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Remittances and Natural Resource Extraction: Evidence from Mexico

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ABSTRACT

While much attention has been given to the effects of migration and remittances on agricultural activities in the communities of origin, the relationship between remittances and rural households' use of natural resources remains understudied. This paper contributes in filling this gap by using a Mexican data set that contains detailed information on both remittances and use of natural resources at the household level. The data set is representative of the rural population of Mexico at the national level, which allows us to move beyond case studies overcoming one of the main challenges for understanding the relationship between livelihoods and the environment. Results show that remittances have significant effects on the use of natural resources by the receiving households. We find that a) remittances decrease the likelihood that a household will participate in natural resource extraction, and b) households that receive remittances and extract natural resources have lower environmental income and lower environmental reliance than households not receiving remittances. By reducing participation in extraction as well as reliance on natural resources, remittances reduce the pressure that local populations put on the natural resource base that surrounds them. This could mean good news for the conservation of natural resources. However, it also shows the vulnerability of Mexico's natural resource to periods of low or negative economic growth in the United States inasmuch as they affect the amount of remittances that migrants send back home.

1. Introduction

In developing countries natural resource rich areas tend to be inhabited by poor households that have complex relationships with the environment. The decisions taken by these households, frequently in a setting of incomplete markets, can have important effects on environmental quality and natural resource stocks. A myriad of factors can affect households' decisions and, consequently, the environment; the direction and magnitude of these effects is frequently unknown beforehand. In this paper, we are interested in understanding the effect that remittances have on the resource extraction decisions undertaken by rural households in migrant-sending areas.

In 2013, 232 million international migrants were remitting approximately 432 billion dollars to their countries of origin (IOM, 2013; UN, 2014). It is believed that migration will be one of the main driving forces behind demographic change in much of the world (de Sherbinin et al., 2008). The considerable amount of people involved in international migration and the significance of the amount of money flowing back has awakened the interest in the study of the effects of migration and remittances in the communities of origin (DeWind and Holdaway, 2008). Significant attention has focused on the effects of migration and remittances on agricultural activities (Gray, 2009). However, an aspect that remains understudied is the existing relationship between remittances and rural households' use of natural resources (Davis and Lopez-Carr, 2010; de Sherbinin et al., 2008).

From a theoretical point of view, the effect that migration and remittances have on the local environment is ambiguous. Remittances relax liquidity constraints and allow households to get involved in activities that require lumpy investments. This can result in households moving away from resource extraction. However, sometimes those new activities increase pressure over the resource base (e.g. cattle raising). Additionally, if there are labor market imperfections migration can decrease participation in labor-intensive activities (e.g., gathering of wild fruits). Finally, remittances might allow households to use market goods instead of natural resources extracted locally (e.g., gas instead of firewood) but they could also increase the demand for goods that put more pressure on the local environment (e.g., locally raised meat). In other words, remittances could diminish or increase the pressure on natural resources; this is, in the end, an empirical question.

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The lack of research in this area is partially explained by the scarcity of adequate data sets containing information on both aspects (Bilsborrow and Henry, 2012). The present work seeks to contribute in filling this gap by using a data set for Mexico that contains detailed information on both remittances and use of natural resources at the household level. The data set is representative of the rural population of Mexico at the national level, which allows us to move beyond case studies overcoming one of the main challenges for understanding the relationship between livelihoods and the environment (de Sherbinin et al., 2008).

Beyond data availability, Mexico is an ideal country to study the potential effects that remittances can have on natural resources back at the communities of origin. In the last few years, remittances from abroad have become ever more important for the Mexican economy, going from a little under 1% of GDP in 1995 to almost 2% in 2014 (World Bank, 2015). In 2010, remittances accounted for nearly 27% of total income in receptor households; 30% for households in rural areas and 25% for those located in urban zones (CONAPO, 2010). Meanwhile, natural resource extraction is one of the productive options that Mexican rural households rely on and is an important income source for many of them; poverty and inequality would be higher without this income source (Lopez-Feldman et al., 2007). Furthermore, natural resources are an insurance mechanism for households subject to negative agricultural shocks (Lopez-Feldman, 2014).

There is a significant amount of research on the potential implications that migration and remittances could have on rural Mexican communities of origin. Nevertheless, although the existent body of literature has covered issues going from agricultural production (Böhme, 2015; Taylor and Lopez-Feldman, 2010) to well-being of rural households (Arslan and Taylor, 2012; Esquivel and Huerta-Pineda, 2007; Taylor et al., 2008), the direct effects on natural resources have been overlooked. Understanding the interrelationship between the environment and remittances can help the design of public policies that aim to promote sustainable development and resource conservation in the Mexican context.

