

1 **Mining, risk and climate resilience in the 'other' Pacific: Latin American lessons for**  
2 **the South Pacific**

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9 Islands

10

11 **Abstract**

12

13 We suggest the value of considering Pacific Latin America and the South Pacific in  
14 relationship to each other in contexts of climate change and investment in extractive  
15 industry. The paper explores the interactions between extractive industry, climate change  
16 and environmental governance through the lenses of double exposure, double  
17 movements, resilience and risk. The first part of the paper addresses the nature and scope  
18 of investments in extractive industries in this “other Pacific”. The geography of these  
19 investments is changing the actual and perceived distribution of exposure and risk in the  
20 region. The nature of this risk is also being affected by climate change and its  
21 implications for the geographies of water and land-use. Much of the contention  
22 surrounding extractive industries can be understood as conflicts over the unequal  
23 distribution of this risk, how to interpret its significance and the ways in which resilience

24 might be enhanced to respond to it. The final section of the paper discusses the ways in  
25 which mining governance and governance for resilience converge and, on the basis of  
26 recent experiences in El Salvador, analyzes the difficulties in governing extractive  
27 industry in a way that manages risk and builds resilience.

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46

47 **Double Exposures and Double Movements**

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49 This paper addresses the relationships between two accelerating global phenomena:  
50 investment in the extraction of underground natural resources, specifically minerals and  
51 hydrocarbons; and climate change. While the paper focuses on South and Central  
52 America, the argument is also presaged on the idea that these phenomena connect the  
53 South Pacific and Pacific Latin America in significant ways. Each region is particularly  
54 vulnerable to climate change and has significant investment in mining. Indeed,  
55 companies based in both regions invest in extracting each other's mineral resources.<sup>1</sup>  
56 There is a case to be made that this mining investment has implications for building  
57 resilience in the face of a changing climate.

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59 In these contexts, governing resource extraction can be viewed as a form of governing for  
60 resilience under conditions of *double exposure* and *double movement*. The notion of  
61 "*double exposure*" (O'Brien and Leichenko, 2008) refers to the idea that places and  
62 peoples are simultaneously exposed to economic globalization and climate change, and  
63 that these processes produce vulnerabilities and influence the options that actors might  
64 pursue in the face of these vulnerabilities. Importantly, the vulnerabilities produced tend  
65 to compound and aggravate each other, either because they overlap in space or interact  
66 across space. In the case of extractive industry expansion under conditions of climate

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<sup>1</sup> The Salvadoran example at the end of the paper is one instance of this. There is a particularly high level of Australian investment in Latin American mining. Latin American investment in the Pacific is on a far smaller scale, though the Brazilian company Vale, for one, has significant investments in New Caledonia (Lemour et al, 2013a; 2013b).

67 change, these compounded vulnerabilities are especially related to land and water.  
68 Polanyi (1954) introduced the idea of “*double movement*” to conceptualize the  
69 relationship between the processes of deepening commoditization that characterize  
70 capitalist expansion and societal efforts to rein in that commoditization. That is, the  
71 former movement extends the frontier of the market while the latter seeks to moderate  
72 this extension and govern its adverse consequences. Asymmetries of power that  
73 characterize relationships between national and international institutions as well as  
74 between individual actors within countries present a key challenge to effectively  
75 governing for resilience under these conditions.

76

77 Figure 1 captures these relationships in simple graphical form. New forms of exposure  
78 are being driven by global climate change on the one hand, and by increased investment  
79 in mining (economic globalization) on the other. This increased exposure demands  
80 efforts to govern for increased resilience at a range of levels: from the individual and  
81 household through to the national government. The possibility of governing for  
82 increased resilience is, however, causally related to the very same investment in the  
83 mineral economy driving increased exposure. There are several factors at play here,  
84 some of which enhance the governance possibilities others of which undermine them.  
85 Figure 1 notes four such factors: the political settlements (Hickey, Sen and Bukenya,  
86 2015; Bebbington, 2015; Khan, 2010) within which mineral expansion is occurring; the  
87 level of social conflict surrounding this expansion; the fiscal and other resources  
88 generated by the mining economy, as well as the rules governing who controls access to

89 these resources; and the ideas and imaginations of “development” that undergird and are  
90 accentuated by mineral expansion.

91

92 The remainder of this paper is organized around the framework presented in Figure 1. In  
93 the following two sections we discuss the two drivers of exposure, climate change and  
94 expanded investment in mining, and outline some of the risks that these are producing.

95 The bulk of the discussion deals with Peru and El Salvador, though we also make some  
96 cross-references to the South Pacific. In the fourth section we discuss in more detail how  
97 the political and economic relationships surrounding expanded investment in mining can  
98 themselves complicate efforts to govern for the risks generated by this same process of  
99 intensified resource extraction. We go on to discuss El Salvador’s efforts to govern for  
100 resilience in the face of such pressures, focusing particularly on how the national  
101 government has approached mining regulation within a more general strategy of  
102 environmental governance that seeks to enhance resilience in the face of climate change.  
103 The discussion also explores several of the political economy and institutional constraints  
104 acting on these efforts. The focus on El Salvador is especially appropriate given the  
105 background interest of the paper in the relevance of Latin American experience to the  
106 South Pacific, and vice-versa. El Salvador shares particularly severe climate change  
107 vulnerability with many parts of the South Pacific, and with respect to many of the same  
108 specific areas of exposure (Alliance Development Works, 2012).

109

110 We delay further theoretical discussion until the conclusion, where we suggest that in  
111 addition to constituting insight into an urgent policy challenge, these efforts to govern

112 mining in ways that respond to climate change suggest the manner in which micro-  
113 (Horowitz, 2008, 2010) *and* macro-political ecologies of resource extraction interact to  
114 produce particular regimes of resource governance.

115

116 **Insert Figure 1**

117

### 118 **Climate Risk in Pacific Latin America**

119

120 The World Risk Index (WRI), a collaboration between the United Nations University,  
121 Alliance Development Works, and The Nature Conservancy seeks to rank the world's  
122 countries according to levels of risk. Risk is understood as a function of: *exposure* to  
123 natural hazards such as earthquakes, cyclones, flooding, drought, and sea level rise;  
124 *susceptibility* (which depends on infrastructure, nutrition, shelter and economic context);  
125 *coping capacities* (governance, disaster preparedness, early warning and medical services  
126 etc.); and *adaptive capacities* to deal with climate change and other events (Alliance  
127 Development Works, 2013). In 2012, the WRI concluded that of the 15 countries  
128 deemed most at risk in the world, four were in Latin America, five were island states in  
129 the Pacific and four were in Southeast Asia.<sup>2</sup> The pattern in its 2014 report (Alliance  
130 Development Works, 2015: 9) was much the same, with Central America deemed slightly  
131 riskier than in 2012, while Fiji no longer figured in the top 15. The 2014 report also

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<sup>2</sup> The countries were (with rankings in parentheses): in Latin America, Guatemala (ranked 4<sup>th</sup>), Costa Rica (7), El Salvador (10), Nicaragua (14); Pacific Island states, Vanuatu (1), Tonga (2), the Solomon Islands (6), Fiji (15) and Papua New Guinea (12); and in Southeast Asia, Philippines (3), Cambodia (8), Timor-Leste (9) and Brunei Darussalam (11).

