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| Book Name: | [Engineering Research: Perspectives on Recent Advances](https://www.bookpi.org/bookstore/product/engineering-research-perspectives-on-recent-advances-vol-1/) |
| Manuscript Number: | **Ms\_BPR\_4164** |
| Title of the Manuscript: | **PREDICTION OF RUNOFF BY SYNTHETIC UNIT HYDROGRAPH METHODS FOR THE DESIGN STORMS IN WARANA RIVER BASIN, MAHARASHTRA, INDIA** |
| Type of the Article | **BOOK CHAPTER** |

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| PART 1: Comments | | |
|  | Reviewer’s comment | Author’s Feedback *(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)* |
| **Please write a few sentences regarding the importance of this manuscript for the scientific community. A minimum of 3-4 sentences may be required for this part.** | This manuscript holds significant importance for the scientific community as it addresses the critical challenge of predicting runoff in ungauged basins, which is vital for effective water resource management and flood risk assessment. By evaluating and comparing multiple synthetic unit hydrograph (SUH) methods, the study provides insights into the most suitable techniques for hydrological modeling in data-scarce regions, such as the Warana River basin. The findings, particularly the validation of Snyder's method as the most accurate approach, offer practical applications for watershed planning, infrastructure design, and disaster mitigation. Furthermore, the research contributes to the broader understanding of morphometric influences on hydrological processes, paving the way for improved modeling in similar basins worldwide. |  |
| **Is the title of the article suitable?**  **(If not please suggest an alternative title)** | The current title, **"Prediction of Runoff by Synthetic Unit Hydrograph Methods for the Design Storms in Warana River Basin, Maharashtra, India"**, is clear and descriptive, but it can be improved for conciseness and broader appeal. A good title should convey the scope, methodology, and significance of the study succinctly. |  |
| Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here. | The abstract of the article is generally comprehensive, providing an overview of the study's objective, methodology, and findings. However, it can be improved by refining its structure and ensuring it addresses all critical aspects concisely.   1. **Clarity and Structure**:  * Begin with a clearer statement of the problem or research gap (e.g., challenges in runoff prediction for ungauged basins). * Follow with the methodology and its uniqueness or significance (e.g., comparison of specific SUH methods).  1. **Quantitative Results**:  * Include key quantitative findings, such as the percentage error, root mean square error (ERMS), or efficiency of Snyder's method compared to other methods. * Mention how these results compare to observed unit hydrographs (e.g., Snyder's method yielded the lowest error of 0.26%).  1. **Implications**:  * Conclude with a sentence highlighting the practical applications of the findings, such as their utility in watershed management, flood prediction, or planning hydraulic structures.  1. **Deletions**:  * Avoid overly technical terms or detailed methodologies that are better suited for the main text. Instead, focus on the broader picture and key outcomes. |  |
| **Is the manuscript scientifically, correct? Please write here.** | Based on the provided document, the manuscript appears to be scientifically correct, as it employs established methods for hydrological modeling and provides a detailed analysis of runoff prediction using synthetic unit hydrograph (SUH) techniques. Here are some points that support its scientific validity, along with minor areas for consideration:   1. **Methodology**:  * The manuscript utilizes well-established SUH methods, including Snyder’s, SCS, CWC, and Commons’ methods, which are widely recognized in hydrology. * The use of Leave-One-Out Cross Validation (LOOCV) for model validation demonstrates a robust statistical approach to ensure the reliability of results.  1. **Data Sources**:  * The study uses accurate and credible data from rain gauge stations, the Survey of India topographic sheets, and Shuttle Radar Topographic Mission (SRTM), ensuring a sound basis for the analysis.  1. **Results and Analysis**:  * The results are logically presented, with quantitative findings supported by comparative tables and validation metrics, such as root mean square error (ERMS) and percentage errors. * The morphometric analysis of sub-basins is thorough, linking hydrological characteristics with flooding and recharge potential.  1. **Conclusions**:  * The conclusions are consistent with the findings, emphasizing the suitability of Snyder's method for the Warana River basin and its potential for similar ungauged basins. |  |
| **Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.**  **-** | The references in the manuscript are relevant and cover a wide range of foundational and regional studies on synthetic unit hydrographs (SUHs), morphometric analysis, and hydrological modeling. However, a significant portion of the references are dated, with many studies from the mid-20th century and early 2000s. Including more recent studies (from 2015 onwards) would enhance the manuscript's relevance and provide a contemporary context. |  |
| Is the language/English quality of the article suitable for scholarly communications? | The language quality of the article is suitable for scholarly communication, as it demonstrates a good command of technical terminology and a clear structure. However, there are areas where the writing could be refined to enhance readability and precision. Overall check the manuscript draft and remove all the grammatical errors. |  |
| Optional/General comments | **General Comments**  1. **Scientific Contribution**: The manuscript makes a meaningful contribution to hydrological modeling, particularly for data-scarce regions. By systematically comparing synthetic unit hydrograph (SUH) methods, it provides valuable insights for practitioners and researchers dealing with ungauged basins. 2. **Practical Implications**: The study has strong practical relevance, especially for watershed management, flood risk assessment, and infrastructure planning in regions like the Warana River basin. Highlighting these aspects more prominently in the abstract and conclusion could broaden the study’s appeal. 3. **Data Visualization**: While the manuscript includes useful figures and tables, integrating additional comparative visuals (e.g., bar charts, scatter plots) could make the results easier to interpret. For instance, a summary graph comparing the errors of different SUH methods would be highly beneficial. 4. **Interdisciplinary Appeal**: The manuscript could appeal to a wider audience by connecting its findings to broader topics like climate change, urbanization, and sustainable water management. A brief mention of how these factors might influence SUH accuracy or applicability would enhance its relevance. 5. **Future Work**: Including a dedicated section or paragraph discussing future research directions would strengthen the manuscript. Suggestions could include applying SUHs to other basins, integrating machine learning approaches, or assessing the impact of land-use changes on runoff predictions. 6. **Streamlining Technical Sections**: The detailed explanations of SUH methods are valuable but could be streamlined slightly to maintain reader engagement. Consolidating equations or summarizing them in a table might help.  **Final Remark:**  The manuscript is well-structured and scientifically robust, with significant relevance for hydrological research and applications. Addressing the minor language, structural, and contextual suggestions will further elevate its quality and impact in scholarly communications. |  |

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| **PART 2:** | | |
|  | **Reviewer’s comment** | **Author’s comment *(if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)*** |
| **Are there ethical issues in this manuscript?** | ***(If yes, Kindly please write down the ethical issues here in details)*** |  |

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| **Reviewer Details:** | |
| Name: | **Abdul Ghani Soomro** |
| Department, University & Country | **Water and Agricultural Waste Management Institute, Pakistan** |