

**PROJECT EVALUATION AND ORGANIZATIONAL LEARNING IN THE ROAD  
CONSTRUCTION INDUSTRY OF UGANDA: A CASE STUDY OF  
UGANDA NATIONAL ROADS AUTHORITY (UNRA)**

**By**

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**A DISSERTATION SUBMITTED TO THE SCHOOL OF BUSINESS AND  
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**NOVEMBER, 2015**

## DECLARATION

I, **Jacob Asimwe Kameraho** declare that, this dissertation is my original work and has never been published or submitted for any award in any other institute or University.

Signed .....

Date.....

**APPROVAL**

This dissertation has been submitted for examination with my approval as University Supervisor

Signed:.....

**Prof. Benon C. Basheka, PhD**

Date:.....

## **DEDICATION**

I dedicate this Dissertation to my wife Olivia K. Asimwe, my Sons; Matthew A. Asimwe and Ryan Ariho.

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I would like to express my thanks and gratitude to various people who have contributed to the completion of this work. It is not possible to name all those who have supported me but I am greatly indebted to everyone. I wish to express my sincere gratitude to my supervisor Prof Benon Basheka for profound effort to supervise this thesis.

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

CPM	:	Critical Path Method
CVI	:	Content Validity Index
M&E	:	Monitoring and Evaluation
OR	:	Operational Research
PERT	:	Programme Evaluation Review Technique
PMI	:	Project Management Institute
PPS	:	Project Planning and Scheduling
UNRA	:	Uganda National Roads Authority
WBS	:	Work Breakdown Structure

## ABSTRACT

The study sought to establish the extent to which formative and summative project evaluation influences organizational learning in Uganda National Roads Authority. The study also examined the moderating role of organizational culture on the above relationship. This was a case study design that adopted both quantitative and qualitative approaches. Data was collected from a sample consisting of 116 UNRA staff at the level of Directors, Managers, M&E Officers, Project Engineers, Maintenance Engineers, Station Engineers, and Assistant Station Engineers. A close ended self-administered questionnaire and interview schedule was used for data collected. The study found inadequate efforts to promptly validate if planned project leadership, activities, milestones, deliverables, time, quality and controls were being fulfilled during project implementation. Formative evaluation was a significant predictor of organizational learning in UNRA ( $\beta = 0.220$ ,  $t = 2.043$ , sig 0.045). The study found inadequate efforts directed to collecting end of project learning point and post utilization project reviews. Summative evaluation was the strongest significant predictor of organizational learning in UNRA ( $\beta = 0.494$ ,  $t = 4.798$ , sig. 0.000). The study found out that UNRA did not exhibit an appropriate clan and hierarchical organizational culture. Organizational culture was found to positively moderate the relationship between project evaluation and organizational learning. The study concluded that formative and summative evaluations significantly influenced organizational learning in construction projects. To enhance organizational learning, the study recommends the management of UNRA should institute an organizational learning policy and unit to coordinate the process of knowledge creation, integration and utilization in all its construction projects. Development of policy guidelines and standardised formative and summative tools to solicit data during and after project implementation is recommended to foster organizational learning.

## **CHAPTER ONE**

### **INTRODUCTION**

#### **1.1. Introduction**

Project evaluation, a control aspect of project management like before is used for a variety of purposes such as augmenting and complementing managerial processes by providing evidence for decision-making, accountability and organizational learning where results and findings help to create learning organizations (PMI, 2012). Translating findings into learning however still remains a challenge to many organizations. There is also scanty literature on the extent to which Monitoring and Evaluation (M&E) influences organizational learning (Cooper, 2014; Makarivo & Sokolova, 2014). This study aimed at investigating the extent to which project evaluation has influenced organizational learning in the road construction sector of Uganda with a specific focus on Uganda National Roads Authority-UNRA. The study sought to examine the moderating role of organizational culture on the relationship between evaluation and organizational learning. The study examined the extent to which project evaluation influences organisational learning in Uganda National Roads Authority. Project evaluation is the independent variable while organizational learning is the dependent variable.

This chapter presents background to the study, statement of the problem, purpose of the study, research objectives, research questions, research hypotheses, conceptual framework, significance of the study, justification of the study, scope of the study and operational definitions.

## **1.2. Background to the Study**

### **1.2.1. Historical background**

Project evaluation as a critical learning stage in the project management cycle can be traced from different fields of application but more so the construction, engineering, telecommunications, and defense areas and these date back thousands of years which remain a mystery for its great success (Lewis and Greenwood, 2002). Diekmann (2007) reviews the history of construction projects world over and identifies notable construction works which have shaped learning in the construction projects. In the Ancient (before 1000 Century) Asia/ Australia notable projects include civil works of the Du Jian Yan Irrigation Project, Grand Canal in China. In the Middle East/Africa include religious building in Hagia Sophia, Turkey; the Dome of the Rock, in Jerusalem and the monumental Egyptian Pyramids. In Europe notable ancient civil works include the Roman Aqueduct in Italy; religious projects such as Pantheon in Italy and Acropolis Greece, and monumental buildings of Stonehenge in the United Kingdom. In Americas, ancient building includes Civil/military works for the Palace of the Governors, New Mexico, and United States of America.

Modern (1900–present) projects in Asia/Australia include notably the Hong Kong Airport, China; Three Gorges Dam, China; Akashi Kaikyo Bridge, Japan; and Jade Buddha Temple, China. In Middle East and Africa modern day projects include notably Suez Canal, Egypt and Burj Al Arab Hotel, Dubai. In Europe Chunnel, United Kingdom and France; Dutch Sea Barrier in Holland. In the America Panama Canal in Panama; Hoover Dam, Nevada, United States has been instrumental in shaping modern day construction projects. It is also noted that the historical

buildings were influenced by culture and had impact on the livelihood of the community people (Diekmann, 2007).

Four major errors according to Azzopardi (2009) have influenced and shaped modern day project management approaches. Prior to 1958 project management was perceived as complex process that project managers were preoccupied with work simplification. A major milestone in the project management movement was the introduction of work breakdown structure (WBS). This was followed by application of management science theories to project management (1958-1979) such as project planning, organizing and controlling for enhanced achievement of project objectives. It was at this time that project planning and scheduling (PPS), Critical Path Method (CPM) of scheduling, Programme Evaluation Review Technique (PERT), and Operational Research (OR) were introduced and underpin modern day project evaluation even in the construction sector.

The period 1980 – 1994 also called the production centre human resources was characterised by a revolution in the development in the information management sector with the proliferation of the personal computer (PC) and associated computer communications networking facilities. The result was availability of low cost PCs that had high efficiency in the management of project management including project evaluation. The projects of the time focused on risk management, group dynamics, and quality management. These have underpinned modern day project evaluation where formative and summative evaluations are used to establish the extent to which projects have achieved their implementation and post implementation objectives and identification of project risks which may constraint the attainment of the project objectives (Azzopardi, 2009).

The period 1995 present, project management is characterized with creating a new environment enabled by information technology especially internet. Today, there are many project management software packages which allows automatic uploading of data so that anyone with a standard browser can; input the recent status of the assigned task within a given project; find out how the overall project is doing; be informed of any delays or advances in the schedule; and stay in the loop for their project role while working independently at a remote site.

Al-jibouri (2003) notes that within construction projects, divergences from the original plan will occur; therefore project evaluation has always been inbuilt within the project implementation as a control measure for completing project within acceptable time and budget through monitoring the actual output, reports and taking of corrective actions on the construction project. However, as noted by Cooper (2014) translating findings into learning still remains a challenge to many organizations. There is also scanty literature on the extent to which M&E influences organizational learning (Makarivo & Sokolova, 2014).

### **1.2.2. Theoretical background**

The study was be guided by the Barnard's (1956: 75) systems theory approach to organizational learning which has roots in Bertalanffy's (1951) general system theory. The Barnard (1956:75) systems theoretical approach to organization learning regards organizations as open systems confronted with environmental pressure which they somehow have to adapt to and deal with. Barnard (1956) asserts that, organizations have to cope with environmental complexity by evaluating the different sub systems (such as M&E) and learn lessons on how to deal with the

overall system complex problem to gain the desired organizational outcomes (Kast & Rosenzweig, 1970).

Katz and Kahn (1978:27) in support of the open systems perspective posit that the organization lives only by being open to inputs and its continuing existence requires both the property of openness and selectivity. To learn, organizations need to be self-referential of which organizational learning is conceived as an increase in problem solving potentials of social systems derived by institutional learning (Klimecki et al. 1991:113). Here management is advised to allow autonomous developments in systems and to design structural preconditions in organizations that promote such self-referential processes for organizational learning. A key assumption of systems thinking is that all outputs of systems are seen as input to other systems, therefore learning means understanding the complex relations of social systems and their dynamics and helping creating and utilizing knowledge for organizational problem solving (Senge, 1990).

Guided by the Barnard (1956: 75) systems theory, the study specifically focused on the M&E sub system in UNRA and examined how the use of formative and summative project evaluations contribute to organizational learning in the road construction sector. The study also considered the organizational culture subsystem and how it moderates the relationship between evaluation and organizational leaning in UNRA. It is hypothesized that the outcomes of the roads project evaluation and organizational culture sub-system will act as input or feedback for problem solving in UNRA leading to creation, integration and utilization of knowledge necessary to deal with the UNRAs complex problems thereby enhancing the attainment of mandate of developing

the road network in the country. The three concepts of project evaluation, organizational culture and organizational learning are detailed in the next subsection of conceptual background.

### **1.2.3. Conceptual background**

Project evaluation has been conceptualized differently by different scholars to suit different contexts (Coryn et al., 2011: 207). Cook et al, (2011) for example has conceptualized project evaluation to include formative and summative evaluations. Formative evaluations are a type of implementation-related evaluation and typically assess the extent to which intended program or policy designs are successfully implemented. It is a rigorous assessment process designed to identify potential and actual influences on the progress and effectiveness of implementation efforts (Coryn, et al., 2011: 207) and others have pointed out that assessing implementation is a necessary condition to being able to evaluate the extent to which a program has achieved its intended outcomes.

Summative evaluation on the other hand is a systematic process of collecting data on the outputs, outcomes or impact and the resulting data provide information on the degree of success, effectiveness, or goal achievement of an implementation project. Summative evaluations therefore focus on the “bottom line” with issues of value for money or costs in relation to observed outcomes (Fleischer & Christie, 2009: 160). This study borrows from the above conceptualization but splits summative evaluations to include two dimensions of end of project evaluations and post utilization evaluations of the roads developed by UNRA.

Cameron (2004) identifies four organizational cultural dimensions of clan, adhocracy, market and hierarchy. The clan culture is characterized with loyalty, morale, commitment, tradition, collaboration, teamwork, participation, and consensus, individual development (Cameron, 2004;

Cameron & Quinn, 2006; Tseng, 2010). Adhocracy culture is characterized with a dynamic, entrepreneurial, innovative and creative workplace (Cameron, 2004; Cameron & Quinn, 2006; Tseng, 2010). A market culture is regarded as a results-oriented workplace with emphasis on winning, outpacing the competition, escalating share price, and market leadership (Cameron, 2004; Cameron & Quinn, 2006).

The hierarchical culture is characterized with formalized and structured place along with procedures, well-defined processes and a smooth-running organization (Cameron, 2004). This study borrows from the Cameron conceptualization considered two dimensions of clan and hierarchical structure deemed relevant in a public sector entity like UNRA implementing government program of development of the national road network without any competitors.

Organizational learning as the dependent variable can simply be described as a dynamic process of creation, acquisition and integration of knowledge aimed at the development of resources and capabilities that contribute to organizational performance thereby contributing to competitive advance and organizational prosperity or survival (Argyris 1993: 12; Fuller *et al.*, 2007: 120; Keller & Just, 2009: 102). Organizational learning is the effective way of making use of past experience and adapting to environmental changes (Argyris 1993: 12; Senior, et al., 2011: 49). Learning may be maintained at the single and double-loop level. Single-loop learning is connected to error detection and correction, which is the main mechanism of quality control. The process involves knowledge accumulation, dissemination, and retention. Double-loop learning moves to a higher level and demonstrates a certain degree of pro-activeness by focusing on error prevention and dedicating to zero-defect quality. Coupled with knowledge refinement and

knowledge creation through incremental changes, double-loop learning leads to total quality (Argyris 1993:12).

To succeed, organizations need to switch to focus on triple-loop learning which involves constantly questioning existing products and systems by strategically asking ‘where the organization should stand in the future and how to support organizational competency to create value in the target market (Argyris & Schön 1996: 27). Triple-loop learning is accompanied by organizational ambition, wisdom and courage, and involves knowledge creation. The triple-loop learning process incorporates a higher degree of creative input and organizational learning, and is an interactive and iterative process (Argyris & Schön 1996: 27). The above detailed review of the concept of organizational learning has helped throw reasonable light on the concept of organizational learning that this study identifies three indicators of knowledge creation, integration and utilization for organizational problem solving in the road construction sector.

