, such as concrete and steel can sustain even flash floods compared with stone masonry and riprap.

Table 8. Status of implementation of Flood Control Construction

Rehabilitations of Roads	Mean	Standard Deviation	Verbal Description
Removal of Existing Structure/s	3.46	0.676	Fully Implemented
Scarify of existing Damaged Asphalt Pavement	3.54	0.645	Fully Implemented
Concreting of Road	3.68	0.512	Fully Implemented
OVERALL	3.56	0.611	Fully Implemented

Table 8 discloses the status of implementation of rehabilitation of roads which obtained an overall mean 3.44 or “fully implemented”. The highest implementation status was on concreting of road (3.68) and scarify of damaged asphalt pavement (3.54). At present, concrete roads would last for a longer time. So, road repair was focused on concreting. Asphaltting of road was given a low priority because the function life of asphalt is shorter compared to concreting of roads. The main issue of concreting road is durability and strength of materials. In addition, the project implementers commented that damaged asphalt road was concreted to ensure lasting strength and durability.



The removal of existing structure obtained the lowest level of implementation (3.46). This activity is costly. Anyway, the rehabilitation of roads can go on without removing remnants of the old one. Aside from that, it was already considered as supplementary items to major items like piling and columns. The removal of existing structures was not necessary as long as these do not block or obstruct road rehabilitation.

**Objective 3. Adequate are the provisions of the following organizational factors: Financial Resources, Manpower Resources, Equipment Support, and Administrative Support**

Table 9. Adequate of financial resources

Financial Resources	Mean	Standard Deviation	Verbal Description
Availability of project budgetary requirements.	3.68	0.512	Very Adequate
Availability of timely cash allocation to pay project billings on time	3.00	0.756	Adequate
Contractor's financial capability to assure continuous construction.	3.26	0.694	Very Adequate
Utilization of funds is properly monitored	3.46	0.542	Very Adequate
Contractor's capability/willingness to meet his financial obligations.	3.22	0.708	Adequate
Processing of payments for all projects is done on a first come, first served basis.	3.32	0.586	Very Adequate
Additional funds are provided for the standardization of regional and district laboratories	6.62	0.725	Adequate
E-procurement implementation in accordance with RA 9184 is fast-tracked.	3.34	0.658	Very Adequate
Invitations to apply for eligibility and to bid using the DPWH website and the Government Procurement System is widely published	3.66	0.519	Very Adequate
Training on the updated rules and regulations in Procurement is regularly conducted	3.10	0.646	Adequate
TOTAL	3.27	0.634	Very Adequate

Table 9 shows the adequacy of organizational factors in terms of financial resources. Garnering the highest adequacy were two (2) items, namely: availability of project budgetary requirements (3.68) and invitations to apply for eligibility and to bid using the DPWH website and the Government Procurement System is widely published (3.66). The availability of project budgetary requirement is high because appropriation of infrastructure projects is always available every calendar year of the General Appropriation Act Program. This scenario is reinforced by the some interest groups like political leaders who are always concerned with infrastructure projects. So, every year budget hearing is always supported through political intervention.

Meanwhile, the bidding process is done through the DPWH website. This is a strategy of avoiding personalism and corruption in the bidding process. In addition, there is public transparency in the procurement system as it is published regularly for public awareness. The project implementers explain that by advertising infrastructure projects thru the website every qualified contractor is given an opportunity to engage in bidding with DPWH. The procedure is from planning of the project location, budget and preparation of bid documents like plans and program of works; pre-procurement conference; competitive bidding; post-evaluation of the winning bidder up to the time the project is awarded to a contractor. Through this procedure, the bidding process is always objective and biases are controlled.

Table 10. Adequate of manpower resources

Manpower Resources	Mean	Standard Deviation	Verbal Description
Provisions of competent and experienced equipment operators enable contractor's prosecution of the work and its completion at the required contract time.	3.18	0.595	Adequate
Provisions of necessary skilled and unskilled labor force required by the work are in proper ratio with the activities involved.	3.12	0.593	Adequate
Provisions of qualified and experienced laboratory staff to carry out all materials quality control and testing requirements of the project.	3.10	0.646	Adequate
Provisions of competent and experienced survey team to carry out all necessary survey works from as-staked survey to construction surveys.	3.08	0.633	Adequate
Provisions of qualified and experienced technical men to carry out an effective engineering supervision and monitoring of the project.	3.32	0.586	Very Adequate

Scrap and build system on hiring employees/workers is implemented	3.00	0.782	Adequate
Responsibilities and accountabilities of all employees are checked quarterly.	3.22	0.545	Adequate
Job rotation for DE's/Regional Directors is being considered.	2.80	0.670	Adequate
Job rotation of personnel is done to avoid camaraderie with contractors	2.74	0.599	Adequate
TOTAL	3.06	0.627	Adequate

