

Middleton, C.; Allouche, J.; Gyawali, D. and Allen, S. 2015.
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in Southeast Asia through an environmental justice lens.
Water Alternatives 8(1): 627-654



The Rise and Implications of the Water-Energy-Food Nexus in Southeast Asia through an Environmental Justice Lens

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ABSTRACT: This article maps the rise of the water-energy-food 'nexus' as a research, policy and project agenda in mainland Southeast Asia. We argue that introducing the concept of environmental justice into the nexus, especially where narratives, trade-offs and outcomes are contested, could make better use of how the nexus is framed, understood and acted upon. With funding from high-income country donors, it is found to have diffused from a global policy arena into a regional one that includes international and regional organisations, academic networks, and civil society, and national politicians and government officials. The nexus is yet to be extensively grounded, however, into national policies and practices, and broad-based local demand for nexus-framed policies is currently limited. The article contends that if the nexus is to support stated aspirations for sustainable development and poverty reduction, then it should engage more directly in identifying winners and losers in natural resource decision-making, the politics involved, and ultimately with the issue of justice. In order to do so, it links the nexus to the concept of environmental justice via boundary concepts, namely: sustainable development; the green economy; scarcity and addressing of trade-offs; and governance at, and across, the local, national and transnational scale.

KEYWORDS: Nexus, environmental justice, sustainable development, water-energy-food, Southeast Asia

INTRODUCTION

Originating in response to the 2008 global food and economic crisis, the water-energy-food nexus ('the nexus') has been promoted as an emerging global development paradigm and research agenda (Allouche et al., this issue). There are divergent framings of the nexus between its various proponents (Bizikova et al., 2013). However, the dominant approach is through socioecological systems thinking that seeks to understand trade-offs and synergies, increase efficiency and improve governance between food, water and energy systems (Hoff, 2011; Davis, 2014). While much more prominent in

international-level policy discussion, in mainland Southeast Asia¹ a range of international organisations and civil society, academics and high-income country donors, working with the region's governments and politicians, are translating and diffusing the nexus concept through their research, programming and policy recommendations.

In Southeast Asia, economic, social and political trends such as liberalisation, regionalisation and globalisation, urbanisation, agrarian transformation and industrialisation, and changing aspirations in terms of work, leisure, and consumption all contribute to create a dynamic region in the throes of rapid change (Lebel et al., 2014; Middleton and Krawanchid, 2014). Behind these trends, new – and contested – visions are being imagined for the future of the region's water, land and forest resources, energy systems, urban and rural areas, and for the people of the region itself (Nevins and Peluso, 2008; Rigg, 2012). In this context, access to, and sustainable use of, food, water and energy resources, which are institutionally fragmented domestically and across borders (Middleton and Dore, in press), is often framed to be within a complex trade-off relationship (Kirby et al., 2010). Inequality is high in the region, and in most countries widening (ADB, 2012a), and access to, exclusion from and contestation over natural resources constitute a key political issue – especially for the region's poor and marginalised (Lebel et al., 2009; Hall et al., 2011). Major decisions around food, water and energy are highly political, and take place within arenas of unequal power relations that often lack democratic equalisers such as transparency and public participation.

Some have proposed to meet these challenges in Southeast Asia through a nexus approach since 2011. A variety of initiatives have emerged, including those led by the Asian Development Bank (ADB) geared towards shaping its investment agenda (ADB, 2012b), by regional research and policy platforms such as the Challenge Program on Water and Food – Mekong (CPWF-Mekong, 2013), and by intergovernmental organisations such as the Mekong River Commission (Bach et al., 2012). On the ground, some researchers have also taken the nexus as a heuristic framework by which to force thinking on the relationship between food, energy and water trade-offs and operationalise the nexus in participatory planning and decision-making processes (Krittasudthacheewa et al., 2012; Smajgl and Ward, 2013). Despite these activities, the region's social movements and local and national civil society have yet to seriously discuss or adopt the nexus concept as framed in global and regional policy circles. It might be said, though, that to many rural farmers, fishers, and community groups, food, water and energy resources had not been conceptually separated in the first place compared to the fragmentation that has occurred in the world of experts and their disciplinary approach to knowledge.²

Unjust exclusion from access to natural resources due to development processes and projects, particularly of socio-economically and politically marginalised groups, has been raised as an issue of 'environmental injustice' both globally and in Southeast Asia (Sneddon and Fox, 2008; Lazarus et al., 2011; Middleton, 2012; Walker, 2012). Academics, social activists and even some governments have conceived of, framed and theorised environmental justice from plural normative and analytical perspectives. A shared concern, however, is an emphasis on social difference and how groups of people, differentiated for example by race, gender, or class, experience the environment differently (Robbins, 2012: 74). From the perspective of environmental justice, modes of (in)justice are: *distributive justice*, namely who wins and who loses in suffering environmental bads (harms and risks) and benefiting from environmental goods; *procedural justice* conceived in terms of the ways in which decisions are made, who is involved, and who has influence;³ and *justice as recognition* meaning who is

¹ In this paper, Southeast Asia refers to mainland Southeast Asia, namely: Cambodia, Lao PDR, Myanmar, Thailand and Vietnam

² The authors thank Dr. Edsel Sajor who shared this insight at the Third Mekong Forum on Water, Food and Energy, November 19-21, 2013, Ha Noi, Vietnam.

³ It includes access to information, participation in decision-making, and access to justice systems.

and is not valued, and that incorporates social and cultural (lack of) recognition, including politics of knowledge (Walker, 2012: 10). The presence or absence of these modes and processes of (in)justice serve to reinforce or undermine each other (Schlosberg, 2004).

In recent years, claims for justice have emerged related to individual components of the nexus, but not towards the nexus itself. These claims often draw on rights-based frameworks given that water, food, and energy, are fundamental to meeting human needs. Food justice, also linked to access to land and related natural resources, is advocated for within a range of social movements such as Via Campesina, as well as more institutionalised processes such as the UN's Special Rapporteur on the Right to Food. Various food justice concepts have emerged, for example Food Sovereignty and Land Sovereignty (Patel, 2009; Borras et al., 2011; Borras and Franco, 2012a; Agarwal, 2014). Regarding water, there have been equivalent movements, including against water grabbing, and in pursuit of the Right to Water (Mehta et al., 2012; Sultana and Loftus, 2012; Franco et al., 2014). Meanwhile, questions have also been raised regarding the production and distribution of energy. Hildyard et al. (2012) highlight that attaining national energy security is typically interpreted as energy to ensure economic growth, which is not necessarily equivalent to 'energy for all' (see also Pasqualetti and Sovacool, 2012).

This paper argues that if the nexus approach is to support its commonly stated aspirations for sustainable development and poverty reduction, then it should engage more directly in identifying winners and losers in 'nexus' natural resource decision-making, the inevitable politics involved, and ultimately with the issue of justice. To date, nexus framings that adopt a systems perspective, whilst broadly calling for 'good governance', are yet to seriously meet this challenge (Lele, et al., 2013; Allouche et al., 2014; Foran, this issue). This paper relates current conceptualisations and framings of the nexus to environmental justice via boundary concepts (Mollinga, 2010; 2013), namely: sustainable development; the green economy; scarcity and addressing trade-offs; and governance at and across the local, national and transnational scale. The paper grounds the linkages between the nexus and environmental justice through mapping the rise of the nexus in Southeast Asia and its framings, and by drawing upon examples from the region.

In the next section, we introduce the concept of the nexus as a nirvana concept and narrative. We then discuss the rise of the nexus in Southeast Asia since 2011 by mapping the four types of actors involved in promoting the nexus (investment-led organisations; sustainable development-led organisations and research institutes; conservation-led organisations; and donors) and the key events and reports that have shaped the emerging nexus framing. The section argues that the nexus started as a concept amongst international actors, but through the construction of epistemic networks and aid-linked activities, is now increasingly embedded in the region's policy narrative, but not yet extensively in national policy. The subsequent section, followed by the conclusion, explores the potential value of approaching the nexus through an environmental justice lens via boundary concepts shared by the nexus and environmental justice.

FRAMING THE NEXUS: A NIRVANA CONCEPT, A FRAME AND A NARRATIVE

The idea of the nexus has traits of 'nirvana concept',⁴ analogous to the idea of Integrated Water Resources Management (IWRM) analysed by Molle (2008). Elements of the nexus concept as an ideal include aspirations for understanding and managing scarcity, synergies and trade-offs; increasing efficiency; bridging across fragmented food, water and energy policy and institutions; improving governance; and ultimately ensuring that development is sustainable. Whilst each of these concepts is broadly appealing, as Molle (2008: 131) states: "[i]deas are never neutral and reflect the particular

⁴ Molle (2008: 132) defines a 'nirvana concept' as those that "embody an ideal image of what the world should tend to. They represent a vision of a 'horizon' that individuals and societies should strive to reach".

societal settings in which they emerge, the worldviews and interests of those who have the power to set the terms of the debate, to legitimate particular options and discard others, and to include or exclude particular social groups".

