

Inquiry into the impact of climate change on Queensland agricultural production

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State Development and Regional Industries Committee

RE: Inquiry into the impact of climate change on Queensland agricultural production

Dear Sir/Madam,

It is a great pleasure to make a submission to your inquiry into the impact of climate change on Queensland agricultural production. In this submission, the focus is on the Term of Reference (b) – *opportunities for the Queensland Government to create and support resilience, adaptation and mitigation measures in preparing the agricultural sector for future climate change.*

Climate change significantly increases the risks of extreme weather events (e.g., drought, excess rainfall, temperature variability), which adversely impact the vulnerable agriculture sector in Australia. Australia's agriculture accounted for over 50% of land use and 12% of goods and services in 2020-2021.¹ In Queensland alone, 80% of the land is employed for agriculture production.² In the past decades, Australian crop production has been the most volatile globally.³ Therefore, it is important to explore effective mitigation and adaptation strategies to manage climate risks.

¹ Snapshot of Australian Agriculture 2022. Department of Agriculture, Fisheries and Forestry, Australian Government. <https://www.agriculture.gov.au/abares/products/insights/snapshot-of-australian-agriculture-2022#around-2072-of-agricultural-output-is-exported>.

² <https://www.globalaustralia.gov.au/industries/agrifood-tech/state-ecosystem/queensland#:~:text=Queensland's%20agriculture%2C%20fisheries%2C%20and%20forestry,is%20used%20for%20agricultural%20production>.

³ Keogh, M. (2012). Including risk in enterprise decisions in Australia's riskiest businesses. The 56th Annual Australian Agricultural and Resource Economics Society, Fremantle, WA. <https://ideas.repec.org/p/ags/aare12/124202.html>.

Weather index insurance (WII), an innovative financial product, is becoming one of the most popular strategic tools used to transfer risks in the agricultural sector. In contrast to traditional insurance, in which the indemnity is claimed based on the actual loss, WII is based on pre-defined thresholds or trigger points (index) of weather parameters (e.g., rainfall). The payout of WII is often triggered if the weather parameter moves beyond the pre-specified threshold. In this regard, WII offers many advantages, including reducing moral hazard and adverse selection, making settlement of claims quicker, and lowering the transaction cost.^{4,5}

While WII has been mostly investigated in developing countries, such as Kenya Ethiopia, Ghana, and India,⁶ with the increasingly significant threat of extreme weather events, WII products could be adopted in developed countries, including Australia. Borrowing the experience of the WII study in developing countries, the Australian (or Queensland) government and financial institutes may provide support to facilitate the implementation of WII.⁷ First, insurance companies need to design a more reasonable weather parameter index. Otherwise, the appropriate correlation between this index and crop loss cannot be established. Second, farmers' knowledge of WII should be improved. For farmers, WII might be a complex financial product, which reduces their confidence in this kind of product. Collaborating with the government, insurance companies may organise relevant workshops to help improve farmers' understanding and awareness of WII products. Finally, the government may provide post-disaster support to enhance farmers' climate change resilience. With the nature of WII, based on weather parameters rather than crop yield, farmers who have purchased the insurance product may not get the payout from losses. In summary, the provision of weather parameter-related insurance products provides an alternative to climate risk management, whereas

⁴ Giné, X., Townsend, R., and Vickery, J. (2008). Patterns of rainfall insurance participation in rural India. *World Bank Economic Review*, 22(3), 539-566.

⁵ Cole, S., Giné, X., Tobacman, J., Topalova, P., Townsend, R., and Vickery, J. (2013). Barriers to household risk management: Evidence from India. *American Economic Journal: Applied Economics*, 5(1), 104-135.

⁶ Clement, Kristina Yuzva, W. J. Wouter Botzen, Roy Brouwer, and Jeroen C. J. H. Aerts. 2018. A global review of the impact of basis risk on the functioning of and demand for index insurance. *International Journal of Disaster Risk Reduction* 28: 845–53.

⁷ Wang, Q., Soksophors, Y., Barlis, A., Mushtaq, S., Phanna, K., Swaans, C., & Rodulfo, D. (2022). Willingness to Pay for Weather-Indexed Insurance: Evidence from Cambodian Rice Farmers. *Sustainability*, 14(21), 14558.



support from governments, financial professionals, and communities is critical to the agricultural sector for future climate change.

Sincerely yours,

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