ResearchGate

See discussions, stats, and author profiles for this publication at: https://www.researchgate.net/publication/382797588

# POST IMPLEMENTATION STUDY OF SUGARCANE IRRIGATION MANAGEMENT SYSTEM

**Article** · March 2021

CITATIONS
0

READS
2

**2 authors**, including:

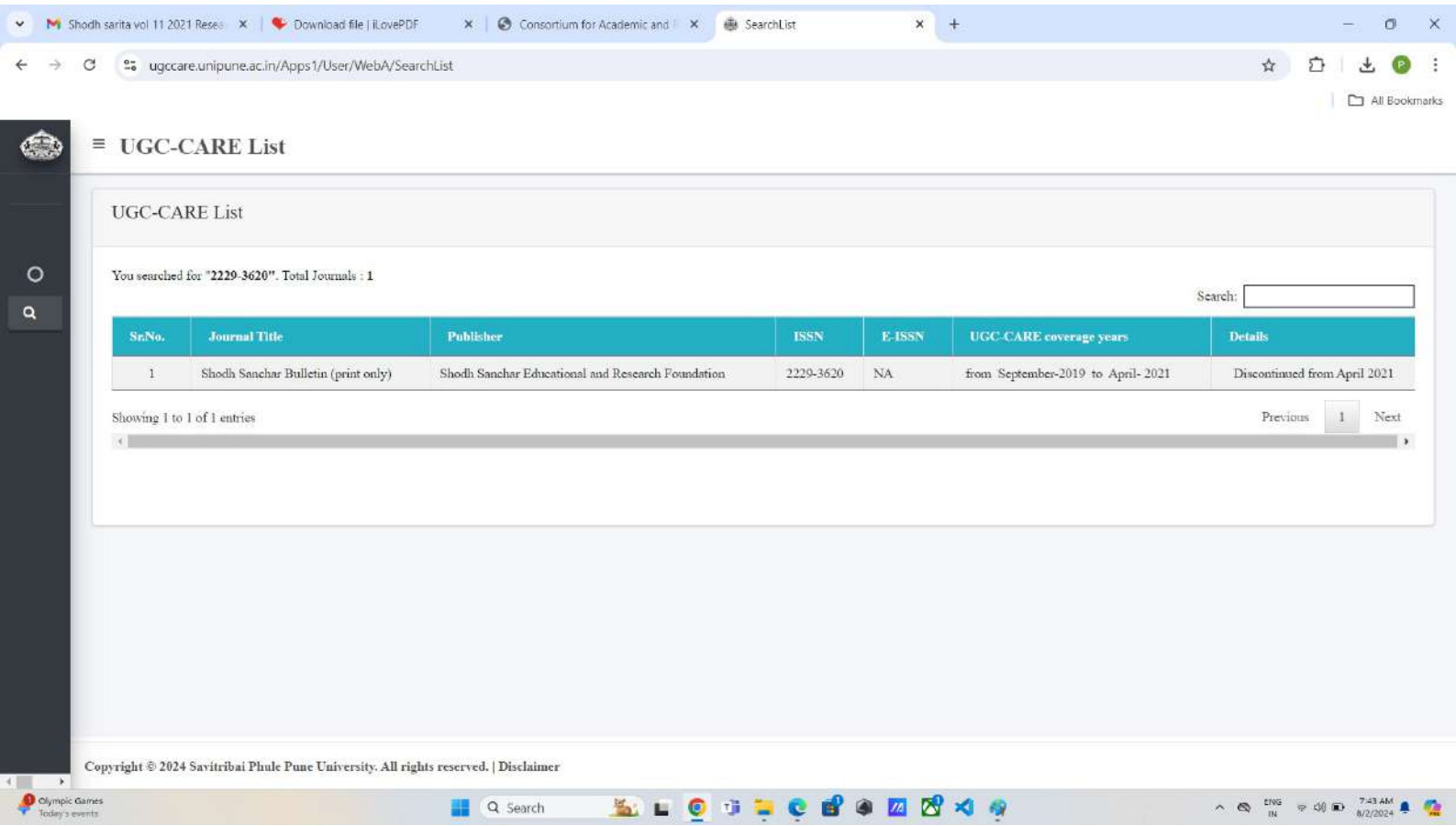
Shivaji Dattu Mundhe

**37** PUBLICATIONS **127** CITATIONS

SEE PROFILE

All content following this page was uploaded by Shivaji Dattu Mundhe on 02 August 2024.

