An Institutional Perspective on the Energy, Water and Food Nexus in Australia

by

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A thesis submitted to the University of Technology Sydney in partial fulfilment of the requirements for the degree of Doctor of Philosophy

Faculty of Engineering and Information Technology

July 2019
Certificate of Original Authorship

I, Kristy April Mamaril declare that this thesis, is submitted in fulfilment of the requirements for the award of Doctor of Philosophy, in the School of Information, Systems and Modelling, Faculty of Engineering and Information Technology, at the University of Technology Sydney.

This thesis is wholly my own work unless otherwise reference or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

This document has not been submitted for qualifications at any other academic institution.

This research is supported by the Australian Government Research Training Program.

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Kristy April Mamaril
Date: 11 July 2019
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Abstract

The security of Energy, Water and Food (EWF) – fundamental human needs – has become an emerging concern because of population and economic growth pressures and climate change impacts. Redressing EWF security is however a challenging task, primarily because of the complex web of interlinkages between EWF (the Nexus), and EWF and the wider economy and polity. A pre-requisite therefore for redressing EWF security is an insightful understanding about the nature of the nexus, and the design of efficacious EWF institutional settings that are informed by nexus considerations and are capable of balancing various interests. While considerable effort has been devoted to understanding the physical and economic dimensions of the EWF nexus, much less so on the institutional dimension. Against this backdrop, the main objective of this research is to develop an institutional perspective on EWF nexus in the context of Australia – the country of focus of this research. To achieve this objective, an analytical framework based on (four) Levels of Institutional Analysis has been developed in this research. This framework draws its imprimatur from the basic tenets of Institutional Theory, more specifically New Institutionalism that recognizes the interdependence between institutions and economic outcomes, and is aligned with neo-classical reasoning. This framework is employed in this research particularly to understand the degree to which (formal and informal) institutions in Australia have promoted a culture of ‘cross-sectoral governance’ of EWF – at the national and state levels, and across five distinctive time phases since the beginning of colonial settlement in 1788 to the present. The analysis suggests that although there has been a general awareness about the nexus between EWF, and in a select few cases, evidence of nexus-informed thinking, such awareness and effort has however failed to translate into the emergence of coherent and lasting institutional settings for jointly governing EWF. Consequently, EWF governance in Australia remains essentially siloed – driven by narrow, sector-specific considerations, economic imperatives and political expediency. Further, such siloedness is pervasive, transcending the political divide, institutional levels and federal-state jurisdictional contrasts. This research has also delineated the broad contours of a nexus-informed institutional and governance landscape for EWF, and made some practicable suggestions to transition towards long-term nexus-based governance to better redress EWF security challenge. Besides establishing the centrality of nexus considerations in the context of EWF security, this research should also serve as a sound platform for engendering public policy debate on other contexts typified by multiple interlinkages.
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<tbody>
<tr>
<td>ABS</td>
<td>Australian Bureau of Statistics</td>
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<tr>
<td>ACCC</td>
<td>Australian Competition and Consumer Commission</td>
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<td>ACT</td>
<td>Australian Capital Territory</td>
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<td>AEMC</td>
<td>Australian Energy Market Commission</td>
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<td>AEMO</td>
<td>Australian Energy Market Operator</td>
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<td>AER</td>
<td>Australian Energy Regulator</td>
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<td>ALP</td>
<td>Australian Labor Party</td>
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<td>ANZEC</td>
<td>Australian and New Zealand Environment Council</td>
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<td>ARMCanZ</td>
<td>Agriculture and Resource Management Council of Australia and New Zealand</td>
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<td>AWA</td>
<td>Australian Water Association</td>
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<tr>
<td>AWC</td>
<td>Australian Water Council</td>
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<td>AWRC</td>
<td>Australian Water Resources Council</td>
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<tr>
<td>BOM</td>
<td>Bureau of Meteorology</td>
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<td>CFI</td>
<td>Carbon Farming Initiative</td>
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<td>CLP</td>
<td>Country Liberal Party</td>
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<td>COAG</td>
<td>Council of Australian Governments</td>
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<td>COM</td>
<td>Commonwealth</td>
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<td>CON</td>
<td>Conservative Party</td>
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<td>COU</td>
<td>Country Party</td>
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<td>CPI</td>
<td>Consumer Price Index</td>
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<tr>
<td>CPNP</td>
<td>Country and Progressive National Party</td>
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<tr>
<td>DEE</td>
<td>Department of Environment and Energy</td>
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<td>DIRD</td>
<td>Department of Infrastructure and Regional Development</td>
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<td>Electoral Reform League</td>
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<td>EWF</td>
<td>Energy, water and food</td>
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<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organisation</td>
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<td>General Agreement on Tariffs and Trade</td>
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<td>Gigalitres</td>
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<td>GWh</td>
<td>Gigawatt hour</td>
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<td>NFWS</td>
<td>National Food Waste Strategy</td>
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<td>NRMMC</td>
<td>Natural Resource Management Ministerial Council</td>
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<td>NSESAD</td>
<td>National Strategy for Ecologically Sustainable Development</td>
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<tr>
<td>NSW</td>
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<td>NWQMS</td>
<td>National Water Quality Management Strategy</td>
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<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<td>Prime Minister’s Science Engineering and Innovation Council</td>
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<td>Statutory Marketing Authority</td>
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<td>SUP</td>
<td>Support from parliamentary factions and independents</td>
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