Leach et al. (2010: 43-52) and others (see, for example, Molle, 2008; Walker, 2012: 4-5) highlight that there are many different ways of explaining a socio-technical-environment system with equally rational ways of understanding. This, in turn, can lead to different narratives of explanation between actors of the same system.⁵ Narratives are causal and explanatory beliefs (Molle, 2008) produced by actors that frame systems in particular ways towards attaining particular goals. The construction of frames involves subjective (normative) judgements and choice of elements. Thus, framing recognises that any system is subject to multiple forms of interpretation by a range of actors dependent upon how scale, boundaries, key elements, dynamics, and outcomes are labelled and categorised, and how assumptions are made based on varying degrees of subjective/value judgements. Molle (2008) shows how the ideational power of nirvana concepts underpins the construction and framing of narratives.

Thus the nexus, and the particularities of how it is defined, can be understood as a framed narrative (or a discourse – see Dryzek, 2005, and Dore et al., 2012), as, of course, is 'environmental justice'. This is not to say that socio-technical-environmental systems cannot be studied and mapped – hence an argument for 'soft constructivism' (see Robbins, 2012: 128-130). Recognition of the nexused relationship between food, water and energy has the potential to add significant value towards resource-management policy and practice. The point is that there is a need to acknowledge the existence and legitimacy of a range of narratives and frames in pursuing a nexus approach; in other words, the nexus is a political process, not just a technical one.

THE RISE OF THE NEXUS IN SOUTHEAST ASIA

In this section, we identify the key actors promoting the nexus in mainland Southeast Asia and how the nexus has been framed. In doing so, we map out how the nexus concept has been promoted and diffused across the region, and evaluate the extent to which it has become embedded to date.

Preceding the arrival of the nexus, there have been various 'nexused notions' calling for the integration of water and related natural resources sectors. Most high profile, of course, is Integrated Water Resources Management (IWRM), which although argued to be different from the nexus still shares some goals including integration across water-related sectors, strengthening governance, and improving public participation (see Benson et al., this issue). Lessons from IWRM in Southeast Asia show us, however, that whilst there has been progress in creating institutions, policy and regulations on paper, critical challenges remain (Molle, 2007; GWP, 2011). Domestically, these include that "uncontrolled developments of catchments and river basin, water pollution and flood risks are common threats" and there is a "...lack of co-ordination among water-related agencies and institutional technical capacity to implement IWRM..." (GWP, 2011: 56). Reflecting on intergovernmental attempts to implement an IWRM Basin Development Plan through the Mekong River Commission for the lower Mekong Basin, Hansson et al. (2012) argue that greater attention must be paid to power asymmetries and politics in regional water politics if transboundary water management is to be sustainable and inclusive (see also Cooper, 2012).

In Southeast Asia, there has been a growing momentum of meetings and reports around the nexus, and thus the concept itself has grown in prominence since 2011. Dore et al. (2012: 26) observe that it is within the nexus discourse that "many actors see a logical, sectoral entry point for themselves in

⁵ According to Leach et al. (2010: xiii), framing is "the different ways of understanding or representing a social, technological or natural *system* and its relevant *environment*. Among other aspects, this includes the ways system elements are bounded, characterized and prioritized, and meanings and *normative* values attached to each" [emphasis in original].

compelling new, multi-sector, interdisciplinary and transboundary deliberations". Surveying the array of major reports written, and conferences and dialogues hosted with a focus on mainland Southeast Asia (see Appendix A), three broad types of organisations that have led to promoting the nexus can be distinguished, as reflected in the organisation's mission statements:

- *Investment/Lending organisations*: Asian Development Bank (ADB); World Bank.
- *Sustainable development organisations and research institutes*: Mekong River Commission (MRC), the CGIAR Challenge Program on Water and Food-Mekong (CPWF-Mekong), the Stockholm International Water Institute (SIWI), United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP), United Nations Environment Programme (UNEP), International Water Association (IWA), International Water Management Institute (IWMI), the Stimson Centre, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), and the Stockholm Environment Institute (SEI).
- *Conservation organisations*: International Union for the Conservation of Nature (IUCN); and the Worldwide Fund for Nature (WWF).

Major donors funding the above organisations are predominantly high-income country governments with interests in Southeast Asia. These include the governments of Australia, Finland, Denmark, Germany, Sweden, the United Kingdom, and the United States. Other donors include 'investment organisations', namely the Asian Development Bank and the World Bank, although these actors also principally receive support from high-income country governments. Global shifts in aid funding towards the nexus reflect the agenda promoted through and beyond the Rio+20 conference and the World Economic Forum (Allouche et al., this issue), as well as in the context of the need to respond to climate change.

Organisations promoting the nexus and their donors have commissioned research, supported networks of government policy makers, academics and civil society, and organised conferences in promoting and deliberating the nexus. The first major conference on the nexus in Southeast Asia was the 1st Mekong Forum on Water, Food and Energy, held in Phnom Penh, Cambodia in December 2011 and organised by the CGIAR Challenge Program on Water and Food-Mekong (CPWF-Mekong) with funding from Australia Aid. Two subsequent conferences organised by CPWF were held in Hanoi in November 2012 and December 2013. These conferences, which have grown in size and scope, were convened as multi-stakeholder dialogues utilising the nexus as a framing concept. One intention of the nexus frame was to draw senior officials from an array of government agencies responsible for water, food, energy and the wider economy. The research of CPWF-Mekong, implemented for two phases between 2004 and 2014, was also presented at these conferences. CPWF-Mekong is linked to a global CPWF project across six transboundary river basins, and has incorporated the nexus into its research programme and activities as the nexus framing has gained momentum globally.⁶

The CPWF-Mekong program,⁷ together with another research network called the Mekong Program on Water, Environment and Resilience (M-POWER),⁸ have built a research-driven epistemic network⁹ around water governance in the region that has increasingly researched and deliberated the nexus at

⁶ <http://wle-mekong.cgiar.org/about/our-focus/> (accessed on 9 January 2015)

⁷ The CPWF-Mekong channelled funds into 32 major research projects in mainland Southeast Asia between 2004 and 2014. See <http://wle-mekong.cgiar.org/> (accessed on 9 January 2015)

⁸ CPWF's successor, the CGIAR Research Program on Water, Land and Ecosystems, adopts the nexus-type relationships as one organising principle for its programme. www.mpowernetwork.org/ (accessed on 9 January 2015)

⁹ Haas (1990: xviii) defines an epistemic community as: "knowledge-based groups of experts and specialists who share common beliefs about cause-and-effect relationships in the world and some political values concerning the ends to which policies should be addressed".

their conferences and other convened dialogues (Dore et al., 2012; Dore, 2014). These networks are formed of international organisations, regional and international researchers and civil society, regional governments, and mainly high-income country donors. Thus, the nexus concept has also spread into other conferences and policy forums that draw upon active members of these networks. Many research projects to date, however, may be better characterised as multi-disciplinary and cross-sectoral but considering particular nexused relationships, rather than specifically engaging the nexus as taken 'off-the-shelf' of global policy; for example, Orr et al. (2012) explore the trade-off between lost fish protein production and plans for construction of mainstream dams on the Mekong River.

Governments have also broadly engaged with the nexus, the most prominent being via the Mekong River Commission (MRC), an intergovernmental transboundary river basin organisation for the Mekong Basin that also draws its funding principally from high-income country donors. In May 2012, the MRC hosted the 'Mekong2Rio' International Conference on Transboundary River Basin Management that convened experts from fourteen major transboundary river basins and sixteen related international organisations to reflect on the nexus-approach (Bach et al., 2012). By hosting the conference, the MRC also placed the Mekong basin as a key focal object in the discussion of nexused transboundary river management globally. The Mekong2Rio conference's conclusions fed into the global Rio+20 process in June 2012 (Bach et al., 2012: 60-61). Subsequently, in April 2014, another major nexus-framed international conference was hosted by the MRC (Bach et al., 2014),¹⁰ from which a nexus-framed message was delivered in person to the region's highest-level political leaders who attended the accompanying Second MRC Summit: "In order to collectively benefit from the opportunities [of the nexus perspective], transboundary agreements and institutions develop and need to adapt to changing environments. For these to work effectively, a combination of political will, technical cooperation and an inclusive process is required".