The user has requested enhancement of the downloaded file.


Shodh sarita vol 11 2021 Rese
Download file | iLovePDF
Consortium for Academic and
SearchList
ugccare.unipune.ac.in/Apps1/User/WebA/SearchList
All Bookmarks
UGC-CARE List
UGC-CARE List
You searched for "2229-3620". Total Journals : 1
Search:
Sr.No. | Journal Title | Publisher | ISSN | E-ISSN | UGC-CARE coverage years | Details
1 | Shodh Sanchar Bulletin (print only) | Shodh Sanchar Educational and Research Foundation | 2229-3620 | NA | from September-2019 to April- 2021 | Discontinued from April 2021
Showing 1 to 1 of 1 entries
Previous 1 Next
Copyright © 2024 Savitribai Phule Pune University. All rights reserved. | Disclaimer
Olympic Games
Today's events
Search
ENG
IN
7:43 AM
8/2/2024

GOVT. OF INDIA RNI NO.: UPBIL/2015/62096

UGC Approved Care Listed Journal

ISSN 2229-3620

# SHODH SANCHAR Bulletin

An International
Multidisciplinary
Quarterly Bilingual
Peer Reviewed
Refereed
Research Journal

Vol. 11

Issue 41

January to March 2021

Editor in Chief
Dr. Vinay Kumar Sharma
D. Litt. - Gold Medalist

sanchar
Educational & Research Foundation

# CONTENTS


| S. No. | TITLE | NAME OF AUTHORS | PAGE No. |
|---|---|---|---|
| 1. | AN ANALYTICAL STUDY OF FLEXI LEAVE POLICY AND ITS IMPACT ON PBO'S EMPLOYEES | Dr. Vijay Dhole | 1 |
| 2. | STUDY OF IMPACT OF CORONA PANDEMIC AND THE GLOBAL RECESSION ON JOB OPPORTUNITIES FOR INDIAN YOUTH IN KPO SECTOR | Dr. Pallavi Sajanapwar | 7 |
| 3. | INNOVATION IN OUT OF HOME (OOH) MEDIAADVERTISING RESEARCH: A LITERATURE REVIEW | Prof. Rupa Rawal<br>Dr. Amod Markale | 13 |
| 4. | ROLE OF COMPUTER TECHNOLOGY ON PHARMACY IN INDIA | Dr. D. R. Vidhate<br>Ms. D. D. Vidhate | 19 |
| 5. | UP SKILLINGTHE SKILLS FORFUTURE EMPLOYMENT CHALLENGE-2030 | Prof. Manoj Sathe<br>Dr. Sudarshan Pawar | 24 |
| 6. | INVESTORS PREFERENCES TOWARDS GOLD AS AN INVESTMENT OPTION WITH REFERENCE TO PUNEDISTRICT. | Mr. Swapnil Patil<br>Dr. Eknath B. Khedkar | 29 |
| 7. | A STUDY OF THE IMPACT OF PANDEMIC COVID 19 ON THE HEALTH CARE SECTOR | Dr. Gauri Prabhu | 33 |
| 8. | LIFELONG MACHINE LEARNING IN SENTIMENT CLASSIFICATION: CONCEPTS AND IMPLEMENTATIONS | Krishna Priya S.<br>Kavita S. Oza | 37 |
| 9. | A COMPARATIVE STUDY OF URBAN AND RURAL HOUSEHOLDS INVESTMENT AVENUES IN MAHARASHTRA. | Ghodake Shamrao P.<br>Dr. E. B. Khedkar | 43 |
| 10. | LITERATURE REVIEW ON EMPLOYEE ENGAGEMENT PRACTICES | Dr. Pushpraj Wagh<br>Ms. Pooja Salvekar | 52 |
| 11. | NEW WORLDVIEW IN SECURITY FOR BANKS: DECEPTION TECHNOLOGY | Ms. Ashwini R. Chavan<br>Dr. R. D. Kumbhar | 58 |
| 12. | COMPARATIVE STUDY OF ONLINE V/S OFFLINE MODE OF EDUCATION | Mrs. Rupali Kalekar<br>Ms. Aanchal Priya | 64 |
| 13. | A STUDY OF INBOUND MARKETING AND ITS IMPORTANCE IN INNOVATION MANAGEMENT | Prof. Asmita Abhijeet Gaikwad<br>Dr. Amod Markale | 68 |
| 14. | POST COVID-19: A TECHNICAL APPROACH FOR HIGHER EDUCATIONAL EXCELLENCE | Ms. Sarika Choudhari<br>Mrs. Arati Patil | 73 |
| 15. | REDEFINING HR WITH ARTIFICIAL INTELLIGENCE: CHATBOTS THE NEW ASSISTANT! | Sarah Dsouza<br>Saylee Anil Karande<br>Angshupriya Datta | 80 |