#### **1.2.4. Contextual background**

UNRA was established under the Uganda National Roads Authority Act, No. 15 of 2006, laws of Uganda and became operational on 1<sup>st</sup> July 2008 with the mandate of developing and maintaining 20,000 Km of national roads network, advise Government on general roads policy and contribute to addressing of transport concerns guided by the Road Sector Development Plan (RSDP). UNRA’s mandate is to handle road administration and execution function by focusing on policy, setting standards, regulation, monitoring and evaluation function to guarantee all year round safe and efficient movement of people and goods throughout the country (UNRA, Strategic plan, 2008-2013).

UNRA set up a Monitoring and Evaluation unit that is responsible for tracking the progress in implementation of the Strategic Plan in order to identify and promptly report observed or likely deviations (providing early warnings); The M&E unit is generation of performance reports and reviews to account to the stakeholders, and fostering learning through participatory evaluations and documenting lessons learnt (UNRA Corporate strategic Plan, 2014-2019). The authority however seems to be constrained in the delivery of its mandate. The Office of the Auditor General of Government (OAG) report, 2013 faults UNRA for failure to learn from previous experiences gained from M&E reports. The authority was faced with cases of Non-performing contract for the supply of high value equipment's, gradual rise in outstanding Commitments of up to 74% which could result into higher costs in terms of interest and litigation by suppliers and contractors. Furthermore; the procurement process for both Road Development and Maintenance contracts always take unnecessarily too long about a year and beyond in some projects leading to escalation of construction costs through variation of price. Similarly, the OAG noted that a review of the reported performance revealed that some key planned activities were not fully executed despite having received adequate funding leading to huge and nugatory payment for prolongation costs which are a waste of Government resources which accelerates the costs of road construction. The authority was also constrained in its Land and Property Compensation challenges which not only delayed the beginning of the projects but has persistently been experienced over the years in most of its projects.

The PPDA Audit covering procurement activities (initiation, bidding, evaluation and contracting) leading to the award of contracts revealed a 98.5% and 1.45% medium and high risk procurement in UNRA respectively. Areas that led to the entity's performance being rated unsatisfactory included lengthy procurement process in majority of the procurements, resulting

in delayed service delivery; and poor estimations of procurements with 25% of the procurements reviewed, the final contract amount was in excess of the planned amounts, leading to diversion of funds from other priority areas (PPDA Audit Report on UNRA, June 2014).

### **1.3. Statement of the Problem**

It is widely advocated by project management scholars and practitioners that project evaluation is used by management for organizational learning through creation, storage, integration and utilization of gained knowledge from evaluation (Mendler, 2007: 1; Kululanga & Kuotcha, 2008:1; Coryn, et al., 2011: 207; Henderson et al., 2013:1). Some formative and summative evaluations in UNRA have been conducted on each road construction project since the inceptions of UNRA in 2008. The authority however seems to be constrained in the achievement of its mandate; a situation which suggests failure to learn by utilizing the knowledge gained from roads project evaluations. The entity has persistently been bogged with inaccurate road projects estimations, protracted procurement process, and non-performing contracts leading to delays to initiate and complete projects on schedule and high cost overruns (PPDA Audit, 2013; OAG Report, 2012). If this trend remains unabated, the development and maintenance of 20,000km road network under UNRA's mandate will persistently be constrained leading to failure to gain value for money and compromising on the role of road projects evaluations to organizational learning in UNRA.

Meanwhile, there is scanty research on organizational learning in the construction sector especially in developing countries (Cooper, 2014:1; Makarivo and Sokolova, 2014:1). Studies in Uganda which have been done have concentrated on factors influencing construction project

delays (Arinaitwe et al, 2011: 44); contract management and quality of construction projects (Baguma, 2012); procurement management and road construction project performance (Konde, 2012); monitoring and contractor performance (Nkooka, 2014). None of these studies has so far ventured into organizational learning, and yet it is on the basis of such learning that the construction sector can generate, integrate and utilize knowledge which will enable completions of construction projects with time, cost and quality expectations. To partially address this knowledge gap, this study aimed at establishing the extent to which road projects evaluation has influenced organizational learning in UNRA.

#### **1.4. Objective of the Study**

##### **1.4.1 General Objective**

To establish the extent to which project evaluation influenced organizational learning in the road construction industry in Uganda; using a case study of UNRA.

##### **1.4.2. Specific objectives**

1. To establish the extent to which formative project evaluation influenced organizational learning in Uganda National Roads Authority
2. To establish the extent to which summative project evaluation influenced organizational learning in Uganda National Roads Authority
3. To establish the moderating role of organizational culture on the relationship between project evaluation and organizational learning in Uganda National Roads Authority.

#### **1.5. Research Questions**

1. To what extent does formative road project evaluation influenced organizational learning in Uganda National Roads Authority?
2. To what extend does summative evaluation influenced organizational learning in Uganda National Roads Authority?

3. How does organizational culture moderate the relationship between project evaluation and organizational learning in Uganda National Roads Authority?

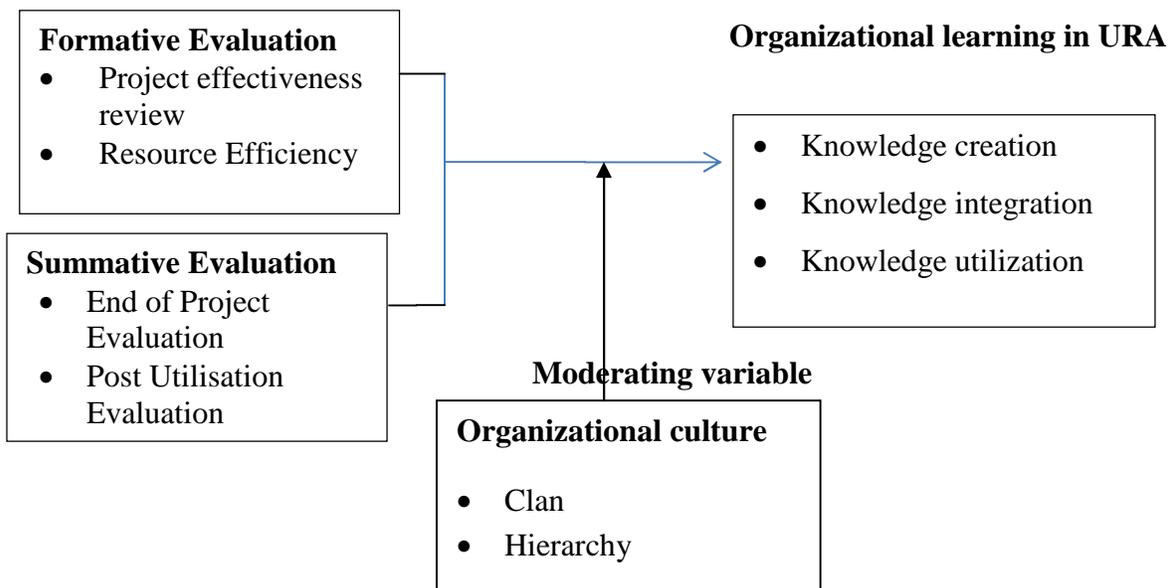
### 1.6. Study Hypotheses

1. Formative project evaluation significantly influenced organizational learning in UNRA
2. Summative project evaluation significantly influenced organizational learning in UNRA
3. Organizational culture significantly moderates the relationship between project evaluation and organizational learning in UNRA

### 1.7. Conceptual Framework

**Figure 1: Conceptual framework**

#### Project Evaluation



*Source: Adopted with modifications from Barnard (1956) systems theory approach to organizational learning.*

The model shows that organizational learning in the construction sector is likely to depend on formative and summative evaluations. The relationship between project evaluation is moderated

by organizational culture. Organizational learning has indicators of knowledge creation, integration and utilization. Formative evaluation had indicators of project effectiveness review, and measurement of efficient resource use. Summative evaluation had indicators of end of project evaluation and post utilization evaluation. Organizational culture has two indicators of clan and hierarchy. It is therefore hypothesized that formative evaluations significantly influence organizational learning in the road construction at UNRA. The model also hypothesized that summative evaluation influenced organizational learning at UNRA. The model further hypothesizes that organizational culture moderates the relationship between project evaluation and organizational learning in UNRA. The failure or inadequate consideration of formative and summative evaluations as well as an appropriate organizational culture therefore constrains organizational learning in the development of the road sector by the authority.

## **1.8. Scope of the study**

### **1.8.1. Content Scope**

The study concentrated on project evaluation under the indicators of formative and summative project evaluation as the independent variable. The study also focused on organizational learning as the dependent variable under the indicators of road sector knowledge creation, integration and utilization. The study considered organizational culture under the indicators of clan and hierarchy cultures as moderating variable.

### **1.8.2. Geographical scope**

UNRA has a series of completed road projects country wide, and this study concentrated on UNRA Head Quarters and its 22 stations countrywide who are involved in planning and supervision of road projects.

### **1.8.3. Time scope**

The study considered the period 2008 to 2015 the time UNRA started on its mandate on developing the road network in the country.

### **1.9. Justification of the Study**

The government of Uganda's works and transport sector budget constitutes 14.9% of the national budget. The road development sector reveals that UNRA takes 64.73% of the road development fund (URF, Physical and Financial performance report, 2011-2012). The attainment of the UNRA mandate largely depends on generation of performance reports and reviews to account to the stakeholders, and fostering learning through participatory evaluations and documenting lessons learnt (UNRA Corporate strategic plan, 2011-2015). This means that the failure to learn by utilizing the knowledge gained from evaluation in the development of the road construction projects will continuously lead to huge adverse effects not only on budget performance but also road service delivery or value for money in the road sector which is critical economic growth and development. It was necessary that expanded empirical studies are carried out to inform management on how they can use the results for evaluation for organizational learning to enhance the achievement of its mandate of developing and maintaining of 20,000km of the national road network.

### **1.10. Significance of the Study.**

The study may be useful in the following ways:

To the management of UNRA, the study helps generate empirical information on the projects evaluation and organizational learning that may be used to strengthen project evaluation and organizational learning policy in the authority.

To the academia, the study helps cover literature gaps on the extent to which projects evaluation influence organizational learning in the construction sector of a developing country like Uganda.

By so doing, the study helps to link M& E theory to practice in the construction sector.

### **1.11. Operational Definition of Terms and Concepts.**

Project evaluation in this study refers to the formative and summative evaluations.

**Formative evaluations** in this study refer to assessment of project progress and effectiveness and assessment of efficiency of resource use.

**Summative evaluations** in this study refer to the end of project evaluation focusing relevance and cost as well as Post Utilization Evaluation focusing on safety analysis and sustainability.

**Organizational culture** in this study refers to the clan and hierarchy culture.

**Organizational learning** in this study refers to the knowledge creation, integration and utilization.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1. Introduction**

This chapter presents a review of related literature on project evaluation and organizational learning based on what other scholars have observed or opined world over. The first section presents the theoretical review. This is followed by the conceptual review and a result of related literature in relation to study objectives.

#### **2.2. Theoretical Review**

The study was underpinned by the system theory perspective of organisational learning Barnard (1956: 75) which conceptualise organisations as open systems that are confronted with environmental pressure they somehow have to adapt to and identifies three distinctive approaches to organisational learning. First the traditional approaches to a system based management asserts that organisational environments were perceived as exerting pressure on organisations, that management had to deal with and organisations that have to cope with environmental complexity have to generate systems to deal with complexity. Organisational learning is therefore undertaken by management in an effort to acquire and use knowledge to manage the complex organisational challenges arising from the environment.

Secondly the self-organisation processes or self-referentiality assumes that organisational learning is conceived as an increase in problem solving potentials of social systems derived by institutional learning (Klimecki et al. 1991). According to this perspective, institutions have to build organisational slack in order for self-referential processes to take place and thereby develop the organisation to a higher level. Here management is advised to allow autonomous

developments in systems and to design structural preconditions in organisations that promote such self-referential processes.

Finally the System Dynamics Approach whose basic assumption is that once organisations have reduced complexity of a network system by analyzing the features of all relevant factors and their dynamic relations over time, this knowledge can be used to understand the functioning of complex systems networks and to intervene accordingly (Ulrich and Probst, 1990). All outputs of systems are seen as input to other systems, therefore learning means understanding the complex relations of social systems and their dynamics. In this approach looking at one system-level, for example the organisation also implies defining the elements of this system on a lower level - the groups or individuals - and describing the larger system into which the system of interest is integrated into. The system-dynamics perspective is also derived from a cybernetic concept of single loop learning, as the model builds on feed-back loops and a perspective of stabilising systemic structures by balancing loops (Senge, 1990) propositions about systems archetypes can be interpreted as Bateson's (1992) Type II or Type III learning because they are based on assumptions that are a result of reflection about 'higher-order-rules'. System thinking is seen as the essential fifth discipline for organisational learning by Senge (1990) and 'organisational learning processes are most effective when they help managers develop a more systemic and dynamic perspective' (Senge and Sterman 1992).