This demonstrates a significant shift in framing from the message delivered to the region's political leaders at the first MRC Summit held four years earlier, which was framed around the implementation of transboundary IWRM (MRC 2010a).¹¹ From an environmental justice perspective, given the particularities of the region, namely the 'ASEAN Way' that emphasises the principle of non-interference in the affairs of other countries (Acharya, 2009), emphasis in the MRC's framing of the nexus is placed on 'balanced' development, managerial-type decision-making, and with reference to principles of international water law (Hirsch and Jensen, 2006; Rieu-Clarke, 2015).

On a different tack, the ADB – an investment organisation – also promoted the nexus through a major conference in Bangkok in February 2012 under its Greater Mekong Subregion (GMS)¹² programme, a programme which is principally geared towards accelerating regional economic integration through infrastructural investment, institutional reform and capacity building (ADB, 2012a). At the conference, experts presented on the nexus principally to senior government officials,

¹⁰ The International Conference on Cooperation for Water, Energy and Food Security Under Climate Change in the Mekong Basin, 2-3 April, 2014, Ho Chi Minh City,

¹¹ Although the nexus as a formal concept itself was absent from the agenda (given it was yet to be 'invented' in the context of sustainability at Bonn 2011), notions of a nexus were hinted at. For example, the conference summary notes "Water is life, and our increasing demands for food and energy depends on our ability to work together to develop and manage this precious resource, while protecting the unique environment of our river basins upon which millions of people and other living creatures depends for their daily living" (MRC, 2010).

¹² The GMS programme was initiated by the ADB in 1992 and geographically encompasses Cambodia, Lao PDR, Myanmar, Thailand and Vietnam, and Yunnan Province and Guangxi Zhuang Autonomous Region of the People's Republic of China. It is principally a subregional economic cooperation that has grown to incorporate multi-country projects in the following sectors: transport, energy, telecommunications, environment, human resource development, tourism, trade, private sector investment, and agriculture.

representatives from the private sector, donors and select civil society. The conference provided input to the GMS programme, with the conference proceeding preface stating:

The progress [of the GMS programme] is reflected in terms of improvements in infrastructure connectivity, promotion of trade and investment, stimulation of economic growth, and reduction of poverty. However, such progress has not been without some adverse impacts on the environment.... Many presentations ... focused on deepening the awareness and understanding of the nexus as a basis for transition to climate-resilient and green economic pathways of development.... ADB is committed to play its part in assisting countries in the subregion to achieve this goal by mobilising additional financial resources and developing new knowledge products (ADB, 2012a: iii).

The ADB's approach to the nexus, working principally with the region's governments, thus reflects an approach to define its investment strategy with the conference outcomes framed in terms of promoting economic growth and a green economy, rather than giving explicit consideration to justice in decision-making beyond generic approaches embodied in calls for good governance. The ADB has launched several additional major reports on water and the nexus, most notably *Thinking about Water Differently: Managing the Water-Food-Energy Nexus* (ADB, 2013a). This report, whilst wide-ranging, emphasises how economic water scarcity in Cambodia, Laos, Vietnam and Myanmar could be addressed through "improving supply side infrastructure", whilst also addressing demand-side factors (including through water pricing), strengthening governance, and building new institutions (ADB, 2013a: vi-vii), thus again explicitly linking the nexus to the ADB's investment strategy.

Overall, only a limited number of international NGOs and policy think tanks have been drawn to the nexus in the region to date. The Stimson Institute, in their report *Mekong Turning Point: Shared River for a Shared Future*, frame their subsequent analysis on the risks posed by plans for mainstream dams on the Mekong River with the opening sentence: "In no part of the world does the increasingly critical nexus of water, food, and energy have more immediate relevance than the Mekong River, a transboundary resource shared by China and five Southeast Asian countries" (Cronin and Hamlin, 2012: 1).

Another example is the WWF's Mekong Nexus Project initiated late in 2014 designed to "research key links, conflicts and positive synergies between conservation of biodiversity, responses to climate change, and supply of energy, food and water" (WWF, 2014). On the other hand, national and local civil society groups have rarely explicitly utilised the nexus as a framing for their work to date. Despite this, implicit to many campaigns are nexus-type trade-offs, as has been demonstrated in heated debates around the revived plans for Mekong mainstream dams (Grumbine et al., 2012; Matthews, 2012; WWF, 2012). Indeed, it is in these debates that claims for justice are most commonly heard (Middleton, 2012; Rieu-Clarke, 2015).

Finally, a number of global-level nexus initiatives have also sought to gather experience from Southeast Asia to both promote the nexus in Southeast Asia and project the region back into global policy arenas. In addition to the CPWF program and Mekong2Rio conferences mentioned above, most notable has been the International Water Association (IWA)-IUCN Nexus Dialogue on Water Infrastructure Solutions that held three 'regional dialogues' including in Bangkok in March 2014 and subsequently a global synthesis meeting in Beijing in November 2014 (GWP-China et al., 2014). Unlikely bedfellows, the IWA in its framing of the dialogue emphasised how the nexus "has led to new demands for water infrastructure and technology solutions"¹³ whilst IUCN has sought a framing emphasising 'natural infrastructure' (see Krchnak et al., 2011).

¹³ www.iwawaterwiki.org/xwiki/bin/view/Articles/NexusDialogueonWaterInfrastructureSolutions-BuildingPartnershipsforInnovationinWaterEnergyandFoodSecurity (accessed on 9 January 2015).

The number of high-profile nexus meetings involving senior political leaders and civil servants would suggest an increasing embeddedness of the nexus in political discourse towards natural resources. However, this comes with provisos, as several recent high-profile political meetings did not highlight the nexus. For example, at the Second Asia Pacific Water Summit held in Chiang Mai, Thailand in May 2013, whilst a session on the nexus was convened (Waldorf, 2013), the Chiang Mai Declaration adopted by the leaders was framed by IWRM rather than the nexus, even as it referred to the green economy and 'the Future We Want' Rio+20 declaration.¹⁴

Several initiatives in Southeast Asia have sought to operationalise the nexus through their field-based work. An innovative research project titled Exploring Mekong Region Futures led by the Commonwealth Scientific and Industrial Research Organization (CSIRO) (2009-2013) used the nexus as a heuristic tool in a regional Delphi assessment, together with five local case studies¹⁵ to explore a range of development scenarios and alternative futures (Smajgl and Ward, 2013; Foran, this issue).¹⁶ For example, the Northeast Thailand Futures study led by the Stockholm Environment Institute (SEI) worked with farmers, local government, academics and others to explore a range of scenarios related to rice, sugarcane, cassava, and rubber production in the context of rising demands for energy (including biofuels) and food in the Huai Sai Bat (HSB) sub-basin of the Chi River (Krittasudthacheewa et al., 2012). The learning-orientated research design and involvement of Thailand's National Economic and Social Development Board facilitated the inclusion of a form of nexus-concept into the 11th five-year National Economic and Social Development Plan for Northeast Thailand.

In a different application, in 2012 the ADB commissioned the consultancy firm International Center for Environmental Management Asia (ICEM Asia) to undertake a Strategic Environmental Assessment (SEA) of Southeast Asia's energy sector. ICEM Asia, in designing the SEA, selected to adopt a nexus-type approach, whereby the study assessed the impact of different energy scenarios according to impacts on a range of securities, including ecological, food, climate, social, economic and energy securities (ICEM Asia, 2013). Thus, the report findings promoted consideration of 'nexused' policy objectives in energy planning. Yet, despite in principle guided by representatives of the region's governments under the Regional Power Trade Coordination Committee convened under the GMS programme, there is little evidence that the SEA has significantly shaped a nexus approach to national-level energy policy and planning to date (Middleton and Dore, in press).

Alongside the conceptual objects of nirvana concept and narrative outlined above, Molle (2008) also proposes a third conceptual object of 'model'. Models, Molle (2008: 138) states, are "based on particular instances of policy reforms or development interventions which ostensibly embody a dimension of 'success' and qualify as 'success stories'". Whilst the nexus concept is itself quite young, particularly to Southeast Asia, some *tentative* models have emerged from the region back into the global nexus discourse. For example, several hydropower projects whose planning, construction and operation predate the arrival of 'the nexus' were partially reframed as nexus projects at the Bonn 2011 Conference. Both located in Lao PDR, these were the Nam Theun 2 (EDF Group, Thailand et al., 2012) and Theun Hinboun projects in Lao PDR (Ministry of Energy and Mines (Laos) et al., 2012). The claims of both dams of being sustainable model projects that adequately integrated project operation with other food, water and livelihood concerns have been contested (FIVAS, 2007; Lawrence, 2009).