| | | | |
|---|---|---|---|
| 16. | CONTRIBUTIONS OF LOGISTICS AND SUPPLY CHAIN IN ENTREPRENEURIAL ECOSYSTEM IN DEVELOPING COUNTRIES WITH SPECIAL REFERENCE TO TANZANIA | Dr. Maige Mwakasege Mwasimba<br>Mr. Alfred Sallwa | 87 |
| 17. | CRITICAL ANALYSIS OF THE CORONA DISEASEPANDEMIC AND ITS IMPACT ON EDUCATION SYSTEM IN INDIA | Prof. Manoj Ashok Sathe<br>Prof. Yugandhara R. Patil | 93 |
| 18. | PERCEPTIVE CROSS - CURRENTS IN VOCATIONAL TRAINING | Dr. Vandana Mohanty<br>Colonel (Dr.) J. Satpathy<br>Ms. Dhanashree Shinde | 98 |
| 19. | TEXT MINING: APPLICATION OF STEMMING ALGORITHMS FOR INFORMATION RETRIEVAL IN HEALTHCARE WITH SPECIAL REFERENCE TO VIRAL INFECTIVE DISEASES | Dr. Ashwini Manish Brahme<br>Dr. Shivaji D. Mundhe | 105 |
| 20. | STUDY OF THE FINANCIAL IMPLICATIONS OF PSB MERGERS IN INDIA | Mr. Yogesh K. Nakhale<br>Dr. Gauri Prabhu | 111 |
| 21. | A POST IMPLEMENTATION STUDY OF SUGARCANE IRRIGATION MANAGEMENT SYSTEM | Dr. Nilam Jadhav<br>Dr. Shivaji Mundhe | 119 |
| 22. | A COMPARATIVE ANALYSIS OF CAPITAL STRUCTURE ADJUSTMENT WITH RESPECT TO PARTIAL CAPITAL STRUCTURE ADJUSTMENT IN THE SELECTED BSE LISTED INDIAN MANUFACTURING COMPANIES | Vikas R. Adhegaonkar<br>Dr. E. B. Khedkar | 124 |
| 23. | ENVIRONMENTAL ANALYSIS: TOANALYZE VARIOUS ENVIRONMENTAL FACTORS AFFECTING ESSITY AND IDENTIFY THE KEY DRIVERS AMONGST THEM. | Tejas Gujar<br>Dr. Bharati Jadhav | 128 |
| 24. | CUSTOMER REVIEWS SENTIMENTS ANALYSIS USING NATURAL LANGUAGE PROCESSING (NLP) AND DEEP LEARNING. | Dr. Sachin Misal<br>Dr. Shivaji Mundhe | 134 |
| 25. | BEHAVIOUR OF INVESTOR ON INVESTMENT DECISION WITH SPECIAL REFERENCE TO MUTUAL FUND VS. TRADITIONAL INVESTMENT AVENUES- A REVIEW | Prof. Mahesh Mahankal<br>Dr. Prabha Singh | 139 |
| 26. | FACE IDENTIFICATION IN A GROUP BASED ON LBP ALGORITHM AND NEURAL NETWORK CLASSIFIER FOR CLASS ATTENDANCE | Narayan Kulkarni<br>Dr. H. S. Fadewar | 145 |

