

INCREASING WATER USE EFFICIENCY

EGU General Assembly 2020

Session 5.2.1. “Advances in Socio – Hydrology”

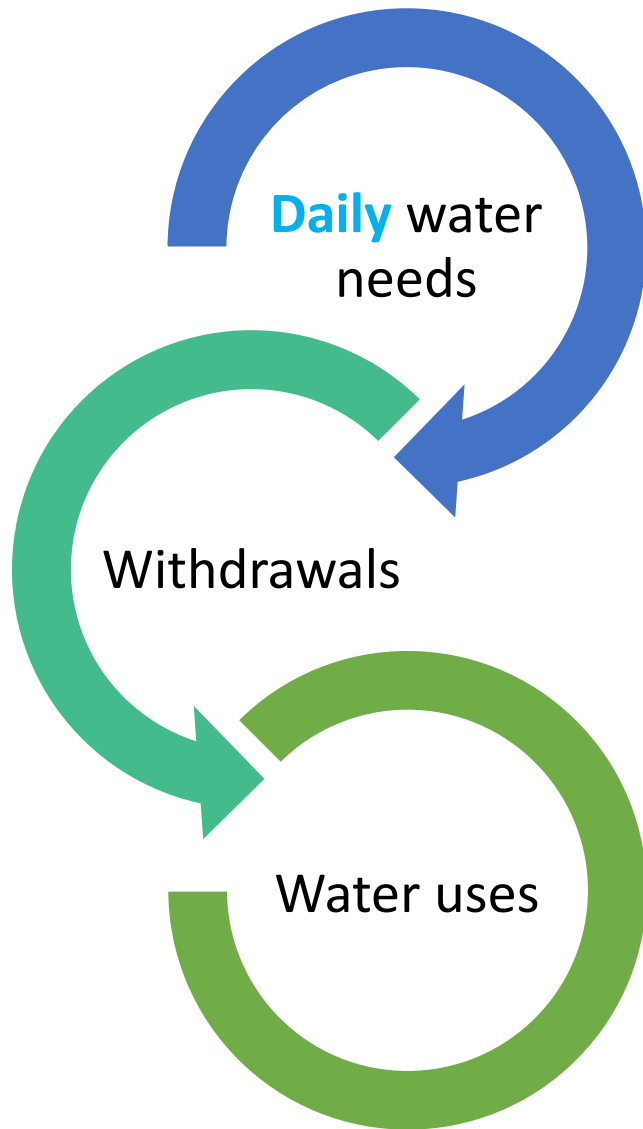
May 05, 2020

Diana Carolina Callejas Moncaleano^a , Saket Pande^a and Luuk Rietveld^a

d.c.callejasmoncaleano-1@tudelft.nl; s.pande@tudelft.nl; l.c.rietveld@tudelft.nl

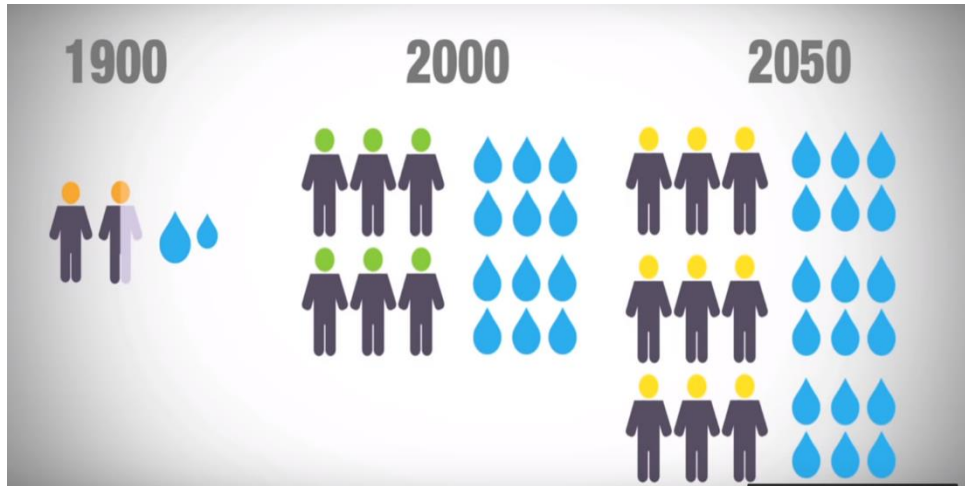
^aDelft University of Technology, Department of Water Management, the Netherlands