On the other hand, there are also nexus-based problem definitions that arguably become the precursor to defining a nexus-based development intervention to thus remedy it (see Escobar, 1995: 21-54). For example, in the recent major UN World Water Development Report, titled *Water and*

¹⁴ <http://apws2013.files.wordpress.com/2013/05/chiang-mai-declaration.pdf> (accessed on 9 January 2015)

¹⁵ Rubber Futures in Yunnan, China; Water options in Lao PDR; Future farming in Northeast Thailand; Impact of development on Tonle Sap; and Sea-level rise and future livelihoods in Vietnam's Mekong Delta.

¹⁶ www.csiro.au/Organisation-Structure/Divisions/Ecosystem-Sciences/Mekong-Futures.aspx (accessed on 9 January 2015)

Energy, the Mekong Basin is identified as a "notable example" of how "[d]amming rivers to produce energy can have adverse impacts on important inland fisheries by changing water flow rates and timing, fragmenting habitat and disrupting fish migration routes" (UNESCO, 2014: 55-56; see also Flammini et al., 2014: 84-88).¹⁷

In summary, there is some indication of the spreading and embedding of the nexus in the region ranging from the presentation of the concept to the region's top political leadership at various policy forums, to the involvement of government, regional academics and others in dialogue meetings and conferences, to the growing volume of academic and policy-orientated research. On the other hand, tangible impact in terms of policy, especially reforming institutions and implementing nexus-type plans and regulations is less apparent. National water policy, on paper at least, is still IWRM-focused, and it remains to be seen whether the nexus will replace, displace or complement it as a new nirvana concept and narrative towards water management.

Diffusion of the nexus: From top to bottom

The nexus to date has emerged as a concept spread principally within regional-scaled policy circles. Many of the most influential nexus-proponent international organisations also have global nexus programmes (e.g. UN agencies, IWA, IUCN, SEI...), and therefore the projection of the nexus into Southeast Asia also reflects the regionalisation of a global policy discourse. It is, in other words, a process of international policy diffusion¹⁸ of which three mechanisms are in evidence (Dobbin et al., 2007), namely: social construction; coercion; and learning.

Social construction processes link policy diffusion to epistemic networks and international organisations and argue that ideas (and rhetoric) propagated through these networks provide the motivation for the willing uptake of policy.¹⁹ Clearly, nexus-related knowledge has been produced in the region through a widening epistemic network that incorporates international organisations, regional governments, regional and international academics and civil society, high-income country donors, and various private-sector actors, bound (loosely) together through programmes such as those of CPWF-Mekong and M-POWER. These epistemic networks are diffusing and using the idea of the nexus through building shared research agendas and organising conferences, multi-stakeholder dialogues, and high-level policy meetings. In contrast, coercion-based policy diffusion occurs under conditions of unequal power relations, including control of resources such as aid grants and loans. That many nexus-related activities have been funded through the international aid of high-income country governments hint at a measure of soft coercion, according to this definition; on the other hand, in contrast to more clearly coercive policies such as past Structural Adjustment Loans, nexus-orientated projects are also driven by demand within the region amongst those organisations and individuals active upon it, including to fund research, inform policy, and influence practice on the ground. Finally, learning-based processes (similar to social construction processes) find that policy diffusion is driven by the sharing of

¹⁷ In another example, in the Red River basin, FAO (2014: 2) write: "As water becomes scarce, and competition is growing between the energy and agricultural sectors, there is still a lack of reliable and policy-relevant data and information to guide water allocation choices. Effective cross-sectoral consultation mechanisms are needed to ensure the development of concerted efforts to address this problem, and to make sure that decisions on water release and allocation are taken as part of an integrated, long-term and multi-sectoral strategy".

¹⁸ (International) diffusion theorists propose that policy adoption is shaped by the choices of others, rather than domestic conditions alone (Dobbin et al., 2007). Given that the nexus has formed principally from a global agenda around the Rio+20 conference and is now increasingly promoted in developed and developing countries, the mechanisms of international policy diffusion offer insight into the spread of the concept.

¹⁹ Dobbins et al. (2007: 452) identify three approaches that could result in social acceptance of a policy: "(a) leading countries serve as exemplars (follow-the-leader); (b) expert groups theorise the effects of a new policy, and thereby give policy makers rationales for adopting it; or (c) specialists make contingent arguments about a policy's appropriateness, defining it as right under certain circumstances".

ideas, but emphasise how policy actors make reasoned observation and rationalisation based on their own experience and the experience of others. In this sense, the CSIRO Exploring Mekong Region Futures project demonstrates these traits, including in the local-level participatory action research case studies that adopted an actor learning perspective, in the process creating the Challenge-and-Reconstruct Learning (ChaRL) framework (Foran et al., 2013; Smajgl and Ward, 2013).

From the knowledge produced and deliberations held on the nexus to date, it is also apparent that much of the focus has been on understanding the interaction between food, water and energy systems, and how to shift towards sustainability through managing scarcity with efficiency measures; articulating trade-offs to inform them; and ensuring economic growth in the form of a green economy. Governance of the nexus, whilst part of the nexus parlance (for example, the need for public participation), has yet to be seriously problematised and integrated, in particular in the context of the institutions, politics and history of Southeast Asia (Foran, this issue). Furthermore, nexus trade-offs are rarely conceptualised in terms of justice either in the region or globally.

A nexus between the nexus and environmental justice?

That food, water, energy and climate are in a nexus relationship is increasingly recognised amongst various experts. As demonstrated above, however, globally and as diffused into Southeast Asia, a plurality of nexus framings exist (Bizikova et al., 2013). The nexus and environmental justice share a number of boundary concepts (Mollinga, 2010; 2013), including sustainable development; the green economy; scarcity and addressing trade-offs; and governance at, and across, the local, national and transnational scale.²⁰

In this section, for each boundary concept, an analysis is made of its relationship with the nexus and environmental justice. The purpose is to draw potential linkages and identify tensions or disjunctures between the nexus and environmental justice via the boundary concepts. The discussion is contextualised through case studies from Southeast Asia.

Sustainable development

The concept of sustainability has come a long way since the groundbreaking report by Brundtland (1987) defined it along the lines of needs and limitations, accounting for present and future generations, prioritising those in poverty, and seeing the earth as a system geographically and temporally that is amendable to systems thinking. Since the Rio Earth Summit in 1992, this famously amorphous idea has continued to be critiqued and furthered (Carter, 2007: 207-239), for example through the concept of dynamic sustainability (Leach et al., 2010).

As the Dublin Principles that informed IWRM were an input to the Rio Earth Summit, so the nexus (and the associated green economy) framed at Bonn 2011 were an input into Rio+20. Hoff (2011: 5), in the background document to Bonn 2011, considers that the nexus can facilitate a sustainability transition through increasing resource use efficiency; generating knowledge that informs trade-offs and identifies synergies across sectors; investing to sustain ecosystem services; and accelerating access and integrating the poorest. Most nexus literature in Southeast Asia (and globally) clearly states sustainability as a goal, often left broadly or undefined, whilst also claiming that the region's development is unsustainable at present and in need of redirection.

Given that the MRC was host to the Mekong2Rio international conference in May 2012, Southeast Asia played a high-profile role to bring a transboundary river perspective about the nexus into discussions about sustainability. The follow-up MRC nexus international conference in April 2014

²⁰ This list is derived from an assessment of the key elements of the nexus by Bizikova et al. (2013) and the themes of the 'Nexus 2015: Water, Food, Energy and Climate Conference' (<http://nexus.unc.edu/>).

sought to link the nexus for transboundary rivers to the Sustainable Development Goals that emerged from Rio+20. Both conferences emphasised transboundary river nexus management, the key role of states, and the value of incorporating transboundary cooperation within these global policy frameworks. Meanwhile, the ADB's approach to sustainability through the nexus in Asia includes developing new economic modelling tools, investment in supply-side infrastructure, and reforming water governance institutions (2013: vi-ix). Whilst both approaches talk about multi-stakeholder approaches, emphasis is on the role of the government in nexus management and planning including bridging between fragmented water, food and energy government institutions.

There is a large body of literature linking sustainable development to environmental justice (Agyeman et al., 2003a; Beder, 2006; Okereke, 2008; Clapp and Dauvergne, 2011). Haughton (1999: 64, cited in Agyeman et al., 2002), observes that finding the common ground between environmental justice and sustainability requires "acknowledging the interdependency of social justice, economic well-being and environmental stewardship. The social dimension is critical since the unjust society is unlikely to be sustainable in environmental or economic terms".

