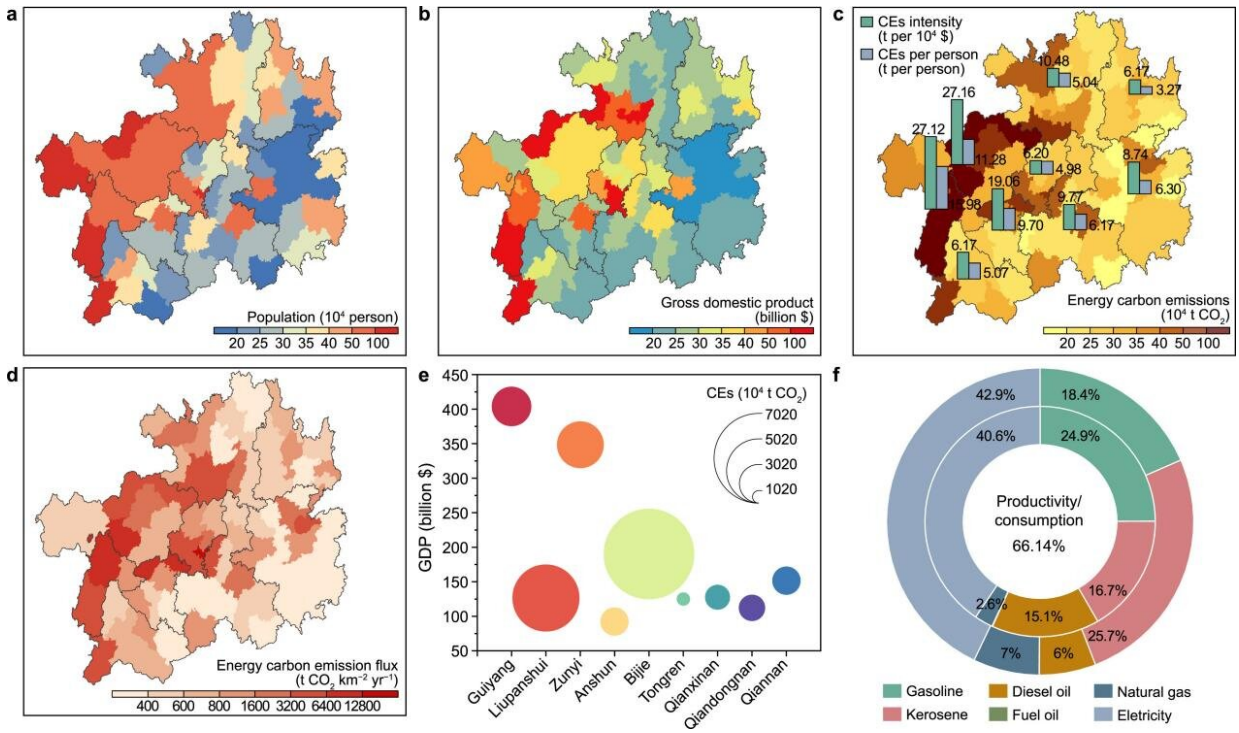
New model accurately evaluates carbon neutrality capacity

July 24 2023



Guizhou's carbon emissions totaled 280 Tg CO_2, with notable spatial differences: higher in the west and lower in the east. Bijie and Liupanshui cities had the highest emissions due to their significant roles in energy production and mineral resources, making their per capita emissions exceed 10 t. Conversely, areas like Qiandongnan and Qianxinan had lower emissions, attributed to their geographic locations, good ecological protection, and higher vegetation coverage. Guizhou needs to transition towards greener practices and enhance its ecosystem's carbon sink potential to meet carbon neutrality goals. Credit: *Environmental Science and Ecotechnology* (2023). DOI: 10.1016/j.ese.2023.100237

In a new study published in the journal *Environmental Science and Ecotechnology*, researchers from the Chinese Academy of Sciences (Guiyang), reveal a new model for accurately evaluating carbon neutrality capacity. The Carbon Neutrality Capacity Index (CNCI) model evaluates contributions from various carbon sinks, providing vital data for climate change policy development and emission reduction strategies.

The study utilized a variety of advanced analytical methods to construct the CNCI model, with a key innovation being the inclusion of carbonate and silicate rock chemical weathering as carbon sinks, an area often overlooked in carbon neutrality assessments. In addition to this, the model also evaluated the vegetation–soil ecosystem as a carbon sink.

The results show that Guizhou has a CNCI of 57%, significantly higher than both China's average (11.88%) and the global average (27.14%). Furthermore, regions within Guizhou, such as Libo and Pingtang, showed surpluses, with CNCIs as high as 643% and 581%, respectively.

These results highlight the region's potential to make a substantial contribution toward China's carbon neutrality goal. The study concludes by emphasizing the critical role rock weathering carbon sinks play in evaluating the CNC of terrestrial ecosystems. It also proposes the CNCI model as an efficient and applicable tool for comprehensive and systematic analysis of carbon neutrality, both at a national and global level.

In the long term, the findings of this study could play a pivotal role in accelerating progress towards global carbon neutrality, a goal of significant importance in tackling climate change. The researchers hope that the findings of this study will provide valuable insights for scientists, policymakers, and climate activists around the globe.

More information: Xiaoyong Bai et al, A carbon-neutrality-capacity index for evaluating carbon sink contributions, *Environmental Science and Ecotechnology* (2023). DOI: 10.1016/j.ese.2023.100237