| | | | |
|---|---|---|---|
| 27. | FACTORS AFFECTING CONSUMER'S BUYING BEHA VIOR TOWARDS ORGANIZED RETAILING WITH REFERENCE TO STAR BAZAAR IN PUNE CITY | Dr. Pushpraj Wagh | 151 |
| 28. | VEHICLE REGISTRATION NUMBER RECOGNITION USING MACHINE LEARNING | Dr. Sachin Misal<br>Mr. Sunil Joshi | 158 |
| 29. | INNOVATION- AN INSTRUMENT FOR SUSTAINABLE ECONOMY | Singha Roy Ekta | 164 |
| 30. | AUTOMATIC IRIS RECOGNITION SYSTEM IN HCI | Ganesh K. Awasthi<br>Dr. H. S. Fadewar | 168 |
| 31. | VOCATIONAL EDUCATION ANDTRAINING: IS IT REALL Y EFFECTIVE? | Dr. Vandana Mohanty<br>Dr. Ashutosh Zunjur | 175 |
| 32. | AN EMPIRICAL STUDY ON TECHNIQUES TO CREATE A POSITIVE LEARNING ENVIRONMENT | Dr. Sonali Dharmadhikari<br>Dr. Shweta Joglekar | 182 |
| 33. | EFFECT OF BONUS ISSUE ON PRICES OF COMPANIES AT STOCK EXCHANGE | Prof. Mahesh Mahankal<br>Mr. Rahul Bari | 187 |
| 34. | TREND ANALYSIS OF FINTECH USAGE IN PUNE CITY DURING COVID-19 | Mrs. Poorva Pachpore<br>Dr. Gauri Prabhu | 191 |
| 35. | A STUDY OF AWARENESS REGARDING DIABETES MELLITUS AMONG RURAL COMMUNITY OF AHMEDNAGAR DISTRICT | Dr. Gorakshanath T. Gund<br>Dr. Prashant Radhakrishna Tambe | 196 |
| 36. | VALIDATING CONSUMER ETHNOCENTRISM SCALE (CETSCALE) | Dr. Ashutosh Zunjur<br>Dr. Joe Lopez | 202 |
| 37. | NLP FOR SOCIAL MEDIA DATA PROCESSING | Miss. Ankita D. Garud<br>Prof. Prashant N. Wadkar | 208 |
| 38. | A COMPARATIVE STUDY OF WIDEL Y USED VIRTUAL CLASSROOM TECHNIQUES | Dr. Nilam Jadhav<br>Dr. Kedar Marulkar | 214 |
| 39. | LINKING BETWEEN KNOWLEDGE AND TALENT MANAGEMENT IN AN IT FIRMS – LITERATURE REVIEW | Ms. Deepti M. Yadav<br>Dr. Bhola Sarang S. | 219 |
| 40. | STUDY OF E-MARKETING PRACTICES OF SELECTED SMARTPHONE BRANDS FOR PCMC REGION | Prof. Amarnath Gupta<br>Ganesh Kalshetty | 226 |

ISSN - 2229-3620
UGC CARE LISTED JOURNAL
SHODH SANCHAR Bulletin
January-March, 2021
Vol. 11, Issue 41
Page Nos. 119-123
AN INTERNATIONAL BILINGUAL PEER REVIEWED REFEREED RESEARCH JOURNAL

# A POST IMPLEMENTATION STUDY OF SUGARCANE IRRIGATION MANAGEMENT SYSTEM

Dr. Nilam Jadhav*
Dr. Shivaji Mundhe**

## ABSTRACT

*Management science is most applicable not only to solve various irrigation problems of various parts of India but also for efficient irrigation management for any kind of farm. Current irrigation techniques are manual and have lots of drawbacks. More water is required for Sugarcane irrigation. Researcher has used management science is an interdisciplinary ability to come out with a solution that will help to take decisions regarding irrigation scheduling. Researcher has designed Expert System that will focus this area. The present study focuses on post implementation study of developed expert system for the assessment in terms of its applications and efficiency.*

**Keywords:** *Management Science, Irrigation Management, Sugarcane Irrigation, Expert System, Irrigation Scheduling*

## INTRODUCTION

Management science is a branch that study different other application areas. Researcher has used this approach to design, develop and implement model that has proved useful in reduce irrigation scheduling issues and tackle sugarcane irrigation problems. Sugarcane is one of the major crop in India which is water intensive. As water resources are limited, it need to properly manage. Expert system, can be developed with a knowledge base using its different techniques. The field of Agriculture is also require a expert knowledge that can be divided into heuristic and factual knowledge to manage required resources efficiently.

