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1 Social science studies of the environment in Taiwan: what can the international community learn
2 from work published within Taiwan?

3
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12
13 **Abstract**

14
15 This Translations contribution synthesises critical environmental social science research
16 produced in Taiwan and published largely in Chinese. Taiwan is distinctive in east Asia in that it
17 has had, over several decades, a relatively large and prolific community of scholars engaged with
18 environmental justice and sustainability. This research tradition is linked to the emergence of
19 grassroots environmentalism in response to environmental issues faced during Taiwan's rapid
20 industrialisation, and to the democratisation of Taiwanese society from the 1980s onwards. Fuller
21 understanding of research produced and published within in Taiwan hence yields insights for the
22 role of social science within newly industrialising and democratising nations. Although the story
23 of Taiwanese society's relation to environmentalism is to an extent understood in English-
24 language literature, less prevalent are the diverse ways Taiwanese social scientists have engaged
25 with environmental issues, the empirical case studies which have shaped their thinking, and the
26 influences of Western environmental sociology and science and technology studies (STS) within
27 Taiwan. By synthesising Chinese-language environmental social science literature from Taiwan,
28 we characterise three strands of scholarship: activism and social movements; environmental
29 controversies; and environmental governance, policy and institutions. We identify (a) the ability
30 of communities and civil societies to affect change from *within* extant governance processes and
31 (b) the local-level implications of national sustainable development rhetoric as two areas where
32 Taiwanese scholarship may make particularly valuable contributions to work at the sustainability-
33 environmental justice interface.

35 **Keywords:** democratisation; environmental justice; environmental sociology; science and
36 technology studies; Taiwan

37

38 **1. Introduction and context**

39

40 This translation piece introduces the rich body of critical environmental social science literature
41 which exists within Taiwan and is published largely in Chinese. Within East Asia, Taiwan has a
42 comparatively strong environmental social science tradition, especially as regards study of social
43 movements and science and technology studies (STS) perspectives on environmental
44 controversies. Environmentalism in Taiwan has to an extent already been covered within English-
45 language texts (see for example Grano, 2015; Ho, 2018; Hsiao, 2019). These texts are thorough
46 and well-researched, and are highly recommended as an overview of the social dimensions of
47 environmental issues in Taiwan. Yet such texts may miss some of the more in-depth and case
48 study-specific research which is published in Chinese within Taiwan's domestic social science
49 journals, and which provide nuanced insight into the dynamics of environmental issues within
50 Taiwan. The purpose of this translation piece is hence to clarify the key trends, thinkers and iconic
51 case studies within Taiwanese environmental social science.

52

53 The development of a strong environmental social science tradition within Taiwan requires
54 contextualisation within the country's development trajectory. Following the retreat of the
55 Kuomintang from Mainland China in 1949, development in Taiwan under Martial Law followed
56 a United States/'Western' model. Such high-intensity development over a short period of time
57 created Taiwan's 'economic miracle.' Yet the emergence of serious environmental problems from
58 the 1960s onwards indicated that local environments were being sacrificed to boost national
59 economic growth. Environmental movements in Taiwan emerged from the grassroots level in the
60 1970s, and were subsequently taken on by the middle classes - a large proportion of whom were
61 educated in the United States in the 1980s. Following the end of Martial Law in 1987, the
62 Environmental Protection Administration was established in response to environmental problems,
63 and Taiwan's democratic transition in the 1980s to 1990s lessened state control and enhanced
64 environmental governance. Yet despite this increasing environmental consciousness, Taiwan's
65 environmental concerns arguably remain inferior to economic growth among decision-makers.
66 There remains strong belief in the objectivity of science to guide environmental decision-making,
67 at the risk of neglecting social or cultural factors. Nonetheless, as outlined in Sections 2 and 3,

68 scholars and domestic regulations are placing increasing attention on considering social impacts
69 within environmental issues.

70

71 **2. Environmental social science in Taiwan and its relation to the wider field**

72

73 Taiwanese scholars have broadly engaged with issues of environment and society in three ways,
74 which are of course not mutually exclusive. These different pathways speak to – and reference
75 texts from – established traditions in the wider global environmental social science literature.

76

77 The first stream concerns *environmental activism and civil society movements*. This thread of
78 scholarship is linked to the grassroots emergence of environmental movements in Taiwan in the
79 1970s, specifically concerns with NIMBY syndrome and local protest against unwanted facilities
80 (Chiou, 2005; Ho, 2006; Lii and Lin, 2000). This area of research has also been interested with
81 the subsequent professionalisation of these grassroots environmental movements, through for
82 example engagement with law professionals and academics (Hsiao, 2019; Lii and Lin, 2003).
83 This stream is mainly connected to sociology and political science, with key thinkers including
84 Hsin-Huang Michael Hsiao and Ming-Sho Ho. Recent scholarly connection with environmental
85 activism and civil society movements in Taiwan has included the Fourth Nuclear Power Plant
86 Abolishment Movement (see English-language overview of Ho (2018)); social transitions within
87 water resource governance via the Jiji and Dadu Dams (Chou & Zeng, 2017); and the engagement
88 of STS scholars in the court hearing on toxic exposure in the Radio Company of America legal
89 case (Jobin & Tseng, 2011; Jobin, Chen & Lin, 2018).

