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**THE POLITICAL ECOLOGY OF THE *COLONIAS* ON THE U.S.-
MEXICO BORDER: HUMAN-ENVIRONMENTAL CHALLENGES AND
COMMUNITY RESPONSES IN SOUTHERN NEW MEXICO***

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ABSTRACT

Economic development and population growth along the U.S.-Mexico border have been determined by the natural resources available for the physical and social transformations in this region. A critical political ecology of the U.S.-Mexico border links environmental hazards with the socioeconomic and political aspects that have generated *colonia* population settlements as locales within the border region's spatialized hierarchies. The political ecological approach to community development processes also brings in the larger border issues associated with Mexico and the United States. By exploring human-environmental challenges facing *colonia* residents, we can gain valuable insights into ecological vulnerabilities also faced by similar population settlements in other regions of the United States. This article applies a political ecological model that examines the transformation of farmland into unincorporated population settlements known as *colonias* on the U.S.-Mexico border and the pressing environmental issues contributing the region's precarious living conditions.

Economic development and population growth along the U.S.-Mexico border has been determined by the natural resources available for the physical and social transformations in this region. Debates over natural resources, particularly land and water, are deeply tied to the history and development of the U.S.-Mexico border (Herzog 1990, 1999; Lorey 1997; Peña 1997). Environmental disasters, although "natural," affect certain population segments more than others because of the social vulnerabilities to which subsections of the population are exposed. Ecological vulnerabilities along the border are developed when natural disasters occur and social-structural inequalities exist. A critical political ecology of the U.S.-Mexico border links environmental hazards with the socioeconomic and political aspects that have generated *colonia* population settlements as locales within the border region's spatialized hierarchies. The political ecological approach to community development processes also brings in the larger border issues associated with Mexico and the United States. The contamination of trans-border ground and surface water resources, the lack of proper disposal of liquid, solid, and air-bound hazardous waste, and an inadequate environmental infrastructure have had

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detrimental consequences for human populations along the border. By exploring human-environmental challenges facing *colonia* residents, we can gain valuable insights into ecological vulnerabilities also faced by similar population settlements in other regions of the United States.

This article applies a political ecological model that examines the commoditization and transformation of farmland into unincorporated population settlements known as *colonias* on the U.S.-Mexico border. The commoditization of the natural landscape, specifically the fertile lands and the much valued water of the Rio Grande/Rio Bravo has made this region of the U.S.-Mexico border a significant space of interest. Increased population growth and pressing environmental issues are adding further stress to the already fragile living conditions along the U.S.-Mexico border, and in particular in *colonia* communities. Heyman (1994) encourages scholars of the U.S.-Mexico border to explore the regional particulars of the border to capture the complexity of border dynamics within a political ecology perspective. In this spirit, this article explores the class challenges of *colonia* residents and the human-environmental relationships in the *colonias* in southern New Mexico as complex human populations tied into local, regional and global histories, ecologies and economies.

REGION OF STUDY

Population settlements in southern New Mexico have been historically influenced by the Rio Grande/Rio Bravo, one of the most important rivers of the U.S.-Mexico borderlands. Also paralleling the Rio Grande is the Camino Real, a historical trade route linking central Mexico to Santa Fe, New Mexico. Several present-day *colonias* began as population settlements associated with early U.S. military forts and Catholic missionary activities. As such, the histories of these population settlements are closely linked to the region's economic growth, as much as to the region's ecology and environment. The region's prominence indicates a heavy reliance on the Rio Grande's water for nourishment, economic development, and population growth. Local population settlements have also been heavily tied to an agricultural-based economy, primarily growing and processing onions, sorghum, and New Mexican green and red chile.

The regulation of the Rio Grande's path and water distribution has helped southern New Mexico grow into a prominent agricultural region. The presence of the Rio Grande/Rio Bravo is significant in the region of study as it has supported the irrigation of agriculture. Agricultural production in southern New Mexico has historically pulled generations of laborers from across the Mexican border. The

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rotation of crops and the development of a growing dairy industry have stimulated the demand for a year-round labor pool. A historical analysis of these populations indicates that ecological and environmental threats are not new to contemporary *colonias*, but have been at the root of their development as early settlements along the U.S.-Mexico border.