Water use

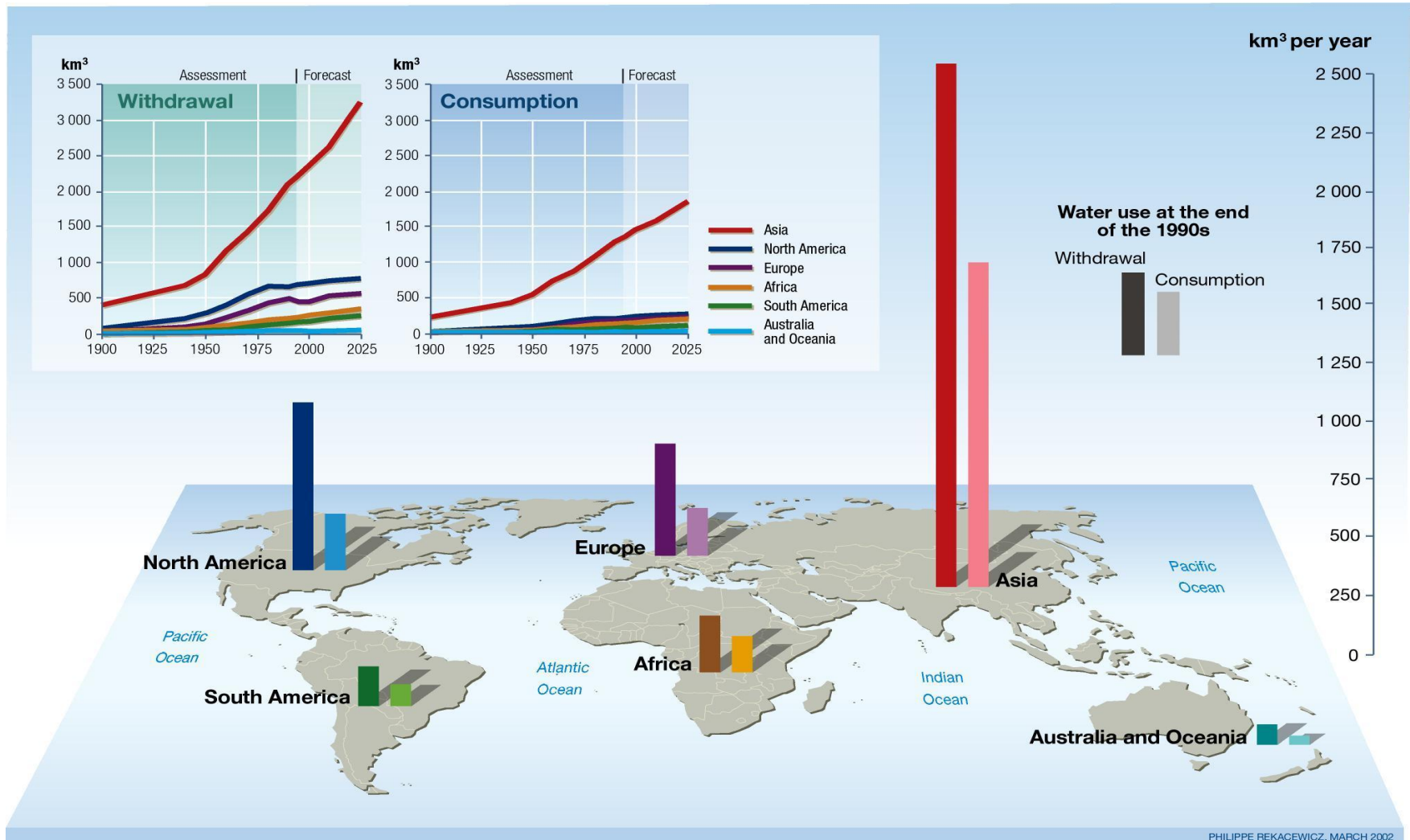


Water demand

High water demand



Gap between withdrawal and water use



Reference:

grida.no (2002). *Water withdrawal and consumption*. Retrieved from <https://www.grida.no/resources/5779>

Examples of existing policies and programs



Global

- Sustainable development goal 6.4.1.



