EVALUATION OF THE EFFECTIVENESS OF ORGANIZATIONAL OBJECTIVES AND IMPLEMENTATION FOR SUSTAINABLE DRINKING WATER SUPPLY SYSTEM USING A MULTI CRITERIA DECISION MODEL

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Degree of Master of Science

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DECLARATION

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Evaluation of the Effectiveness of Organizational Objectives and Implementation for Sustainable Drinking Water Supply System Using a Multi Criteria Decision Model

Abstract

The evaluation of the effectiveness of organizational objectives can be done by an analysis of the actual situation at the field level compared to the organizational objectives. Without proper management at the field level, the organization cannot be achieve objectives. Lack of guidelines at field level; reduces the effectiveness of water supply scheme. A system manager has to consider all major criteria to manage a water supply scheme. MCDA can be used to manage water supply schemes effectively.

This study identified the organizational objectives through a stakeholder survey and literature survey. Four parameters in the management of water supply schemes are income generation, system sustainability, system losses and system reliability. There are 12 sub parameters which were identified as new connection, bill collection, staff salaries, O&M expenditure, NRW, no water, water quality, leak main, leak connection, leak night time, low pressure, defective meter. The prioritization of all the sub and main parameters enabled the identification of management views corresponding to schemes. A MCDA model use for Ja Ela Water Supply Scheme. AHP method was selected as the type of MCDA model because it can determine preference among main and sub criteria by using pairwise comparison. Six zone office areas selected as an alternative for this study.

Model Identified the values 0.4, 0.44, 0.12 .0.04 respectively for main parameters for the income generation, system sustainability, system losses and system reliability. Identified sub parameters of main criteria are New connection, Bill collection, O&M expenditure ,Staff salaries, NRW, No water, Leak main, leak connection, Defective meters, Low pressure , Leak night time ,Water quality respective parameters for these are 0.49, 0.51, 0.56, 0.44, 1, 0.46, 0.23 ,0.12, 0.06, 0.05, 0.03, 0.05 respectively.

Model verification was completed by comparing the MCDA model priority order of alternatives and the prioritization alternatives at the field level. Only the area Engineer's priority order considered for field level prioritization. Priority order obtained from the MCDA model closely matched with the Area Engineer's Priority order and indicated satisfactory model verification. There is a lack of clear guidelines for various levels of management and field level management. Building up proper guidelines that reflect the organizational objectives will be easy for field level management and it will lead to increased effectiveness of achieving organizational objectives and sustainability of the water supply schemes.

Key Words:
Water Supply System, MCDA, Organizational Objectives, Stakeholder Survey,

Table of Contents

List of Figures

List of Tables

List of Abbreviations

AHP	Analytical Hierarchy Process
AWWA	American Water Works Association
BWTP	Biyagama Water Treatment Plant
CBO	Community Base Organization
CKD	Chloric Kidney Diseases
GND	Grama Niladhari Divisions
KDI	Korean Development Institute
LOS	Level of Service
MC	Main Criteria
MCDA	Multicriteria Decision Analysis
NRW	Non-Revenue Water
NWSDB	National Water Supply and Drainage Board
OIC	Office In Charge
PI	Performance Indicator
PIP	Project Investment Plan
SDG	Sustainable Development Goals
SC	Sub Criteria
W/N	Western North
WHO	World Health Organization