90

91 The second stream relates to *environmental controversies*, with a strong focus on environmental
92 and land justice, and on sustainable development. In the Taiwanese context, environmental justice
93 relates to indigenous land issues (Chi, 2005; Lin, 2015); localised effects of developments on
94 marginalised communities (Huang & Hsu, 2017); climate change risks and the transformation
95 challenge of high carbon society (Chou, 2019); and civil society participation in environmental
96 monitoring and assessment processes (Ho, 2010). This strand of scholarship has roots in sociology,
97 political science, STS, legal studies and environmental law. Influential scholars in this field
98 include Chun-Chieh Chi, Juju Chin-Shou Wang, Kuei-Tien Chou and Mei-Fang Fan. Iconic case
99 studies associated with environmental controversy scholarship in Taiwan include radioactive
100 waste storage on Orchid Island (Fan, 2017); the planned building of National Glory petrochemical
101 complex on the coastal area (Lee, 2014); advocacy for a national trust for wetland conservation

102 (Wang, 2012); and the construction of manufacturing plants on farmlands with forced eviction of
103 residents (Huang & Hsu, 2017).

104

105 A third stream concerns *environmental policy, governance and institutions*. Within this there is a
106 strong interest in the political and social dimensions of environmental impact assessment (Tang,
107 2000), and in critical assessment of the mass employment of expert advisory schemes within
108 Taiwan as a means of resolving environmental issues (Tu, 2012). Scholarship in this field is rooted
109 in public administration, political science, environmental planning and land economics and policy;
110 with key thinkers including Ching-Ping Tang, Wen-Ling Tu, and Tze-Luen Lin. Examples of how
111 Taiwanese scholars have engaged with these issues critically include indicators and policy for
112 intergenerational justice and sustainability in Taiwan's responses to climate change (Hsu, Chi, &
113 Hsiao, 2016); challenges of institutional arrangements for governing local common-pool
114 resources and importance of governmental support to indigenous conservation programs (Tang &
115 Lu, 2002); limitations of energy governance and institutional arrangements for rooftop solar PV
116 systems in Kaohsiung (T.-L. Lin & Lee, 2017); evaluation of how local political and social factors
117 can constrain local-level environmental protection practices in Taipei and Kaohsiung (Tang,
118 2002); and disputes over the environmental impact assessment (EIA) for the third stage of the
119 Central Taiwan Science Park Development (Tu, 2010).

120

121 Common across these strands is a background in *democratisation* and its relation to environmental
122 issues, especially as regards civil society participation, the rights of marginalised groups, and the
123 role of expert involvement in decision-making. These different traditions also have a common
124 methodological interest in techniques with a qualitative focus, for instance document analysis
125 (Hsiao, Jou & Huang, 2017); interviews (H.-N. Lin, Wang, & Taiban, 2016); and case study
126 approaches (as exemplified by Chiu (2018) on the electronics industry and chemical regulation in
127 Taiwan). Moreover, it is worth noting that a number of the scholars listed above have PhD training
128 in either the United States or Europe within social science and STS traditions.

129

130 This training of a number of Taiwanese environmental social science scholars in a 'Western'
131 setting may be reflected in the links within the Chinese-language literature to concepts and
132 thinkers from a North American and European tradition. Work on environmental justice, for
133 example on indigenous and marginalised community issues (Fan, 2016), links to and cites the
134 thinking of David Schlosberg (2007) and also Gordon Walker's (2009) distributional analysis and
135 impact assessment. Chinese-language scholarship from Taiwan on environmental controversy

136 likewise draws on notions of citizen science (Fan & Chiu, 2019; Tu & Shih, 2019); in particular
137 Brian Wynne's (1996) seminal work on local knowledge and Cumbrian sheep farmers (cited in
138 Fan & ZhangJian, 2014); and also Sheila Jasanoff (2003) on citizens having a right to knowledge
139 (cited in Tsai & Fan, 2014). Within the Taiwanese research into environmental governance and
140 controversy, the interest in procedural justice also borrows from Gwen Ottinger's (2010) research
141 into procedural justice and knowledge gaps (cited in Fan, 2014; Tu & Shih, 2014).

142

143 In sum, Taiwanese environmental social science has a core interest in how democratisation
144 impacts upon the dynamics of environmental issues, and how the pursuit of environmental rights
145 and a liberalised political and legal system can constitute a mutually informing relationship. The
146 research reviewed above has a strong qualitative and empirical focus, drawing heavily on case
147 study-based approaches to site-specific environmental issues within Taiwan. Nonetheless, this
148 body of Chinese-language work is conceptually rooted in - and refers to - ideas of environmental
149 justice (distributional, procedural and recognitional), local knowledge, citizen science, and the
150 rights of citizens to knowledge published in English and originating in a 'Western' academic
151 context. As above, this may in part be explained by the exposure of many of the current generation
152 of Taiwanese environmental social scientists to ideas of STS and environmental sociology
153 through doctoral study in the US or Europe.