Regional- European Commission

- The Roadmap to a Resource Efficient Europe.



Local –Australia

- Making every drop count - water efficiency programs.



Local –Colombia

- National Policy for the IWMR- water efficiency programs



Local – Unites States

- Promoting an efficient and sustainable water.



Local – United States

- Water efficiency programs.

Inefficient use of water



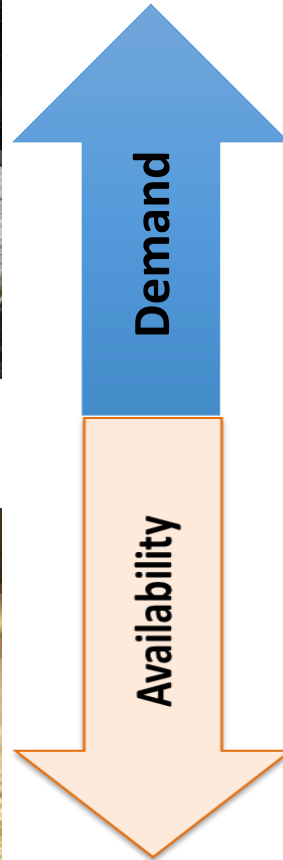
Water services



Irrigation systems



Households



Farmers

➤ Water use



the efficient use of water
remains a challenge

➤ High water
demand



➤ Withdrawals vs
water consumed

Why water is used
in an inefficiency
manner?

➤ Wastage



Objective

Studying the limitations in our understanding of human behaviour underlying water use efficiency from contextual and behavioural factors.

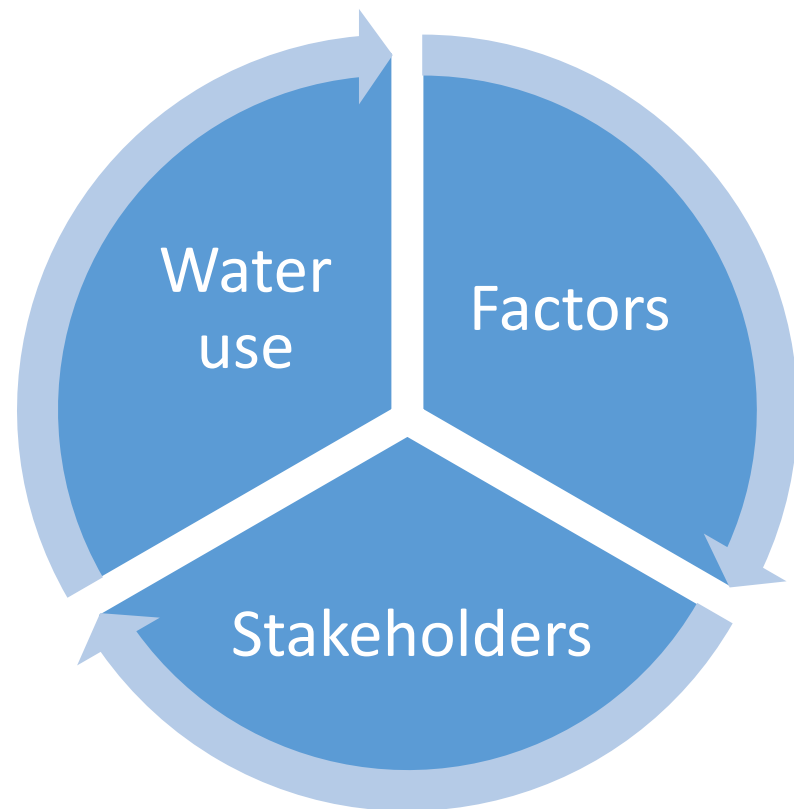
Research question

What are the gaps in understanding the human behaviour underlying water use efficiency from contextual and behavioural factors, and how is human behaviour linked to these factors towards water use efficiency?

