

The Global Yield Gap Atlas has been set up to support efforts to achieve the highest possible crop yields from existing farmland. The Atlas provides a range of information, offering relevant data to policy makers, researchers and industry. This extensive open-data initiative takes a bottom-up approach to data, concentrating on delivering detailed information on weather, cropping systems and soils. It up-scales the locally gathered data so it can be of relevance at national and global levels.

To deliver effective country-based and regional information successfully, it relies on open data sources that accumulate highly localized data linked to weather patterns, soil conditions and cropping methods. This data populates the Atlas with information of value in planning and decision-making.

The designers of the Atlas consider previous yield gap analyses to be “too coarse or too empirical”, and criticise those earlier efforts as lacking transparency with regard to methods, sources of data, and underpinning assumptions, making it hard to validate or improve estimates. “To address these deficiencies, the Atlas utilizes methods that are transparent, reproducible and based on the best available science”, the website’s introduction states.

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The website also makes it clear that there is an urgency to improve this kind of data, “The current rate of yield increase for major food crops is not fast enough to meet demand on existing farmland. Given limited land suitable for crop production and population soon to exceed 9 billion, ensuring food security while protecting carbon-rich and biodiverse rainforests, wetlands, and grasslands depends



on achieving highest possible yields on existing farmland.”

In implementing the service, they are concerned that most major crop-producing countries, including data-rich regions such as the USA and Europe, have insufficient reliable data on yield potential or water-limited yield potential. This revealed the need for the Atlas which helps with best available estimates of the exploitable yield gap, defined on the website’s introduction as the difference between current average farm yields and 80% of yield potential and water-limited yield. Water resources to support rain-fed and irrigated agriculture are also limited, which means efficiency in converting water to food (alternatively described as water productivity) is another key food security benchmark included in the Atlas.

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The team at the Atlas also state, “Our approach has a strong agronomic foundation. It gives preference to best available sources

of weather, soil, and management data, well validated crop simulation models to estimate potential yield and water productivity, and expert opinion to provide scientifically robust, transparent, and reproducible yield gap assessments. Results are up scaled from location to climate zone and country following a novel bottom-up approach.”

This approach involves access to location-specific data on current cropping systems, soil type, and long-term weather data from selected reference weather stations. This means results can be validated and improved upon in major crop-producing regions worldwide.

The partnership behind the Atlas believe it can help determine the untapped crop production potential and identify the most promising regions for investment in agricultural development and technology. The Atlas can also be used to monitor progress

towards closing yield gaps, quantitatively estimate the impact of R & D investments on yield gap closure over time, and assess the degree to which food self-sufficiency can be achieved through sustainable crop intensification. Furthermore, the Atlas offers a foundation for explaining and mitigating yield gaps and for spatial studies that deal with a wide range of issues such as impact of climate change, land use, environmental footprint of agriculture, and for in-season crop forecasting.

The team managing the Atlas is made up of the Water for Food Institute of the University of Nebraska-Lincoln, Wageningen University, and Alterra, a research, development and consultancy organisation based at Wageningen University.

Source:
<http://www.yieldgap.org/web/guest/methods-overview>
<http://www.yieldgap.org/web/guest/glossary>

