

Preface

The large-scale urbanization and technological advancements have induced high demand for energy in nearly every part of the World. As a result the finite source of fossil fuels which is the main source of supply has failed to satisfy this growing need of energy. Not only electricity, fuel is required to run automobiles, maintain industrial output, and for many other purposes.

The necessity of more fuels imbibed the need of an alternative source of energy which is available infinitely but not expensive to utilize as electricity or fuel. The solar energy among many other renewable sources of energy is one of the reliable most option in this aspect.

The solar power utilization is costly. The conversion efficiency lies within 40 %. The resource availability is during the daylight hours only. All these constraints except conversion efficiency changes with change in the location. The cost of installation, maintenance and labour charge also varies with location.

That is why if optimal location for solar energy utilization can be identified then quality, quantity and time of production will be ensured to be maximum among all the available alternatives.

The present investigation is an attempt to provide a methodology for site selection which will be both objective and cognitive. Multi-Criteria Decision-Making and new variant of Neural Networks like Group Method of Data Handling was utilized to imbibe objectivity and cognitivity into the procedure respectively.

Chapter 1 introduces the justification of the present investigation and in Chap. 2 the importance of solar energy was highlighted. Chapter 3 states the strength, weakness and application of Multi-Criteria Decision-Making in decision-making problems.

Chapter 4 depicts the advantage, disadvantage and applicability of new Artificial Neural Networks like Group Method of Data Handling and the detail methodology and its way of implementations in the present study was also described in Chap. 5.

The sixth chapter describes the results derived from the Analytical Hierarchy Process Multi-Criteria Decision-Making process and the predictive models developed with Group Method of Data Handling. The result of the application of the developed indicator in 12 different cities for knowing their feasibility as a location of solar power generation was also discussed in this chapter.

The seventh chapter concludes the study with highlighting the strength, weakness and future scopes of the study.

Feasibility Model of Solar Energy Plants by ANN and
MCDM Techniques

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