Literature review

- Factors and determinants of water use efficiency behaviour

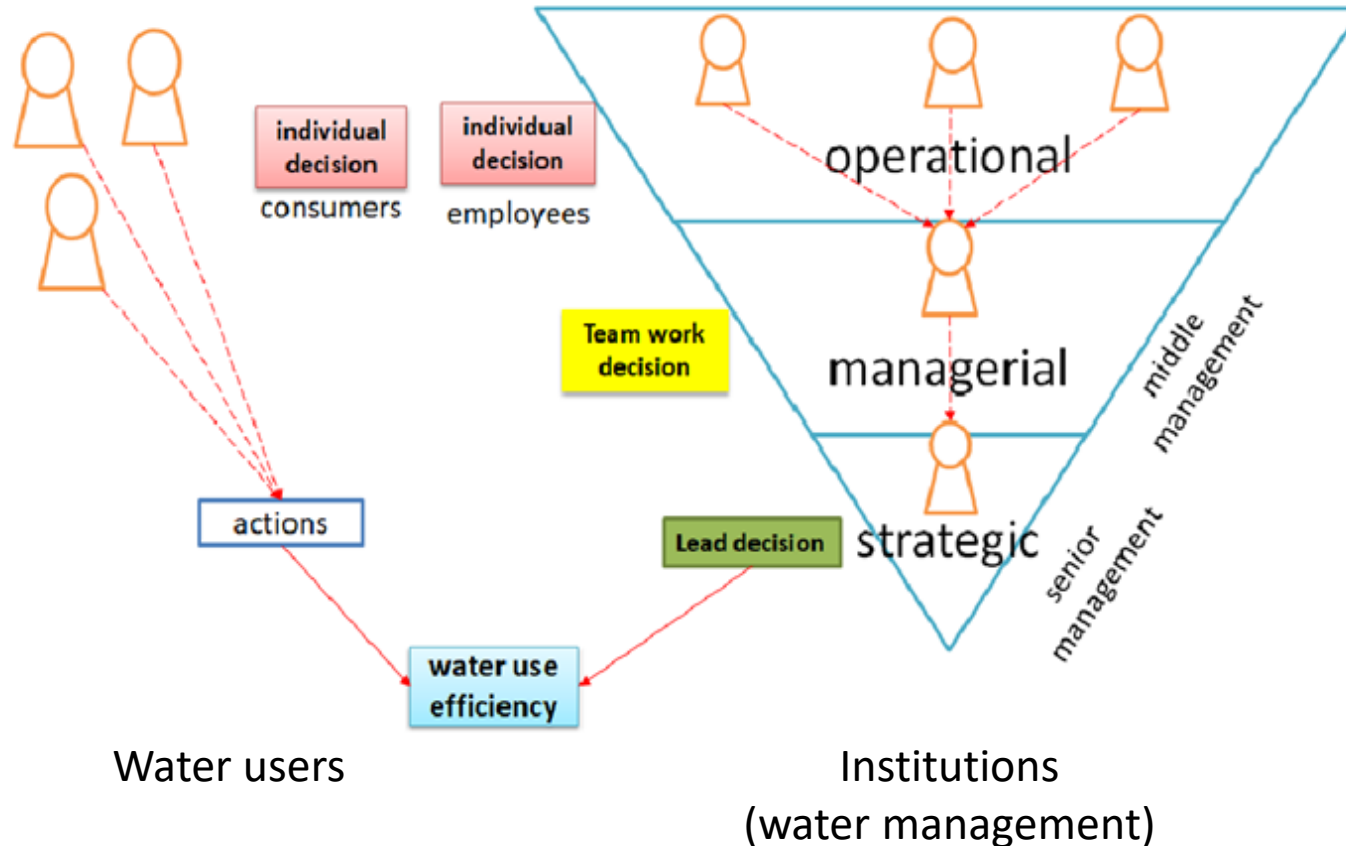
- Contextual factors
- Behavioural factors
- Stakeholders
- Water users