From the Barnard (1956) systems theory, the study identifies and evaluates the M&E sub system in UNRA and its contribution to organizational learning in the development of the road sector in Uganda. The study hypothesizes that the results of the roads project formative and summative evaluation sub-system act as in an input or feedback for problem solving in UNRA leading to

creation, integration and utilisation of knowledge necessary to deal with the UNRA's complex problems thereby enhancing the attainment of its mandate.

## **2.3. Conceptual Review**

### **2.3.1. Project Evaluation**

The project management Institute (2004) defines project evaluation as the systematic collection of information about activities, characteristics, and outcomes of projects to make judgments about the project, improve effectiveness, and inform decisions about future project management. Project evaluation is majorly formative or summative (PMI, 2004; Stetler, et al., 2006).

Formative evaluation is concerned with implementation-related evaluation and typically assesses the extent to which intended project activities and milestones are successfully implemented. It is a rigorous assessment process designed to identify potential and actual influences on the progress and effectiveness of implementation efforts (Stetler, et al., 2006) a necessary condition to ascertain the extent to which a project will achieve its intended outcomes. Cook, et al (2011) noted that formative evaluation is typically conducted during the development or improvement of a project or program and it is conducted, often more than once, for internal and external stakeholders with the intent to improve. Irrespective of whether conducted by internal or external teams, Coryn, et al. (2011) is of the view that the purpose of formative evaluation is to validate or ensure that the goals of the project are being achieved and to improve if necessary, by means of identification and subsequent remediation of problematic aspects.

Summative evaluation is defined by Fleischer and Christie (2009) as a systematic process of collecting data on the outputs, outcomes or impact and the resulting data provide information on the degree of success, effectiveness, or goal achievement of an implementation project. Zedtwitz (2002) classified project summative evaluation in the construction sector under end and

post project utilisation evaluations. End of projects evaluations are terminal evaluations commonly used approaches for passing on previous experience to enhance future project and organizational practice while post utilisation evaluation on the other hand focus on obtaining feedback on recently completed construction projects from people involved in the construction process, occupants and other end users with a view of establishing impact of the project on society.

Summative project evaluation process according to Wideman (1991) consists of activities performed by a project team at the end of the project's life cycle to gather information on what worked well and what did not, so that future projects can benefit from that learning. It aims to find out best practices and documenting "lessons learned". Lessons learned can be determined especially while discussing the problematic areas and their reasons, or while developing improvement suggestions. By this way, lessons of the project will be transformed into explicit knowledge from tacit knowledge and can be used later on future projects.

Summative evaluation processes according to Corbin et al (2001) although different can be generalised beginning with data collection where data about the important points for success and management of the project are collected. Data collection is followed by evaluation where the project is evaluated against success criteria, risks, and different applications to generate a general picture of the project for future projects' benefit. The third step is the establishing lessons learned involving examining the different applications in the project and their advantages-disadvantages after evaluation from which critical learning points are taken on the underlying factors for project successes and failures. The fourth step according to Corbin et al (2001) is verification where data

and/or evaluation results' correctness and sufficiency are examined while the fifth very important step of documentation where evaluation results are documented as case studies or reports and final sixth step of information dissemination ends the summative evaluation and involves dissemination of results and lessons learned for future use.

The focus of summative evaluation or post project evaluation according to Wideman (1992) may involve three critical areas of equal importance, namely the technical objectives of the project as represented by its scope and quality parameters. The second dimension of the project relates to the business management objectives as represented by its time and cost parameters. The third dimension, which is more difficult to grasp and to state explicitly, has to do with stakeholder satisfaction and their collective perception of the success of the project. Therefore, a complete project evaluation should take all these considerations into account and try to distinguish the factors affecting them. Post project evaluation should also focus on some other issues, affecting these main subjects, like project risks and risk management activities, human resources, and communications (Maylor, 1999).

Other key learning points that need to be evaluated in the project according to Shenaret *al.*, (2002) are the key success factors leading to success namely high-level management support, technical success, availability of raw materials, need to lower cost, timing, commitment of project staff, use of cross-functional, experienced, systematic monitoring and control mechanisms, overall project management processes, and the traditional project performance criteria time, cost and quality.

The above detailed explanation of summative evaluation guided this study in exploring the extent to which end and post project utilisation has considered use of key steps; consideration of critical areas of technical scope and quality parameters, business management objectives and stakeholder satisfaction in evaluating UNRA projects and their use for organisational learning.

### **2.3.2. Organizational Culture**

There has been no consensus on a comprehensive definition of organizational culture among many scholars who have attempted to define it. To this effect, similarities have been highlighted to include values, beliefs, practices, rites, rituals, stories, visible behavior patterns, symbols and language based on technology emergent, evolving with learning gained from crises all shared by most employees in a company (Ball & Quinn, 2001; Cerovi *et al*, 2011). However, a more suitable description of organizational culture adopted in this study is by Cameron (2004) four organizational cultural dimensions of clan, adhocracy, market and hierarchy.

Cameron (2004) views clan culture as a friendly place with an extended family working together. The clan culture is characterized with loyalty, morale, commitment, tradition, collaboration, teamwork, participation, and consensus, individual development (Cameron, 2004; Cameron and Quinn, 2006; Tseng, 2010). Adhocracy culture is characterized as a dynamic, entrepreneurial, innovative and creative workplace (Cameron, 2004; Cameron and Quinn, 2006; Tseng, 2010). It emphasizes new product and service development, growth, change, and experimentation (Cameron, 2004; Cameron & Quinn, 2006; Tseng, 2010).

A market culture on the other hand is regarded as a results-oriented workplace with emphasis on winning, outpacing the competition, escalating share price, and market leadership (Cameron,

2004; Cameron & Quinn, 2006). This indicator is may not be easily applied in this study context given that it a public entity with no competitor.

The hierarchy culture is characterized with formalized and structured place along with procedures, well-defined processes and a smooth-running organization (Cameron, 2004). The long-term concern of this type of culture is the stability, predictability, and efficiency (Cameron, 2004; Tseng, 2010). This study borrows from the Cameron conceptualization but considered two dimensions of clan and hierarchical structure deemed relevant in a public sector entity like UNRA implementing government program of development of the national road network without any competitors.

### **2.3.3 Organisational Learning**

Organizational learning can simply be described as a dynamic process of creation, acquisition and integration of knowledge aimed at the development of resources and capabilities that contribute to organizational performance thereby contributing to competitive advance and organizational prosperity or survival (Argyris 1993; Fuller *et al.*, 2007; Keller & Just, 2009).

Huber (1991) construes organizational learning process as made up of knowledge acquisition, distribution, interpretation and memorizing. Other scholars contend that learning involves identification of information that seems relevant to learning and /or the creation (generation) of new knowledge by combination. Secondly, some mode of exchange and diffusion of knowledge either from the individual to the collective level or on the collective level. Knowledge then has to be integrated into existing knowledge systems on a collective and or individual level or into procedural rules of the organisation whereby either integration or modification of the adopting system can take place. Finally the (new) knowledge has to be transformed into action and

applied in organisational routines in order to have an effect on organisational and individual behaviour (Argyris 1993; Fuller *et al.*, 2007; Keller & Just, 2009).

Argyris (1993) equally contends that learning may be maintained at the single and double-loop level. Single-loop learning is connected to error detection and correction, which is the main mechanism of quality control. The process involves knowledge accumulation, dissemination, and retention. Double-loop learning moves to a higher level and demonstrates a certain degree of pro-activeness by focusing on error prevention and dedicating to zero-defect quality. Coupled with knowledge refinement and knowledge creation through incremental changes, double-loop learning leads to total quality (Argyris, 1993).

To succeed, organizations need to switch to focus on triple-loop learning which involves constantly questioning existing products and systems by strategically asking 'where the organization should stand in the future and how to superpose organizational competency to create value in the target market (Argyris and Schön 1996). Triple-loop learning is accompanied by organizational ambition, wisdom and courage, and involves knowledge creation. The triple-loop learning process incorporates a higher degree of creative input and organizational unlearning, and is an interactive and iterative process (Argyris and Schön, 1996).

Pawlowsky (1994) on the other hand categorises organisational learning into three prototypes of learning can be clarified as '*Type I*' referring to the correction of deviations where learning refers to the detection of performance gaps and their correction in line with the operating norms or standards that have been defined. '*Type II*' implies an adjustment to the environment and is based on the assumption that organizations have theories in use, interpretations-systems and frames of reference that guide and determine organizational behaviour. If the environmental

feed-back that the organization receives challenges the organization's assumptions, and if these assumptions are differentiated, redefined or altered completely in order to fit the environmental demand, then one can say that learning of Type II has occurred. '*Type III*' is referred to as problem-solving learning ('learning to learn'). This kind of learning requires collective reflection of governing rules and assumptions.

The above conceptual review of the concept of organizational learning helped this study identify three indicators of knowledge creation, integration and utilization in the routine management of road construction projects in UNRA and related organizations.

#### **2.4. Project Evaluation and Organizational Learning**

There is an increasing body of research on project evaluation and organisational learning related outcomes. Lin and Lin (2006) for example identifies five factors for project evaluation to contribute to organisational learning in the construction sector namely; establishment of a reward strategy, willingness to Share Knowledge, mechanism to approve activities, friendly system to exchange and reuse Knowledge, and top management support. The study observed that, most engineers felt that knowledge management in construction projects is necessary and important process to improve construction management.

The above views are supported by Ahmad and An (2008) conclusion that in the construction sector, organisational learning system provides a great opportunity to learn experiences from previous projects, helps work quality and reduces costs and time required in projects by providing problem solutions and reducing the probability of mistakes, can be used for staff training, solve problems of losing knowledge and experiences form personnel who leave the

organisation; feedbacks from the evaluation of the system that provide very useful knowledge for the improvement of the management system is very vital for organisational survival.

A more recent study by Carrillo, Ruikar and Fuller (2012) equally insinuates that construction industry is highly competitive and demands continuous improvement through capturing and disseminating lessons learned to foster attainment of project performance expectations. The use of lessons learned in the construction sector according to Bakker et al. (2010) and Carrillo et al. (2011) may be either at intermediate stages such as stage gate project reviews or at the end of project e.g. post project reviews, post mortems. The next sub sections of this chapter reviews specific related literature focusing on formative and summative evaluations and organizational learning.

#### **2.4.1. Formative Evaluation and Organizational Learning**

The review of exiting literature on formative evaluation and organisational learning in the construction sector revealed a narrowly research area with scanty empirical studies. Never the less, literature search from peer reviewed journals in the construction sector revealed related studies such as Fuller and Unwin (2004) who noted that contrary to the suggestion that knowledge is best used when it is shared between parties, adversarial arrangement between contractors and client, useful construction knowledge has becomes an important resource to be hoarded, kept from others and used to further one's own goals while undermining others. The author opines that restrictive learning environment during project implementation is perpetuated by no impetus to communicate or share knowledge across organisational or even functional boundaries, skill, learning and training. Prencipe and Tell (2001) had earlier observed, the capacity to transfer knowledge and lessons learned is often under-developed in situations where

teams are typically disbanded after each project; much of their accumulated collective knowledge and experience is lost.

To this effect, Bennett and Peace (2006) are of the view that the use of partnerships encourages collective learning and knowledge-sharing during project implementation by advancing a set of cultural values and beliefs that support trust, allow discretion and experimentation, and creates a collective ethos within which individuals feel comfortable collaborating and sharing knowledge between client's team and contractors. Waroonkun and Stewart (2008) goes on to note that during project implementation knowledge transferors must have appropriate characteristics such as willingness, knowledge base, experience, management and the like for establishing solid relationships with the transferee. Moreover, relationship building between the transferor and transferee trust, understanding, communication, is the key enabler to knowledge transfer in the host construction sector. In this context, improved technology transfer evaluation can help such organisations to devise targeted strategies for accelerating rates of technology transfer, which will ultimately decrease their reliance on foreign firms when procuring large scale infrastructure projects.

Hallgren and Wilson (2007) examines the informal and incidental learning among four power plant projects using participative observations, interviews, reports, minutes of meetings, observations, and email correspondence. The study found that learning occurred at two levels namely as each of the deviations was handled and secondly aspect of learning involved the patterns in which remedies were handled during project implementation. This study observation on the level of learning are informative that it will necessitate examining if the management of UNRA use project deviations and remedies as learning avenues.

Kululanga et al (2008) in their study equally found that that size and experience play a significant role in the way that construction contractors appropriate lessons from the various constructs of project reviews. Furthermore, the enablers of project review were significantly correlated to lessons learned, shared and planned for implementation for a correlation coefficient. These studies however do not give empirical evidence to the extent to which use of formative evaluation contributed to the learning acquired. Kululanga and Koutcha (2008) further notes that some of the vital lessons that could have been learned from project reviews are lost by contractors because of lack of a structured framework for undertaking them. Even though the construction business environment has moved toward modernizing some of its business processes, unnecessary loss of lessons still characterize the industry. The lack of a structure framework for organizational learning is an interesting observation in this study that it was in this study's best interest to examine the extent to which UNRA has put in place and formative evaluation structural framework to enable knowledge sharing.

