



Oil Extraction and Indigenous Livelihoods in the Northern Ecuadorian Amazon

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Summary. — Globally, the extraction of minerals and fossil fuels is increasingly penetrating into isolated regions inhabited by indigenous peoples, potentially undermining their livelihoods and well-being. To provide new insight to this issue, we draw on a unique longitudinal dataset collected in the Ecuadorian Amazon over an 11-year period from 484 indigenous households with varying degrees of exposure to oil extraction. Fixed and random effects regression models of the consequences of oil activities for livelihood outcomes reveal mixed and multidimensional effects. These results challenge common assumptions about these processes and are only partly consistent with hypotheses drawn from the Dutch disease literature.

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1. INTRODUCTION

In the Amazon Basin and other parts of the world, the large-scale extraction of mineral resources and fossil fuels is increasingly penetrating into isolated and biodiverse regions inhabited by indigenous peoples. This process is of significant global concern due to the dramatic regional-scale economic and environmental changes that can result from these activities, along with the perceived vulnerability of indigenous peoples, their livelihoods, and their lands (O’Faircheallaigh, 2013). These issues are particularly evident in the Western Amazon where areas of oil and gas extraction and exploration overlap with some of the world’s highest concentrations of biodiversity as well as the territories of indigenous peoples living in isolation (Finer, Jenkins, Pimm, Keane, & Ross, 2008). These concerns are exemplified by the attention surrounding the ongoing legal action by residents of the Ecuadorian Amazon against Texaco/Chevron, which was responsible for widespread oil pollution in the region (Kimerling, 1991; Valdivia, 2007).

However, viewed locally, these issues are much more complex (Cepek, 2012). In response to criticism of past practices and the growing influence of environmental and indigenous movements, corporate and state policies on resource extraction have become more favorable to indigenous peoples over time (Billo, 2015; O’Faircheallaigh, 2013). Given the employment opportunities and aid distribution that can result, not all indigenous groups are opposed to the expansion of extractive activities in their territories (Valdivia, 2007). Nonetheless, the social and environmental history of the extractive industries in the Amazon Basin is an ugly one (Bebbington & Bury, 2013), and indigenous peoples remain at an enormous disadvantage when interacting with oil companies and allied state bodies (Sawyer, 2004; Swing, Davidov, & Schwartz, 2012).

These concerns lead to an important question: What can empirical research tell us about the consequences of large-scale resource extraction for the livelihoods of indigenous peoples? A relatively small number of studies have previously addressed this question, primarily using small-scale, qualitative approaches (e.g., Bebbington & Bury, 2013). These studies suggest mixed effects on social and economic outcomes and

negative effects on environmental outcomes, as described in detail below. However, few if any studies have been able to draw robust, regional-scale conclusions about these processes, in part reflecting the absence of large-sample, longitudinal datasets.

To address this lacuna, we use data from a unique longitudinal survey from the Ecuadorian Amazon covering 32 indigenous communities, 484 baseline households, an 11-year period, five ethnicities, and a wide range of exposures to oil exploration and extraction. Drawing on a multilevel, multivariate analytical approach, we use these data to investigate the effects of community-level exposure to oil activities on various dimensions of indigenous livelihoods, including participation in off-farm employment, agriculture, hunting and fishing, as well as ownership of consumer goods. This approach is used to test hypotheses drawn from the literature on Dutch disease effects in oil-dependent economies. Our results suggest that exposure to oil extraction has mixed and multidimensional effects on indigenous livelihoods and has contributed to a shift away from traditional livelihood activities. These findings are consistent with previous studies in other settings and partly consistent with a Dutch disease process, but challenge the common narrative that the consequences of extractive activities for indigenous peoples are entirely negative.

2. LARGE-SCALE RESOURCE EXTRACTION AND INDIGENOUS PEOPLES

Driven by favorable state policies, rising commodity prices, new technologies of extraction, and the depletion of traditional supplies, the extraction of mineral resources and fossil

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fuels by national and transnational companies has expanded globally into isolated areas inhabited by indigenous peoples (O'Faircheallaigh, 2013). Many of these areas are also important reservoirs of biodiversity (Naughton-Treves, Holland, & Brandon, 2005). In most cases, the material consequences of large-scale resource extraction include the construction of transportation infrastructure such as roads, the installation of extraction infrastructure such as mines and wells, the removal of natural vegetation and/or soil, and the introduction of toxic materials such as petroleum and mine tailings (Bebbington & Bury, 2013; O'Rourke and Connolly, 2003). To construct, operate, and maintain this infrastructure, a predominantly non-local staff must also be employed, fed, and housed.