Gaps

- An holistic and systematic approach is required to assess factors, and evaluating and understand the linkages between water use efficiency, factors and human behaviour.
 - Isolated assessment of behavioural and contextual factors.
 - A lack of consideration for the influence of institutions on water efficiency.
 - The absence of a systematic method to understand WUE behaviour in terms of contextual and behavioural factors.

Actors involving on water efficiency

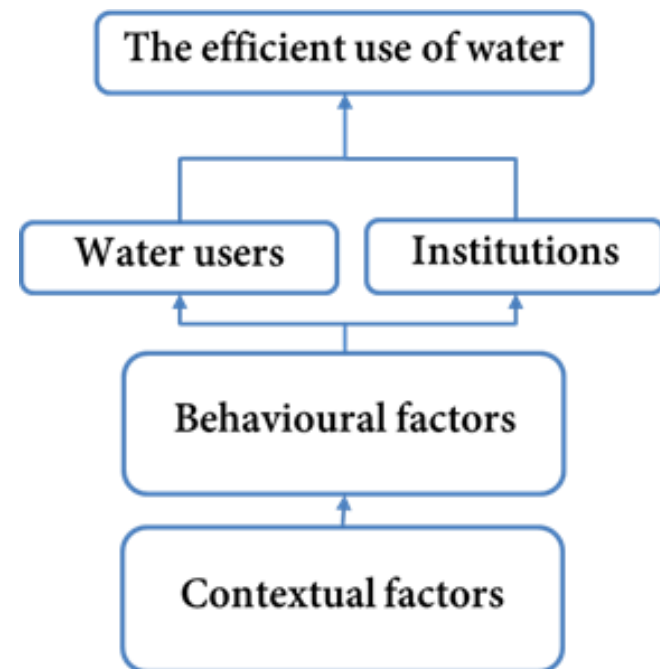


Conceptual model

This research proposes the conceptual model in order to:

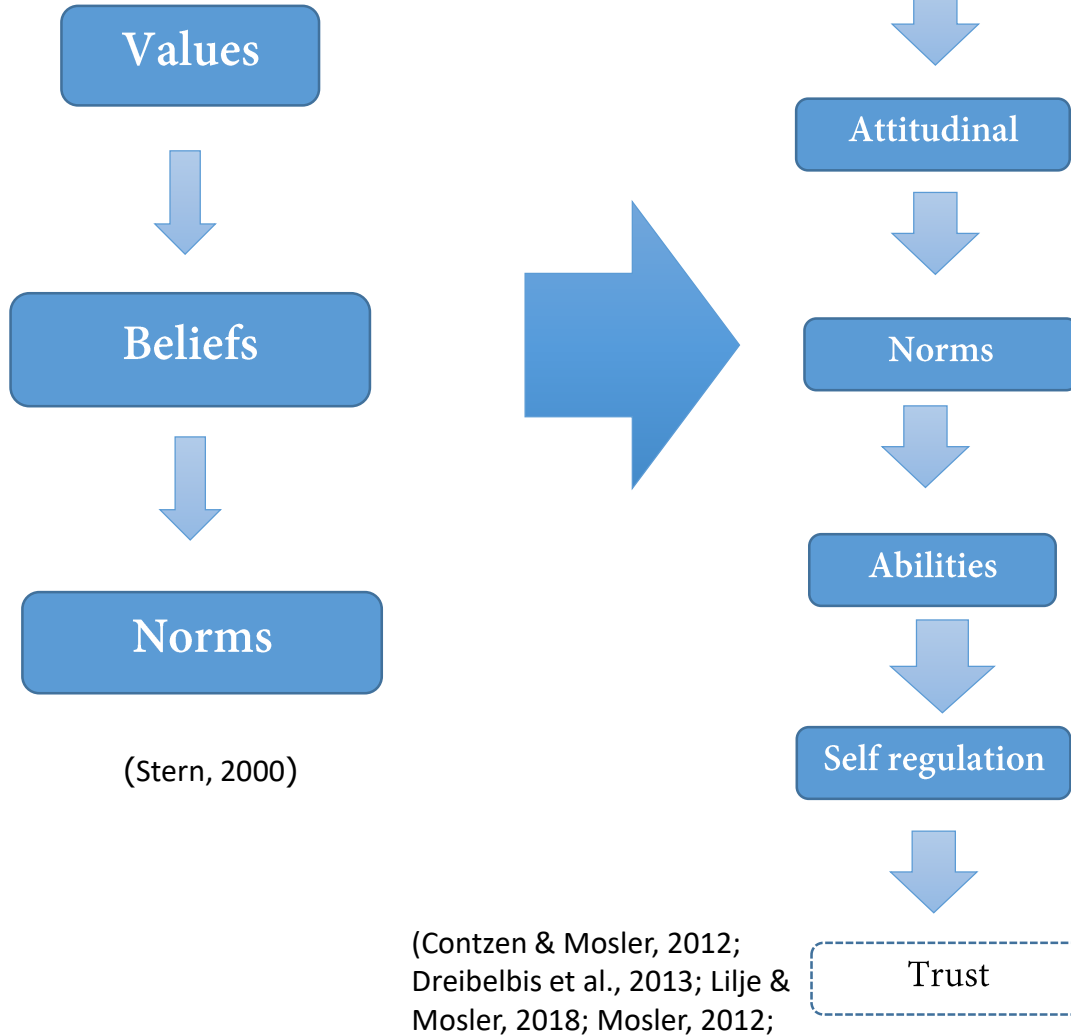
(I) Connect contextual and behavioural factors .

(II) Represents the prior causal-effect relationships between water users and institutions.