132 identified Peru and Colombia as high-risk countries, partly because of the greater  
133 emphasis that that year's report placed on urban risk.

134

135 While rankings ultimately depend on how risk is defined and the differential quality of  
136 data across countries, the vulnerability of the Pacific Islands, Central America and El  
137 Salvador is noted by a variety of other assessments as well.<sup>3</sup> The World Bank's Global  
138 Facility for Disaster Reduction and Recovery (2010), for instance, concludes that fully  
139 88.7% of El Salvador's territory, 95.4 % of its population and 96.4% of its gross  
140 domestic product is at risk due, largely, to climate change and reduced resilience. Indeed,  
141 in 2010, then El Salvadoran President Funes stated: "We are vulnerable in the first place,  
142 to the changing extreme and more frequent natural phenomena that threaten the life of  
143 our communities and jeopardize governments' capacity to respond" (Funes, 20 July,  
144 2010).

145

146 As one dimension of the sorts of risks to which Funes was referring, the frequency of  
147 extreme rainfall events<sup>4</sup> in El Salvador has increased exponentially since the 1960s  
148 (Figure 2).<sup>5</sup> This increase reflects, in particular, a marked jump in tropical cyclones from  
149 the Pacific Ocean. These extreme events have led to catastrophic flooding, landslips and

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<sup>3</sup> For instance: Human Development Index (HDI) developed by UNDP, the Climate and Regional Economics of Development Vulnerability Index (VI-CRED) by the Stockholm Environmental Institute, the Climate Change Vulnerability Index (CCVI) by Maplecroft, Global Adaptation Index (GAIN) by the Global Adaptation Initiative, and the Climate Vulnerability Monitor (CVM) by DARA.

<sup>4</sup> Defined as events depositing a country average of at least 10 cm of rain in 24 hour periods and more than 35 cm in 72 hour periods.

<sup>5</sup> Figure 2 is based on a graphic produced by the Minister of Environment and Natural Resources of the Government of El Salvador.

150 loss of life, and constitute an increasingly frequent destabilizing factor in an already  
151 vulnerable landscape. For instance, between the 10th and 19th of October, 2011,  
152 Tropical Depression 12E dropped 762 mm of rain (averaged across the country): put  
153 another way, 42% of the annual average precipitation for the period between 1971-2000  
154 fell in one single event. In just three events between 2009 and 2011 (Low E96/Ida,  
155 Tropical Storm Agatha and Tropical Depression 12E), loss and damage was calculated at  
156 \$1,267 million (5.9% of 2010 GDP), according to a formal evaluation conducted jointly  
157 by the UN Economic Commission on Latin America (ECLAC) and the Government of El  
158 Salvador.<sup>6</sup> More than 250 people died in El Salvador during those three events. This  
159 trend towards more frequent and more costly, higher magnitude, disaster-related weather  
160 events is apparent across Central America. A recent study by Garlati (2013) notes that  
161 that flooding events in the region increased from around 200 p.a. during the 1970s to over  
162 1100 p.a. in the 2000s: storm and landslide events also showed significant increase over  
163 the same period.

164

**Insert Figure 2**

166

167

168 If one source of climate change driven risk is episodes of too much water, another is too  
169 little water. In a paper dealing with drought in the US South West, Ault et al. (2014)  
170 estimate the risk of decadal drought as being at least 70% and their data imply that the  
171 risks in much of Central and South America are at least as high. Water-related risk is

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<sup>6</sup> Noted by the Minister for Environment, Herman Rosa.



172 also serious in the Central and Northern Andes, where deglaciation has accelerated over  
173 recent decades. Indeed, Peru's Cordillera Blanca has lost 30% of its glaciated area since  
174 1930 and Colombian glaciers have lost 20-50% of their areas (Schauwecker et al., 2014).  
175 These are significant losses in a context in which coastal areas – where the bulk of the  
176 national population as well as the country's dynamic export agricultural sector are  
177 concentrated—depend considerably on shifting glacial melt for water supply (Bury et al.,  
178 2013). Meanwhile, the IPCC identifies water availability, drought and flooding as  
179 particularly likely risks for South and Central America, together with food insecurity due  
180 to drought and increased temperature (IPCC, 2014).

181

182 Like the Pacific Islands, then, Pacific Latin America is a region of particular vulnerability  
183 to climate change. If in the South Pacific the primary manifestations of this vulnerability  
184 hinge upon sea level rise, coastal flooding and groundwater salinization, in Central  
185 America and the Andes the primary manifestations are a steady trend towards warmer,  
186 drier, water scarce conditions and increasingly frequent high magnitude events  
187 characterized by heavy rainfall, flooding and slope slippage. In the following section we  
188 consider how this form of exposure might interact with changing dynamics in the mining  
189 economy. The precise nature of this interaction will depend on the ways in which overall  
190 tendencies in climate manifest themselves at more local levels (something that is difficult  
191 to model with accuracy at finer spatial resolutions) and how the locally specific  
192 geographies of exposure to climate change interact with the locally specific geographies  
193 of extractive industry.

194

195

196 **Extractive Industry Expansion and Risk: Peru and El Salvador**

197

198 The last two decades have seen a dramatic intensification of investment in extractive  
199 industry in Latin America (Bury and Bebbington, 2013). This has been the case for hard  
200 rock mining and hydrocarbons alike, though here we focus only on mining. The region  
201 now receives around one quarter of global investment in mining exploration, and the  
202 value of mineral exports has increased exponentially (Figure 3, from Bury and  
203 Bebbington, 2013). Indeed, most curves associated with the mining sector since the early  
204 1990s have been exponential in nature, whether one is graphing trends in export value,  
205 area affected by mining licenses, number of mining licenses given, or number of socio-  
206 environmental conflicts related to mining (Bury and Bebbington, 2013). These patterns  
207 are repeated at both national and sub-national scales. Rudas (2011), for instance, has  
208 shown that approved and requested mining licenses in Colombia grew from essentially no  
209 presence in 1990 to covering the larger part of the country's Andean region by 2009 –  
210 even before Colombia declared in its 2010-2014 National Development Plan that mining  
211 would be the primary “locomotive” of national development (Ulloa and Göbel, 2014).<sup>7</sup>  
212 At a completely different scale, in their analysis of one watershed in Ancash, Peru, Bury  
213 et al. (2013) report that “[s]ince 1990, more than 90 percent of all recorded mining claims  
214 were placed in the watershed. In 2010, there were three large mining operations in the  
215 watershed, six new planned projects, twelve mineral processing facilities, and 1,848

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<sup>7</sup> Though in the end, the period 2010-2014 saw little investment in mining projects.

216 active mining claims covering approximately 52 percent (6,111 km<sup>2</sup>) of the drainage  
217 area.”

