

Human Dimensions

Further resources and recommended reading

Ref	Summary
Anibaldi, R., Rundle-Thiele, S., David, P., & Roemer, C. (2021). Theoretical underpinnings in research investigating barriers for implementing environmentally sustainable farming practices: Insights from a systematic literature review. <i>Land</i> , 10(4), 386. https://doi.org/10.3390/land10040386	Progress towards more sustainable agricultural production, the rate of change varies across and within regions and is, overall, too slow. Based on the assumption that theory-informed research can contribute to adoption policy and practice, this review ascertained and described the use of theory in the identification and examination of barriers to adoption in studies included in a recent systematic literature review relevant to the sustainable agriculture space. Results are discussed relative to how theoretical constructs and mechanisms within individual and across studies can assist in explaining why and how adoption of sustainable practices is constrained.
Coggan A, Thorburn P, Fielke S, Hay R & Smart JCR 2021, 'Motivators and barriers to adoption of Improved Land Management Practices. A focus on practice change for water quality improvement in Great Barrier Reef catchments', <i>Marine Pollution Bulletin</i> , vol. 170, p. 112628. https://www.sciencedirect.com/science/article/pii/S0025326X21006627	In this paper we synthesise the literature on how these human dimensions influence decision making for land management practice and highlight where future investment could be focussed.
Coutts, J., Roberts, K., Frost, F., & Coutts, A. (2005). The role of extension in building capacity - what works, and why; A review of extension in Australia in 2001-2003. Rural Industries Research & Development Corporation. https://agrifutures.com.au/product/extension-for-capacity-building/	This report presents the outcomes of the national extension/education review, a project of the Cooperative Venture for Capacity Building for Innovation in Rural Industries (CVCB). The review investigated a range of extension and education projects being funded across industries and issues in rural and regional Australia in order to identify 'what works and why'.
Dean, A., & Schultz, T. (2023). From theory to practice-how insights from psychology can be applied in agricultural extension. <i>Rural Extension and Innovation Systems Journal</i> , 19(1), 22-33. https://search.informit.org/doi/10.3316/informit.238472045379885	It is generally recognised that knowledge of technical issues is not sufficient to drive adoption and that extension programs can benefit from considering psychological factors that shape behaviour. There are many factors that influence adoption, from individual psychological and demographic factors, farm-level, through to broader environmental and institutional context. This paper provides a selective overview of



	psychological factors that can influence adoption.
Eberhard R, Coggan A, Jarvis D, Hamman E, Taylor B, Baresi U, Vella K, Dean AJ, Deane F, Helmstedt K & Mayfield H 2021, 'Understanding the effectiveness of policy instruments to encourage adoption of farming practices to improve water quality for the Great Barrier Reef', <i>Marine Pollution Bulletin</i> , vol. 172, p. 112793,	This paper presents a critical review of policy instruments as implemented in Great Barrier Reef catchments. We catalogue the evolving mix of policy instruments employed in reef programs, and examine evidence of the effectiveness of agricultural extension, financial incentives, and direct regulation of farming practices.
Fielding KS, Terry DJ, Masser BM & Hogg MA 2008b, 'Integrating social identity theory and the theory of planned behaviour to explain decisions to engage in sustainable agricultural practices', <i>British Journal of Social Psychology</i> , vol. 47, no. 1, pp. 23-48, https://doi.org/10.1348/014466607X206792	The present research integrates core aspects of social identity theory with the theory of planned behaviour to investigate factors influencing engagement in sustainable agricultural practices.
Hay, R., Eagle, L., & Saleem, M. A. (2019). Social marketing's role in improving water quality on the Great Barrier Reef. <i>Asia Pacific Journal of Marketing and Logistics</i> , 31(5), 1308–1343. https://doi.org/10.1108/APJML-08-2018-0318	The purpose of this paper is to focus on the implications of claimed detrimental impacts for the agricultural activity of the Great Barrier Reef (GBR) ecosystem health in Queensland, Australia. The authors discuss the complex interaction of factors that have contributed to the decline in reef ecosystems and the challenges presented by multiple industries operating within the GBR catchment area.
Kanakakis, K., Bickle, M., & Erbacher, J. (2024). Understanding the perceptions of producers: A tool for the extension toolbelt. <i>Rural Extension & Innovation Systems Journal</i> , 20(1). "https://www.apen.org.au/static/uploads/files/reis-2024-2001-f6-wfiswekaqiov.pdf	Since mid-2019, surveys have been used to assess the attitudes, group norms, self-efficacy, motivations, and barriers of farmers in the sugar cane, grazing, horticulture, and banana industries across the Great Barrier Reef catchment as a way to understand the individual perceptions that influence practice change. These insights give extension officers a practical tool to tailor their approach to each producer's position on the change continuum, while also helping build their own professional skills in line with the emerging Extension Model of Practice.
Kuehne, G., Llewellyn, R., Pannell, D. J., Wilkinson, R., Dolling, P., Ouzman, J., & Ewing, M. (2017). Predicting farmer uptake of new agricultural practices: A tool for research, extension and policy. <i>Agricultural Systems</i> , 156, 115–125. https://doi.org/10.1016/j.agsy.2017.06.007 KG2	ADOPT is a quantitative tool that predicts the rate and peak level of adoption of new agricultural practices based on user responses to 22 questions about the practice and its potential adopters, with a practice's relative advantage being the key factor. It produces diffusion-curve predictions and sensitivity analyses, while also helping researchers, extension staff and