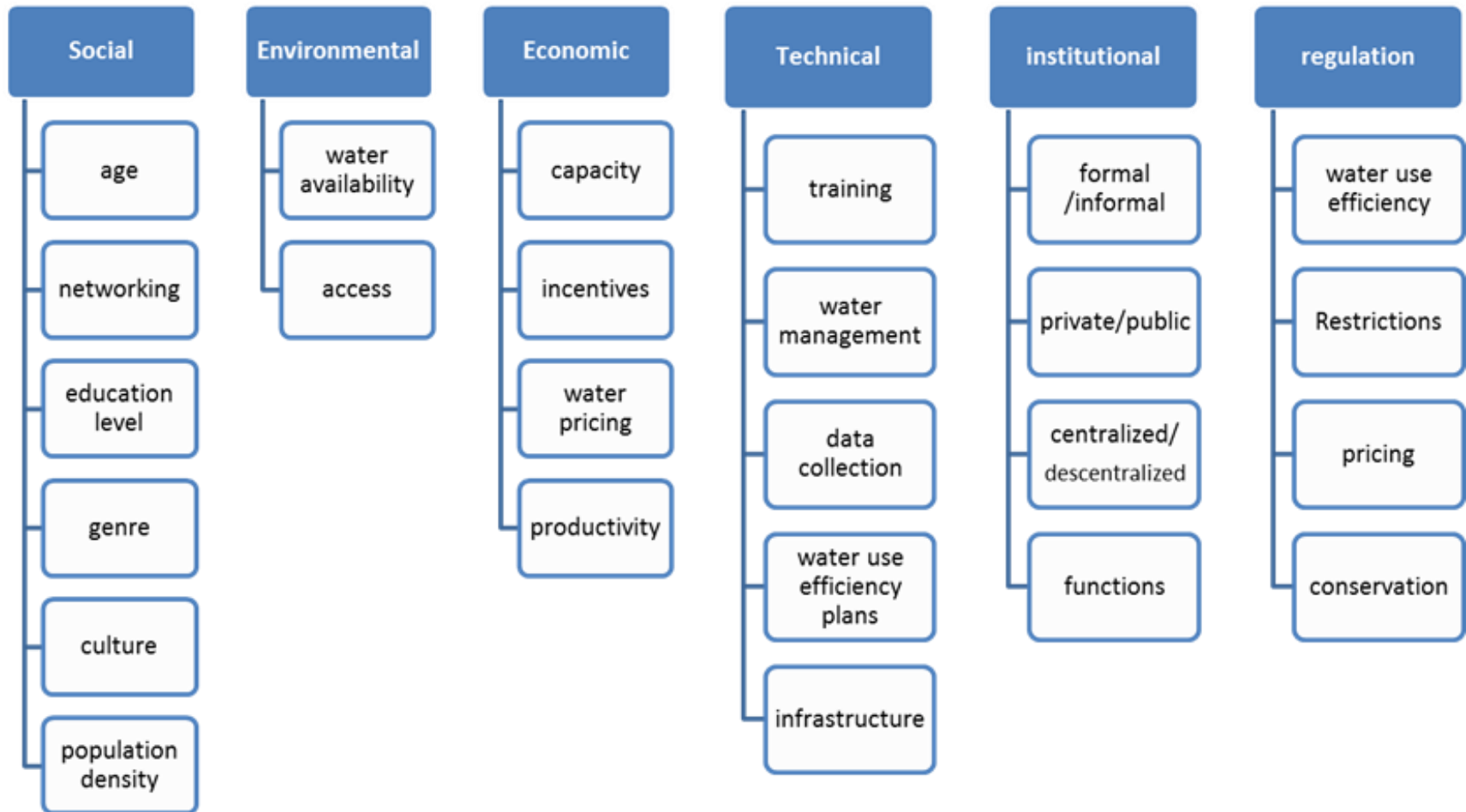


Behavioural factors

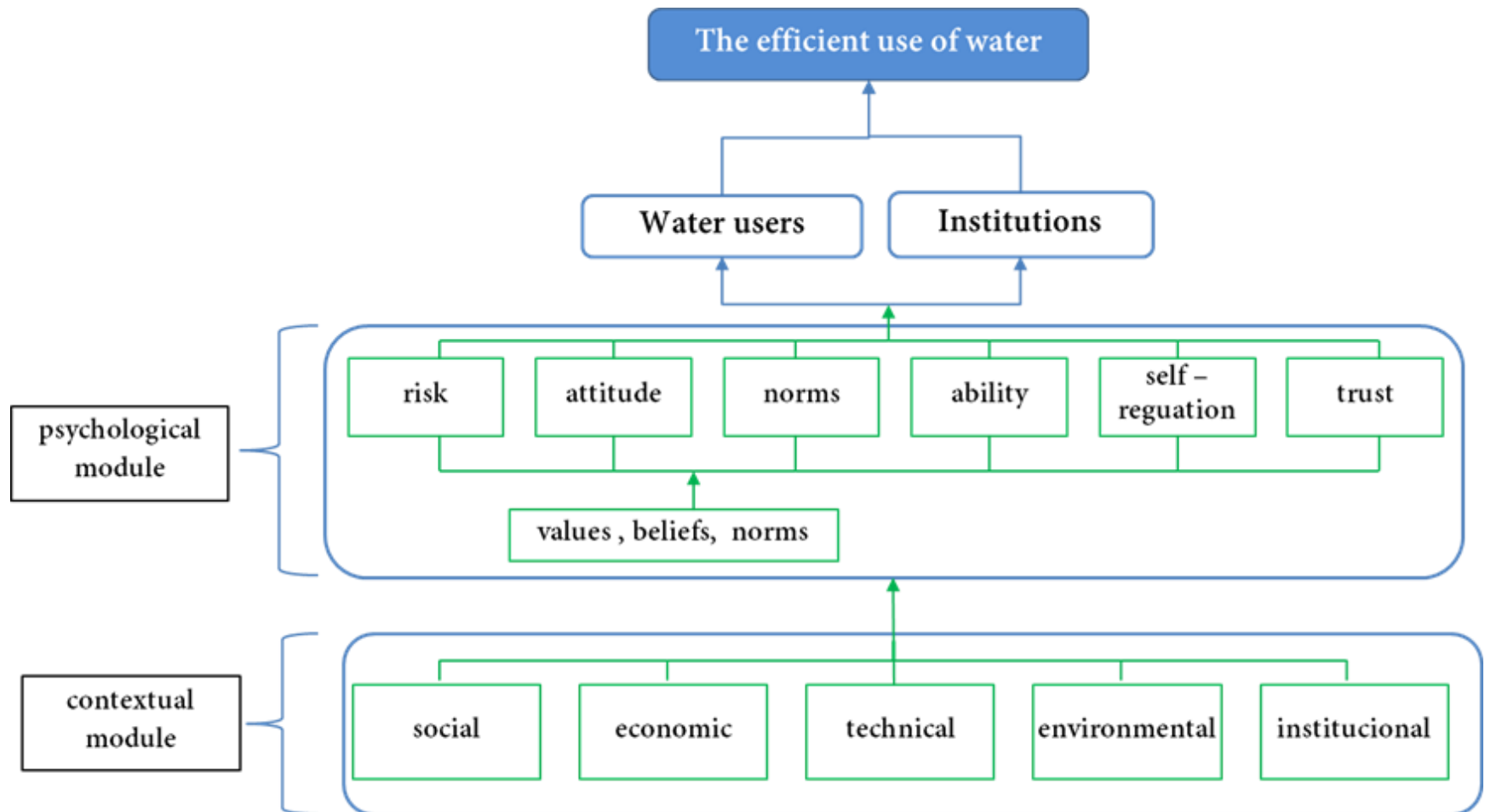
Existing psychological models and theories