218

219 In this section we discuss how these trends manifest themselves spatially, and in the  
220 process, produce forms of risk that interact with climate-change generated risks  
221 surrounding agriculture and water. Indeed, The IPCC (2014) identified these as two of  
222 the three main climate change risks for Central and South America (the other being an  
223 expansion of vector-borne diseases). For reasons of space, we limit ourselves to a  
224 discussion of Peru and El Salvador. The former has a long history of mining, while the  
225 latter is currently grappling with a possible surge of mining investment, but has little  
226 experience governing the sector.

227

### 228 *Agriculture*

229

230 Peru has experienced a significant boom in mining investment since the early 1990s. By  
231 2013, the country was the world’s third largest producer of copper, silver, tin and zinc,  
232 and fifth of gold. Exports of copper, iron, gold and other minerals have accounted for  
233 around 60% of the country’s total export earnings, 13% of total foreign investment, 30%  
234 of income taxes and 15% of total tax revenues (Sanborn, 2015). Another measure of this  
235 growth has been the increased acquisition of mining licenses, which grant the holder the  
236 subsoil rights required to carry out exploration work. Figure 4 shows the extent of these  
237 licenses (or concessions) for the whole of Peru.

238

239 Reflecting this steady expansion of mining licenses, the proportion of agricultural land  
240 affected by concessions has also increased significantly, as shown in Figure 5. This  
241 graph is based on the national government’s classification of land according to its  
242 agricultural potential in the country’s three broad eco-regions: the coast, highlands and  
243 eastern rainforest. The proportion of land affected by concessions began to increase  
244 significantly in 2002, with another notable rise after 2007. Given that assessments of  
245 “potential” agricultural land might overstate the areas affected (given that not all potential  
246 land is actually turned to agricultural use), we also assessed the percentage of “actual”  
247 agricultural land affected by concessions. This is a more challenging task as actual  
248 agricultural land was determined on the basis of commercially available remotely sensed  
249 data. This data understates the extent of actively managed agricultural land because it  
250 does not pick up grazing land nor that lying in fallow as part of rotational cycles.  
251 Nonetheless, the overlaps suggest similar percentages of agricultural land affected by  
252 concessions, again with marked increases beginning around 2002 and then again in 2007  
253 (Bebbington, Cuba and Rogan, 2014a).

254

255 The extent of these overlaps is significant and speaks to a double exposure that is  
256 important both at the national and subnational level. Such overlaps also speak directly to  
257 debates in *Asia Pacific Viewpoint* on “contested geographies of coexistence in natural  
258 resource management” (Howitt et al., 2013) contestations that involved not merely the  
259 overlapping of land use claims, but also of ontologies of the environment and landscape  
260 (see also Marsh, 2013 and Doohan, 2013). It should be noted, however, that the extent to  
261 which the exposure and contestation produced by these overlaps is real versus potential is

262 a point of debate. It could be argued that the mere existence of a mining license in a  
263 given area means very little, given that other forms of land-use and livelihood are only  
264 affected in the cases where exploration actually begins, and only significantly affected in  
265 the relatively small number of cases in which exploration culminates in an active mine  
266 proposal. This line of reasoning would thus conclude that the geographical reach of the  
267 double exposure is limited.

268

269 Conversely, if mere knowledge of the existence of a concession changes farmer  
270 incentives and practices, then there may be an effect even without exploratory activities  
271 being present. Perhaps more significantly, the concession constitutes a legal right to  
272 subsurface resources, thus affecting the security of tenure and livelihood of the owners of  
273 surface rights. The existence of such concessions indicates the willingness of some parts  
274 of government to facilitate the expansion of mining activities into the areas so licensed.  
275 Thus even if there is debate about the possible physical effects of a mining license,  
276 the actual geography of concessions tells us much about the functioning and priorities of  
277 a planning system.

278

279 *Water*

280

281 Similar overlay exercises can be conducted for water resources, distinguishing between  
282 areas at risk of increased competition over resources and areas at risk of contamination of

283 water.<sup>8,9</sup> To assess potential pressure on the water resource base, mining concessions can  
284 be overlain onto drainage basin maps to reveal the percentage of basins that have been  
285 licensed for possible mining activity. Figure 6 highlights this issue for the whole of Peru  
286 from 1992 to 2011 and reveals that more than 36% of most coastal and highland drainage  
287 basins are occupied by concessions, with still higher percentages in other regions of the  
288 country. This concession-watershed overlap can, in turn, be overlain with maps of  
289 potential or agricultural land-use to identify those areas of agricultural production where  
290 water resources may become subject to particularly intense competition between  
291 agriculture, mining and urban settlements. This implies that in locations with especially  
292 significant competition, there might be greater risk of adverse implications for  
293 agricultural production and levels of social conflict over water (Boelens et al., 2013; Bury  
294 et al., 2013)

295

296 Similar patterns emerge from an assessment of the percentage of high Andean wetlands  
297 and grasslands (ecosystems that are deemed to be important sources of water for  
298 downstream areas) affected by concessions (Bebbington, Cuba and Rogan, 2014b).

299 These patterns are all the more concerning when we take into account that the Peruvian  
300 coast is divided between desert, high population areas, and the heart of the country's

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<sup>8</sup> Assessing water resources at risk of contamination can be done by mapping streamflow downstream of mine sites and the areas that it serves for human and ecosystem use (Bebbington, Cuba and Rogan, 2014a). This in turn can be overlain with areas of potential or agricultural land-use to identify agricultural sites whose water resources are at risk of contamination.

<sup>9</sup> It is important to note that agriculture, overall, uses much more water than does mining and that agriculture can also be a serious source of water contamination. The point here is not to overlook this fact, but to focus attention on the additional exposure that could result from the introduction of mining into areas where water resources are already used by other economic and social activities.

301 export-oriented agricultural sector. These actual and perceived risks for water resources  
302 have been a recurring theme in the growing level of conflict surrounding expansion of the  
303 mining sector in Latin America (Perreault, 2014; de Echave et al., 2008; Bebbington and  
304 Williams, 2008; Bebbington, 2012).

305

306 This potential pressure on water resources is particularly significant in contexts where  
307 they are already under pressure from the accumulated impacts of prior human use.

308 According to 2007 data from the government system for monitoring water quality, only  
309 20% of surface water in El Salvador can be potabilized by conventional methods, and  
310 fully 76% is not fit for use in irrigation (TAU, 2011). Meanwhile over the last three  
311 decades, river discharge declined by 80% in the north of the country, and by 30 to 50% in  
312 the rest of the country (TAU, 2011).<sup>10</sup> These statistics reflect the combined effect of  
313 widespread deforestation and land cover change in the country (notwithstanding early  
314 indications of some forest rebound: Hecht et al., 2006), as well as of completely  
315 underdeveloped systems of municipal and industrial waste and wastewater management.  
316 Under such conditions, while the extent of mining concessions is much less expansive in  
317 El Salvador (see below) than in Peru, the risks implied may still be quite significant.