	policy makers better understand the adoption process.
Montes de Oca Munguia O, Pannell DJ, Llewellyn R & Stahlmann-Brown P 2021, 'Adoption pathway analysis: Representing the dynamics and diversity of adoption for agricultural practices', <i>Agricultural Systems</i>, vol.191, p. 103173. https://doi.org/10.1016/j.agsy.2021.103173	This paper presents "adoption pathways analysis," a survey-based method that represents the uptake of agricultural practices as a dynamic, diverse process—mapping individual farmers' decisions across different stages into proportional flow diagrams rather than treating adoption as a binary choice.
Murray-Prior R, Schultz T, Long P (2024) Question 7.2 What are the behavioural (attitudinal), economic, social and cultural factors that hinder or enable the uptake of management practices that aim to improve water quality outcomes for the Great Barrier Reef? In Waterhouse J, Pineda M-C, Sambrook K (Eds) 2022 Scientific Consensus Statement on land-based impacts on Great Barrier Reef water quality and ecosystem condition. Commonwealth of Australia and Queensland Government. https://reefwgconsensus.com.au/wp-content/uploads/2024/06/2022-SCS-Q7.2_Evidence-Review_Final.pdf	This review found that the factors that influence the uptake of management practices to improve water quality operate at various systems levels. These levels can be described as macro (governance, culture, media, economics, policy and legislation), meso (industry, research and development agencies and community), micro (individuals and relationships to people) and practice or behaviour characteristics. Landholder distrust and suspicion of certain groups including government and scientists involved in Great Barrier Reef research, program delivery organisations, program managers and delivery staff is a key factor hindering uptake of management practices.
Pannell, D. J., Marshall, G. R., Barr, N., Curtis, A., Vanclay, F. & Wilkinson, R. (2006). Understanding and promoting adoption of conservation practices by rural landholders. <i>Australian Journal of Experimental Agriculture</i>, 46, 1407-1424. https://dx.doi.org/10.1071/EA05037.	This review presents the adoption of conservation practices by rural landholders as a dynamic learning process. Its key conclusion is that low adoption of many conservation practices stems from their failure to provide a relative advantage (especially economically) or from difficulties in trailing them, with important implications for research, extension and policy.
Pickering, J., Jenner, A., Haantera, K., Moore, S., Iseppi, C., Markey-Towler, B., & Ruzsicska, N. (2020). Why behavioural science matters in extension. <i>Rural extension and innovation systems journal</i>, 16(1), 24-30. https://www.apen.org.au/static/uploads/files/reis-2020-1601-p1-wfggomrsjdjh.pdf	This paper demonstrates the applicability of behavioural science to agricultural extension and the value of behavioural science training to enhance extension practice, with examples of how behavioural science is applicable to extension.
Reef and Rainforest Research Centre (2021) James, J. (2021) Principles for establishing greater trust between scientists and farmers: A synthesis of NESP Tropical Water Quality Hub research. Report to the National Environmental Science Program. Reef and Rainforest Research Centre Limited, Cairns (63 pp.). https://nesptropical.edu.au/wp-	This report synthesises survey and literature research from the NESP Tropical Water Quality Hub to tackle the trust deficit between farmers and scientists working on Great Barrier Reef water quality, on the premise that farmers won't change practices unless they trust the science and those delivering it. Drawing on themes such as



content/uploads/2022/08/v20220317-Project-6.6-Synthesis-Report.pdf	trust, engagement, participative research, communication and transparency, it offers project leaders practical guidance anchored in the idea that trust is the essential "glue" for successful behaviour-change projects.
Williams, A., James, J., & Prichard, P. 2021. Developing an Extension Model of Practice to guide and empower extension practitioners. Rural Extension and Innovation Systems Journal, 17(1), 10– 20. https://search.informit.org/doi/10.3316/informit.685227536646757	This paper presents an "Extension Model of Practice," a professional framework that integrates the core concepts and tools of extension and conceptualises how professionals engage with and support farmers. The model aims to make extension more effective at driving practice change in agriculture in partnership with farmers, provided it is backed by suitable training and awareness sessions.