Effective knowledge transfer depends on the extent to which the organization documents the knowledge gained. A study by Carrillo, et al (2012) however notes that none of the companies had a dedicated system for lessons learned. Instead, the interviewees described a number of different initiatives; some of which fall under the broad umbrella of knowledge management e.g. discussion forum. The practices were varied from individuals visiting project sites to capture experiences on paper to numerous forms that promoted the collation of lessons learned such as Post Project Review Forms, Project Data. Carrillo, et al (2012) study equally notes that many of the lessons learned outputs were placed on ICT systems such as spread sheets, databases, the

intranet, bespoke systems. In relation to knowledge retrieval Carrillo, et al (2012) et al notes that whilst some companies are embracing ICT technologies, others highlighted companies' archaic approach to ICT. In several cases company intranets are seen as a dumping ground that makes it difficult to deliver value. The study also stressed the importance of people-to-people interaction including visiting site and speaking to people, the use of Communities of Practice to learn from one another, forums to discuss project issues, spending time with existing project teams ahead of new projects.

The Carrillo, et al (2012) study offer a useful insight into the need to examine the extent to which UNRA has put in place ICT as well as person to person interactive platforms for knowledge sharing during project implementation and how effective they have been for gaining knowledge which could be used for improvement of construction projects in the authority. More recent studies such as Henderson et al (2013) examines some hindrances in using project implementation review activities for organizational learning and reported that the current approach of detecting and correcting errors is significantly hindering the extent to which learning from previous experiences is taking place.

Shokri-Ghasabeh and Chileshe (2014) equally identifies barriers to effectively capture lessons learned in Australian construction industry and how knowledge management can benefit from lessons learned application and found that the top-3 barriers to the effective capturing of lessons learned were "lack of employee time", "lack of resources" and "lack of clear guidelines", whereas, "lack of management support" was the least ranked barrier. The study established that despite the majority of the ACCs having formal procedures for recording the tenders submitted

and their outcomes, only a minority actually retained the lessons learned documentation for each project. The larger contractors were found to be more aware of the importance of lessons learned documentation. Henderson et al (2013) notes that improved integration between design and construction is required in the form of improved feedback if continuous improvement in the areas of efficiency, quality, value and general learning from previous experiences/projects is to be achieved. These studies on barriers are insightful as they remind us of examining the barriers to using formative evaluations for organizational learning in UNRA and identifying mechanisms for mitigation of such construction project barriers to foster organizational learning in road projects.

#### **2.4.2. Summative Evaluation and Organizational Learning**

The review existing literature revealed that summative evaluations have recently received a wider research interest than formative evaluation. Cushman and Conford (2003) for example reports that post project review is one of the most commonly used approaches for passing on previous experience to enhance future project and organizational practice. As to the timing of summative evaluations, Carrillo, et al (2012) study reports that project lessons learnt were conducted immediately after the completion of the project 3-6 months after project completion while other were performed more than 6 months after project completion. Carrillo, et al (2012) further notes that whilst many companies accept lesson learned are best done at project stage gates, there are still many that rely solely on the project's completion to generate lessons learned.

In complement, Paranagamage, et al (2012) in their Malaysian study reports that about 42% of the construction firms under study reported that formal lessons learned activities happen immediately after completion of a project. It is also noteworthy that during construction around

25% said that lessons learned takes place formally, informally and both formally and informally, thus indicating that in this stage lessons learned in both forms is likely to happen.

Carrillo (2005) in their study of how Canadian engineering, procurement and construction companies to address lessons learned on their construction projects notes that these firms exploited lessons learnt to improve performance on future projects through post project evaluation. Mendler (2007) equally notes that Post Occupancy Evaluation (POE) helps in obtaining feedback on recently completed construction projects from people involved in the construction process, occupants and other end users. However, POE is severely underutilized as sustainability continuous to grow as a priority in the construction industry. In complement, Carthey (2006) notes that lessons learned from POE can be used to improve the process and the design of future construction projects. Similarly, the most important function of POE is to feed forward the learning of lessons obtained from the review of completed projects into future projects. POE has the potential for supporting “double-looping learning” (Argyris and Schon, 1978); that is to reflect on whether goals need to be reconsidered as well as evaluating how to achieve existing goals better. The use of POE contributes to the reduction of environmental impacts, increased economic viability and high client satisfaction in the construction industry (Kaatzet *al.*, 2006).

Construction organizations are required to integrate the concept of social and environmental concerns in the operations; however this can only be achieved through the acquisition of knowledge on the sustainability concept to develop relevant solutions and standards through

learning (Muller & Siebenhuner, 2007). Progress towards more sustainable construction requires both government and individual organizations to take action (Holton et al., 2008).

The above authors' observations on PCE and POE informed this study of the need to examine whether UNRA undertakes such interventions in the construction projects and how it contributes to organizational learning in the authority for improvement of future projects.

Palaneeswaran, Ramanathan and Tam (2007) observes that most of the project-based human errors are avoidable by having adequate knowledge, better management practices and relevant systems. Consequently, several inadequacies in project systems such as lack of knowledge, poor coordination, and mediocre quality management add to difficulties for such timely discoveries and/or prevention measures. Since time pressures and resource limitations are common in the construction industry, many of the error-related dysfunctions and lessons are not properly documented in all cases.

In complement, Maqsood, Finegan and Walker (2006) research found that project histories are poorly designed, implemented, managed and applied in the organization studied for reasons relate to lack of support from senior management, and proper integration of project histories into a company's overall strategy and vision. Paranagamage, et al (2012) findings further shows the lack of incentives was the highest barrier followed by lack of a learning culture. Other barriers to organizational learning included pressure of time to devote to lessons learned; the reluctance to share problems; and that lessons learned exercises being too generic to be of value.

Furthermore, Carrillo, et al (2012) report that some project managers were not interested in documenting lesson learned because it reflected poorly on them. There is also an ingrained culture of looking forward to new projects, not back to completed projects. Generally, through the interviewees companies felt they have provided a wide range of corporate tools for capturing lessons learned. However, they acknowledged that their processes are not enforced and they still have a long way to go in finding the best way of communicating those lessons learned with their employees. It was in this study's best interest to identify the barriers to using summative evaluations for organizational learning in UNRA.

As remedies to the above observations, Robinson et al (2005) reports that to reinforce the importance of the lessons learnt program, human intermediaries should monitor and review their staff's use of the lessons learned. In order to create an environment conducive to learning, senior management need to visibly support an lessons learnt initiative, assess the organization's culture, eliminate barriers, set goals, get departmental buy-in, designate a champion, empower workers, allocate resources, and measure and track results.

Robinson *et al*,(2005) further reports that to reinforce the importance of the lessons learnt program, human intermediaries, managers should monitor and review their staff's use of the lessons learnt. In order to create an environment conducive to learning, senior management need to visibly support an lesson learnt initiative, assess the organization's culture, eliminate barriers, set goals, get departmental buy-in, designate a champion, empower workers, allocate resources, and measure and track results. In complement, Kululanga and Kuotcha(2008) on their part note that the engagement in project reviews and the application of lessons learned provides a

mechanism for organizational learning and lessons learned should be documented and feedback into the organization. McBeath and Ball (2012) reports the five key themes required for successful knowledge transfer that were established for moving parts to new production facilities: willingness to share information, willingness to receive information, explicit knowledge transfer, tacit knowledge transfer and verification.

Graham and Thomas (n.d) examines the need and use of Lessons learnt in Irish construction sector and concluded that for ample consideration of lessons learnt, there is need for careful design of the lessons learnt process and integrates it into existing organisational procedures. The collection of lessons learnt should incorporate both a sought input and a requirement for individual contributions. Use of a lessons learned database should be incorporated into existing organizational practices with careful consideration given to the classification system used, particularly based on date of lessons learnt. Emails and memos notifying staff of new lessons learnt and reminding them to use the database, in addition to refresher courses on the use of the lesson learnt database are also recommended. Lessons learnt seminars should be organized for staff to augment the lesson learnt database, with careful thought given to the timing, location and delivery of them. Site-based seminars may be more appropriate and relevant on large projects, which can be linked to current and upcoming subcontract and trade packages on site. The integration of lessons learnt practices with construction project development has the potential to align both individual and organisational objectives.

Paranagamage, et al (2012) recommends that sharing of lessons learned in post project evaluation would include;- raising awareness of the existing lessons learned and effective

distribution; simplifying and coordinating the available systems; gearing lessons learned to the roles of individuals; improving the sharing culture within the industry; incentives of different kinds; incorporating lessons learned into operating procedures; improving feedback mechanisms; and; creating champions for lessons learned.

Paranagamage, et al (2012) further recommends recognising any confidentiality issues that need to be kept within team boundaries only and considering lessons learned with a public relations perspective where internal staff is allocated to publicising the lessons learned and ensuring that when employees attempt to retrieve those lessons learned, it is easy to do, relevant and useful.

The raised recommendations are insightful and guided this study in identifying recommendations for mitigation of barriers for organizational learning in UNRA.

## **2.5. The moderating role of organizational culture on the relationship between project evaluation and organizational learning**

There has been a stream of literature on the relationship between organizational culture and organizational learning in this decade. Hall and Goody (2007) for example observes that organizational culture is frequently cited as one such barrier. However, in cases where a supposed “knowledge culture” exists, organizational culture is valued as an enabler. Therefore, before fostering knowledge base in their organizations managers have to consider some cultural barriers in knowledge sharing such as: structure of the organization; employees’ behavior towards change; and benefits after change (Keskin, 2006).

Hernández-Mogollón et al. (2010) in their study demonstrates the positive effect of organizational culture on organizational innovation. A truly innovative firm must be embedded in a strong culture that stimulates engagement in innovative behavior. The basic assumption is that culture plays a key role in enabling companies to achieve speed and flexibility in the innovation process. This is enabled by the view that an adequate culture injects new ideas into the organization, increases the capacity to understand new ideas and strengthens creativity and the ability to spot new opportunities that favor organizational innovation (Santos-Vijande & Alvarez-Gonzalez, 2007).

In complement, a study by Auernhammer and Hall (2013) notes that organisations that seek a positive influence on processes of knowledge creation, creativity and innovation should be open to change; encourage and value free communication and new and/or unusual ideas; tolerate mistakes; and nurture intrinsically motivated staff. Their leaders need to promote these characteristics as shared values, while challenging and empowering their staff to generate new ideas in a drive to further innovation. Auernhammer and Hall (2013) further notes that three main determinants of knowledge creation and creativity processes are identified as: (1) structured “space” that creates expertise and experience of individuals while working in routine; (2) willingness to innovate, i.e. individuals’ propensity to experiment with ideas, even at risk of failure; and (3) authorised and dedicated “space” designated specifically for individuals to explore new ideas. This study will be interested in examining if the hierarchical structure as suggested by Auernhammer and Hall (2013) actually moderate the relationship between evaluation and organizational learning in UNRA.

A previous study by Schwandt and Marquardt (2000) had earlier noted that knowledge sharing is also affected by structure. More exclusively, it is negatively influenced by a hierarchical structure and positively affected by strong intra-organizational relationships. Organizations with hierarchical structures possess the assumptions, orientations, and values linked with the hierarchy culture, whereas strong relationships, similar to those of an extended family, are typical of the clan culture. Lastly, organizational memory, which is intrinsically associated to organizational culture, facilitates the learning processes within organizations by ensuring that what has been learned in the organization can be stored, shared, and updated. It will be in this study best interest to establish the extent to which a clan culture existed in UNRA and how it has fostered sharing knowledge gained from projects evaluation.

Foss, et al. (2010) in their study notes that cultural change in organizations requires the conscious destruction of old procedures and structures, as well as the institutionalization of new processes and structures. Furthermore, this proposition relates cultural change to organizational processes and structures, which drop within the integration function. This function is represented by the dissemination/diffusion subsystem, which coordinates elements of the learning system. The idea of the institutionalization of these processes and structures refers explicitly to organizational memory, which plays a significant role in guiding knowledge- related processes. The point of emphasizing change in organizational culture by the above author is insightful and guided this study in examining the extent to which UNRA has undertaken to change some its systems for enhanced institutional memory in the development of the road sector in Uganda.

In complement, Schein (2010) notes that another determinant of knowledge sharing is the degree to which members have frequent values and a shared context for sharing knowledge, in the form of widespread experiences, vocabulary, or academic background. These meanings and values are determined by one's essential assumptions, which are the building blocks of culture. A more recent study by Jafari et al (2013) found a positive and significant relationship that exists between organizational culture factors (common values, beliefs and faiths) and knowledge management implementation. The study also found that support as another cultural factor includes elements such as team-orientation, freely sharing of information, individualism, cooperation and collaboration of people was found to have a positive and significant association with knowledge management implementation.