318

319

## 320 **Mining Expansion and Governing for Resilience under Conditions of Climate**

### 321 **Change**

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<sup>10</sup> The one exception was the river feeding San Salvador where discharge has increased – but this is because the river has been increasingly fed by water drawn from other basins.

323 Both climate change and expanded investment in the mining industry have, then,  
324 generated both longstanding and new forms of actual or potential risk for different  
325 countries in Latin America (and, though we have not discussed it here, the Pacific also:  
326 Adger, Barnett, Chapin, & Ellemor, 2011; Banks, 2002; Barnett, 2011; Evans, 2010;  
327 Hoeke et al., 2013; Lata & Nunn, 2012; Le Meur, Ballard, Banks, & Sourisseau, 2013; Le  
328 Meur, Horowitz, & Mennesson, 2013). The geographies of these risks overlap and  
329 interact such that one can reasonably speak of two levels of double exposure: first, at a  
330 country level, as national institutions have to respond to the aggregate and interacting  
331 effects of these risks; and second, at the level of specific territories where pressures  
332 induced by climate change and mining coincide in space. In some sense, localized  
333 conflict and maneuvers by subnational authorities reflect efforts to govern these  
334 decentralized double exposures while machinations within ministries, executive offices  
335 and other national institutions constitute attempts to govern exposures at a macro-scale.  
336 These two governance responses—each elements of a sort of Polanyian counter-  
337 movement—interact with each other.

338

339 As noted earlier, the nature of these responses, and the extent to which they succeed in  
340 inducing new modes of governing for resilience, are in turn causally related in four key  
341 ways to the very process of mining expansion that they seek to govern. First, they are  
342 related financially. The extent to which government can invest in building capacities to  
343 respond to climate change depends entirely on the revenue available to government (for  
344 the case of investment in human development, see UNDP, 2014). Thus, extractive  
345 activities can only contribute to a fiscal capacity to respond if they first grow to the point



346 where they generate this tax and royalty revenue for the state. This argument often  
347 weighs heavily in political discussions of resource extraction as actors such as Ministries  
348 of Finance insist on first promoting investment in order to generate revenue. Governance  
349 for resilience thus comes after governance for investment.<sup>11</sup>  
350  
351 Second, any efforts to build capacities to govern for resilience are caught up within the  
352 same asymmetrical relations of power within which the extractive economy has  
353 expanded. These relations of power—insofar as they have supported and been supported  
354 by the growth of resource extraction—are likely to resist governance responses that might  
355 constrain this growth. One particularly brazen demonstration of this occurred in 2014,  
356 when the Peruvian Ministry of Economy and Finance encroached upon the authority of  
357 the Ministry of Environment in order to simplify environmental permissions for mining  
358 in the name of economic growth (de Echave, 2014; MEF, 2014). Not all responses will  
359 necessarily be so blunt—more often they involve public criticism of, or budget  
360 constraints to, environmental regulations or free prior and informed consent (FPIC)  
361 requirements<sup>12</sup> The more general point, though, is that the wider political settlement that  
362 made mining growth possible constitutes the same set of political relationships with  
363 which any countermovement has to contend.  
364

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<sup>11</sup> Revenues have also been shown to affect capacities to govern for resilience in other ways. For instance, Arellano-Yanguas (2012, 2011) has shown that in Peru, the transfer of extraction-generated revenues back to the regions in which extraction occurs has often given rise to conflict, as different groups seek access to the resources or suspect local authorities of not managing them honestly. This general proclivity to conflict, oriented as it is to accessing rents, complicates efforts to build other governing capacities.

<sup>12</sup> Though this may not always be the case. For example, the pro-extraction government of Ecuador has also increased the Ministry of Environment's budget.

365 Third, governance responses are affected by the conflict that often surrounds mineral  
366 expansion, as well as, in some instances, longer histories of violence that have imparted  
367 certain meanings to more recent conflict around extraction. The relationships between  
368 this conflict and governance possibilities are complex. In some cases, the conflict  
369 becomes so severe that it challenges the profitability of resource extraction and so elicits  
370 institutional change (Franks et al., 2014; Bebbington, 2012). In other cases, conflict may  
371 be interpreted through historical lenses (e.g. of terrorism or civil war) that also affect  
372 responses. In El Salvador (see below), the recent history of civil war was interpreted as  
373 having left a legacy that further reduced country resilience (GoES, 2011). This  
374 interpretation supported arguments favoring more strict regulation of mining. The history  
375 of Bougainville in Papua Guinea is another instance where conflict has shaped thinking  
376 about mining and any effort to govern it. Similarly, in the Solomon Islands, broad  
377 conflict between Guadalcanal and Malaitan militants—including over mining—led to a  
378 raid of the Gold Ridge mine in search of weapons and vehicles to use in the fighting  
379 (Evans, 2010).

380

381 Fourth, efforts to govern for resilience are also affected by the transnational apparatus  
382 within which mineral expansion occurs. There are many components to these apparatus,  
383 and their weight varies from country to country. They include: the influence and thinking  
384 of international financial institutions; the weight of key bilateral relationships and their  
385 influence on how companies from that country are governed; the influence and ideas of  
386 transnational corporations *and* civil society; and, not least, the transnational legal  
387 architecture designed to facilitate foreign direct investment and trade. This last apparatus

388 in particular tends to constrain national sovereignty to strengthen institutions of  
389 environmental governance and law.  
390  
391 In the following section, we will expound upon these four causal interactions by  
392 analyzing recent efforts to regulate mining expansion in El Salvador. Within the larger  
393 framework of the paper, these efforts constitute an attempt to address the types of  
394 pressure on water resources, agriculture and society that are reflected in the maps that we  
395 have discussed above. While those maps helped visualize processes in the Andes, not  
396 dissimilar patterns are also apparent in El Salvador. We have chosen to focus the  
397 remainder of the paper on governance responses in El Salvador because the case is  
398 particularly revealing and one on which we have been able to garner relatively detailed  
399 insights.<sup>13</sup>

400

401 *El Salvador: seeking resilience against the odds*

402

403 We have already noted some of the dimensions of double exposure in El Salvador. While  
404 not all aspects of economic globalization necessarily aggravate country risk, a mining  
405 economy might contribute to ungovernable risk based on the overall level of vulnerability  
406 in the country. This has been the case in El Salvador where diverse vulnerabilities have

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<sup>13</sup> This section draws heavily on Bebbington's own direct involvement in some of the processes discussed here, in particular: discussions within El Salvador's Ministry of Environment regarding strategies for environmental governance under conditions of climate change; the implementation of a Strategic Environmental Assessment of the mining sector; and the background work for the preparation of draft legislation regarding the regulation of mining. In this work, he collaborated directly with the 2009-2014 FMLN government, above all with the Ministry of Environment – this collaboration has continued with the new FMLN government elected in 2014.