Table 10 provides data on the adequacy of manpower resources. Only one indicator garnered “a very adequate status of manpower”. That pertained to provision of qualified and experienced technical men to carry out an effective engineering supervision and monitoring of the project (3.32). The finding has proven that DPWH implements projects not only in quantity but most often these were also based on quality. The objective of this undertaking was to produce durable projects which can sever the public efficiently. Such target is attainable through the expertise of qualified and experienced technical men. Relative to the consideration of qualification and experiences of technical men, the DPWH adopts Department Order No. 184, s. 1999 on the Guidelines of the Accreditation of Contractors’ and Consultants’ Material Engineers. For instance, the appropriate qualification of Materials Engineers is a Registered Civil Engineer.

The findings of this specific problem found support in the principles advanced by several management experts indicating the emphasis on technical skills and competence. It implied that people with specialized skills and expertise are hired to carry out specific parts of the total work of the organization, which are only performed efficiently, effectively, and consistently by them ( Batlen, 1998; Robbins, 2007). The DPWH takes a cognizant emphasis on work specialization based on the technical skills and qualifications of manpower resources. Specialized technical men can perform work narrowing of the scope of the tasks which enable them to specialize on few tasks but increased efficiency and productivity (Lorenzana, 2003; Meyer, 2007).

Table 11. Adequate of Equipment Support

Equipment Support	Mean	Standard Deviation	Verbal Description
Availability of appropriate and sufficient equipment when needed for the prosecution of the various work activities.	2.96	0.637	Adequate
Needed equipment in good running condition to ensure maximum work output	2.76	0.624	Adequate
Provision of oils, fuel, and maintenance services for equipment.	3.08	0.488	Adequate
Proper monitoring of equipment utilization	3.00	0.670	Adequate
Coordination among government and contractor's engineers regarding equipment utilization schedule	2.98	0.622	Adequate
TOTAL	2.96	0.608	Adequate

Table 11 reveals the adequacy of equipment support. Garnering the “highest adequacy” was provision of oils, fuels, and maintenance services for equipment (3.08). The provision of oil and fuel is adequate because almost all of the infrastructure projects are equipment-based. This equipment is heavy which consume a huge bulk of oil supply in project implementation. Laborers are only there to perform and facilitate activities but the major activities and construction are done through heavy equipment. It is also imperative to sustain maintenance services to ensure the functional continuity of the equipment. The provision of proper monitoring of equipment utilization was also “adequate” (3.0).

Ensuring that the DPWH equipment was appropriately used is one of the tasks of the DPWH monitoring team. The concern was for the equipment to be utilized for public use only and most specifically as instruments for the construction of infrastructure projects.

Table 12. Adequate of Administrative Support

Administrative Support	Mean	Standard Deviation	Verbal Description
Management shows commitment and support to the on-going implementation of the projects	3.66	0.557	Very Adequate
Set reasonable standards and guidelines to ensure the quality of project output.	3.64	0.562	Very Adequate
Impose appropriate decisions in case of discrepancies of the locally funded project.	3.38	0.635	Very Adequate
Sees to it that performance of the construction works is acceptable to deliver of quality public service.	3.46	0.578	Very Adequate
Management extends protection for the safety and security of field personnel especially on political and environment interventions.	3.44	0.611	Very Adequate
TOTAL	3.52	0.588	Very Adequate

Table 12 reveals the adequacy of administrative support. Administrative support was “very adequate” in terms of commitment and support to the on-going implementation of the projects (3.66) which was also reinforced by setting reasonable standards and guidelines to ensure the quality of project output (3.64).

The DPWH management is a very supportive to the implementation of the projects. This form of organizational commitment not only is as a manifestation of the department’s role expectations but foremost for public service as well. The top management does not only rely on the independent performance of the agency but it also shows a cooperative effort in proper monitoring, re-engineering, tracking system of documents, and advisory system for all infrastructure projects. Administrative support and intervention are necessary in order to evaluate if the expected objectives were being met, that is, if the standards of quality are being met, and that the implementation of projects are done efficiently and effectively. Williamson (2006) emphasizes the situation that in a positive work-unit organization, administrative commitment is vital to the willingness and responsiveness to offer constructive support to the constituents.

Table 13. Summarized Data on the Adequacy of Organizational Factors

Organizational Factors	Mean	Verbal Description
Financial Resources	3.1	Very Adequate
Manpower Resources	3.06	Adequate
Equipment Support	2.96	Adequate
Administrative Support	3.52	Very Adequate

Table 13 summarizes the data on the adequacy of the organizational factors in terms of financial resources, manpower resources, equipment support, and administrative support indicates these to be “very adequate” (3.52) followed by financial resources (3.27 or “very adequate”). Rated lowest or only on “adequate” levels was equipment support (2.96).