Many concepts of environmental justice readily link to those of sustainable development, and thus could also contribute insight to the nexus. Recognising the temporal consideration of sustainable development, the community of justice is often understood to include the rights of future generations (Walker, 2012: 10). Meanwhile, regarding meeting needs that also prioritise poverty, the crux of environmental justice often focuses on the environmental burden and lack of access to decision-making of economically, socially and politically marginalised communities.

The concept of procedural justice, a central tenet of environmental justice, is embodied in Principle 10 of the Rio Declaration – a foundational document both of sustainable development and international environmental law. Principle 10 emphasises participation, access to information, and access to justice systems for redress and remedy. Procedural justice is intended to ensure that state institutions and laws and policies are fair and inclusive. In Southeast Asia, whilst policies and laws on water governance and social and environmental protections may be broadly improving (Robert et al., 2006), challenges include incoherent or incomplete legal frameworks, a wide gap between legal frameworks and implementation in practice, and limited capacities of the state and of civil society (Dao, 2010; Foran et al., 2010; TEI, 2011; Grumbine et al., 2012). For example, ADB (2010) note that Thailand and Vietnam have the most comprehensive Environmental Impact Assessment (EIA) procedures, although "loopholes still exist" (2010: vi), whilst practices of Cambodia, Lao PDR and Myanmar are significantly weaker.

There is no shortage of cases in Southeast Asia where disputes have arisen around decision-making of large-scale irrigation or hydropower projects that unequally distribute environmental harms and risks, with the voices of affected communities marginalised from decision-making processes.²¹ They may seek to influence decision-making – to the extent that political space allows – through attempts to engage in formal policy and planning processes, or working outside of these processes such as in street protests, media work or direct action, or both, thus seeking redress for environmental injustices (Middleton, 2012). For example, in the case of the Xayaburi Dam,²² under construction on the Mekong River in Northern Lao PDR since late 2010, international and regional civil society groups and communities' representatives, in particular from Thailand, Vietnam and Cambodia, sought to suspend the project through official processes such as a regional consultation process hosted by the Mekong

²¹ A particular stream of environmental justice, termed 'environmentalism of the poor', refers to how the poor may seek to defend their existing access to resources from large-scale extraction projects, including those associated with forms of the nexus such as large-scale land uses and large hydropower dams, because "[t]his behaviour is consistent with their interests and with their values" (Martinez-Alier, 2014: 240).

²² The US\$3.5 billion 1260 MW Xayaburi Dam is constructed by a predominantly Thai private-sector consortium and would export 95% of its electricity to Thailand.

River Commission initiated in September 2010,²³ as well as subsequently in the Thai administrative courts and through the Thai National Human Rights Commission, and via various international voluntary mechanisms such as the OECD Guidelines for Multinational Enterprises (Matthews, 2012; Herbertson, 2013; LeFevre, 2014). They also organised numerous street protests, peace walks, and worked extensively with the media, seeking to influence decision-makers and public opinion outside of the formal processes; even as the project was somewhat redesigned, overall the project developers and the Government of the Lao PDR remained relatively impervious to these protests (Middleton, 2014). Many other well-documented cases exist of contentions politics around large water infrastructure, for example the contested Pak Mun and Rasi Salai dams in Northeast Thailand since the 1990s (Missingham, 2003; Foran and Manorum, 2009; Molle et al., 2009) and the Lower Sesan 2 currently at an advanced stage of planning in Northeast Cambodia (Grimsditch, 2012).

There is, however, some tension between various frames of environmental justice and sustainability regarding the extent that they are considered compatible (Walker, 2012: 37). Agyeman et al. (2002: 88), reflecting on the different origins of sustainability (rooted originally in international policy spheres) and environmental justice (rooted originally in grassroots social movements) argue that the discourses "have developed in parallel" and that there had been "insufficient interpenetration of values, framings, ideas and understandings". On the other hand, Fisher (2003: 206) argues that environmental justice movements and sustainability movements have symbiotic goals. Agyeman et al. (2003b), meanwhile, call for joined up thinking to bring together sustainability with environmental justice. Others, however, see the sustainability discourse as too readily acceding to the status quo of market-led development, technical eco-modernisation solutions and power asymmetry, and doubt that environmental justice is seriously considered (Walker, 2012: 37).

Environmental justice literature recognises that unequal power relations together with deeper economic, social and political structures and processes that shape the (re)production of environmental harms mean that 'procedural justice' is not the only precondition to accessing environmental justice.²⁴ An environmental justice lens can thus problematise nexus goals of sustainability, in particular by identifying winners and losers in projects and plans proposed for sustainable development, including highlighting the need for procedural (and recognitional) justice in decision-making (see also 'trade-offs' below).

Green economy

The concept of the green economy was popularised by the UNDP's Green Economy Initiative during the 2008 global financial crisis (at the same time that World Economic Forum also initiated its discussion on the nexus). It took a central role in the Rio+20 conference, sparking much debate amongst governments, scholars, and activists including over the concept's radical, minimal, or zero transformative potential; and whether it displaces, facilitates, or reinforced the concept of 'sustainable development' (Ehresman and Okereke, 2014). Ehresman and Okereke (2014), surveying recent literature, propose a typology that maps out the relationship between different framings of green economy – which they identify as a 'woolly' and 'amorphous' concept – with principles of environmental justice associated within them:

²³ The Procedures for Notification, Prior Consultation and Agreement (PNPCA) is required under Article 5 of the 1995 Mekong Agreement for mainstream dam projects. Its interpretation and conclusion has been subject to significant uncertainty and contestation (Middleton, 2014; Rieu-Clarke, 2015).

²⁴ Processes of exclusion have been investigated by an array of social and political (ecology) theories, ranging from common property theory and Marxist political economy to urban metabolisms and environmental governmentality (Robbins, 2012: 49-81).

- *Thin Green Economy*, which emphasises the central role of a liberalised market in increasing resource efficiency, holds beliefs that technological solutions will address resource scarcity, and that creating economic growth will address environmental impacts by following the environmental Kuznets curve; to *market justice* which emphasises the centrality of creating and protecting property rights, and thus implicitly economic rights.
- *Moderate Green Economy*, which proposes significant reforms but not displacement of the existing economic system, including strategies towards "sustainable production and consumption", market and non-market instruments, and reforming institutions drawing, for example, on earth systems governance scholarship; to various concepts of *liberal egalitarian concepts of justice*, for example Rawlsian egalitarianism, capabilities approach, and human rights justice.
- *Thick Green Economy*, which concludes the current economic system must be radically transformed due to fundamental limits to growth yet runaway levels of material consumption (especially in the Global North), and to be achieved through de-growth models and retraction from neoclassical economic models; to *structural justice* whereby a whole new political economy must be created that places as central social equity and environment protection.

In Southeast Asia, the green economy has been promoted in the region both in relation to the nexus and separate from it. The UNEP and UNESCAP have been amongst the lead regional proponents. UNESCAP, in a position paper published in 2013 on the WEF nexus in Asia and the Pacific region, acknowledging the "dearth of studies on the interconnections between water-food-energy in the Asia Pacific region" recommends the wider region to:

[e]mbrace green economy as a new policy goal and pursue 'low carbon, resource efficient, and socially inclusive' development strategies as espoused in the United Nations Conference on Sustainable Development (UNCSD or Rio+20)... The world needs to find profitable market-oriented solutions to nexus challenges... (UNESCAP, 2013: 49).

The strategy detailed is essentially an ecological modernisation project, orientated around a market-based approach of resource productivity, efficiency and technology. Little consideration is given to whether markets themselves are resulting in social exclusion or undermining sustainable environmental exploitation. Other reports have been published in a similar vein, for example by UNESCAP et al. (2012), which relate to a thin concept of green economy evoking what Ehresman and Okereke (2014) term principles of market justice.

Other organisations have approached the nexus recommending a moderate Green Economy. For example, the MRC's Mekong2Rio conference in April 2012 explicitly linked a Green Economy to the need for basin management, building upon the Bonn 2011 conference which was framed by the Stockholm Environment Institute's background briefing paper (Hoff, 2011). In their conference report, framings of the green economy include: highlighting the (economic) value of natural infrastructure and their ecosystem services, and then the need to rebuild natural capital; mobilising consumers to shape their sustainable consumption; and aiming for growth in income and employment driven by public and private investments that should be green. MRC states that rebuilding natural capital is "especially important for poor people whose livelihoods and security depend on nature" (Bach et al., 2012: 14). The report moves away from an emphasis on market instruments, and balances them with non-market interventions including the importance of (cross-border) dialogue.

