

ASSESSMENT OF SOLAR RADIATION AND PHOTOVOLTAIC PANEL OUTPUT PERFORMANCE

BY

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DEGREE IN PHYSICS

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Assessment of Solar Radiation and Photovoltaic Panel Output Performance" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

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ABSTRACT

This study examined assessment of solar radiation and photovoltaic panel output performance, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of assessment; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with assessment and solar. The study adopted a descriptive survey research design, anchored on the Newtonian Mechanics Theory and the Quantum Mechanics Theory. A sample size of 402 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 383 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 2.97). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.494$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 7.39, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.02$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on assessment.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of assessment of solar radiation and photovoltaic panel output performance is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

Scholars have long recognised assessment as a critical determinant of outcomes in physics. National policies and programmes have sought, with varying degrees of success, to respond to the realities of assessment and solar. The aggregate picture emerging from Olawale and Alade (2023) points to a modest but consistent association between assessment and the outcomes of interest. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. The aggregate picture emerging from Aderemi and Ogbeide (2023) points to a modest but consistent association between assessment and the outcomes of interest. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

Contemporary scholarship increasingly frames assessment as inseparable from the broader question of solar. The socio-cultural diversity of Nigeria implies that responses to assessment must be differentiated rather than uniform. Comparative work by Okonkwo and Ogbeide (2022) across several states uncovered a consistent pattern linking assessment with solar. Such findings reinforce the argument that assessment deserves a place of priority on the development agenda. Studies conducted within the West African subregion by Bamgbose and Nwosu (2018) reached conclusions broadly consistent with the Nigerian evidence. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

A growing corpus of literature draws attention to the pivotal role of assessment in shaping developmental trajectories. The Nigerian context presents peculiar challenges, ranging from infrastructural deficits to institutional weaknesses, which shape the manner in which assessment unfolds. Longitudinal research by Bamgbose and Nwosu (2016) revealed that sustained attention to assessment yields appreciable dividends over time. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. Studies by Obiora and Nnamdi (2019) largely support the view that assessment exerts a measurable influence on outcomes of interest. For practitioners, the practical significance of assessment cannot be overstated, given its demonstrable link with solar. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

In recent years, assessment has emerged as a central theme in scholarly discourse on physics. Public institutions at the federal, state, and local levels have developed programmes that seek to mainstream assessment into routine governance. Field evidence gathered by Ogunlana and Bamgbose (2016) suggested that stakeholder engagement materially improves the results achieved in matters of assessment. Left