Schein (2010) and Jafari et al (2013) points out a positive relationship between culture and organizational learning as a position which relates to a great extent to this study finding that organizational culture acted as moderator on the relationship between project evaluation and organizational learning in UNRA.

## **2.6. Summary of Literature Review**

The review of existing literature revealed wide use of the systems theory perspective to organizational learning suggesting single loop, double loop and triple loop learning as well as Type I,II, III learning arising from organizational subsystems. There is however limited empirical research testing the open systems theory of organizational learning in the construction sector.

Similarly, the review of existing literature suggested that project evaluation according to literature takes the form formation and summative evaluations and there has been increased

interest to research on the influence of evaluation on organizational learning in the construction sector. However, there was scanty literature on the extent to which formative and summative evaluations have influenced organizational learning in the construction sector especially in developing countries. There was no empirical literature on the moderating role of organizational culture on the relationship between project evaluation and organizational learning in the construction sector.

This study therefore strived to cover the raised literature gaps by testing the applicability of the systems theory to organizational learning and provide empirical evidence in the extent to which formative and summative evaluations contribute to organizational learning in the construction sector of Uganda. The study also provides empirical evidence on the moderating role of organizational culture on organizational learning in the construction sector of Uganda.

## **CHAPTER THREE**

### **METHODOLOGY**

#### **3.1. Introduction**

This chapter presents the research design, population of study, sample size and selection, data collection methods, data collection instruments, validity and reliability, data collection procedures, data analysis and measurement of variables.

#### **3.2. Research Design**

The study used a case study design where both quantitative and qualitative approaches were adopted to determine the relationship between project evaluation, organizational culture and organizational learning. Yin (2004) argues that case study research strategies are appropriate for in-depth investigation and when the concern is to study contemporary issues over which the researcher has no control. The case study design also enables in-depth analysis, extraction of data and information specific to an organization to help answer the research questions and test the study hypotheses (Yin, 2004). The quantitative approach was used to quantify findings on the study variables using majorly the correlation and regression techniques while the qualitative approach was used to draw explanation (Amin, 2005) on project evaluation, culture and organizational learning.

#### **3.3. Study Population**

The study was carried out on an accessible population of 116 UNRA staff consisting of Directors, Managers, M&E Officers, Project Engineers, Maintenance Engineers, Station Engineers, and Assistant Station Engineers. These were considered because they are all instrumental in project evaluation and are entry points for knowledge capturing which could be used for organizational learning. Effective use of lessons learnt in the different directorates

would ideally contribute to a comprehensive organizational learning practice leading to enhanced achievement of UNRA’s mandate.

### 3.4. Sample Size and Selection Technique

Sampling according to Amin (2005) is the process of selecting a sufficient number of elements from the population so that a study of the sample and an understanding of its characteristics would make it possible to generalise such characteristics to the population elements. Sample size therefore is the total number of elements selected to represent the population of study. The study selected up to 108 respondents based on Krejcie and Morgan Sampling Guidelines as shown in table 1 below.

**Table 1: Population Category and Sample size of the respondents**

<b>Population category</b>	<b>Population</b>	<b>Sample</b>	<b>Sampling technique</b>
Directors	6	6	Purposive
Managers	30	28	Simple Random
M&E Officers	2	2	Purposive
Project Engineers	8	8	Purposive
Maintenance Engineers	4	4	Purposive
Station Engineers	22	20	Simple Random
Assistant Station Engineers	44	40	Simple Random
<b>Total</b>	<b>116</b>	<b>108</b>	

*Source: UNRA HR Establishment 2013*

### 3.5. Sampling Techniques

According to Amin (2005: 234), there are broadly two sampling approaches namely the probability and none probability sampling techniques. The probability sampling approach involves selecting a sample in such a way that all the elements in the population have some

chances of being selected while in non probability, the elements in the population do not have a well-defined chance of being selected.

### **3.5.1. Simple Random Sampling**

The study used simple random sampling in which a sample is obtained from the populations in such a way that samples of the same size have equal chances of being selected (Amin, 2005). Simple random sampling was used for the Managers, Station Engineers and Assistant Engineers. In using simple random sampling, the study used the lottery approach where names in each category were written on tag and one picked at a time until the required number is reached. The numbers in each category were selected based in Krejcie and Morgan (1970) sampling guidelines for each sub population.

### **3.5.2. Purposive Sampling**

Amin (2005) suggests that purposive sampling is suitable to select individuals within the sample who have specialized information or experiences about the study problem by virtue of their managerial position or related specific attributes possesses relevant to the study. This study used purposive sampling based on judgment on possession of specialized managerial experiences and knowledge on project evaluation, organizational culture and organizational learning in UNRA. Purposive sampling was used for Directors, M&E Officers, Project Engineers and Maintenance Engineers.

## **3.6. Data Collection Methods**

Given the nature of the study objectives, the study used a survey approach where both qualitative and quantitative data was collected using a questionnaire survey and interviewing approaches to enable triangulation (Sekaran, 2003). Each of the methods used is discussed below.

### **3.6.1. Questionnaire Survey Method**

A questionnaire survey is a data collection approach using a questionnaire issued to a wide sample of respondents to solicit for views of respondents in the study problem and objectives (Mugenda and Mugenda, 1999). The questionnaire was used because it is less expensive for data collection (Amin, 2005) and can collect fact amounts of data in short time from a big population of UNRA.

The questionnaire was used to collect primary data from all the 108 selected respondents at the level of Directors, Managers, and Supervisors at different levels. The questionnaire was personally delivered to the respondents where they were expected to record their answers within closely defined alternatives based on their experiences of project evaluation and organizational learning in UNRA.

### **3.6.2. Interview method**

Interviewing is a method of data collection where the researcher collects information from the targeted respondent through forms of face to face conversations and probing of the respondent's responses to gain detailed explanations to the study phenomenon (Amin, 2005). In this method the researcher interviewed two (2) M&E unit staff who are at the core of project evaluation in UNRA. These were interviewed face to face to obtain in depth qualitative data on project evaluation, organizational culture and organizational learning in UNRA.

## **3.7. Data Collection Instruments**

### **3.7.1. Self-administered Questionnaire**

The study used a close ended questionnaire divided into sections of background information, formative and summative evaluation, organisational culture and organizational learning. A

standard Questionnaire on a five point Likert scale was used to get quantifiable primary data from individual respondents on a scale of 5- Strongly Agree; 4- Agree; 3- Not Sure; 2- Disagree; 1- Strongly Disagree.

### 3.7.2. Interview guide

Interview schedule included semi-structured interviews along areas of formative and summative evaluation, organizational culture and their influence on organizational learning in UNRA.

## 3.8. Validity and Reliability

### 3.8.1. Validity

The validity of the instrument according to Sekeran (2003) measures the relevance of the questionnaire item in measuring the variables they are supposed to measure and was tested using the Content Validity Index. This involved judges scoring the relevance of the questions in the instruments in relation to the study variables and a consensus judgment given on each variable taking only variables scoring above 0.70. The Content Validity Index (CVI) was arrived at using the following formula.

$$CVI = \frac{\text{Total number of items declared valid}}{\text{Total number of items}}$$

The CVI results are presented in table 2 below.

**Table 2: Content Validity Index Results**

Variable	No of items	No. of valid items	CVI
Formative evaluation	15	12	0.80
Summative evaluation	18	16	0.89
Organizational culture	12	11	0.92
Organizational learning	14	12	0.86

*Source: Expert Judgment*

Table 2 shows that on the formative evaluation yielded CVI of 0.80, summative evaluation yielded a CVI of 0.89, organizational culture yielded a CVI of 0.92 while organizational learning yielded a CVI of 0.86. Since all variables yielded a CVI above 0.70 accepted for social sciences, it was inferred that the instrument was relevant in measuring project evaluation, organizational culture and organizational learning.

### 3.8.2. Reliability

Reliability of the study instrument according to Sekeran (2003) measures the consistent of the instrument in measuring what it is supposed to measure. The study questionnaire was pretested for its reliability on a sample of 10 respondents to examine individual questions as well as the whole questionnaire on project evaluation and organizational learning from which adjustments were made based on Cronbach's alpha coefficient tests generated from Statistical Package for Social Sciences (SPSS) taking only variables scoring above 0.70 as suggested by Nunally (1978) and the findings are presented below.

**Table 3: Reliability Results**

Variable	Cronbach's Alpha	No of Items
Formative evaluation	0.845	15
Summative	0.867	18
Organisation Culture	0.904	12
Organisational learning	0.885	14

*Source: Primary data*

Table 3 shows that on the formative evaluation yielded Cronbach's alpha value of 0.845, summative evaluation yielded alpha value of 0.867, organizational culture yielded an alpha value of 0.904 while organizational learning yielded an alpha value of 0.885. Since all variables yielded a Cronbach's above 0.70 accepted for social sciences, it was inferred that the instrument

was consistent in measuring project evaluation, organizational culture and organizational learning.

### **3.9. Data Collection Procedure**

Data was collected with the help of two research assistants who were trained in administration of the study questionnaires on the study population. A cover letter from UTAMU was used to seek permission to conduct the study from the management UNRA. The filled questionnaires were picked one week after they have been filled and entered into SPSS in preparation for analysis.

### **3.10. Data Analysis**

#### **3.10.1. Quantitative Analysis**

Quantitative data was presented in form of descriptive statistics of mean and standard deviations for each of the variables used in the study. Pearson's correlation statistics was used to test the relationships at 99 and 95 confidence limits. Specifically the Pearson's  $r$  value was used to show the direction and strength of the relationship between the variables. A positive correlation indicates a direct positive relationship between the variables while a negative correlation indicates an inverse/ negative relationship between the two variables. A multiple regression analysis using ANOVA statistics of adjusted  $R^2$  values, beta,  $t$  values and significance values was used to determine the magnitude of the influence (Amin, 2005) of formative and summative evaluation on organizational learning. The multiple regression technique using two steps was used to establish the moderating effect of organizational culture on the relationship between project evaluation and organizational culture in UNRA while controlling for demographic characteristics of the respondents.

### **3.10.2. Qualitative Analysis**

The useful qualitative data gained through the interviews was arranged in major themes using a content analysis technique where implications, conclusions and inferences on project evaluation, organizational culture and organizational learning will be identified. Effort was also directed to cross-examine the qualitative data with the quantitative findings on their level of agreement.

### **3.11. Measurement of Variables**

The questionnaire was designed to ask responses about formative and summative evaluation based on Carthey (2006) set of questions on implementation and post project completion evaluation. Organizational culture was measured using Cameron (2004) measures of clan and hierarchy cultures measures. Organizational learning was measured based on Argyris, (1993) organizational learning set of questions. These were channeled into observable and measureable elements to enable the development of an index of the concept using a 5 point Likert scale of 5- Strongly agree; 4- Agree; 3- Not sure; 2- Disagree; 1- Strongly disagrees were used to measure both the independent and dependent variables.

### **3.12. Ethical considerations**

As part of the ethical considerations, the study used an introductory letter from UTAMU to seek permission to conduct the study. The respondent remained anonymous by not indicating their names on the questionnaire. The final report was to be defended before a panel constituted by UTAMU and also be presented for approval and adoption of recommendations by the management of UNRA.

## CHAPTER FOUR

### PRESENTATION, ANALYSIS AND INTERPRETATION OF RESULTS

#### 4.1. Introduction

This chapter presents analyses and interprets the study findings of evaluation and organisational learning in the construction sector of Uganda based on the information obtained from the study questionnaire and interviews. It specifically presents the response rate, background information about the respondents and a presentation of the inferential findings in relation to formative, summative, organizational culture and organizational learning in UNRA.

#### 4.2. Response Rate

Response rate indicates the number of study tools anticipated against those actually obtained by the study. It shows how representativeness of the study finding in relation to the total sample used from a given population (Amin, 2005). Table 4 below shows the number of study tools issued and those actually returned

**Table 4: Response Rate**

Category	No. of questionnaires issued	Questionnaire returned	Response rate
Director	6	1	17%
Manager	28	20	71%
M&E Officer	2	2	100%
Project Engineer	8	8	100%
Maintenance Engineer	4	2	50%
Station Engineer	20	14	70%
Assistant Station Engineer	40	31	78%
Total	108	78	
<b>Overall Response rate</b>			<b>72%</b>

*Source: Primary data*

A total of 108 questionnaires were distributed but 78 useable questionnaires were returned in time for consideration in this study giving a response rate of 72% suggesting that about 7 in every 10 targeted respondent responded. Amin (2005) suggested that a high response rate suggests a good representation of the sample of the population.

### 4.3. Background Information about the Respondents

This sub section presents the station, job title, level of education and time worked with UNRA and is tabulated in table 5 below gained from the primary data.