154

155 **3. How and why insights from Taiwanese environmental social science are of interest to** 156 ***Local Environment* readers**

157

158 Recent English-language texts recognise the value of the Taiwan case to international study of
159 environment, sustainability and justice. Taiwan exemplifies the challenges a successfully
160 industrialised economy faces while transitioning towards less predatory and exploitative
161 development course (Grano, 2015), particularly as regards social movement dynamics, civil
162 society organisations, democratisation and the emergence of middle class (Hsiao, 2019). As such,
163 Ho (2017) argues that understanding the processes behind increased citizen expectations on
164 environmental matters has much wider relevance to newly-industrialising or emerging markets
165 and to recently democratised countries.

166

167 Nonetheless, *Local Environment* has carried only a relatively small number of articles with an
168 empirical focus on Taiwan. For example, Fan (2006) on justice concerns associated with the siting
169 of radioactive waste facilities on indigenous land, and Kang & Lafond's (1998) critical evaluation

170 of the utilisation of cultural resources and community involvement within local development
171 planning in Taiwan. Yet as Section 2 illustrates, a rich body of empirically-driven yet
172 conceptually-grounded literature exists within Chinese-language social science journals in
173 Taiwan. This literature offers additional explanatory purchase and granularity in understanding
174 the contours of environmental controversies and their governance within a recently industrialised
175 and democratised country context. Moreover, given the conceptual commonality and indeed
176 crossover with key thinkers and seminal texts from the English language, the body of Chinese-
177 language work from Taiwan provides a base for rigorously assessing the applicability of science
178 and technology studies and environmental sociology ideas outside of the Western context in
179 which they emerged.

180

181 We illustrate two ways in which insights from the Chinese-language texts reviewed in Section 2
182 can nuance and build on what is written in English language texts. First is Wen-Ling Tu's (2010)
183 analysis of the EIA review process for the third stage of the Central Taiwan Science Park. Whilst
184 the EIA for the project was passed, protest was raised by publics and EIA commissioners over
185 the speed at which the EIA was conducted, and controversy over national and local policy for
186 environmental protection remained. The question of how laws and policies can enshrine effective
187 participation within environmental assessment processes is already the subject of much interest
188 (e.g. Pettersson, Stjernström, & Keskitalo, 2017). Yet Tu's analysis brings to the fore the potential
189 for publics and civil society members to develop strategies to raise their concerns *within* existing
190 fora (in this case by attending all related meetings); and to attain outcomes perceived as more
191 satisfactory (in this case demanding the developer to hold public meetings, form environmental
192 monitoring groups, and conduct health risk assessment to enhance its communication with local
193 residents) as a result. Tsai & Fan's (2014) assessment of the KaoPing Great Lakes Project likewise
194 outlines how local residents, civil society groups and experts formed an alliance to develop and
195 propose an alternative water resource management strategy to that put forward by Taiwan's Water
196 Resources Agency. Amidst criticism of the ability of EIA processes to take into account non-
197 expert concerns (Saikkonen, 2013), empirical research from Taiwan illustrates the agency of
198 citizens, communities and independent experts to facilitate change by working within existing
199 systems and structures.

200

201 Second is Huang & Hsu's (2017) reflection on the Dapu incident – a protest against the
202 development of a science-based industrial park which was argued to have detrimental effects on
203 neighbouring and already disenfranchised communities. Huang & Hsu argue that whilst the park,

204 and the national spatial planning system within which it is embedded, are developed under the
205 goal of sustainable development, this has the effect of sidelining rights and justice concerns at the
206 local level for already marginalised peoples. Building on understandings of the need for more
207 nuanced attention to scale within environmental justice thinking (Beebeejaun, 2019), the Dapu
208 incident demonstrates in a very empirical way how in a newly emerging economy context,
209 national-level sustainability objectives can conflict with local conceptualisations of sustainability
210 and justice. Moreover, the Dapu incident and also the controversy over indigenous opposition to
211 nuclear waste disposal on Orchid Island (Fan, 2017) demonstrate how national-level ideas of
212 planning and policy in the name of progress and sustainable development may run up against
213 indigenous world views; and also reflect the effects of colonisation on knowledge, continuity and
214 land management issues (e.g. Stocker, Collard, & Rooney, 2016).

215

216 **4. Conclusion**

217

218 Whilst a significant proportion of environmental social science research published by Taiwanese
219 scholars in Chinese-language journals is focused on Taiwan-specific case studies, this does not
220 mean the research is not of international interest or significance. Section 2 illustrates how such
221 research has been heavily informed by – and feeds back into – thinking from STS (and
222 environmental social science more broadly) which is already well known in the international
223 research community. Indeed, Section 3 shows that insights from in-depth and case-specific
224 research within Taiwan can contribute learnings to extant English-language thought, especially
225 as regards indigenous and marginalised people’s land issues and the politics of environmental
226 impact assessment processes. Taiwan’s vibrant domestic environmental social science
227 community means the country has a corpus of knowledge on the interface between society,
228 environment, democratisation and industrialisation, which has significant value to analogous
229 settings globally.

230

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