Researcher has undertaken the study to find out various sugarcane irrigation problems of western Maharashtra region. The research is further extended to study of various factors governing water requirements to find exact water requirement for the sugarcane. The knowledge thus generated is used for development of expert system for irrigation management of sugarcane. This paper focuses the assessment of efficiency of developed expert system.

## SIGNIFICANCE OF THE STUDY

In India Sugarcane is major crash crop which is water very intensive. Most of the farmer use traditional irrigation methods that results in problems such as water logging, salinity and severe water pollution by chemical fertilizers. This is also because farmers cant get exact water requirement and use calendar method for irrigation. Effective rainfall varies largely in the regions of the western Maharashtra. Researcher has designed Expert System for effective irrigation management and scheduling which could tackle above problems. The post implementation study of such system is also important to get effectiveness of the model. The present research paper highlights the post implementation study of developed expert system.

## REWIEW OF LITERATURE

Various research papers available on agricultural applications of management science.

*Assistant Professor - Shivaji University, Kolhapur
**Director - International Institute of Management Science, Pune

But very few of them cover the area studies here. Some of them are discussed here.

Les Levidow et al in their paper entitled "Improving water-efficient irrigation: Prospects and difficulties of innovative practices"[1] presented their view on irrigation management systems.

Zongkun Tan et. al., in their paper entitled "The Design And Implementation of Sugar-Cane Intelligence Expert System Based On EOS/MODIS Data Inference Model" [2] presents how Sugarcane spatially distributed.

This paper, "Designing and Simulation of an Automated Irrigation Management System Deployed by using Wireless Sensor Networks (WSN)" by Joseph Haule and Kisangiri Michael [3] presents an use of wireless sensor network in automated irrigation management system that looks after real time water amount in the soil.

After rigorous review of related literatures researcher found following research gap

- The studies were not carried out for western region of Maharashtra
- Post implementation study was not carried out for any such developed model

## Research Methodology

Present study is particularly evaluative analysis type of study. Other details are as below:

### *Scope of the Study*

This paper presents findings of Post implementation analysis of irrigation scheduling model and is confined to only 33 farmers and 10 experts study area only to verify results whether it is able to solve sugarcane irrigation problems or not.

### *Hypothesis of the Study*

The hypothesis set for the study is,

"There is a significant difference between irrigation problems faced by farmers before and after implementation of expert system."

Hence null hypothesis is,

Ho: There is no significant difference betwee irrigation problems faced by farmers before an after implementation of expert system.

This main null hypothesis is divided into followin sub null hypotheses,

a. There is no significant difference betwee getting exact water requirement before an after implementation of expert system.
b. There is no significant difference betwee efficient use of water before and afte implementation of expert system.
c. There is no significant difference betwee irrigation management before and afte implementation of expert system.
d. There is no significant difference betwee the soil salinity and erosion before an after implementation of expert system.

### *Objectives*

The broad objective of the research is to tes whether the usefulness and efficiency of exper system to solve analysed problems. The study also focuses on its advantages and applications and challenges to implement the system

### *Sample Size*

Kolhapur division having three district (Kolhapur,Sangli and Satara) is considered for th study. 386 farmers and 33 experts were selected fo main study. 10% of it was selected for post analysis study.

### *Questionnaire*

An questionnaire was prepared in Marathi to collect data. The questionnaire for farmer contains 19 closed-ended questions and for experts 30 closed-ended questions to gather specific answers.

### Data Analysis and Interpretation

The data thus collected was cleaned and tabulated in SPSS for detail analysis. The data is also used to test the hypothesis.

## Hypothesis Testing

For testing this sub hypothesis 9 experts and 32 farmers are selected who were interviewed before for sugarcane irrigation problem identification. Developed system were provided to them and again asked for same problems. Pre and post measurement of the opinion of each respondent is studied on a Likert scale, here 1 = Strongly Disagree to 5 = Strongly Agree. Wilcoxon sign test was performed for comparison of average of these two dependent samples.