407 been produced by long histories of inequality and violence, profound transformation of  
408 land cover (Hecht et al. 2006; Browning, 1971) and reduction of areas covered by natural  
409 ecosystems.<sup>14</sup> These histories culminated in the 1980-92 civil war that left a heritage of  
410 some 75,000 killed, a million or so displaced and notorious human rights violations  
411 (Skidmore, 2010). The Peace Accords that brought an end to the war in 1992 addressed a  
412 series of political and social concerns, in particular allowing the umbrella organization of  
413 the guerrilla groups, the FMLN, to become a legitimate political party. The accords left  
414 untouched the basic neoliberal organization of the economy and the social control of the  
415 state, which remained in the hands of the economically conservative ARENA party from  
416 1989 to 2009.

417

418 A series of policy reforms passed after the Peace Accords facilitated mining investment  
419 (Spalding, 2013). In particular, a new mining code passed in 1995/6 and revised in 2001  
420 reduced royalties from 4% to 2%. In 1999, the government passed a new investment law  
421 “which allowed foreign investors to bring disputes to the World Bank’s International  
422 Center for the Settlement of Investment Disputes [ICSID].... rather than depend on local  
423 courts” (Spalding, 2013: 27). By 2006, eight international mining companies held  
424 investments in the country (Spalding, 2013) and by 2007, the state had granted twenty-  
425 nine exploration licenses (Cartagena, 2009). One such license paved the way for the El  
426 Dorado mining project in the Department of Cabañas, on the site of a former mine from  
427 the 1940s. Exploration began there in 1993, and in 2003 the project was subsequently  
428 acquired by the Canadian company Pacific Rim (Cartagena, 2009).

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<sup>14</sup> No protected area in the country is larger than 10,000 hectares, and 81% of these are smaller than 500 hectares.

429

430 Initial mining activity scarcely appeared on the radar of civil society organizations, but  
431 this began to change by the early 2000s, when the Roman Catholic Church and several  
432 NGOs created the National Forum Against Metal Mining (Cartagena, 2009; Steiner,  
433 2010; Spalding, 2013). This platform articulated emerging local conflicts, including in  
434 Cabañas, and received important international support from, among others, Oxfam  
435 America—an organization that had for some time been working on mining in Latin  
436 America as an issue of rights and livelihoods. Over the next few years, conflicts over  
437 mining projects became more intense, and involved both deaths<sup>15</sup> and mobilizations.  
438 This led the Minister of Environment of the pro-business ARENA government, Hugo  
439 Barrera, to decide in 2007 to stop processing any Environmental Impact Assessments  
440 (EIAs) for mining projects on the grounds that the sector had become too conflictive and  
441 the impacts were potentially serious. This was not a formal moratorium on mining so  
442 much as a decision to cease reviewing project requests. One such unprocessed EIA was  
443 that of Pacific Rim’s El Dorado Project. Pacific Rim took this to be a politically  
444 motivated and unjustified infringement of its investment rights under both domestic  
445 legislation and the Central American Free Trade Area (CAFTA) treaty and on December  
446 9th, 2008, filed notice of its intent to sue for damages at ICSID (ITA, 2014). Another  
447 company operating in the east of the country, the US-based Commerce Group, did  
448 likewise.

449

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<sup>15</sup> It is not at all clear that the deaths of mining activists were because of the mining projects, though they were often interpreted as such.

450 By this time, national and local debates over mining had become of such significance that  
451 they influenced the language of the national business community and the 2009  
452 presidential election campaigns. For example, a representative of the National  
453 Association of Private Enterprise commented, “We are not going to go out and support  
454 Pacific Rim”.<sup>16</sup> For his part, Mauricio Funes, the presidential candidate for the FMLN,  
455 declared that if elected he would ban metallic mining in El Salvador. On March 15<sup>th</sup>  
456 2009 Funes was elected in what was a historic first victory for the FMLN; six weeks  
457 later, on April 30, 2009, Pacific Rim served the government of El Salvador with notice  
458 that it was taking its complaint to arbitration (Crowell & Moring, 2009).

459

460 Funes was hardly the only successful presidential candidate in Latin America to have  
461 made campaign commitments to act assertively against mining and mining companies.  
462 Alan Garcia and Ollanta Humala in Peru, and Rafael Correa in Ecuador, have each made  
463 similarly stern commitments only to shift their stance once in office and become staunch  
464 supporters of mining (Bebbington, 2009). Such a shift was, however, not so easy for  
465 Funes because, regardless of what his personal commitments may have been (and they  
466 may well have been skeptical of mining), he did not share the same room for political  
467 maneuvering that his peers had enjoyed. A TV host, he had not made his way up through  
468 the ranks of the FMLN, but had instead been chosen as the party’s candidate because of  
469 his electability. Once in office, he therefore needed to continue building legitimacy with  
470 members of the party who were skeptical of having a journalist rather than a former  
471 guerrilla as their candidate. The need to build this legitimacy was particularly pressing

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<sup>16</sup> In Spanish: “No vamos a salir a apoyar a Pacific Rim.” Interview with Bebbington in San Salvador, July 2010.

472 because Funes began government with a cabinet that included many similar non-militant  
473 technocratic members. This was, then, a governing apparatus of which the party bases  
474 were skeptical but which at the same time needed the party in order to act legislatively.  
475 These party bases were, moreover, largely opposed to mining. Funes had to listen.  
476  
477 At the same time as working through a response to this national mining conflict, Funes’  
478 cabinet had to worry about a stalling post-crisis economy suffering from sharp declines in  
479 the volume of remittances sent home by Salvadorans living in the US (the country’s main  
480 source of foreign currency), growing unemployment coupled with serious gang  
481 violence,<sup>17</sup> a domestic entrepreneurial elite that distrusted Funes and on whom he  
482 depended for investment, and not least, the brewing case in ICSID. It fell largely to the  
483 Ministers of Environment and of Economy to work out how to handle the mining  
484 question in this context, though they had to do so in a way that would be endorsed by  
485 Funes and his two Prime Ministers.<sup>18</sup> Both ministers<sup>19</sup> were former  
486 researchers/academics and neither belonged to the FMLN. At a personal level they  
487 doubted that opening up a mining economy would be sensible for the country; they had  
488 the sense—one more intuitively, the other more analytically—that the environmental

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<sup>17</sup> Job creation was still an urgent concern at the end of the government. A senior member of the team preparing the FMLN’s agenda for the 2014 elections commented that: “Employment is the principal demand, in all the surveys.” He noted, furthermore, that the business sector had taken advantage of this, linking job creation to investment and environmental regulation as an obstacle to investment and their job creation.

<sup>18</sup> Technically these positions are referred to as “Secretaries”: the technical secretary, responsible for overseeing finance and economic strategy, and the political affairs secretary, responsible for state-society relations and securing the political viability of the government.

<sup>19</sup> Herman Rosa Chávez, Minister of Environment; Hector Dada Hirezi, Minister of Economy.