**Table 5: Background Information about the Respondents**

<b>Item</b>	<b>Description</b>	<b>Frequency</b>	<b>Percentage</b>
Work station	Head Office	30	38.5
	Station	48	61.5
	<b>Total</b>	<b>78</b>	<b>100.0</b>
Job title	Director	1	1.3
	Manager	20	25.6
	M&E Officer	2	2.6
	Project Engineer	8	10.3
	Maintenance Engineer	2	2.6
	Station Engineer	14	17.9
	Assistant Station Engineer	31	39.7
	<b>Total</b>	<b>78</b>	<b>100.0</b>
Level of education	Diploma	2	2.6
	Degree	43	55.1
	Post Graduate	29	37.2
	Others	4	5.1
	<b>Total</b>	<b>78</b>	<b>100.0</b>
Time worked with UNRA	Less than a year	4	5.1
	1-3 years	10	12.8
	4-7 years	64	82.1
	<b>Total</b>	<b>78</b>	<b>100.0</b>

*Source: Primary data*

Table 5 above shows that majority of 61.5% of the respondents worked in UNRA stations while 38.5% worked at head office. The implication was the staff views were solicited from the head

office and field stations and therefore representative of UNRA experiences on project evaluation and organizational learning.

Among these, the majority of 39.7% were Assistant station engineers, followed by 25.6% who were Managers and 17.9% who were station engineers. The least number of respondents were directors (1.3%), M&E officers and maintenance Engineers representing 2.6% each. This means that data was collected from projects top management and operations staff who implement UNRA's projects and therefore deemed knowledgeable in project evaluation practices and organizational learning in UNRA.

Table 5 above shows that majority of 55.1% of the respondents has attained university degree as their highest level of education closely followed by 37.2% who had attained postgraduate education while the least 2.6% had attained a diploma as their highest level of education. The implication was that the respondents had attained a reasonable level of education to understand project evaluation and organizational learning in UNRA by virtue of their fairly high level of education.

A majority of 82.1% of the respondents had worked with UNRA 4-7years (since it was started in 2008) whole 12.8% had worked with the authority for 1-3 years and only 5.1% had worked for less than one year. The implication was the respondent had gained adequate experiences on project evaluation and organizational learning in the entity.

#### **4.4. Formative Evaluation and Organizational Learning**

The first objective of the study was to establish the extent to which formative project evaluation influences organizational learning in Uganda National Roads Authority. Formative evaluation according to the conceptual framework had two indicators of project effectiveness review and

resource efficiency measured using 15 items scored on a five point Likert scale ranging from 5= Strongly Agreed, 4= Agree, 3= Not Sure, 2= Disagree, 1= Strongly Disagree and the findings are presented in Table below using descriptive statistics of mean and standard deviation.

**Table 6: Descriptive results for formative evaluation**

	Mean	Std. Dev
<b><i>Project effectiveness review</i></b>		
1. UNRA undertakes to promptly validate if project leadership is provided for each construction project	2.08	1.467
2. UNRA undertakes to promptly validate if the planned project activities were undertaken as planned on each construction project	2.22	1.411
3. UNRA undertakes to promptly validate the effectiveness of routine project activities needed to support project success	2.71	1.270
4. UNRA undertakes to promptly validate the status of planned project milestones	3.60	1.166
5. UNRA undertakes to promptly validate if the staged project deliverables are being achieved during project implementation	2.09	1.261
6. UNRA undertakes to promptly validate if the staged project documentation/reports are produced	3.88	1.217
7. UNRA undertakes to promptly validate if the project quality expectations will be achieved	2.37	1.369
8. UNRA undertakes to promptly validate if the project time expectations will be achieved	2.38	1.198
9. UNRA undertakes to promptly validate the effectiveness of the project controls	2.41	1.454
<b><i>Resource efficiency review</i></b>		
10. Effort is undertaken to review fulfillment of project timelines	2.28	1.347
11. Effort is undertaken to review project funds absorption rate at project implementation	2.78	1.191
12. Effort is undertaken to compare the original project budget to the actual amount spent during implementation	3.90	1.265
13. Effort is undertaken to establish the use of appropriate construction materials during implementation	4.22	.976
14. Effort is undertaken to establish the use of appropriate construction equipment during implementation	2.32	1.294

15. Effort is undertaken to establish the use of appropriate project personnel during implementation	2.36	1.395
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Table 6 above shows that whereas the respondents agreed with UNRA undertaking to promptly validate the status of planned project milestones (mean = 3.60) and project documentation (mean = 3.88), they disagreed with prompt validation of project leadership (mean = 2.08), project activities (mean = 2.22), staged project deliverables (mean 2.09). These findings revealed inadequate efforts directed to conducting project effective reviews on project leadership, project activities, deliverables status for prompt corrective action during project implementation. The inadequate project reviews is detrimental in that it adversely affects the attainment of overall project performance expectations due to late realization of delays or deviations.

The respondents further disagree that UNRA undertook to promptly collect data on project quality (mean = 2.37), time (mean = 2.38), and controls (mean 2.41) expectations. These findings revealed gaps in the project effectiveness reviews that constrain the attainment of the desired project time and quality expectations due to inadequate efforts directed to project controls. Project controls based on project plan are instrumental in identifying deviations and taking of corrective actions to ensure the project meets it time, cost and quality expectations and for future use as a basis for organization learning.

Table 6 above further shows that whereas the respondent agreed that conducting of budget reviews (mean = 3.90) and use of appropriate construction materials (mean = 4.22), they disagree with efforts directed to fulfillment of project timelines (mean = 2.28), use of appropriate construction equipment (mean = 2.32) and use of the competent personnel at project implementation (mean = 2.36). These findings revealed gaps in conducting project resource efficiency reviews during project implementation. The failure to conduct project progress

reviews on project resources related to work plans, use of appropriate equipment and personnel constrain the attainment of the project time, cost and quality expectation. Late identification of deviations may imply late corrective actions due to the time lapse where corrections especially on quality would have been overtaken by events. The inconsistent project reviews equally deprives the entity the opportunity to learn from project resource utilization during project implementation.

Asked to describe how formative evaluations are conducted in UNRA, interviewee I had this to say:

Generally, M&E section in UNRA is understaffed with only two M&E Officers yet it is also underfunded. We therefore use monthly progress reports from user departments to generate M&E reports. This comes with challenges in that the fact that the reports used are generated by the implementing team, the authenticity of the information given is not from a verified position. The other challenge is that because of being understaffed, the team rarely goes to the field to interface with the project implementers. There are also delays in monthly progress reports that are sent to M&E office and this affects reporting timelines to various stakeholders.

Asked How UNRA uses the results of formative evaluations for organizational learning in the construction sector, interviewee II put it:

After reviewing the submitted progress reports, various reports are reproduced to suite different stakeholders namely Road Fund, Ministry of Finance, Prime Minister's Office, State House, World Bank and other Donor Agencies. The reports are then used to account for the funds given and used to solicit for more funding.

Analysis of the qualitative findings equally reveals constrains in conducting on-going project evaluations during implementation and relying on unauthenticated reports from field managers. There seems to be little efforts if any to use the results from project implementation reports for organizational learning but specifically for accountability to the relevant authorities. The inadequate consideration of project effectiveness and resource efficiency reviews if not addressed will continuously constrain knowledge creation, integration and utilization.

#### 4.4.1. Correlation analysis between formative evaluation and organisational learning

To test if there was relationship between formative evaluation and organisational learning a correlation analysis was conducted using Pearson’s correlation coefficient and significance statistics and the findings are presented in Table below.

**Table 7: Correlation Results between formative evaluation and organizational learning**

		Formative Evaluation	Organizational Learning
Formative Evaluation	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	78	
Organizational Learning	Pearson Correlation	.877**	1
	Sig. (2-tailed)	.000	
	N	78	78
**. Correlation is significant at the 0.01 level (2-tailed).			

$p \leq 0.05$

**Source: Primary data**

Table 7 above shows the Pearson’s correlation coefficient  $r = 0.877^{**}$  between formative evaluation and organizational learning suggesting that the two variables had a positive significant relationship. The  $r = 0.877^{**}$  and significance  $p = 0.000$  between formative evaluation and organizational suggests that there was a high positive significant relationship between formative evaluation and organizational learning in the road construction sector. The managerial implication was that knowledge creation, integration and utilisation in the road construction sector depends on the efforts to conduct formative evaluations involving project effectiveness and resource efficiency reviews. Inadequate formative evaluation adversely affects organizational learning in the construction sector.

#### 4.5. Summative Evaluation and Organizational Learning

The second objective of the study was to establish the extent to which summative project evaluation influences organizational learning in Uganda National Roads Authority. Summative evaluation according to the conceptual framework had two indicators of end of project and post utilization evaluation measured using 18 items scored on a five point Likert scale ranging from 5= Strongly Agreed, 4= Agree, 3= Not Sure, 2= Disagree, 1= Strongly Disagree and the findings are presented in Table below using descriptive statistics of mean and standard deviation.

**Table 8: Descriptive results for summative evaluation**

	Mean	Std. Dev
<i>End of project evaluation</i>		
1. UNRA always collect data on important project planning points that contributed to project success	2.27	1.374
2. UNRA always collect data on important project planning points that contributed to project failures	2.42	1.254
3. UNRA always collect data on important points on project contractor solicitation that contributed to project success	2.32	1.274
4. UNRA always collect data on important points on project contractor solicitation that contributed to project failure	2.22	1.101
5. UNRA always collect data on important points on contract management that contributed to project success	1.99	1.233
6. UNRA always collect data on important points on contract management that contributed to project failures	2.45	1.411
7. UNRA undertakes to evaluate the fulfillment of the project quality expectation	3.74	1.012
8. UNRA usually evaluates the fulfillment of project cost parameters	4.06	.958
9. UNRA usually evaluates the fulfillment of project time parameters	3.97	1.069
10. UNRA evaluates completed projects against risks to generate a general picture of the project for future benefit	2.35	1.091
11. UNRA undertakes to establish critical learning points in the management	2.31	1.085

of the different projects		
12. UNRA undertakes to verify the correctness of the information gained from which lessons learnt are derived	2.53	1.170
13. Effort is undertaken to document lessons learnt from the different completed construction projects	2.33	1.234
14. UNRA undertakes to disseminate lessons learned for future use using a multiplicity of platforms (workshops, seminars, websites)	2.38	1.209
<b><i>Post utilization evaluation</i></b>		
15. UNRA undertakes to evaluate the post utilization stakeholders perceptions	2.49	1.214
16. UNRA undertakes to evaluate recently completed road projects safety concerns	3.92	1.078
17. UNRA undertakes to evaluate recently completed road projects environmental impact issues	2.77	1.104
18. UNRA undertakes to evaluate the recently completed road projects economic impact	2.22	1.101

***Source: Primary data***

Table 8 above shows that although the respondents indicated that UNRA undertook to evaluate the fulfillment of the project quality (mean = 3.74), cost (mean = 4.06) and time (mean = 3.97) expectations, they disagreed with collecting data on success factors related to project planning (mean = 2.27), contractor solicitation (mean 2.32), contract management (mean = 1.99). The finding revealed that UNRA emphasized reviewing project performance expectations of time, cost and quality at the compromise of key planning, supplier solicitation and contract management success and failure factors which could act as a basis for project management use and contribute to knowledge creation, integration and utilization.

The respondent also disagree with efforts to conduct post utilization stakeholders perceptions (mean = 2.49), conducting of environmental impact assessments (mean = 2.77) and economic impact (mean = 2.22) on completed projects while considering mostly safety issues (mean = 3.92). These finding revealed little efforts directed to conducting critical post project utilization reviews which could have informed planning and implementation of future construction projects.

Asked to describe how summative evaluations are conducted in UNRA interviewee I put it:

As M&E section in UNRA, we base on the final completion reports produced by the supervising team to produce an evaluation report on a few road projects. At the end of every project, an assessment report is produced to verify whether what was planned has been executed. After completion of these projects, they are handed over to the Directorate of Operations that is responsible to maintain and monitor the performance of the road.

Interviewee II noted:

The challenge is lack of funds to carry out end of project evaluations on various projects, and in the case of post utilization evaluation, most of the road furniture (road signs, guardrails etc) are vandalized within the first three years after a road project has been completed. This affects the performance of the road in terms of accidents caused. There is generally lack of funds to carry out the post utilization evaluations.

On the utilization of the summative project evaluations, interviewee I noted:

UNRA always hold quarterly meetings where all directorates meet to review the works done. It's during this period, that the M&E team disseminates the findings and the recommendations to UNRA staff. Similarly, through various reporting formats these findings and recommendations are disseminated to various stakeholders for future use.

#### **4.5.1. Correlation analysis between summative evaluation and organizational learning**

To test if there was relationship between summative evaluation and organizational learning a correlation analysis was conducted using Pearson's correlation coefficient and significance statistics and the findings are presented in Table below.