Following are the reasons for selecting this test for testing all sub hypotheses

- As mentioned earlier both pre and post measurement of the opinions of each respondent are studied on a Likert scale and this test works well for ordinal data
- The test is nonparametric test hence used as both data are not normally distributed.
- Through this hypothesis researcher wants to prove that sugarcane irrigation problems have been resolved through this expert system. Same sample is considered for pre and post study. For pre and post study the given test is useful to statistically say whether or not the expert system resolved the irrigation problems faced by farmers.

TABLE I. TEST STATISTICS OF RESPODENTS OPINION ABOUT ALL 4 SUBHYPOTHESIS

| Subhypothesis | Z (Based on positive ranks) | | Asymp. Sig. (2-tailed) | |
|---|---|---|---|---|
| | *Expert* | *Farmer* | *Expert* | *Farmer* |
| I | -2.724 | -5.208 | 0.006 | 0.00000019 |
| II | -2.724 | -4.920 | 0.006 | 0.00000086 |
| III | -2.588 | -4.960 | 0.010 | 0.00000070 |
| IV | -2.701 | -5.014 | 0.007 | 0.00000053 |

*Source: Data compiled by researcher using SPSS*

From table 1 it is clear that, the opinion of both respondents for the sugarcane irrigation problem of getting exact water requirement, the calculated value of test statistics is 0.006 and 0.00000019 which is less than 0.05. Thus the null hypothesis is rejected and alternative hypothesis is accepted. It shows much more difference between getting exact water requirement before and after implementation of expert system.

It is also clear that, the opinion of both respondents for the sugarcane irrigation problem of efficient water use for irrigation, the result of test statistics is 0.006 and 0.00000086 which is less than 0.05. Thus null hypothesis is rejected and alternative hypothesis is accepted which means that there is a significant difference between efficient use of water before and after implementation of expert system.

It is also observed that, the opinion of both respondents for the sugarcane irrigation problem of irrigation management, the result of test statistics is 0.010 and 0.00000070 which is less than 0.05. Thus null hypothesis is rejected and alternative hypothesis is accepted which means that there is a significant difference between irrigation management before and after implementation of expert system

From table no. 1, it is clear that, as per the opinion of both respondents for the sugarcane irrigation problem of soil erosion and salinity, the result of test statistics is 0.007 and 0.00000053 which is less than 0.05. Thus null hypothesis is rejected and accept alternative hypothesis is accepted which means that there is a significant difference between the soil salinity and erosion before and after implementation of expert system.

From above it can be observed that result of test statistics is less than level of significance for both the respondents for all above sub hypotheses. All of the above results also indicate that after implementation of expert system the sugarcane irrigation problems seem to be minimized.

Thus main null hypothesis is rejected and alternative hypothesis is accepted. Hence it can be concluded that the irrigation problems can be minimized.

Thus it can be concluded that the implementation of expert system caused a significant decrease in sugarcane irrigation problems.

## FINDINGS

The findings of the study are as under:

### *Application of Expert System:*

- Out of total sample data selected for post implementation analysis of expert system named as 'Expert Irrigator' all 32 farmers and 9 experts (100 % of sample) used and tested all functionalities of Expert Irrigator. All of them agree to the fact that all functionalities of Expert irrigator work satisfactory.
- Overall, 100 % of the farmers and experts state that EI provides help to get exact water requirement of sugarcane
- Majority of them (72.73 % of the farmers and 100 % of the expert) state that after use of EI water for irrigation can be used efficiently.
- Majority of the respondents (100% of farmers and experts) state that after effective irrigation scheduling of EI Irrigation management is proper.
- Majority of the farmers (72.73 %) and experts (88 %) state that after implementation of EI problems of soil erosion and fertility loss are minimized.

### *Irrigation Estimation Method of Expert System*

- All experts agree to the fact that weather condition, soil type, growth phase, sugarcane type are considered for estimation of sugarcane water requirement in expert irrigator.
- 100 % experts agree to the fact that wind and water flow is also considered determining exact irrigation requirement sugarcane in EI.
- All experts are agree to the fact that meth used for irrigation scheduling is accu thereby generating correct results.