When these activities take place in isolated indigenous territories, they commonly affect populations whose livelihoods are directly dependent on the natural environment, who interact primarily through communal tenure systems and non-market forms of exchange, and who have limited access to external markets, services, and resources (Godoy, Reyes-Garcia, Byron, Leonard, & Vadez, 2005). As such, extractive activities can potentially represent a major transformation of the social, economic, and environmental context, including the introduction of private land tenure and the expansion of incipient local market economies (O'Faircheallaigh, 1998). Compounding these changes, companies may offer access to employment, cash payments, or health and transportation services to indigenous communities in order to facilitate their work and/or to comply with legal or internal mandates for "corporate social responsibility" (Billo, 2015; Hilson, 2012; O'Faircheallaigh, 2013), although the timeframe of these benefits is often short. In other cases, indigenous communities may simply be dispossessed of their traditional lands and resources with little recourse, reflecting their marginal position within national political economies as well as alliances between state bodies and extractive industries (O'Rourke and Connolly, 2003). In either of these cases, protests, displacement, violence, and intra-community feuds can result, potentially halting or curtailing the extractive activity (Haley, 2004; Lu, 2012; Sawyer, 2004).

Building on a definition of livelihoods as "the capabilities, assets and activities required for a means of living" (Chambers & Conway, 1992), the background above and previous work suggest four pathways by which large-scale resource extraction could affect indigenous livelihoods (Bury, 2004). Firstly, extractive activities could lead to a loss of access to natural capital (land, water, and forests), undermining traditional livelihood activities such as wild resource harvesting and small-scale agriculture. Secondly and in contrast, new employment opportunities and access to physical capital (tools, inputs, and infrastructure) could lead to livelihood diversification, increasing cash incomes and access to consumer goods. Thirdly, human capital (health and knowledge) could be undermined by exposure to toxins and new diseases or, alternatively, improved by access to education, information, and health services from the outside world. Fourthly, social capital (trust and social relationships) could suffer from the introduction of inequality and market-based forms of exchange, or could potentially strengthen due to the need to organize engendered by the changing context. Overall, this framework suggests the possibility of mixed and multidimensional effects on indigenous livelihoods, with the legal and institutional context likely to play a central role.

Beyond this broad framework, the most relevant predictive theory for the social impacts of oil is the Dutch disease process as observed by economists and other social scientists (Ross,

2015; Rudel, 2013; Wunder, 2005). In this process, a positive resource shock such as oil extraction alters the economy by increasing the returns to resource-related activities, increasing the returns to non-tradable sectors such as housing, increasing government revenues through taxes on extraction, and inflating prices relative to unaffected areas. Together these effects undermine profitability in tradable sectors such as agriculture unless protected by trade barriers. In the past this framework has primarily been applied to national economies, but it can also be applied to local economies such as an indigenous community. When oil extraction arrives to an indigenous community, the returns to participation in wage labor increase and we would expect household participation to increase as well. In a labor-scarce economy with access to external markets, we would expect indigenous households to lower their participation in traditional productive activities such as fishing, hunting, and swidden agriculture and to buy more food produced outside the community. However the net effects for household wealth and income are expected to be positive, given the creation of lucrative new opportunities with the oil company. Limitations of this theory for the indigenous context are that (1) it does not account for non-economic consequences of oil extraction such as environmental contamination and cultural change, and (2) these effects may not apply to indigenous communities that have excess labor or are remote from external markets. Nonetheless, with the goal of comparing our results to this literature, we derive testable hypotheses below and evaluate them with the subsequent analysis.

Consistent with the livelihoods approach but only partly consistent with the Dutch disease framework, previous small-scale studies of mining in the Andes and oil extraction in the Amazon reveal both mixed and negative effects of resource extraction on indigenous livelihoods. Studies of the Yanacocha gold mine in Cajamarca, Peru, found that local rural communities experienced improvements in economic status and access to education and health services, but declines in water quality, access to land, and intra-community social capital (Bebbington & Bury, 2009; Bury, 2004). More negatively, studies in the Achuar territories of the Corrientes River region of the Peruvian Amazon reveal that oil extraction led to widespread water pollution and the depletion of wild resources by outsiders, but, following protests and activism, some degree of increased access to wage employment and health services (Bebbington & Scurrah, 2013; Orta-Martínez & Finer, 2010). Meanwhile, Hindery (2013) found that community development projects planned for indigenous communities affected by the Don Mario mine in remote eastern Bolivia were only partly successful, and that mine-driven road improvements led to significant new pressure on natural resources by outsiders. Similarly and from our study region, Ceppek (2012) describes how the Cofán of Dureno, Ecuador were exposed to high levels of oil pollution in the past but see economic potential benefits from contemporary interaction with oil companies. Other stories of mixed and negative outcomes are available from indigenous communities across the developing world (Gardner, Ahmed, Bashir, & Rana, 2012; Gilberthorpe & Banks, 2012; Lu, 2012; Van Alstine & Afionis 2013).

These studies provide important preliminary evidence that large-scale resource extraction can potentially have positive benefits for indigenous communities but that the overall effects are more often negative. However, the strength of the findings cited above is limited by the exclusive use of small-scale, case-study designs, typically including one or a few communities and lacking data from multiple time periods or unaffected communities. Building on a large number of previous studies

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