

Development of HydroGIS Model Development Framework: Research Methodological Perspectives

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The common problem of transdisciplinary research is the acceptable research methodology. The author was questioned with the same when developing a HydroGIS model development framework as it synthesises multiple disciplines. Hence, the present work aims to systematically select the methodology options for developing research methodology for the research. For that purpose, it carried out a comprehensive literature review to formulate how ontology, epistemology, and axiology axioms are aligned with the author's thoughts. By utilising the "Heightening your Awareness of your Research Philosophy" tool and Burrell and Morgan's (year) four paradigm approach selected and verified the most suited philosophy. Based on such underpinning, it analysed the best-suited theory-building approach and formulated the research steps. Founded on those steps it comprehended the methodological choices available to the research design. By analysing the findings, it systematically selected the research strategies for operationalising the research design. Finally, it could identify the framework developed in the interpretivism philosophy and explains the subjectivistic truth which is axiologically experienced by the researcher. The deductive approach is identified as the theory-building approach, where the components of the framework are identified through the explanatory science approach while the design science approach verifies the findings. Due to this bidirectional shift, research needs to follow the sequential multi-phase approach of the mixed method. Further, it identified constructivist grounded theory, survey, document research, and Multi-Criteria Decision-Making tools as the best-chosen research strategies to operationalise the research design. Finally, this study demonstrates how to systematically select the research philosophy and formulate research methodology for transdisciplinary research.

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