### *Advantages of Expert System*

- Most of the farmers (96.88 %) state that EI easy to install.
- 100 % of the farmers and experts state that is very user friendly and easy to operate.
- 87.50 % of the farmers agree to the statem that, "It generates maximum output wi minimum inputs"
- 100 % of the farmers and experts state that wi the help of EI, it is possible to get help at eac step of operation.
- It was found that most of the farmers (96.88 % and experts (100 %) state that due application of EI, it is very useful to decide tim for water in case of common irrigati schemes.
- 93.75 % of the farmers and 100 % of th experts state that EI facilitates drip irrigati more effectively and there is no signific difference in responses of the respondent (standard deviation is 0.59 for farmers and 0 for experts).
- About 100 % of the farmers and all of th experts state that Irrigation problems can b minimized by using ES. After detail testing o functionalities and analyzing advantages an applications of EI, overall 94% of th respondent farmers and 89% experts agree that they would suggest the EI to other farmers for their benefit.

### *Conclusion*

Post implementation analysis shows that developed Expert System caused a significant decrease in sugarcane irrigation problems. Hence it can be used for effective irrigation scheduling. The developed expert system also found accurate, easy to use, efficient, satisfactory and useful.

References


Les Levidow, Daniele Zaccaria, Rodrigo Maia, Eduardo Vivas, Mladen Todorovic, Alessandra Scardigno, Improving water-efficient irrigation: Prospects and difficulties of innovative practices, Agricultural Water Management, Volume 146, 2014, Pages 84-94, ISSN 0378-3774,https://doi.org/10.1016/j.agwat.2014.07.012.

Z. Tan, M. Ding, X. Yang, Z. Ou, Y. He, Z. Kuang, H. Chen, X. Mo and Z. Huang, "The Design and Implementation of Sugar-cane Intelligence Expert System Based on Eos/Modis Data Inference Model", Computer And Computing Technologies In Agriculture, Volume II, pp. 1181-1191.

J. Haule and K. Michael, "Designing and Simulation of an Automated Irrigation Management System Deployed by using Wireless Sensor Networks (WSN)", IOSRJECE, vol. 9, no. 5, pp. 67-73, 2014.

L. PWL, "Decision Support Systems for Sugarcane Production Managers", Proc S Afr Sug Technol Ass, vol. 85, pp. 206 - 220, 2012.

E. Hokam, "Computer-based expert system to optimize the water supply for modern irrigation systems in selected regions in Egypt", Ph.D., institute of land improvement the Justus Liebig university of Giessen., 2002.

S. Segrera et al., "Evolution of Decision Support System Architectures: applications for land planning and management in Cuba", JCS&T, vol. 3, no. 1, pp. 40-46, 2003.

[7] Tan Z., Ding M., Yang X., Ou Z., He Y., Kuang Z., Chen H., Mo X. and Huang Z., "The Design and Implementation of Sugar-cane Intelligence Expert System Based on Eos/Modis Data Inference Model", Computer And Computing Technologies In Agriculture, Volume II, pp. 1181-1191.

[8] Yost R, Attanandana T., Pierce Carol J., Itoga Stephen (2011) "Decision Support Systems in Agriculture: Some Successes and a Bright Future", Efficient Decision Support Systems – Practice and Challenges From Current to Future, Prof. Chiang Jao (Ed.), ISBN: 978-953-307-326-2

[9] Nilam Jadhav,Shivaji Mundhe(2018)" A review of literature related to Expert System for Sugarcane Irrigation Scheduling", International Journal of Computer Engineering and Applications ISSN 23213469

[10] Nilam Jadhav,Shivaji Mundhe(2018)" Analysis of 'Expert Irrigator' Developed for Sugarcane Irrigation Scheduling", International Journal of Information Systems ISSN 2229-5429 Vol VII, Issue II

[11] Nilam Jadhav,Shivaji Mundhe(2018)" Analyzing Awareness of Farmers in Kolhapur Region About Expert System Implementation for Irrigation of Sugarcane", International Journal of Information Systems ISSN 2229-5429 Vol VI, Issue II





View publication stats