

15 January 2024

RE: Draft United Nations Framework Classification For Resources (UNFC), *Supplemental Groundwater Specifications*

Dear EGRM Groundwater Resources Working Group (GRWG),

As co-authors of the groundwater management framework on which the draft UNFC *Supplemental Groundwater Specifications* are partially based, we welcome the opportunity to comment on these. We note that the Supplemental Groundwater Specifications form a *resource-project and principles-based classification system for defining the environmental, social, economic viability and technical feasibility of projects to develop resources (UNECE, 2013; UNECE, 2020)*. We remain unclear, however, as to what “principles-based” implies in this classification system since the specifications make no reference to rights-based approaches to water, which are designed to ensure the inclusion of people, especially historically marginalised groups, in decisions that are of importance to them. Further, notwithstanding the proposed applications for the proposed framework (p. 5), we remain unclear as to the context in which the proposed *Supplemental Groundwater Specifications* will be applied and who would recognise these.

Beyond these general concerns, please note the following comments for consideration:

1. *Make explicit reference in the Supplemental Groundwater Specifications of how the human right to water is protected or influenced by each application under consideration and include a clear definition of what is meant by “Socially Necessary Groundwater Projects” and the extent to which considered applications influence that human right.*
2. *Provide a more explicit recognition of the integrated nature of groundwater and surface water and how freshwater capture of surface water through groundwater withdrawals (as noted in paragraph 2 of page 8) is integrated into the metrics F and G within project classifications depicted in Figure 1.*
3. *Address the conflation of residence time and renewability indicated by the document’s simplistic and misrepresentative descriptions of shallow and deep groundwater. For example, the overview states “Shallow groundwater... stays fresh and renewable” whereas “Deep groundwater is not usually renewable on human time scales”. Despite embracing definitions of groundwater renewability proposed by Cuthbert et al. (2023), the overview fails to recognise that *timescales of freshwater capture dictate whether groundwater is renewable rather than predevelopment recharge rates* (Ferguson et al., 2020).*

4. *Reconsider reference to the flawed definition of the Earth System Boundary for Groundwater defined by Rockström et al. (2023) or coincidentally cite criticisms of how the Earth System Boundary for Groundwater was defined (Cuthbert et al., 2024) as definition of this boundary is inconsistent with the conceptualisation of renewability by Cuthbert et al., (2022, now 2023) embraced by the proposed scheme on page 10.*
5. *Consider citing new evidence of groundwater depletion from global-scale piezometric data in the characterisation of groundwater availability: groundwater-level declines have accelerated over the past four decades in 30% of the world's regional aquifers (Jasechko et al., 2024).*
6. *Update pre-print reference to Cuthbert et al. (2022) with the open-access reference to Cuthbert et al. (2023) published in Water Resources Research.*

Cited References:

- Cuthbert, M.O., Gleeson, T., Bierkens, M.F.P., Ferguson, G. and Taylor, R.G. (2023) Defining renewable groundwater use to improve groundwater management. *Water Resources Research*, Vol. 59(9), e2022WR032831.
- Cuthbert, M.O., Gleeson, T., Bierkens, M.F.P., Ferguson, G. and Taylor, R.G. (2024, accepted) Concerns regarding proposed groundwater Earth System boundary. *Nature*
- Ferguson, G., Cuthbert, M. O., Befus, K., Gleeson, T., & McIntosh, J. C. (2020) Rethinking groundwater age. *Nature Geoscience* 13(9): 592–594.
- Jasechko, S., Seybold, H., Perrone, D., Fan, Y., Shamsudduha, M., Taylor, R.G., Fallatah, O. and Kirchner, J.W. (2024, accepted) Rapid groundwater decline and some cases of recovery in aquifers globally. *Nature*
- Rockström, J., Gupta, J., Qin, D., Lade, S. J., Abrams, J. F., Andersen, L. S., ... & Zhang, X. (2023) Safe and just Earth system boundaries. *Nature* 619: 102–111,
- United Nations Economic Commission for Europe (UNECE, 2013) United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 Incorporating Specifications for its Application. ECE Energy Series 42. United Nations, Geneva.
- United Nations Economic Commission for Europe (UNECE, 2020) United Nations Framework Classification for Resources Update 2019. ECE Energy Series No. 61. United Nations, Geneva.

Yours sincerely,

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