**Table 9: Correlation Results between summative evaluation and organizational learning**

		Summative Evaluation	Organizational Learning
Summative Evaluation	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	78	
Organisational Learning	Pearson Correlation	.907 <sup>**</sup>	1
	Sig. (2-tailed)	.000	

	N	78	78
**. Correlation is significant at the 0.01 level (2-tailed).			

p ≤ 0.05

Table 9 above shows the Pearson’s correlation coefficient  $r = 0.907^{**}$  between summative evaluation and organizational learning suggesting that the two variables had a positive significant relationship. The  $r = 0.901^{**}$  and significance  $p = 0.000$  between summative evaluation and organizational learning suggests that there was a very high positive significant relationship between summative evaluation and organizational learning in the road construction sector. The managerial implication was that knowledge creation, integration and utilisation in the road construction sector depends on the efforts to conduct summative evaluations involving end of project and post utilisation evaluation. Inadequate summative evaluation adversely affects organizational learning in the construction sector.

#### 4.6. The Moderating role of Organizational Culture

The third objective of the study was to establish the moderating role of organizational culture on the relationship between project evaluation and organizational learning in UNRA. Organizational culture was conceptualized as the moderating variable under two indicators of clan and hierarchical culture measured using 12 items scored on a five point Likert scale of (5) for strongly agree (4) for agree, (3) for not sure (2) for disagree (1) for strongly disagree. The views on of the respondents on organizational culture are presented first in table 9 below.

**Table 10: Descriptive Results for Organizational Culture**

	Mean	Std. Dev
<i>Clan culture</i>		
1. UNRA projects teams are loyal to collecting necessary information for sharing with others	2.41	1.323

2. UNRA project team have good work morale	2.22	1.158
3. UNRA project team are committed to learning for enhanced delivery of UNRA's mandate	2.28	1.268
4. Collaboration is highly valued in UNRA	2.36	1.162
5. Team work is a highly valued in UNRA	2.33	1.224
6. All employee participation irrespective of position is highly valued in UNRA	2.42	1.013
7. Consensus is highly valued in UNRA decisions making	2.01	1.063
8. UNRA values development of individual employee competencies	2.17	1.189
<b><i>Hierarchical culture</i></b>		
9. Formalization of work processes in UNRA enables learning in the UNRA	2.74	1.343
10. Standard operating procedures in UNRA enables learning in the UNRA	2.60	1.188
11. The organizational structure in UNRA enables learning in the UNRA	2.08	1.137
12. UNRA boasts of clearly defined work processes	3.65	1.267

***Source: Primary data***

Table 10 above shows that the respondents disagreed with virtually all the clan organizational culture attributes of;-team loyalty(mean = 2.41), morale (mean 2.22), commitment to learning (mean = 2.28), collaboration (mean = 2.36), teamwork (mean = 2.33), employee participation (mean = 2.42), decision making by consensus (mean = 2.01) and development of core employee (Engineers) competencies (mean = 2.17). These findings revealed low or total absence of clan organizational culture in UNRA which constrains the attainment of project expectation due to lack of organizational cohesion, teamwork and team synergy especially collecting data for organizational learning.

The respondents were not sure if formalization of work processes (mean = 2.74) and Standard operating procedures (mean = 2.60) enabled learning in the UNRA but disagree that the organizational structure (mean = 2.08) in UNRA enabled learning in the UNRA. This study inferred that there was need to develop an appropriate hierarchical organizational structure that

fosters institutional stability and efficiency prerequisites for knowledge creations, integration and utilization.

After establishing the status of organizational culture, the study wanted to establish if the organizational culture moderate the relationship between formative and summative evaluations on the other. A multiple regression using two stages was used and the results are shown below.

**Table 11: The moderating role of organisational culture**

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.	F-Constant	Adj R <sup>2</sup>
		B	Std. Error	Beta (β)				
1	(Constant)	-.116	.145		-.801	.426	214.070	0.847
	Formative Evaluation	.329	.088	.349	3.739	.000		
	Summative Evaluation	.664	.103	.601	6.448	.000		
2	(Constant)	.016	.153		.102	.919	151.946	0.855
	Formative Evaluation	.208	.102	.220	2.043	.045		
	Summative Evaluation	.545	.114	.494	4.798	.000		
	Organisatio n Culture	.231	.104	.249	2.231	.029		
a. Dependent Variable: Organizational Learning								

P≤0.05

The model in table 11 above shows that formative and summative evaluation combine predicted 84.7% of the variance on organizational learning (adjusted R<sup>2</sup> = 0.847, sig. = 0.000). However, when we introduce the organizational culture, the predictive strength increases to 85.5% (adjusted R<sup>2</sup> = 0.855, sig. = 0.000) suggesting that organizational culture significantly moderates the relationship between project evaluation and organizational learning. The implication was that

for UNRA to create, integrate and utilise knowledge gained from project evaluations, there is need for an enabling clan and hierarchical culture.

Table 11 further shows that summative evaluation was the most significant predictor of the variance of organizational learning ( $\beta = 0.494$ ,  $t = 4.798$ , sig. 0.000) suggesting that organizational learning in UNRA largely depends on the efforts to collect and share data at the end of project and post utilization of the road projects. Formative evaluations although small in predictive strength, was also found to be a significant predictor of the variance in organizational learning ( $\beta = 0.220$ ,  $t = 2.043$ , sig = 0.045) suggesting that organizational learning in UNRA depends on the efforts to conduct project effectiveness and resource efficiency reviews.

### Decisions on Study Hypotheses

Hypothesis	Decision	Inferential statistics
1. Formative project evaluation significantly influences organizational learning in UNRA	Substantiated	$\beta = 0.220$ , $t = 2.043$ , sig 0.045
2. Summative project evaluation significantly influences organizational learning in UNRA	Substantiated	$\beta = 0.494$ , $t = 4.798$ , sig. 0.000
3. Organizational culture significantly moderates the relationship between project evaluation and organizational learning in UNRA	Substantiated	Adjusted $R^2$ increase from 0.847 to 0.855, sig. = 0.000, $\beta = 0.247$ , $t = 2.231$ , sig 0.029

*Source: Primary data*

## **CHAPTER FIVE**

### **SUMMARY, DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS**

#### **5.1. Introduction**

This chapter presents the summary, discussion, conclusions and recommendations of the study based on the study findings on project evaluation and organizational learning. The first section is a summary of the study findings. The discussions, conclusions, recommendations, limitations, contributions and areas for further studies then follow.

#### **5.2. Summary of the Study Findings**

##### **5.2.1. Formative Evaluation and Organizational Learning in UNRA**

The study found inadequate efforts to promptly validate if planned project leadership, activities, milestones, deliverables, time, quality and controls were being fulfilled during project implementation. Only project costs were emphasised. Formative evaluation was a significant predictor of organizational learning in UNRA ( $\beta = 0.220$ ,  $t = 2.043$ , sig 0.045). The study confirmed the hypothesis that formative project evaluation significantly influences organizational learning in UNRA.

##### **5.3.2. Summative Evaluation and Organizational Learning in UNRA**

The study found inadequate efforts directed to collecting end of project learning point on success and failures related to project planning, contractor solicitation and contract management and dissemination of lesson learnt. End of project evaluation emphasised evaluation of time, cost and quality. There was also little efforts directed to conducting post utilization stakeholders perceptions, environmental and economic evaluation. Summative evaluation was a significant predictor of organizational learning in UNRA ( $\beta = 0.494$ ,  $t = 4.798$ , sig. 0.000) and it was the

strongest predictor of the variance in organizational learning. The study confirmed the hypothesis that summative project evaluation significantly influences organizational learning in UNRA.

### **5.2.3. The Moderating Role of Organizational Culture in UNRA**

The study found out that UNRA did not exhibit an appropriate clan culture where there is team collaboration, morale, commitment, employee participation and consensus. The hierarchical organizational culture emphasizing formalization of work processes, standard operating procedures and the nature of the organizational structure constrained organizational learning. The study found that organizational culture moderates the relationship between project evaluation and organizational learning. The hypothesis that organizational culture significantly moderates the relationship between project evaluation and organizational learning in UNRA was confirmed.

## **5.3. Discussion of the Study Findings**

### **5.3.1. Formative Evaluation and Organizational Learning in UNRA**

The study found that formative evaluation was a significant predictor of organizational learning in UNRA implying that knowledge creation, integration and utilization in the road construction sector depends on the efforts to conduct formative evaluations involving project effectiveness and resource efficiency reviews.

The study findings relate to a great extent to Hallgren and Wilson (2007) study which found that informal and incidental learning among four power plant projects occurred as each of the deviations was handled and as remedies were handled during project implementation. Bakker et al. (2010) and Carrillo et al. (2011) equally report that lesson learnt took place during project implementation. Kululanga and Koutcha (2008) however notes that some of the vital lessons that

could have been learned from project reviews are lost by contractors because of lack of a structured framework for undertaking them. Carrillo, et al (2012) equally reports the lack of a dedicated system for lessons learned in many organizations while Shokri-Ghasabeh and Chileshe (2014) identify barriers related to lack of clear guidelines, lack employee and management commitment and resources to organizational learning.

This study therefore inferred that the failure to adequately conduct formative evaluations by promptly validating if planned project leadership, activities, milestones, deliverables, time, quality and controls were being fulfilled adversely constrained organizational learning in UNRA.

### **5.3.2. Summative Evaluation and Organizational Learning in UNRA**

The study found that summative evaluation was a significant predictor of organizational learning in UNRA implying that knowledge creation, integration and utilization in the road construction sector depends on the efforts to conduct end of project and post utilization project reviews. The failure to conduct summative project evaluations adversely affects organizational learning in UNRA. The study findings and observation on the summative project evaluation and organizational learning are similar to previous studies such as Kululanga and Kuotcha (2008) who found that the engagement in project reviews and the application of lessons learned provides a mechanism for organizational learning and lessons learned. Carrillo, et al (2012) in their study found that project lessons learnt were conducted immediately after the completion of the project 3-6 months after project completion while other rely solely on the project's completion to generate lessons learned.

In complement, Paranagamage, et al (2012) Malaysian study reports conducting of formal lessons learned activities immediately after completion of a project. Mendler (2007) observed that although Post Occupancy Evaluation helps in obtaining feedback on recently completed construction projects it is severely underutilized in the construction industry.

From the afore going discussion of the study, we noted that the management of UNRA needs to emphasize collection of data on key success factors and failures as well as post utilization and their dissemination for enhanced organizational learning.

### **5.3.3. The Moderating Role of Organizational Culture in UNRA**

The study found out that organizational culture moderated the relationship between project evaluation and organizational learning in UNRA. The findings echo Jafari et al (2013) study which found a positive and significant between organizational culture factors and knowledge management implementation. Other studies have however noted culture challenges in organizational learning. Carrillo, et al (2012) report that some project managers were not interested in documenting lesson learned because it reflected poorly on them. There is also an ingrained culture of looking forward to new projects, not back to completed projects.

Robinson et al (2005) recommends that senior management need to visibly support lessons learnt initiative, assess the organization's culture, eliminate barriers, set goals, get departmental buy-in, designate a champion, empower workers, allocate resources, and measure and track results. McBeath and Ball (2012) equally reports of the willingness to share information, willingness to receive information, explicit knowledge transfer, tacit knowledge transfer and verification. Auernhammer and Hall (2013) recommends openness to change by encouraging value free communication and new as well as unusual ideas; tolerate mistakes; and nurture intrinsically

motivated staff. Foss, et al. (2010) calls for conscious destruction of old culture of procedures and structures, as well as the institutionalization of new processes and structures to foster organizational learning.

This study therefore affirmed that project evaluation will significantly contribute to organizational learning if there is an enabling clan and hierarchical organizational culture.

## **5.4. Conclusions of the Study**

### **5.4.1. Formative Evaluation and Organizational Learning in UNRA**

The study concludes that formative project evaluation in UNRA emphasizes validation of the status of planned project milestones, project records, budget reviews and use of a validation of use of construction material. Little if any effort was directed to review level of attainment of project leadership, activities, deliverables, quality, time and controls, use of qualified personnel and construction materials. Formative evaluation significantly influences organizational learning in the UNRA and the failure to adequately conduct project effectiveness and resource efficiency reviews during project implementation adversely affects knowledge creation, integration and utilization in the Roads authority.

### **5.4.2. Summative Evaluation and Organizational Learning in UNRA**

The study concludes that UNRA emphasize evaluation of project performance indicators of time, cost and quality at the compromise of key learning points for project success and failures related to planning, contractor solicitation, contract management and post utilization in their summative evaluations. Summative evaluation significantly influences organizational learning in the UNRA and the failure to adequately conduct project end of project and post utilization evaluations after

project completion adversely affects knowledge creation, integration and utilization in the Roads authority.

#### **5.4.3. The Moderating Role of Organizational Culture in UNRA**

The study concluded that UNRA had not developed an appropriate clan and hierarchical culture but relied on highly formalized standard operating processes. Organizational culture moderated the relationship between project evaluation and organizational learning in UNRA and the inappropriate clan and hierarchical cultures constrains the usefulness of project evaluation for knowledge creation, integration and utilization.