The objective of the present work is to analyze the relationship between the reception of international remittances by Mexican rural households and: a) the decision to participate in natural resource extraction, b) environmental income, and c) reliance on environmental sources (measured as the share of environmental income in overall income). Following Sjaastad et al. (2005) and Angelsen et al. (2014), we refer to environmental income as income obtained by selling, using or consuming wild or uncultivated natural resources (whose original stock is not a consequence of a human productive process).[1] In this way, environmental income is explicitly distinguished from agriculture or livestock income, both of which imply a previous productive process (i.e., farming the land or raising livestock). Accordingly, by participation in resource extraction we mean participation in activities that will lead to the generation of environmental income.

The empirical strategy that we follow is based on the use of instrumental variables; we use a variable that has been shown to be a valid instrument to control for endogeneity in remittances (Demirgüç-Kunt et al., 2011). By analyzing a series of empirical estimations, we show that the relation between remittances on one hand, and participation, environmental income and reliance on the other, is negative; evidence suggests that remittances from the United States reduce pressure on the direct use of natural resources by Mexican rural households.

2. Natural Resources, Remittances and Rural Livelihoods

In many developing countries a large fraction of the income of the rural poor comes from the use and extraction of natural resources (TEEB, 2010;Angelsen et al., 2014). Beyond acting as an income source, environmental goods and services can play different roles (e.g., insurance mechanism) in rural households' livelihood strategies (WRI, 2005;Angelsen et al., 2014;Lopez-Feldman, 2014). Remittances, on the other hand, can also have a significant effect in households' livelihood decisions inasmuch as they can help overcome liquidity and insurance constraints (Lucas and Stark, 1985; Taylor et al., 2003; Yang and Choi, 2007). Hence it can be argued that, depending on the specific context, environmental resources and remittances can play complementary or substitute roles in rural households' livelihoods. Understanding the potential interactions between these two factors has been overlooked in the existing literature.

Thus far, most of the published work on the relationship between migration and resource-use dynamics has focused on immigration (Robson and Berkes, 2011). The few studies that look at emigration, the focus of this paper, concentrate on deforestation and land use and do not address specifically the use of environmental resources. The results from this literature show that the effect of remittances on land use is context dependent; they could either increase the pressure over land (Taylor et al., 2006) or aid in the preservation or regeneration of forest areas (Hecht et al., 2006).

The empirical literature that looks at the role that environmental income has in rural livelihoods started with the work of authors such as Jodha (1986) and Cavendish et al. (1999) who underscored the importance of including income from natural resources when estimating poverty and inequality. More recent studies have looked at the relationship between income, participation in the collection of natural resources and reliance. Although some results point to a negative relation between income and reliance (e.g., Angelsen et al., 2014) others have found that reliance exhibits a U-shaped relation with income (Narain et al., 2008). Research in this area has grown in recent years[2] but there are still very few studies that look at causality and use nationally representative samples; this study is one of those few.

As Greenstone and Jack (2015) argue, in order to analyze certain questions related to the environment in developing countries we need to use tools from developing economics. For this reason the approach that we follow is based on the New Economics of Labor Migration (NELM) first proposed by Stark and Bloom (1985). The NELM offers a conceptual framework to analyze the potential effect of remittances on the use of natural resources by households functioning in a setting of incomplete markets. Under the NELM, migration is analyzed as an economic institution in which the agent of decision is the household and not the individual. Migrants can act as financial intermediaries by allowing rural households to overcome credit restrictions and the lack of insurance to which they are subject, thus becoming able to move from subsistence or small-scale productive activities to more lucrative ones.

The NELM postulates that financial restrictions and the reduced access to insurance markets limit rural households' total income and welfare. The hypothesis is that these households decide to participate in migration (to receive remittances) with the purpose of minimizing their loss of wellbeing due to the existence of imperfect markets (Mora and Taylor, 2006). Nevertheless, the net impact of migration and remittances in households' production is not clear. On one hand, migration reduces household's labor supply. In a

[1] The concept of environmental income is related to the more ambitious concept of 'GDP of the poor' (Sukhdev, 2009; TEEB, 2011), which includes non-use values provided by ecosystem services.

[2] See for example the results from the Poverty Environment Network discussed in (Angelsen et al., 2014).