The history of early population settlements in the region of study indicates these communities have gone through a series of floods and resettlement processes. In fact, some of the region's earliest settlements have been flooded and redefined by the Rio Grande since the late 19th century (Horgan 1984). The precarious environmental conditions of this region, in particular the seasonal flooding of the Rio Grande, have required the people of southern New Mexico to organize and rebuild their communities over time and space. Today, the Rio Grande is far from being big and bold, as it is controlled through a series of human-made dams that control and release its waters for agricultural and other human consumption purposes. Nonetheless, the presence of water in this desert region of the U.S. Southwest is significant for its contribution to the region's economic and ecological survival. Politically, the limited water supply in a vast desert region has required the implementation of local and international water treaties to support regional agricultural industries competing to survive in the midst of population increases. Agricultural industries thriving or struggling in this region of the U.S. Southwest depend on natural climatic forces as much as they rely on economic and political factors in a global market mediating the supply and demand of labor.

Thomas Sheridan (1988) argues that the ecology of any human community is political in the sense that it is shaped and constrained by other human groups. In this region of the border, the growth in human populations around the Hatch Valley is directly related to the intersection and presence of the Rio Grande. The Hatch Valley is an agricultural center, and therefore its location, climate, geography and topography must intimately relate to its future population and economic development. For many decades, farming in the Hatch Valley has been concentrated along the Rio Grande's floodplain where irrigation is available and the soils are better suited for farming. The *colonia* communities surveyed for this study are located in the Hatch Valley, which is intersected by the Rio Grande.

Ecological concerns for *colonias* in southern New Mexico deal with the location and settlement of these populations and their vulnerability to numerous ecological disasters. Many *colonias* were built on old flood plains and/or deserted farmland. Many of these settlements are located in or near natural *arroyos* (small streams) and built close to irrigation ditches that often overflow during seasonal flash floods

occurring between the months of June and August. Flooding in this desert region poses several challenges for unincorporated population settlements usually lacking adequate infrastructure (e.g., paved roads, sewerage systems, and adequate drainage facilities). Not only must *colonia* populations contend with their ecological vulnerabilities to natural disasters, but they must also contend with the physical, economic, and political marginalization and alienation from larger urban cores and other centers of power. As such, *colonia* populations throughout the U.S.-Mexico border are invisible, except in stereotypes. These population settlements are often defined as primarily Mexican settlements, although a few *colonias* have a minimal representation of Anglos, Native Americans and African Americans.

Given their ethnic-racial composition and the low economic status usually associated with Mexican populations in the United States, *colonias* have been compared to “Third World” countries and as “the worst the border has to offer” (for a critical discussion of social stigmas associated with *colonia* populations in the U.S. media, see Hill 2003). Much of the stigma associated with *colonias* is tied to local political-economic circumstances that led to the development of these communities as illegal subdivisions that were informally platted and subdivided without government oversight or authorization (Guzman 2002; Paterson 2000). However, many *colonias* in New Mexico have existed on the maps and in the historical record since the mid-1800’s and have not until in the last thirty years been recognized, labeled and recategorized as *colonias*. The populations of these older *colonias* have been revitalized with the more permanent settlement of Mexican immigrants, and have benefitted from the longer established relationships or social networks with individuals and institutions of power. As such, *colonias* house thousands of working-class residents who greatly contribute to southern New Mexico’s border life and economy by adding value and life to a region that has been historically undervalued and overlooked by policy makers, scholars, and mainstream America. The people of the *colonias* play many social and functional roles as: laborers, U.S. war veterans, entrepreneurs, senior citizens, school children, clients/patients, and consumers contributing to the region’s vitality.