**Objective 4. The significant relationship between the performance of project implementer’s and the implementation of regular infrastructure projects.**

Table 14. Test of Relationship between the Performance Implementer’s and the Implementation of Regular Infrastructure Projects

Performance of Project Implementers	Regular Infrastructure Program	Pearson Correlation	P-Value	Significant
Quality Assurance	Road Construction	0.530	0.000	Significant
	Bridge and Approach Construction	0.318	0.025	Significant
	Flood Control Construction	0.336	0.017	Significant
	Rehabilitation of Roads	0.398	0.004	Significant
Monitoring System	Road Construction	0.195	0.174	Not Significant
	Bridge and Approach Construction	0.201	0.162	Not Significant
	Flood Control Construction	0.283	0.047	Significant
	Rehabilitation of Roads	0.287	0.044	Significant
Capability of Project Implementers	Road Construction	0.631	0.000	Significant

	Bridge and Approach Construction	0.423	0.002	Significant
	Flood Control Construction	0.448	0.001	Significant
	Rehabilitation of Roads	0.632	0.000	Significant
Executive and Information System	Road Construction	0.452	0.001	Significant
	Bridge and Approach Construction	0.407	0.003	Significant
	Flood Control Construction	0.478	0.000	Significant
	Rehabilitation of Roads	0.451	0.001	Significant

Table 14 contains the result on the test of relationship between the performance of project implementers and implementation of regular infrastructure projects of DPWH. Quality assurance was significantly related with all regular parameters of regular infrastructure projects, to wit: road construction ( $r=.530$ ); bridge and approaches construction ( $r=.318$ ); flood control construction ( $r=.336$ ); and rehabilitation of roads ( $r=.398$ ). Since the  $p$  values fall within  $0.00-0.05$ , the null hypothesis was rejected. The relationship between the two variables was positive. This discerned that the higher the conformity and compliance to standard specification requirements and approved plans on the provision of Material Quality Control, the higher the implementation of the aforementioned infrastructure projects. The manifestation of high concern for quality assurance resulted to a high extent of project implementation. Seen in this context, the project implementer's quality assurance program has improved the status of implementation of the infrastructure projects as well as enhanced the efficiency and effectiveness of the services rendered. These findings confirmed the views of some authors that quality assurance sets standards to increase productivity and objectivity by determining as clearly as possible what are acceptable and what are not acceptable (Crocker, 2006; Hoyle, 2005).

The monitoring system was significantly related to the implementation of regular infrastructure projects which had only in two indicators, namely: flood control construction ( $r=.283$ ); and rehabilitation of roads ( $r=.287$ ). Since the probability values are lesser than  $.05$ , the null hypothesis was rejected for these selected indicators of project implementation. This seemed to suggest that the

higher the monitoring activities extended to flood control construction and rehabilitation of roads, the higher the implementation of these projects. The two aforementioned projects require a tough monitoring system. Logically, because these contributions have to be free from slippages and prevent unacceptable performance. Heavy works and much heavier equipment are operating on these projects. Hence, regular monitoring and supervision is vital.

Moreover, the capability of project implementers is similarly related to project implementation in all indicators of road construction ( $r=.631$ ); bridge and approach construction ( $r=.423$ ); flood control construction ( $r=.448$ ); and rehabilitation of roads ( $r=.632$ ). Since the  $p$  values fall within the range of .000-.05, hence the null hypothesis between these two variables was rejected. Thus, the higher the technical skills of the project implementers are, the higher is the extent of project implementation. Similarly, the more extensive is the project implementer's capability to provide complete equipment, machineries, and manpower resources, the more extensive is the project implementation. The project implementer's capability as manifested in technical skills of DPWH engineers in leading, managing, and supervising people at work positively affect the construction of projects. Technical leaders are goal-oriented. In this case, the DPWH project implementers are project-oriented. Highly capable managers lead by setting examples. Kalada (2007) and Dale (2008) emphasized that technical skills are components of human capability in producing positive results and efficient products. It also stresses that the management skills in leading technical work and technological advancement of quality products.

Similarly, executive and information system is significantly related to the implementation of regular infrastructure projects in terms of road construction ( $r=.452$ ); bridge and approach construction ( $r=.407$ ); flood control construction ( $r=.478$ ); and rehabilitation of roads ( $r=.451$ ). The null hypothesis was rejected indicated by the  $p$  values being within .000-.05. The data indicated that the higher the utilization of executive and information system by the project implementers, the higher the extent of which infrastructure projects were implemented. The implementations of infrastructure projects were enhanced when the project implementers religiously conduct construction supervision, and also make transactions transparent to the public. Infrastructure projects were attained fully through the aid of information technology. Most importantly, the strict implementation of IRRA of RA 9184 was also a factor which made project implementation efficient and effective.



