**Supplementary Material**

**Hydrogen technology adoption analysis in Africa using a Doughnut-PESTLE hydrogen model (DPHM)**

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The PESTLE aspect of the model was validated by analyzing the same indicators in countries located in South Asia, East Asia, and the Pacific region. The region was selected because it has a perfect mix of advanced and developing countries. Most importantly, advanced countries such as Japan and South Korea are well-known global leaders in the hydrogen economy. Therefore, the PESTLE landscape in this region can be directly translated into the PESTLE landscape in regions such as Africa and South America.

Map

Description automatically generated

Figure S 1 South, East Asia, and Pacific political indicators

Map

Description automatically generated

Figure S 2 South, East Asia, and Pacific economic indicators

A map of the world

Description automatically generated with medium confidence

Figure S 3 South, East Asia, and Pacific social indicators

A map of the world

Description automatically generated with medium confidence

Figure S 4 South, East Asia, and Pacific technological indicators

Map

Description automatically generated

Figure S 5 South, East Asia, and Pacific legal indicators

Map

Description automatically generated

Figure S 6 South, East Asia, and Pacific environmental indicators

A map of the world

Description automatically generated with low confidence

Figure S 7 South, East Asia, and Pacific overlayed PESTLE indicators

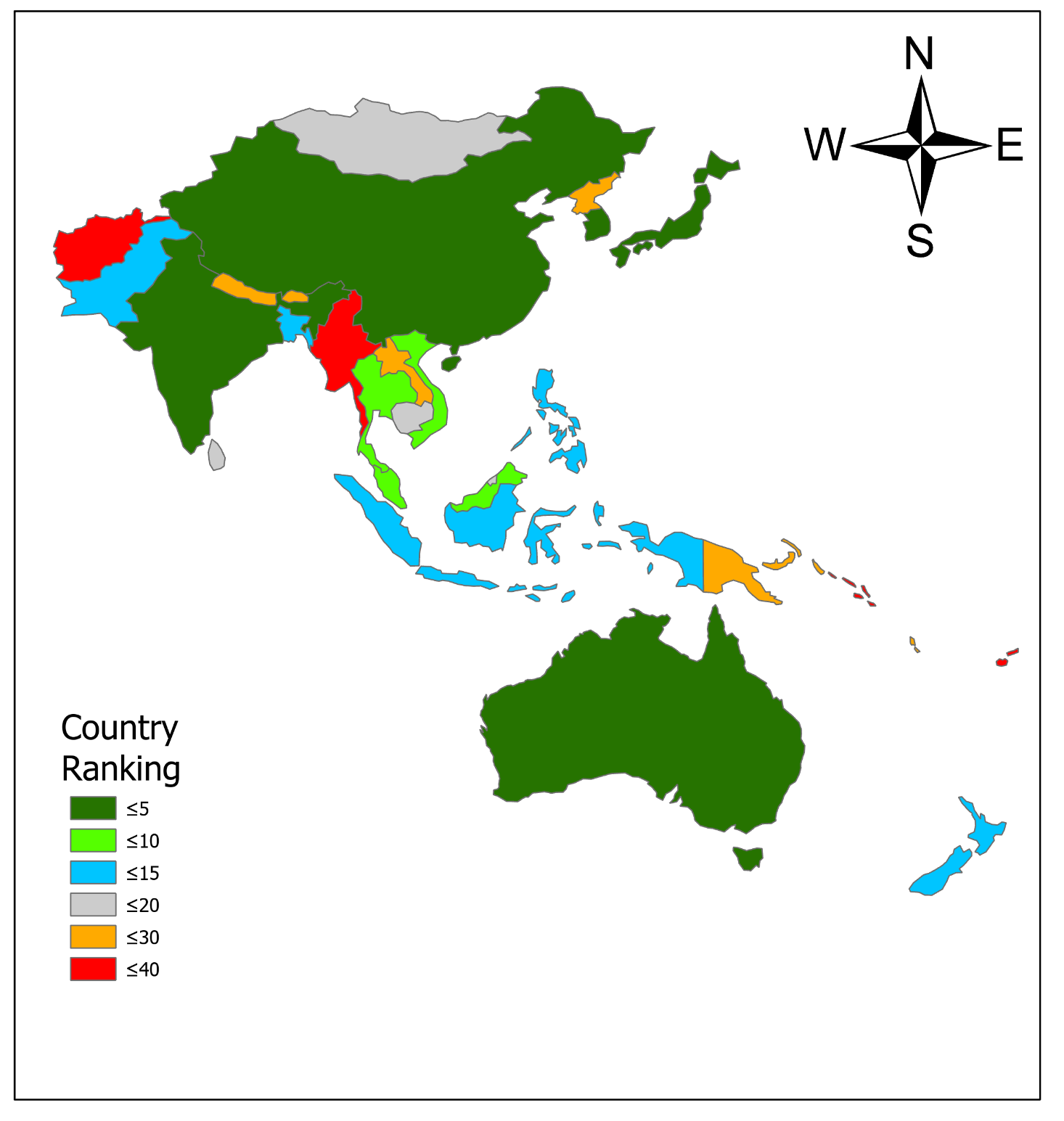


Figure S 8 South, East Asia, and Pacific country ranking