POLITICAL ECOLOGY OF U.S.-MEXICO BORDER COLONIAS

A political ecology perspective that examines the region’s ecology from the point of view of the people who live and work the land, provides a framework for understanding population settlements on the border according to their living conditions within specific ecologies and the sociopolitical contexts. Theoretically, political ecology serves as a guiding principal in the analysis of local resource use

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and the social, political, and economic organization involved in the transformation of “natural” resources such as land and water into commodities. The political ecology approach is relevant for considering the roles of local, regional, national, and international social institutions in providing constraints and possibilities that affect human decisions, which in turn also affect those same institutions and the natural environment (Stonich 1993). Political ecology was initially defined by Eric Wolf as a challenge to social analysts to “combine our inquiries into multiple local ecological contexts with a greater knowledge of social and political history” (Wolf (1972) as cited in Stonich 1993:25). Two major theoretical thrusts that have led to the development of the political ecology approach have been proposed by Greenberg and Park (1994). These orientations include the theoretical framework of political economy, with its insistence on linking the distribution of power with productive activities, and an ecological approach that incorporates a broader vision of bio-environmental relationships.

Thomas Sheridan (1988) has argued that the ecology of any human community is political in the sense that it is shaped and constrained by other human groups. Sheridan applied a political ecological analysis to describe how people battled aridity, and one another, to survive in an agrarian society characterized by economic inequality and political conflict. Sheridan’s “ethnography of resource control,” showed how the exploitation, distribution, and control of natural resources were mediated by differential relationships of power within and among societies. He indicated how exploited resources impose additional constraints that modify the political force emanating from outside the communities in question. Sheridan showed how local environmental and demographic factors are constantly engaged in a creative dialectic between both local and external forces. This analysis of cultural and political activities within an analysis of socially constructed ecosystems provides an increased understanding of the interaction between social, economic, political and environmental variables.

The consideration of human-ecological relations within a specific region or location also requires a critical analysis of demographic factors, environmental concerns, and issues related to health. As working-class population settlements, the distribution of *colonias* across the borderland’s landscape, and their relationship to the physical environment, has much to do with the intersection of ethnic, class, and political interjections that render their positions within local, national, and global spatial, economic, and ecological hierarchies. The social and spatial analysis of these communities examines the physical shape and nature of these settlements as well as the social and political activities that take place within them. This paper provides

a political ecology analysis of *colonias* as: 1) population settlements throughout rural New Mexico where class, ethnic, and citizenship differences are made visible vis-à-vis the local political economy dynamics in the region of study; and 2) as populations intricately engaged in community development processes focused on human-environmental concerns and relationships. As U.S.-Mexico border population settlements, *colonia* communities are contested spaces along several structural, economic, and environmental intersecting forces. As such, residents of *colonias* must contend with several dichotomies often associated with the U.S.-Mexico border, including racial-ethnic, class, gender, citizenship, and spatial hierarchies.

METHODOLOGY

The ethnographic approach employed in this study was aimed at recognizing the intersecting roles of power, class, ethnicity, gender, language, citizenship and social agency in *colonia* community development efforts. Deep and engaged ethnographic understandings of *colonia* life have been sought via extensive interactions in *colonia* households and in the daily life of the residents, and through participant observation in several venues including: resident meetings in *colonias*, community-based agency meetings, county and state government meetings, professional conferences, and policy-making arenas. This ethnographic effort recognizes both material and symbolic/ideational approaches to understanding culture and life in *colonias* in particular. The material aspects of culture are heavily based on how people make a living within a region's economic, historical and political organization. On a more symbolic level, the identities, ideas, hopes, and beliefs of a web of social actors involved in *colonia* life and policy practices are also significant for understanding how people have come to live and organize around human-environmental concerns in such precarious economic and ecological environments. On a practical and applied level, I have also worked with *colonia* residents in solidifying social and political relationships in *colonias* at the household, community, regional, state and federal levels.