**Objective 5. Intervening effect of the organizational factors to the relationship between performance of project implementers and the implementation of regular infrastructure projects of DPWH.**

Table 15. Multiple Regression Result on the Intervening Effect of the performance of project implementers and the implementation of regular infrastructure projects

VARIABLES WHICH HAVE INTERVENING EFFECTS					
Intervening Variables	Regression Coefficient	F value	Prob.	Interpretation	Decision on Ho
Administrative Support	R <sup>2</sup> =.46319 .414143 .452126	9.381	.0015	Significant	Rejected
Financial Resources	R <sup>2</sup> =.42223	8.870	.0031	Significant	Rejected
VARIABLES WHICH HAVE NO INTERVENING EFFECTS					
Manpower Resources	.10382	.440	.5237	Not Significant	Not Rejected
Equipment Support	.08415	.321	.5094	Not Significant	Not Rejected

Table 15 shows the result of the multiple regression analysis on the intervening effect of the organizational factors in terms of financial resources, manpower resources, equipment support, and administrative support to the relationship between the independent variable and dependent variable. Two (2) organizational factors appear as significant intervening variables in the regression model. Thus, the null hypothesis is rejected in this case. These included administrative support (F=9.381; p= .0015); and financial resources (F=8.870; p= .0031). The r<sup>2</sup> value of .46319 for administrative supported 46% on the positive relationship between the performance of project implementers and status of implementation of regular infrastructure projects of DPWH-RO X. The significant intervening effect arises from the all-out support of management specifically on their sustained effort towards the goal of completing the on-going project construction in order to finish it on time as indicated in the approved plan and specifications. The main reason of administrative support is towards producing quality infrastructure for quality delivery of public-service. That such quality is the prime concern of

the administration and that sub-standards materials used should not replace or substitute the approved standards.

As declared by several authors, in product and program management, zero defects are emphasized. Therefore, specifications and standard requirements of quality of materials and products are to be considered and monitored. Quality assurance aims to prevent defects and aims at quality output (Broadwell & House, 2006; Hoyle, 2005; Kalada, 2007).

Moreover, financial resources appear as a significant intervening variable. The corresponding  $r^2 = .42223$  indicated that 42% of the variance of the relationship between the project implementer's performance and implementation of infrastructure projects can be explained by the intervening effect of financial resources. This could be attributed to the fact that the project budgetary scheme has a significant bearing and provides a mobilizing factor to project implementation. Budget is important for a number of reasons. First, the project implementers cannot readily look for consultants as well as contractors to realize the planned project construction; and secondly, the delayed project completion is attributed to inadequate and delayed release of budget. Furthermore, financial resources facilitate the contractor's activities in facilitating project completion, without which the implementation of the regular infrastructure projects are delayed. Cash allocation is important to have continuous project construction because it is a waste of time to start a project and not completed on time. The continuity of the on-going project construction depends upon the timely payment of project billings. The inability to pay punctually project billings will lead to discontinuity of the process. The appropriate and proper utilization of fund is vital in the completion of infrastructure projects (<http://www.dbm.gov.ph>).

However, the other two organizational factors, namely: manpower resources and equipment support did not reach a significant level to justify their inclusion in the regression model. Hence, manpower resources and equipment support did not have a significant intervening effect to the relationship between the performance or project implementers and the status of implementation of regular infrastructure projects. Hence, the null hypothesis cannot be rejected for these two intervening variables.

## CONCLUSIONS

From the findings as indicated in the analysis of data, a full implementation of the DPWH regular infrastructure projects is made possible through the commitment of the project implementers whose performance is "very good"

on the parameters of quality assurance, monitoring system, and executive and information system. Although the project implementer's capability to implement is "low", nevertheless, they ensure their best to set vital standards, specifications, and requirements to produce quality infrastructure projects. A very high level of implementation is observed on road construction, bridge and approach construction and rehabilitation of roads. The scenario that flood control constructions is somewhat "low" necessities a reengineering scheme to solve the observe problem. The intervening effects of administrative support and financial resources strengthen the positive effects of the project implementers' performance on the implementation of the regular infrastructure projects of DPWH-RX.

### RECOMMENDATIONS

1. The DPWH Project Implementers and the DPWH Monitoring Team asses and implement the proposed intervention Design for Planned Change;
2. The project Contractors with the joint effort of the bidding Committee should strictly follow the strict requirements and specifications for manpower resources and equipment support; and
3. Interested researchers can expand the topic by making it global in scope through data mining technique.

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