At the national level, it appears that the Myanmar government – now apparently entering a period of democratic transition and economic transformation (Holliday, 2011) – has demonstrated the greatest interest amongst the countries of the region in a green growth-orientated nexus. At the Third Green Growth Forum in November 2013, a major conference opened by President Thein Sein and backed by some high-income country donors and international NGOs such as the World Wide Fund for Nature

(WWF), three days were spent in Yangon and Nay Pi Daw discussing the 'water-energy-food nexus' and relating it to Myanmar's development pathway (see also Kattelus et al., 2014). Contradictorily, however, in Myanmar there are regular reports of ongoing unsustainable and unjust natural resource extraction and exploitation, for example around land (Woods, 2014) and hydropower projects (Hadfield, 2014; Saw Yan Naing, 2014).

Globally, a more radical civil society and social movement have opposed the Green Economy concept; the World Social Forum has called it the 'Green Washington Consensus', stating "this latest phase of capitalist expansion seeks to exploit and profit by putting a price value on the essential life-giving capacities of nature" (Working Group on Green Economy, 2012). In Southeast Asia, many civil society and social movements rally around the rights of local communities to access and manage their natural resources and defending natural resource commons, including to access rivers, forests and land (Ahmed and Hirsch, 2000; Cuasay and Vaddhanaphuti, 2005; Lran, 2011; Middleton, Grundy-Warr et al., 2013). They tend towards holding a "thick green economy" position – although would not refer to the position using this phrase – with an emphasis on redressing structural injustices, especially the role of the market and the power asymmetries exercised through it by domestic and international investors and state versus local communities (see Hall et al., 2011).

Thus, building from Ehresman and Chukwumerije's (2014) assessment of the linkage between green economy and environmental justice, it is also possible to relate the nexus to environmental justice via the green economy as a boundary concept, and thus more explicitly consider the role that justice should and could play both in the green economy and the nexus.

Scarcity and addressing trade-offs

Claims for resource scarcity are often evident in nexus framings, with crisis narratives created by some actors, epitomised by the World Economic Forum's Global Risks 2011 report: "[s]hortages could cause social and political instability, geopolitical conflict and irreparable environmental damage. Any strategy that focuses on one part of the water-food-energy nexus without considering its interconnections risks serious unintended consequences" (WEF, 2011: 7).

Given the emphasis on scarcity, managing trade-offs have been seen as central to the nexus (Mushtaq et al., 2009; ODI et al., 2012; Rasul, 2014). Largely adopting a systems approach, nexus thinking seeks to integrate sectors through making apparent the relationships between food, water and energy systems, and addressing interconnected externalities (Howells et al., 2013). Managing trade-offs is approached from the perspective of maximising benefits through minimising inefficiencies, reducing externalities, informing trade-offs through knowledge production, and identifying synergistic win-win scenarios where they exist. The Stockholm Environment Institute observes:

In some cases, however, especially when resources are very scarce, a nexus analysis may not find a win-win option, but just difficult trade-offs (Weitz et al., 2014). The role of science in such situations is not to say what the 'right' answer is, but to clarify the choices and ensure that all cross-sectoral impacts, externalities and trade-offs are known and understood. Participatory processes can also help ensure that vulnerable stakeholders have the information and access they need to advocate for themselves, and can foster dialogue across sectors and scales (Davis, 2014: 2).

Critical approaches to resource scarcity and the trade-offs entailed emphasise how scarcity can also be understood as a social phenomenon, shaped by market rules and other societal decisions; from this perspective, who experiences scarcity is determined by a politics of resource allocation that excludes particular groups from access (Mehta, 2010; see also Hall et al., 2011; and Scoones et al., 2014).²⁵ Thus,

²⁵ Scoones et al. (2014) examining global land grabs, propose three framings of scarcity: (Malthusian) absolute scarcity; (Ricardian) relative scarcity; and (Marxist) political scarcity.

it is important to ask food, water, and/or energy security "for whom, by whom and from whom, security of what and for what?" (Brauch, 2011: 62). Yet, across much of the nexus literature, the principles of distribution and governance of trade-off decisions – including who takes decisions and for whom – are inadequately problematised (Lele, Klousia-Marquis et al., 2013). Foran (this issue), for example, critiques systems approaches as under-theorised and under-politicised, in particular with regard to historical and relational considerations. Nexus literature to date, if serious about attaining poverty reduction goals, needs to pay more attention to *whose* food, water and energy that security is secured, including the means by which the needs of the marginalised will be prioritised (Allouche et al., 2014).

Water scarcity in Southeast Asia is a complex proposition, including because of the uneven distribution of water availability temporally between seasons, and between years and spatially, (see MRC, 2010b; Middleton, 2012). Furthermore, flooding and drought are experienced by groups differently (Lebel and Sinh, 2007); for example, variability in annual flood regimes of the Tonle Sap Lake, Cambodia shape risk reception and livelihood strategies of fishers and farmers living in its floodplains differently, including decisions for household members to migrate in search of work (Middleton et al., 2013). Meanwhile, water availability and allocation are continually changing due to construction of water storage infrastructure (hydropower dams and irrigation systems, for example), evolving institutional arrangements, and changes in hydrological regime, including due to climate change; these redistributions of access to water, of course, raise questions of the incorporation of justice in the decisions surrounding them (Neal et al., 2014). The politics of these changing water allocations have been extensively documented, although not necessarily within a nexus framing (Molle et al., 2009; Lazarus et al., 2011).

Across the recent nexus literature on Southeast Asia, scarcity is a common framing. For example, at the ADB's GMS 2020 conference on the nexus, experts presented mainly technical assessments on how water resources are under growing pressure from agriculture, industry, energy production and water extraction (Thapan, 2012); and how food security, which is already insecure for millions across the region, is further at risk for a range of reasons including growing water scarcity (Rosegrant et al., 2012). Broadhead et al. (2012: 205), however, assess that for water availability in the GMS overall:

although dry areas do exist, Thailand and Chinese parts of the subregion do not experience significant water scarcity with less than 25% of water from rivers being withdrawn for human purposes (IWMI, 2007). Outside the PRC and Thailand, the GMS experiences 'economic water scarcity' in which "human, physical and financial capital limit access to water and although less than 25% of water from rivers is withdrawn for human purposes, malnutrition exists". On the whole, however, per capita water availability in the GMS is greater than 5000 cubic meters (m³) water per year – among the worlds [sic] highest.

Whether water scarcity already exists, as it does in some places, or is claimed to be looming, approaches to tackle these challenges generally orientate, as discussed earlier, around technical and managerial approaches including the need for more data and research, investment in infrastructure, and policy reform.

Viewed through an environmental justice lens, trade-off decisions are evaluated by drawing on concepts of distributional, procedural and recognitional justice; making explicit narratives and associated power asymmetries and their manifestations, for example the politics of knowledge and scale; and incorporating other concepts such as vulnerability, needs and responsibilities (Walker, 2012: 46). Thus, recognising that trade-off decisions entail contested claims for entitlements, critical analysis of the claims and narratives of competing actors – for example, what evidence is invoked or which

concept of justice should apply²⁶ – can help render visible how social environmental (in)justice is produced (Walker, 2012: 40).²⁷ Whose knowledge, evidence or arguments are recognised as legitimate is particularly important to claim-making,²⁸ as has been well documented in environmental politics in general (Forsyth, 2003) and for water governance in Southeast Asia (Contreras, 2007).

The Northeast of Thailand within the Mekong Basin is an (unfortunate) example demonstrating the production of environmental injustice. Here, there are contested framings, visions and ideologies for allocation and use of water between irrigated food production, electricity generation, and water for wetlands and other local small-scale uses upon which many poorer households depend (Molle, Floch et al., 2009). Also known as the Korat Plateau or Isaan, the region receives the least annual rainfall across the Mekong Basin of less than 1000 mm per year (MRCb, 2010). Government agencies have framed the area as "a poor and parched inhospitable place, begging for more irrigation" (Dore et al., 2012: 26), and have pursued developmentalist visions of large irrigation and hydropower schemes. These projects have been justified by government agencies as seeking to address food insecurity, alleviate poverty, and during the 1970s to counter communist insurgency in the region.²⁹ Pursued first by the Royal Irrigation Department (RID) since the 1960s with the backing of the US Bureau of Reclamation and, since the 1970s, also by the then newly created Department for Energy Development and Promotion (DEDP), successive waves of plans for large- and medium-scale dam and diversion schemes have sought to irrigate Thailand's Northeast region, including the Green Issan Project in the early 1980s, the Khong-Chi-Mun Project in the late 1980s and 1990s, the Water Grid Project in the early 2000s, and most recently a Thai-Lao PDR Water Transfer project (Molle et al., 2009; Blake, 2013).