489 risks would be too great. However, the broader political economy context—and  
490 especially the arbitration at ICSID of Pacific Rim’s complaint that the Government of El  
491 Salvador had violated their investment rights under CAFTA and Salvadoran law<sup>20</sup>—did  
492 not allow for legislation that would immediately appease the demands of the FMLN  
493 bases and anti-mining movements. Legal and political calculations indicated that a  
494 quickly passed law banning mining would weaken El Salvador’s position in the  
495 arbitration because it would lend credence to Pacific Rim’s assertion that the  
496 government’s refusal to process the company’s EIA had been arbitrary and politicized  
497 rather than technically grounded. At the same time, such a law would convey to the  
498 national capitalist class that the FMLN government was disposed to override contractual  
499 commitments when politically expedient. Such a message would only increase the  
500 likelihood of the class boycotting investment, which the government could ill afford. In  
501 the light of such calculations, the ministerial team opted to commission a Strategic  
502 Environmental Assessment (SEA) of the whole mining sector (a process that had been  
503 initiated under the ARENA government) on the grounds that this would provide an  
504 independent, technical view of the risks and benefits associated with mining and that this  
505 technical view could serve as the basis of any subsequent legislation (Achtenberg, 2011).

506

507 If the SEA was affected partly by these calculations, it also went ahead in a context in  
508 which the new Ministry of Environment (MARN)<sup>21</sup> was actively fostering national and  
509 cabinet debate on the climate change risks facing El Salvador. The Ministry was aided in

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<sup>20</sup> One of the Ministers referred to the Central America Free Trade Agreement with the US as an “absolute defense of all companies registered in the US.” ICSID is the venue at which CAFTA disputes are arbitrated.

<sup>21</sup> The Ministerio de Ambiente y Recursos Naturales.



510 this effort by nature itself – in particular the flurry of high magnitude rainfall events and  
511 associated human tragedies and economic losses that occurred in the first two years of the  
512 new government. These storms made clear that El Salvador’s landscape was vulnerable  
513 to landslides and severe flooding in the face of high magnitude events. The experience  
514 further endorsed the minister’s view that risk management (“*gestión de riesgos*”) should  
515 be the key theme underlying the ministry’s work. More broadly, the minister adopted an  
516 explicit strategy to insert risk management into the language used by the president’s  
517 economic team,<sup>22</sup> on the grounds that it should be at the core of any development policy  
518 for the country. Indeed, the country’s five-year plan noted the need to “rebuild the social  
519 and productive fabric that has been damaged by natural phenomena, and to build an  
520 effective system for civil protection, early warning systems and capabilities to prevent  
521 and manage risks across the country” (Gobierno de El Salvador, 2010: 54).<sup>23</sup> Risk and its  
522 reduction continue to be visible themes in the most recent five-year plan (Gobierno de El  
523 Salvador, 2015).

524

525 The SEA was put out to tender and won by a Spanish consulting company that then  
526 compiled a team including mining economists, biologists, social scientists, lawyers and  
527 organizational analysts. Many members were based outside the country, so travel  
528 complicated coordination both within the team and with the Ministry. In addition, team  
529 members were not of the same mind on mining and ranged from true believers to radical

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<sup>22</sup> Interview in 2010. Four years later, a senior member of the team preparing the FMLN’s electoral platform for 2014 said that “*gestión de riesgos*” and disaster responsiveness had indeed, been one of the Ministry’s great achievements.

<sup>23</sup> The Spanish is: “Reconstruir el tejido social y productivo dañado por fenómenos naturales y desplegar en todo el territorio nacional el sistema de protección civil y un efectivo sistema de alerta temprana y de prevención y de manejo de riesgos.”

530 skeptics. At the same time, the team had to negotiate its reports with an oversight  
531 committee that had to endorse their quality, if not agree with all of their contents.<sup>24</sup>  
532  
533 These negotiations were not always straightforward, as opinions differed on costs, the  
534 nature of evidence required to substantiate arguments and the role of public consultation  
535 within the overall SEA. The consultant was, understandably, conscious of controlling  
536 costs, while the committee (who did not have to worry about cost) sought a more  
537 consultative process. For these and other reasons, the SEA process took well over a year,  
538 between contracting the consultants and production of the final report. This relative  
539 slowness itself fed doubts in the anti-mining movement that the government was  
540 committed to any serious regulation of mining (the demand of the movement) and was  
541 instead using the SEA as a tactic to delay action. As leaders of the Working Group  
542 Against Metallic Mining in El Salvador stated, “If the government has already said there  
543 would be no mining, then why are they doing an SEA? .... the SEA could open a space  
544 for the justification of mining.” Indeed, their reading of the terms of reference for the  
545 SEA was that they revealed “a tendency pointing towards justifying” mining. A program  
546 officer of an international organization close to the Working Group similarly commented  
547 that the SEA was either a trick (“*engaño*”) or at best an attempt to avoid lawsuits. These  
548 concerns were further aggravated by a relative lack of fluid communication between the

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<sup>24</sup> Bebbington chaired this committee: other members were the late, great ecologist Robert Goodland, geochemist Ann Maest and geologist Allan Astorga.

549 minister and movement organizations.<sup>25</sup> Conversely, the Minister kept the Prime  
550 Ministers informed of progress and of emerging arguments.  
551  
552 In the end, the report concluded that while mining *could* be viable in El Salvador, the  
553 conditions required to make it so were nowhere near in place in the country (TAU, 2011).  
554 The report emphasized that El Salvador’s water and landscape resources were already  
555 extremely degraded and vulnerable. Drawing on the government’s national development  
556 plan (Gobierno de El Salvador, 2010), the report also noted that El Salvador was socially  
557 fragile, in part because of the still recent civil war. In this context, the report concluded  
558 that the government would need a range of capacities to plan, monitor, supervise, tax,  
559 consult and negotiate in order to make mining viable—hardly any of which were  
560 currently in place. Put another way, the report argued that El Salvador would simply be  
561 unable to govern for resilience if it were to allow expanded mining investment. The  
562 report’s authors therefore suggested that the most sensible approach was to put all mining  
563 projects on hold until the country had built the capacities it would need to govern mining  
564 for resilience. This would require El Salvador to develop technical expertise; implement  
565 new legislation and tax and royalty systems; elaborate land-use planning procedures that  
566 could handle mining and create geological, hydrological and other information systems,  
567 among other things (TAU, 2011). The SEA’s oversight committee submitted a similar

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<sup>25</sup> It is worth noting that the Minister and representatives of the Mesa did not see this the same way. In some sense, though, these different interpretations are themselves indicative of the difficulty in which these actors had in communicating with each other in ways that were fluid and frank. The Vice-Minister did maintain more fluid lines of communication, reflecting in part her own political background and earlier work in the Fundación Heinrich Boll, the foundation of the German Green Party that is closely linked to the more radical environmental movement in El Salvador. This Vice-Minister is now Minister of Environment under the second FMLN government.

568 argument to the Minister of Environment, though were yet more concerned about the  
569 government's regulatory capacity and overall vulnerability of its human and physical  
570 environments (Bebbington, Goodland and Maest, 2012).

571

572 The minister's initial response to these reports was that their findings meant that the  
573 country really *should* ban mining. This option was soon dismissed by the prime minister  
574 responsible for economy and finance, and was also strongly discouraged by the legal  
575 team, given concerns over the implications of such an action for the ICSID proceedings.  
576 Instead, they decided to prepare draft legislation for an indefinite suspension of all  
577 administrative procedures related to mining projects (in practice an indefinite  
578 moratorium) until the capacities to govern for resilience had been developed. The draft  
579 law proposed that a multi-actor committee (government, civil society, church and  
580 business) would be the mechanism for determining when such capacities had been  
581 achieved.