#### **5.5. Recommendations of the Study**

The general study recommendation is that to enhance organizational learning in UNRA, the management of UNRA should institute an organizational learning policy and unit to coordinate the process of knowledge creation, integration and utilization in all its construction projects. Development of policy guidelines and standardized formative and summative tools to solicit data during and after project implementation is recommended as a practice to foster organizational learning.

##### **5.5.1. Formative Evaluation and Organizational Learning in UNRA**

To enhance organizational learning the study recommends that the management of UNRA, should conduct project effectiveness and resource efficiency reviews by:

- Promptly validating if project leadership is provided for each construction project

- Undertaking to promptly validate if the planned project activities were undertaken as planned on each construction project.
- Promptly validating if the staged project deliverables are being achieved during project implementation
- Undertaking to promptly validate if the project quality and time expectations will be achieved
- Undertaking to promptly validate if the effectiveness of the project controls
- Undertaking to establish the use of appropriate construction personnel and equipment during implementation

#### **5.5.2. Summative Evaluation and Organizational Learning in UNRA**

To enhance organizational learning the study recommends that the management of UNRA should conduct end of project and post utilization reviews by:

- Always collecting data on important project planning points that contributed to project success and failures
- Always collecting data on important project contractor selection points that contributed to project success and failures
- Always collecting data on important project contract management points that contributed to project success and failures
- Documenting and validating lessons learnt from the different completed construction projects.
- Collecting data on the post utilization stakeholders' perceptions, environmental and economic impact.

- Disseminating lessons learned for future use using a multiplicity of platforms such as workshops, seminars, websites

### **5.5.3. Organizational Culture and Organizational Learning in UNRA**

To enhance organizational learning, the study recommends that the management of UNRA should with a help of external consultants conduct an institutional development plan for an appropriate organizational structure and institute team processes which foster knowledge creation, integration and utilization culture.

### **5.6. Limitations of the Study**

The study relied on primary data collected using a questionnaire and interview methods alone. The use of secondary data would have enabled triangulation of the data and enhance the quality of data to inform the conclusions on the study. The other limitation of the study is the use of case study approach which limits the generalization of the study findings to other organizations engaged in road sector development in Uganda like Local governments and KCCA.

### **5.7. Contributions of the Study**

The study has helped to develop organizational learning policy recommendations in UNRA demanding the introduction of organizational learning policy and unit to coordinate knowledge creation, integration and utilization based on formative and summative evaluations and institutionalization of an appropriate organizational culture. The study has also helped cover

knowledge gaps on project evaluation and organizational learning in the construction sector of a developing country-Uganda.

### **5.8. Areas Recommended for Future Research**

The study found out that formative and summative evaluations predicted 85.5% of the variance in organizational learning in UNRA with organizational culture as moderator. Other studies need to examine the moderating effect of use of ICT on the relationship between evaluation and organizational learning with a view of identifying appropriate technology to foster organizational learning from evaluation.

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## APPENDICES

### Appendix I: Study Questionnaire

#### Introduction

Dear respondent,

My name is Jacob Asiimwe Kameraho pursuing a Masters in Project Monitoring and Evaluation at Uganda Technology and Management University (UTAMU). I am interested in establishing the extent to which Project Evaluations have been used for organizational learning in UNRA. You have been selected as a respondent from UNRA to provide us with your views on this study. Your views will be kept and treated confidentially in line with the study. Please answer diligently and honestly.

#### SECTION I: BACKGROUND INFORMATION (tick as appropriate)

1. Your work station: UNRA Head Office [  ] Station [  ]
2. Your Job category: Director [  ] Manager [  ] M&E Officer [  ] Project Engineers [  ]  
Maintenance Engineer-(Head Office) [  ] Station Engineer [  ] Assistant Station Engineer [  ]
3. Your Level of education: Diploma [  ] Degree [  ] Postgraduate [  ] others (specify).....
4. Time worked with the UNRA: Less than a year [  ] 1-3 years [  ] 4-7 Years [  ]

#### SECTION II: Formative Evaluation

##### Instructions

Indicate the extent to which you agree with the following observations on formative project evaluations in UNRA construction projects using a scale of (1) = strongly disagree-SDA (2) = disagree-DA, (3) = not sure-NS (4) = agree-A, (5) = strongly agree-SA.

Scale	SDA	DA	NS	A	SA
<b><i>Project effectiveness reviews</i></b>					
1. UNRA undertakes to promptly validate if project leadership is provided for each construction project	1	2	3	4	5
2. UNRA undertakes to promptly validate if the planned project activities were undertaken as planned on each construction project	1	2	3	4	5
3. UNRA undertakes to promptly validate the effectiveness of routine project activities needed to support project success	1	2	3	4	5
4. UNRA undertakes to promptly validate the status of planned project milestones	1	2	3	4	5

Scale	SDA	DA	NS	A	SA
5. UNRA undertakes to promptly validate if the staged project deliverables are being achieved during project implementation	1	2	3	4	5
6. UNRA undertakes to promptly validate if the staged project documentation/reports are produced	1	2	3	4	5
7. UNRA undertakes to promptly validate if the project quality expectations will be achieved	1	2	3	4	5
8. UNRA undertakes to promptly validate if the project time expectations will be achieved	1	2	3	4	5
9. UNRA undertakes to promptly validate the effectiveness of the project controls	1	2	3	4	5
<b>Resource efficiency</b>					
10. Effort is undertaken to review fulfillment of project timelines	1	2	3	4	5
11. Effort is undertaken to review project funds absorption rate at project implementation	1	2	3	4	5
12. Effort is undertaken to compare the original project budget to the actual amount spent during implementation	1	2	3	4	5
13. Effort is undertaken to establish the use of appropriate construction materials during implementation	1	2	3	4	5
14. Effort is undertaken to establish the use of appropriate construction equipment during implementation	1	2	3	4	5
15. Effort is undertaken to establish the use of appropriate project personnel during implementation	1	2	3	4	5

### Section III: Summative Evaluations

#### Instructions

Indicate the extent to which you agree with the following observations on summative evaluations in UNRA Construction projects on a scale of (1) = strongly disagree-SDA (2) = disagree-DA, (3) = not sure-NS (4) = agree-A, (5) = strongly agree-SA.

Scale	SDA	DA	NS	A	SA
<b>End of project Evaluation</b>					
1. UNRA always collect data on important project planning points that contributed to project success	1	2	3	4	5
2. UNRA always collect data on important project planning points that contributed to project failures	1	2	3	4	5
3. UNRA always collect data on important points on project contractor solicitation that contributed to project success	1	2	3	4	5
4. UNRA always collect data on important points on project contractor solicitation that contributed to project failure	1	2	3	4	5
5. UNRA always collect data on important points on contract management that contributed to project success	1	2	3	4	5
6. UNRA always collect data on important points on contract management that contributed to project failures	1	2	3	4	5
7. UNRA undertakes to evaluate the fulfillment of the project	1	2	3	4	5

Scale	SDA	DA	NS	A	SA
quality expectation					
8. UNRA usually evaluates the fulfillment of project cost parameters	1	2	3	4	5
9. UNRA usually evaluates the fulfillment of project time parameters	1	2	3	4	5
10. UNRA evaluates completed projects against risks to generate a general picture of the project for future benefit	1	2	3	4	5
11. UNRA undertakes to establish critical learning points in the management of the different projects	1	2	3	4	5
12. UNRA undertakes to verify the correctness of the information gained from which lessons learnt are derived	1	2	3	4	5
13. Effort is undertaken to document lessons learnt from the different completed construction projects	1	2	3	4	5
14. UNRA undertakes to disseminate lessons learned for future use using a multiplicity of platforms (workshops, seminars, websites)	1	2	3	4	5
<b><i>Post utilization evaluations</i></b>					
15. UNRA undertakes to evaluate the post utilization stakeholders perceptions	1	2	3	4	5
16. UNRA undertakes to evaluate recently completed road projects safety concerns	1	2	3	4	5
17. UNRA undertakes to evaluate recently completed road projects environmental impact issues	1	2	3	4	5
18. UNRA undertakes to evaluate the recently completed road projects economic impact	1	2	3	4	5

### Section III: Organisational Culture

#### Instructions

Indicate the extent to which you agree with the following organisational culture observations in UNRA using a scale of (1) = strongly disagree-SDA (2) = disagree-DA, (3) = not sure-NS (4) = agree-A, (5) = strongly agree-SA.

Scale	SDA	DA	NS	A	SA
<b><i>Clan culture</i></b>					
1. UNRA projects teams are loyal to collecting necessary information for sharing with others	1	2	3	4	5
2. UNRA project team have good work morale	1	2	3	4	5
3. UNRA project team are committed to learning for enhanced delivery of UNRA's mandate	1	2	3	4	5
4. Collaboration is highly valued in UNRA	1	2	3	4	5
5. Team work is a highly valued in UNRA	1	2	3	4	5
6. All employee participation irrespective of position is highly valued in UNRA	1	2	3	4	5

7. Consensus is highly valued in UNRA decisions making	1	2	3	4	5
8. UNRA values development of individual employee competencies	1	2	3	4	5
<b><i>Hierarchy culture</i></b>					
9. Formalization of work processes in UNRA enables learning in the UNRA	1	2	3	4	5
10. Standard operating procedures in UNRA enables learning in the UNRA	1	2	3	4	5
11. The organizational structure in UNRA enables learning in the UNRA	1	2	3	4	5
12. UNRA boasts of clearly defined work processes	1	2	3	4	5

#### **Section IV: Organizational Learning**

##### **Instructions**

Indicate the extent to which you agree with the following organizational learning observations in UNRA using a scale of (1) = strongly disagree-SDA (2) = disagree-DA, (3) = not sure-NS (4) = agree-A, (5) = strongly agree-SA.

<b>Scale</b>	<b>SDA</b>	<b>DA</b>	<b>NS</b>	<b>A</b>	<b>SA</b>
<b><i>Knowledge creation</i></b>					
13. UNRA has gained knowledge through close interaction with other project teams	1	2	3	4	5
14. UNRA has gained intuitive knowledge from experiences in management of construction projects	1	2	3	4	5
15. UNRA has construction project skills base relevant for project success gained from evaluation of its projects	1	2	3	4	5
16. UNRA has construction project idea relevant for project success gained from project evaluations	1	2	3	4	5
17. UNRA has important construction project values relevant for project success gained from evaluations of its projects	1	2	3	4	5
18. UNRA has important construction project models relevant for project success gained from project evaluations	1	2	3	4	5
19. UNRA has construction project formula relevant for project success gained from project evaluations	1	2	3	4	5
<b><i>Knowledge Integration</i></b>					
20. Effort is undertaken to diffuse the acquired knowledge from evaluations of road construction projects to individual users	1	2	3	4	5
21. Effort is undertaken to diffuse the acquired knowledge from evaluations of road construction projects for functional/departmental use	1	2	3	4	5
22. Effort is undertaken to diffuse the acquired knowledge from evaluations of road construction projects for strategic use	1	2	3	4	5
23. UNRA had undertaken to mainstream the knowledge gained from project evaluations into its standard operating procedures	1	2	3	4	5

<b><i>Knowledge Utilisation</i></b>					
24. UNRA uses the new knowledge gained from project evaluation for project planning	1	2	3	4	5
25. UNRA uses the new knowledge gained from project evaluation for project implementation	1	2	3	4	5
26. UNRA uses the new knowledge gained from project evaluation for M&E.	1	2	3	4	5

## **Appendix II: Interview Guide**

Introduction: Self introduction

1. Describe how formative evaluations are conducted in UNRA in relation to:
  - Project effectiveness review
  - Resource Efficiency
2. What are the challenges in conducting formative project evaluations?
3. How does UNRA use the results of formative project evaluations for organizational learning in the construction sector?
4. Describe how summative evaluations are conducted in UNRA in relation to:
  - End of project reviews
  - Post utilization reviews
5. What are the challenges in conducting end of project evaluations?
6. What are the challenges in conducting post utilization road project evaluations?
7. How does UNRA use the results of summative project evaluations for organizational learning in the construction sector?
8. Describe the culture in UNRA in relation to values and structure
9. How has culture influenced the relationship between project evaluation and organizational learning in UNRA?

**Appendix III: Krejcie and Morgan tables for determining sample size from given population**

Note: “N” is population size

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	246
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	351
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	181	1200	291	6000	361
45	40	180	118	400	196	1300	297	7000	364
50	44	190	123	420	201	1400	302	8000	367
55	48	200	127	440	205	1500	306	9000	368
60	52	210	132	460	210	1600	310	10000	373
65	56	220	136	480	214	1700	313	15000	375
70	59	230	140	500	217	1800	317	20000	377
75	63	240	144	550	225	1900	320	30000	379
80	66	250	148	600	234	2000	322	40000	380
85	70	260	152	650	242	2200	327	50000	381
90	73	270	155	700	248	2400	331	75000	382
95	76	270	159	750	256	2600	335	100000	384

“S” is sample size