The large-scale development plans and individual projects have been frequently contested by affected villagers, social activists, NGOs and academics on the grounds of their environmental and social costs, and who have held different visions of development (Missingham, 2003; Blake et al., 2009). In some cases, sustained community protests have resulted in government compromise, for example in the case of the Rasi Salai and Hua Na irrigation dams³⁰ where since 2013 the RID has committed to spend US\$133,300 per year until 2023 on wetland recovery; discussion has now switched to how collaboration can occur as communication remains poor, and how to channel these resources which at present appear to reflect government priorities. In other cases, such as the Pak Mun hydropower dam, disputes remain entrenched and ongoing (Foran and Manorum, 2009). Power asymmetries and politics

²⁶ Justice involves positioning of what is 'fair' and thus can be highly contested and political; the notion of justice can be defined according to multiple principles, including equality of rights, utilitarian equity, and justice as fairness, as well as accommodating indigenous and customary justice arrangements. A detailed treatment of justice is beyond the scope of this paper (see Walker, 2012: 42-53, and Schlosberg, 2007).

²⁷ Walker (2012: 40) differentiates between evidence of how things are, which tends towards description, process of why things are how they are, which aims to be explanatory, and justice or how things ought to be, which is normative in prescription.

²⁸ The perceived validity of evidence relates to recognitional justice and thus with deeper processes of cultural, identity-based and institutional bias.

²⁹ It is interesting to note that early interventions by the RID promoted from the 1930s to the 1950s emphasised small-scale tank irrigation and river diversion projects.

³⁰ Completed in 1994, the Rasi Salai project failed to achieve its anticipated benefits and irrigates less than 1600 hectares (ha) of land, compared to an original plan for 5000 ha. Meanwhile, nearby communities directly affected experienced loss of farmland, reduced river resources, and the loss of a wetland area (locally called 'Pa Boong Pa Taam' areas) that was important for rice and fishery production, herbs, firewood, grazing areas, non-timber forest products and vegetable production. The dam was originally estimated to cost 140 million Baht, but actual costs were far over budget costing 871 million Baht (nearly six times the planned amount). Over the course of the project, villagers were repeatedly excluded from the decision-making process and access to information was denied, especially in the final stages of construction (see Sretthachau et al., 2000; Dulin et al., 2008).

of scale (see next section) have shaped whose voice is heard within project decision-making and who benefited or paid the costs associated with these decisions (Sneddon, 2003).

Northeast Thailand has entered into Southeast Asia's recent nexus discourse. Blake (2013) labelled the Thai government's approach 'irrigationalism' at a nexus conference held in Chiang Rai in March 2013 organised by the Shared Waters Partnership and IWMI. He argued that a lack of post-facto evaluation hides the extent of irrigation development failures in Northeast Thailand, and that rice production in Thailand is "basically an unprofitable crop without subsidies, unless grown purely for subsistence purposes". Meanwhile, the Stockholm Environment Institute, in their Northeast Thailand Futures nexus project (introduced above) found that in the Huai Sai Bat sub-basin increased access to irrigation in recent years had resulted in heightening water competition between dry-season rice with other crops (sugar cane, cassava, and rubber) (Krittasudthacheewa, Polpanich et al., 2012). As research entailed participatory scenario processes, livelihood surveys and modelling of water use and livelihood changes, it sought to sensitise members of the sub-basin river committee to nexus trade-offs and thereby embed a nexus approach in decision-making (to the extent that the committee has influence).

Governance at and across the local, national and transnational scale

Through the lens of environmental justice, scale, place and distance are important considerations in understanding the production of environmental injustices. The emergence of transnational environmental justice movements and analysis grew from a concern over the relocation of polluting industries to the South, alongside the growing consumption patterns in high-income countries facilitated by international trade (Schroeder et al., 2008). More recently, processes of international 'land grabbing' and other natural resource appropriations have garnered public attention (Borras and Franco, 2012b). The growing distance between the point of consumption and the point of production creates spatial disconnects that can render environmental injustices in areas of production invisible to consumers (Agyeman, 2014).

Political and economic geographers have highlighted how place-based environmental injustices are produced through the interaction between the specifics of the place and interaction with higher-scale actors, drivers and structures (e.g. Harvey, 1996; Leichenko and Solecki, 2008; Sikor and Newell, 2014). These include, for example international markets, the investments, commodities and knowledge that flow through them, and the local and national institutions that mediate them. Furthermore, a growing ecological footprint of the relatively wealthy in the North (and the South³¹) significantly raises the likelihood of environmental injustice, including across nexused natural resources. Given the thin to moderate green economy approach that frames many international organisations' approach to the nexus (discussed above), these insights from environmental justice are pertinent.

In laying the foundation for the nexus, Hoff (2011: 38) considers its governance, institutions and policies as best addressed through multi-scaled, nested governance (see also Davis, 2014):

There are large opportunities to be realised if the nexus is addressed coherently across all scales, through multi-level governance with differentiated (but clearly defined) responsibilities of institutions. At the local scale, trends for more participation and decentralisation co-develop with new guidelines and codes of conduct.

Scott et al. (2011) identify how institutions and decision-making on energy and water resources are coupled at multiple scales (local, national, transnational). They consider how existing multi-tiered institutional arrangements (laws, policies, and organisations that operate across jurisdictional levels) for water and energy either match or do not resource coupling across scales. In other words, national

³¹ Increasingly, the North is in the South, and the South in the North; namely that there are enclaves of high consumption in the South, whilst there are also areas of poverty and low consumption in the North.

demands for energy can have local impacts on water use, and national or regional-level water and energy policies and regulatory mechanisms can either reinforce or undermine local governance arrangements.

Many governance challenges related to cooperation between water, food and energy institutions have already been experienced as major challenges by IWRM-approaches, yet there is little new thinking in nexus thinking about how to move beyond them aside from calling for a more equal footing between the water, food and energy sectors. Lele et al. (2013: 61), however, highlight the lack of studies on nexus governance and more broadly argue that there remains insufficient clarity on the meaning of good governance in water, food and energy systems, as well as a need for a better understanding of "the roles of and linkages between policies and institutions at various political and administrative levels".

An important dimension of nested government that arguably needs greater attention in understanding the politicised character of nexus governance is the politics of scale (Norman et al., 2012). This refers to how projects or issues are framed by multiple scales to (de)legitimise actors' claims to environmental benefits and harms, and how in decision-making processes, many local-scale impacts are rendered invisible (i.e. non-recognised) by project proponents (Dore and Lebel, 2010).

For example, the Xayaburi Dam (discussed above) entails a range of nexused trade-offs (see ICEM, 2010; Costanza et al., 2011) that have been framed at multiple scales.³² The project, located in Northern Lao PDR, is under construction by a largely Thai consortium, funded wholly by Thai banks, and exports 95% of its 1,260 MW to Thailand. To its proponents, including the Lao PDR government, the project developer, and some of Thailand's relevant ministries including the electricity utility, it is a national and transboundary project; they argue that the project would contribute towards Thailand's energy security and suggest that the cross-border FDI and project revenues would bring 'development' to Lao PDR. They have sought to reframe the Mekong River from a common pool resource central to the livelihoods of riverside fishing and farming communities to the river as a common good for regional economic cooperation and growth. To project opponents, including local NGOs throughout the region, international NGOs, and some communities, it is a local project, but with transboundary implications also experienced at the local level; they emphasise that the dam is resettling approximately 2,100 people in Lao PDR and that more than 200,000 people located near the dam will experience some negative impacts to their livelihoods and food security due to the projects operation, both within Lao PDR and in neighbouring countries. They highlight how the project's Environmental Impact Assessment report is of poor quality and does not consider transborder impacts (International Rivers, 2011). This cross-border power trade project with impacts on the transboundary Mekong River has raised challenging questions in terms of sovereignty and access to justice, namely the relative roles and responsibility of the Lao PDR government (the project host), the Thai government (without which the project could not proceed), and the Vietnam and Cambodian governments that are also members of the MRC (see Middleton, 2012; Rieu-Clark, 2015).