582

583 The drafting and debate of the law within the national assembly took another several  
584 months, during which time the FMLN lost its clear majority in the assembly in mid-term  
585 elections. Arguably because the government did not sufficiently explain their intent  
586 behind the law to the anti-mining movement,<sup>26</sup> the Mesa were not supportive on the

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<sup>26</sup> For some this was a more general limitation. A senior member of the team preparing the 2014 electoral platform of the FMLN felt that the Ministry had been too technocratically concerned with policy design, and not politically astute enough. Speaking of the Ministry's agenda in 2014 he commented: "now is the time for the ministry to think politically .... MARN's battle is not the law but rather the social legitimacy of what it's doing" ("es el momento que el ministerio piense en lo politico....

587 grounds that they had not been adequately consulted, the law did not propose a ban, and  
588 that anything short of a ban could easily be manipulated into a green light for mining.<sup>27</sup>  
589 Nor did they necessarily accept the argument that a ban would compromise the case  
590 being arbitrated at ICSID, and overall, their deep distrust of both government and  
591 national political elites left them unable to support anything other than a ban. It was  
592 probably also the case that the movement itself found it hard to move beyond its  
593 longstanding frame demanding a ban of mining, and believed that a future, more militant,  
594 FMLN government, would pass far more stringent legislation banning mining (which has  
595 proven not to be the case under the current government, notwithstanding the presence of  
596 former guerrillas in the cabinet and executive office). In the words of one movement  
597 leader, the law was “weak; any future government could change the composition of the  
598 committee [charged with guaranteeing the implementation of the law].”<sup>28</sup> The  
599 movement’s access to key FMLN members of the Legislative Assembly, and (perhaps)  
600 the fact that some movement leaders and members of the assembly shared backgrounds  
601 going back to the civil war, contributed to the law becoming stalled in parliamentary  
602 committees. Meanwhile, the President’s office did not actively push for the law to be  
603 passed, further reducing the political space open to the Ministry of Environment to be  
604 especially assertive in pushing the law. In the end, the micropolitical foundations of an  
605 alliance *within the state* and *between state, legislature and social movements* were never  
606 adequately constructed such that the law could have momentum in the Assembly.

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“la batalla del MARN no es la ley es la legitimidad social de lo que haces”, interview San Salvador, July 2013).

<sup>27</sup> Indeed, the movement then presented its own proposal for a law that would ban mining outright.

<sup>28</sup> Interview with Bebbington, San Salvador, July 2013.

607

608 While this slow drama unfolded, the case in ICSID continued—a background constraint  
609 on political opportunities in El Salvador. The lawyers representing the Government of El  
610 Salvador cast an argument that was part detailed legal reasoning against the legitimacy of  
611 Pacific Rim’s claims, and part sustainability science, with an argument grounded in  
612 notions of resilience and vulnerability. Indeed, a significant part of the lawyers’  
613 argument drew on testimonies submitted by two members of the Oversight Committee<sup>29</sup>  
614 and paralleled the position elaborated in the SEA that El Salvador was so vulnerable that  
615 the decision to suspend mining activities was a technically substantiated one and not an  
616 arbitrary political act. In some sense, this position also constituted an effort to govern for  
617 resilience, in this instance through the institutions of international investment arbitration.

618

619 As the case has moved slowly forward, the damages claimed by Pacific Rim have crept  
620 up from an initial \$77 million to just over \$300 million. At the same time, Pacific Rim  
621 itself—a relatively small operation—was running out of the money necessary to retain its  
622 lawyers. In November 2013, the company was acquired by the Australian mining  
623 company, Oceanagold, for just over US\$8 million (Oceanagold, 2013). If ICSID finds in  
624 favor of Pacific Rim the return on Oceanagold’s investment will be very high, and it is  
625 conceivable that Oceanagold was more interested in acquiring the arbitration case than  
626 the mining project itself. Indeed, in an interview at the mine site in Cabañas, the then  
627 Pacific Rim geologist commented that he felt the project had become so conflictive that it  
628 was going to be difficult for the company to implement even if they did win the

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<sup>29</sup> These were from Robert Goodland and Anthony Bebbington.

629 arbitration. If this is so, then the only value that Pacific Rim had at the point it was  
630 acquired resided in its legal case at ICSID.

631

632 Seven years after the then-Minister of Environment Hugo Barrera refused to process  
633 EIAs for mining projects, El Salvador still has no new mining law and is awaiting the  
634 outcome of what will be a game-changing decision in Washington, DC. Yet in the  
635 interim, there has been an immense amount of negotiation, knowledge politics, network  
636 building, and argument construction (cf. Horowitz, 2010) to try and build forms of  
637 mining governance that can enhance the overall resilience of this at-risk country. That  
638 these forms of governance are yet to be realized institutionally reflects the fact that they  
639 are subject to the same types of transnational relationships, political settlements and  
640 conflicts that underlie the growth of the very mineral economy that they would govern.

641

642

### 643 **Conclusions and Discussion**

644

645 Significant parts of the island Pacific and of Pacific Latin America share a double  
646 exposure to climate change and intensified investment in mining. Governing the drivers  
647 and consequences of this exposure presents an immense challenge and involves, *inter*  
648 *alia*, building institutions of participatory land-use planning, mechanisms of free, prior  
649 and informed consent (FPIC), systems for monitoring and sanctioning the environmental  
650 and social impacts of resource extraction, water governance institutions that ensure its  
651 availability and quality for a range of uses and mechanisms for increasing transparency in

652 the issuing of licenses and management of taxes and royalties. The draft mining  
653 legislation sent by the Ministry of Environment and Natural Resources to the Salvadoran  
654 Legislative Assembly identified the need to progress in each of these domains before El  
655 Salvador would be in a position to govern mining under conditions of post-conflict and  
656 acute climate change risk.

657

658 While these challenges look like mining governance pure and simple, they are  
659 simultaneously means of governing for resilience and vulnerability reduction. At the  
660 same time, they are reformist measures. They do not change the fundamentals of the  
661 working of a capitalist economy and in most instances they would not imply blanket bans  
662 or moratoria on resource extraction. They would, though, seek to enhance capacities of  
663 voice and public sector regulation, and to produce landscapes less vulnerable to  
664 disturbance events of high magnitude and potentially increasing frequency.