Contextual factors



Conceptual model



Conclusions

- The implementation of WUE is limited, mainly in some developing countries, due to the lack of an integrated framework encompassing major interacting factors driving the actions and behaviour of institution and users.
- The linkages between stakeholders are essential because each has an important role to play in making decisions and taking actions that affect water efficiency.
- The review of WUE presented here was motivated by the need to increase current knowledge and to understand better the human-environmental behaviour, specifically the relation between water use and human being.

1. Contzen, N., & Mosler, H.-J. (2012). The Risks, Attitudes, Norms, Abilities, and Self-regulation (RANAS) approach to systematic behavior change. In *Eawag*. <http://www.eawag.ch/en/departement/ess/main-focus/environmental-and-health-psychology-ehpsy>
2. Publications
3. Dreibelbis, R., Winch, P., Leontsini, E., Hulland, K. R., Ram, P. K., Unicomb, L., & Luby, S. P. (2013). The integrated behavioural model for water, sanitation, and hygiene: a systematic review of behavioural models and a framework for designing and evaluating. *BMC Public Health*, 13(1015), 1–13.
4. GRIDA.no (2002). *Water withdrawal and consumption*. Retrieved from <https://www.grida.no/resources/5779>.
5. Lilje, J., & Mosler, H. J. (2018). Effects of a behavior change campaign on household drinking water disinfection in the Lake Chad basin using the RANAS approach. *Science of the Total Environment*, 619–620, 1599–1607. <https://doi.org/10.1016/j.scitotenv.2017.10.142>
6. Mosler, H. J. (2012). A systematic approach to behavior change interventions for the water and sanitation sector in developing countries: A conceptual model, a review, and a guideline. *International Journal of Environmental Health Research*, 22(5), 431–449. <https://doi.org/10.1080/09603123.2011.650156>
7. Stern, P. C. (2000). New Environmental Theories: Toward a Coherent Theory of Environmentally Significant Behavior. *Journal of Social Issues*, 56(3), 407–424. <https://doi.org/10.1111/0022-4537.00175>