Towards energy, food and water nexus justice in Southeast Asia

This paper has mapped how the nexus has spread throughout mainland Southeast Asia from global-level policy conceptualisation to within regional policy circles that have included international and regional organisations, academic networks, and civil society, national politicians and government officials, and high-income country donors. The nexus is yet to be extensively grounded, however, into national policies and practices, and broad-based local demand for nexus-framed policies is currently limited. The paper has also highlighted that more attention is required to the politicised nexused relationships between food, water and energy governance systems (c.f. Foran, this issue).

³² See Sneddon (2003) for a politics of scale analysis of large water infrastructure development in Northeast Thailand.

Pieterse (2010) has argued that for ideas to be significant, social forces must carry them into action. Meantime, Molle (2008: 143) suggests that a 'snowballing effect' results in a growing number of actors promoting and implementing a particular nirvana policy concept, such that it is "gradually established as a consensual and controlling idea". If the nexus is to become embedded in the region, there must be demand for it both from above and below. This paper would argue that to increase demand from below, a technocratic ecological modernisation approach will be insufficient, and the concept must engage more clearly with promoting fair decision-making and thus to the expectations of many of the community resource users themselves.³³ It is proposed, therefore, that introducing the concept of environmental justice into the nexus, especially where narratives, trade-offs and outcomes are contested, could make better use of how the nexus is framed, understood and acted upon.

To this end, the article has also demonstrated that there are a number of boundary concepts common to both the nexus and environmental justice, including sustainable development; the green economy; scarcity and addressing trade-offs; and governance at, and across, the local, national and transnational scale. Environmental justice is at its strongest in evaluating fairness in decision-making, and explaining why (in)justices may have occurred. It is institutionally rooted, with an emphasis on understanding processes of decision-making and with strong linkages to policies, law, and systems of justice – a weakness of the current nexus approaches. Environmental justice approaches are arguably weaker than Nexus approaches in explaining inter-sectoral linkages between food, water and energy systems, including consequences of cross-sectoral decisions that could have justice implications. We thus argue that in light of food, water, and energy trade-offs within Southeast Asia, bridging the gap between the nexus and environmental justice – via boundary work (Cash et al., 2003) – can redress in part a weakness of each.

This article concludes that justice matters in nexus governance. Yet, even defining justice in water governance from a multi-disciplinary perspective is at an early stage due to its complexity (Neal et al., 2014; Zeitoun et al., 2014), leaving conceptualisation of justice in nexus governance at an even earlier stage. This article has proposed that drawing on environmental justice scholarship and practice offers a promising starting point to redress this deficit.

ACKNOWLEDGEMENTS

The authors would like to thank the project 'Dams, securitization, risks and the global water-energy nexus under climate change scenarios (KN/11015)', of the Social, Technological and Environmental Pathways to Sustainability (STEPS) Centre, Institute of Development Studies, University of Sussex for its support in preparing this paper.

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³³ This is not to say that nexus-promoting organisations – or some individuals within them – are not working towards justice through their work on the nexus; yet such language has not been explicit in nexus literature to date.

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APPENDIX A

Table A. Chronology of major nexus conferences in mainland Southeast Asia.

Date	Conference	Lead organiser	Lead sponsor
7-9 December, 2011.	1 st Mekong Forum on Water, Food and Energy, Phnom Penh, Cambodia ³⁴	Challenge Program on Water and Food	Australian Aid
20-21 February, 2012	GMS 2020: Balancing Economic Growth and Environmental Sustainability, Bangkok, Thailand ³⁵	Asian Development Bank	Swedish International Development Aid (SIDA), Finland
1-3 May, 2012	Mekong2Rio: International Conference on Transboundary River Basin Management, Phuket, Thailand ³⁶	Mekong River Commission	Multiple international organisations ³⁷
13-14 November, 2012	2 nd Mekong Forum on Water, Food and Energy, Hanoi, Vietnam ³⁸	Challenge Program on Water and Food	AusAid
5-7 March, 2013	Mekong Environment Symposium, Ho Chi Minh City, Vietnam ³⁹	DLR and WISDOM	Federal Ministry of Education and Research, Germany
11-13 March, 2013	Food Security in the Mekong – The Water, Food and Energy Nexus Revisited, Chiang Rai, Thailand ⁴⁰	The Shared Waters Partnership, ⁴¹ IWMI and Mae Fah Luang University	-
2-3 and 5-6 December, 2013	Water-Food Security in Cambodia and the Vietnam Delta – Assessing risk and alternatives under an altered flow regime, Phnom Penh, Cambodia and Can Tho, Vietnam	The Shared Waters Partnership	-
19-21 November, 2013	3 rd Mekong Forum on Water, Food and Energy, Hanoi, Vietnam ⁴²	Challenge Program on Water and Food	AusAid
11-13 March, 2014	Nexus Dialogue on Water Infrastructure Solutions, 3 rd Regional Workshop – Asia, Bangkok, Thailand ⁴³	IUCN and International Water Association (IWA)	Natural Heritage Institute, International Hydropower

³⁴ <http://wle-mekong.cgiar.org/mekong-forum-proceedings/1st-mekong-forum-on-water-food-and-energy/> (accessed on 9 January 2015)

³⁵ www.gms-eoc.org/events/international-conference-gms2020 (accessed on 9 January 2015)

³⁶ www.mrcmekong.org/news-and-events/events/mekong2rio/ (accessed on 9 January 2015)

³⁷ Sponsors identified as ADB; CPWF; Danish International Development Agency (DANIDA); DHI Group; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ); Global Water Partnership (GWP); ICIMOD; IUCN; IWMI; Mississippi River Commission; M-POWER; SEI; SIWI; UNEP; World Bank; WWF.

³⁸ <http://wle-mekong.cgiar.org/mekong-forum-proceedings/2nd-mekong-forum-on-water-food-and-energy/> (accessed on 9 January 2015)

³⁹ www.mekong-environmental-symposium-2013.org/frontend/index.php#.VK_zRSuUeSp (accessed on 9 January 2015)

⁴⁰ www.wateregovernance.org/swp-workshop (accessed on 9 January 2015)

⁴¹ UNDP Water Governance Facility and SIWI Water Governance Facility.

⁴² <http://wle-mekong.cgiar.org/mekong-forum-proceedings/> (accessed on 9 January 2015)

⁴³ www.waternexussolutions.org/239/events/asia-regional-workshop.html#.VLABnyuUeSo (accessed on 9 January 2015)

2-3 April, 2014	2 nd MRC Summit International Conference on Water, Energy and Food Security Under Climate Change in the Mekong Basin, Ho Chi Minh City, Vietnam	Mekong River Commission	Association, Hydropower Sustainability Assessment Protocol, and UNEP Multiple international organisations ⁴⁴
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Table B. Chronology of major reports and papers on the nexus in mainland Southeast Asia.

Year	Report/ Paper	Note
2012	Mekong Turning Point: Shared River for a Shared Future (Cronin and Hamlin, 2012)	Civil society report
	Climate Change Adaptation for Water Management in a Green Economy (UNESCAP, 2012)	International organisation report
	Water Wealth? Investing in Basin Management in Asia and the Pacific (Pangare, Das et al., 2012)	International organisation report
	Transboundary River Basin Management: Addressing Water, Energy and Food Security (Bach, Bird et al., 2012)	Conference proceedings
	International Conference on GMS 2020: Balancing Economic Growth and Environmental Sustainability, Focusing on Food-Water-Energy Nexus (ADB, 2012b)	Conference proceedings
2013	Thinking about Water Differently: Managing the Water-Food-Energy Nexus (ADB, 2013a)	International organisation report
	The Status of the Water-Food-Energy Security Nexus in Asia and the Pacific region: A position paper commissioned by the United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP, 2013)	International organisation report
	Asian Water Development Outlook 2013: Measuring Water Security in Asia and the Pacific (ADB, 2013b)	International organisation report
	The Water-Food-Energy Nexus in the Mekong Region: Assessing Development Strategies Considering Cross-Sectoral and Transboundary Impacts (Smajgl and Ward, 2013)	Academic publication
2014	Cooperation for Water, Energy and Food Security in Transboundary Basins under Changing Climate (Bach, Glennie et al., 2014)	Conference proceedings

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⁴⁴ GWP, UNDP Water Governance Facility, SIWI, WWF, IWMI, ADB, World Bank, SEI, ICIMOD, UNEP, DHI, University of the West of England, IUCN, IWA, UNESCO-IHE, Australian Aid, DANIDA, GIZ, University of Arizona, AGWA, World Water Council, Swiss Agency for Development and Cooperation, Ministry of Foreign Affairs of Finland, Ministry of Foreign Affairs of Sweden.