665

666 The Salvadoran experience illustrates the extent to which the space for such reforms is  
667 constrained by a combination of the operations of a formal capitalist economy that  
668 generates few jobs, the related calculations of national electoral politics, and a national  
669 and international legal regime that has been designed to reduce the scope of action for  
670 national regulatory authorities. At the same time, it also shows how a particular  
671 convergence of social mobilization, cabinet composition and technical argumentation can  
672 push back against some of these constraints. In this sense, the Salvadoran experience has  
673 been a case study of the double movement in real time, in which the deepening  
674 commoditization of the country's subsoil resources has been accompanied by a



675 combination of protest, electoral change and statecraft that, in different ways, has sought  
676 to limit some of the consequences of that commoditization. In no way revolutionary<sup>30</sup>  
677 (and this has been the great complaint of social movements—a complaint that may turn  
678 out to have unraveled regulatory reforms), this counter-movement was nonetheless real in  
679 both its intent and its potential impact on market deepening.

680

681 The material discussed here has conceptual and methodological implications for ways of  
682 thinking about governing for resilience in the face of double exposure. First, and perhaps  
683 most simply, is that discussions of exposure, vulnerability and resilience must not only be  
684 socially disaggregated (something we have not done in this paper) but also spatially  
685 explicit. In this instance, spatially explicit visualization of the relationships between  
686 mining expansion, agriculture and water resources helps identify areas of particular  
687 vulnerability at the same time as making palpable the importance of more participatory  
688 land-use planning as a component of building resilience. (Such visualization can also be  
689 especially powerful as a means of communicating risk and its geography).

690

691 Second, the Salvadoran case shows the value (though of course, also the difficulty) of  
692 understanding maneuvers within government, political parties, social movements and  
693 companies. This reinforces arguments that have been made elsewhere by political  
694 ecologists and students of development studies (Wolford, 2010; Ferguson and Gupta,  
695 2002; Bebbington et al., 2004)—even if such research has focused primarily on

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<sup>30</sup> Indeed, in one interview a very senior member of the Ministry of Environment said that their goal was “not to change the model, just to reduce irrationality” within it (“no cambiar el modelo, es solo reducir la irracionalidad”: interview, July 2010, San Salvador).

696 development agencies and government and said much less about political parties or  
697 companies (see Kemp, 2014). Still, the point remains that it can be analytically risky to  
698 treat organizations as relative black boxes while at the same time affording interpretations  
699 of actions that emanate from those organizations. In this case, the failure (if that is what  
700 it ends up being) of the legislative proposal for an indefinite suspension of mining in El  
701 Salvador could easily be labeled a bill that was designed to fail, thus reflecting the  
702 proclivities of a government that was too timid and neoliberalized to challenge any sort of  
703 private investment. Reading it this way would not only be inaccurate, but more  
704 significantly would have missed potential causal paths between protest, long-term  
705 learning within a social democratic party, and regulatory change, as well as the extent to  
706 which problems of communication between Ministries and social movement  
707 organizations may ultimately have undermined the potential for governing for resilience.

708

709 Another insight gained from having been able to look within government is that  
710 processes of negotiation matter greatly and that there are arguments to be won, lost and  
711 brokered. Outcomes of these arguments are not necessarily determined by structural  
712 necessity or power-relations. In this instance, it mattered more how the Ministries of  
713 Environment and Economy constructed an argument. However, building an argument  
714 that convinced other parties in government took time, and when it finally became  
715 convincing, the FMLN had lost its majority in the Assembly. This, in turn, further  
716 complicated the possibility of passing legislation to indefinitely suspend all mining  
717 activity in the country. Negotiation thus matters analytically as a manifestation of the  
718 science-policy interface, as a communicative exercise conducted under conditions of

719 asymmetry and, importantly, as a process that unfolds over time. As such, the timing of  
720 negotiation interacts with other temporalities in ways that are causally important.  
721

722 Third, the argument here has implications for the different scales at which political  
723 ecology is conducted, and the different methods open to political ecologists. In a series  
724 of articles dealing with the politics surrounding mining, environmental risk and  
725 conservation in New Caledonia, Leah Horowitz has developed an argument for what she  
726 refers to as “an up-close, micropolitical angle within a political ecology framework, in  
727 what might be termed ‘micropolitical ecology’” (Horowitz, 2008:260; also Horowitz,  
728 2010, 2011). In this spirit, she has sought to understand the indigenous *kanak* society and  
729 environmental movement organizations from within in order to analyze broader dynamics  
730 surrounding mining and natural resource governance (see also Lemeur et al, 2013a, b).  
731 Being attuned to these micro-politics, she shows, helps understand why certain  
732 knowledge claims surrounding mining and its impacts become more or less credible  
733 among different parts of Kanak society, why sub-groups position themselves differently  
734 vis-à-vis mining and how they come to trust or distrust other actors involved in mining  
735 governance. She shows convincingly that this attribution of trust and credibility can then  
736 have material implications for the broader development of large-scale mineral projects.  
737

738 For Horowitz, this project involves analyzing these micro-political tensions “within their  
739 broader historical, social and politico-economic context” (2008: 261): what we might call  
740 a combination of micro and macro-political ecology. This combination can also help  
741 understand the experience of the draft law in El Salvador. On the one hand, the process

742 leading to it involved all manner of micro-political negotiations over knowledge claims,  
743 as well as processes of persuasion in which some actors within government tried to  
744 convince others in different ministries of the extent to which mining might represent  
745 unmanageable levels of risk in contexts of climate change and post-conflict society. On  
746 the other hand, these actors did less to persuade social movement organizations – allied to  
747 the same political party – that to propose legislation that would ban mining outright  
748 would run the risk of losing the claim that Pacific Rim had made against the government.  
749 Indeed, this broader global governance of investment haunted micro-political tensions  
750 surrounding mining within El Salvador. That said, this very macro-political ecology was  
751 not just a structure determining the contours of micro-political debate. Instead, the  
752 arbitration at ICSID was only happening *because of* the conflicts that surrounded Pacific  
753 Rim’s and other mining projects in the country. Had these conflicts not arisen in the first  
754 place, Pacific Rim’s project would have gone ahead and there would have been no  
755 arbitration proceedings. In this sense, the micro and macro political ecologies of the  
756 mining question in El Salvador constituted each other.

757

758 While some of the most intense mining conflict in El Salvador had existed around the  
759 Pacific Rim project, those conflicts were part of broader politics of resource governance  
760 in the country in which this project was one of many, and in which the politics of mining  
761 existed in relation to politics of large scale land cover transformation and an increasingly  
762 well articulated politics of knowledge surrounding climate change risk. There were  
763 therefore many dimensions of the “macro” that impinged on discussions of the proposed  
764 mining law, the implication being that an analytical framework pursuing the co-

765 constitution of the macro and micro-political ecological requires methodologies to grasp  
766 these broader processes. In this paper we have referred to just one such approach—  
767 namely large scale mapping of shifting and overlapping geographies of resource access  
768 and rights. Combining such approaches with micro-political explorations of resource  
769 governance (in this case of policy and legislative conflicts, in Horowitz’s case, of  
770 conflicts within movements) follows the GIS and political ecology agenda laid out by  
771 McCusker and Weiner (McCusker and Weiner, 2003; see also Weiner and Harris, 2003)  
772 and further endorses the claim that political ecologies of the subsoil will often have to be  
773 interdisciplinary and team-based exercises (Bebbington and Bury, 2013; Postigo et al.,  
774 2013).

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