This study is based on many extensive fieldwork sessions in southern New Mexico's *colonias*, beginning with exploratory research in 1999, a U.S. Census Bureau commissioned ethnographic research project based on *colonia* residents' perceptions of the 2000 U.S. Census (see Vélez-Ibáñez, Núñez, and Rissolo 2000, 2002), and three years of ethnographic fieldwork conducted for my doctoral dissertation between 2002 and 2004. Data were collected using several ethnographic methods, including the use of a structured survey instrument,

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participant observation in household and community activities, life and labor histories, genealogies, as well as spatial analyses of households and communities. Household interviews were conducted using a two-staged interview protocol or *ethno-survey*. These close-ended questionnaires were designed to collect self-reported household information through a random sample of five *colonias* in northern Doña Ana County, New Mexico. The survey questionnaires included topics on genealogies, household composition and density, household contacts, labor histories, household production and repairs, household consumption, residential mobility and kinship networks, health, language and identity, and education. The set of questionnaires was intended to collect basic sociodemographic characteristics of these settlements that included data not usually reported in census questionnaires, primarily information on kin and social networks that provided examples of *colonia* residents' concerted efforts to build what Ward (1999) calls stronger horizontal and vertical ties in their communities.

One out of every five households in a cluster of five *colonia* communities within a three to five-mile radius in Doña Ana County, New Mexico were selected for a total of 75 stratified randomly selected households. The ethno-surveys were pretested with the assistance of key *colonia* community leaders and residents, who helped identify and rectify several culturally-sensitive issues in the household survey instrument. The household survey interviews were scheduled during two home visits, ranging from two to three hours each. Most of the interviews were conducted over a year and a half, at various times of the day, to maximize participation. Considerable efforts were made to interview residents in the evenings and on weekends. After the first year of fieldwork, residents were interviewed during the three-month agricultural unemployment season, because people were more likely to be at home during the day. Upon completion of the ethno-surveys, participant observation and deep ethnographic inquiries were conducted in selected households in each of the five surveyed *colonias*. These household contacts have generated rich ethnographic data over a longitudinal period from 1999 to the present.

This sociocultural analysis focuses on both households and communities as ethnographic units of analysis to understand *colonia* community development from the *colonia* residents' perspectives. The household was selected for its productive, reproductive, and enculturation roles, primarily as *colonia* residents often respond to changing labor opportunities and economic uncertainties by making decisions at the household level (Netting, Wilk, and Arnould 1984). The "community" is also an important unit of analysis as a spatially recognized place or locality and as a clearly

distinguished locus of concentrated activity among residents. The social organization and the physical distributions of households and *colonia* communities provide valuable insights into organic and inorganic population settlement processes, community development efforts, and self-help initiatives. Household and community analyses helped identify issues not usually reported in traditional census data, such as ethnic tensions and people's responses to the limited labor and economic opportunities that have also played a role in pushing them out of formally incorporated communities and out to *colonias*. Long-term ethnographic interviews of selected households have also brought to light the historical trajectories of many of these border-dwelling families who have been occupying these U.S.-Mexico settlements along the border for generations and have extensive ties to the land and to the people of these communities.

CONTESTED AND SPATIALIZED HIERARCHIES ON THE BORDER

Colonias are a combination of historical population settlements and suburbs of the U.S.-Mexico border region's working poor (Campbell and Heyman 2007; Granjón 1986; Núñez 2006; Paterson 2000; Ward 1999). They are communities where people live to be closer to their jobs in rural and urban New Mexico. Many *colonia* residents include farm/dairy laborers living at or below the national poverty level, and senior citizens, including retirees and veterans living on fixed incomes. Another portion of these residents includes an elite class of entrepreneurs and private business/land owners, who choose to live in *colonias* while operating home-based businesses (contract labor, trucking, ranch owners, etc.). *Colonias* are a mixture of historical Hispano settlements and more recent farmworker and immigrant enclaves; this combination of older and more settled populations and more recently arrived immigrants generates cultural, linguistic, and political tensions and fusions characterizing these border populations.

Colonias are a distinct border phenomenon, primarily because the term is associated with federal/state/local county definitions associated with their location along the U.S.-Mexico border. However, *colonia*-type settlements are visible throughout central California, northern New Mexico, and throughout the state of Texas and other states located beyond the border zone. As population settlements, *colonia* communities are located in regions undergoing demographic, economic, and environmental transformations. Several characteristics are typically associated with these population settlements; one of the most significant qualifiers for *colonia* communities to be formally recognized as "*colonias*" by federal, state, and local authorities is their geographic location or proximity to the U.S.-Mexico border. For

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example, federal agencies such as the U.S. Department of Housing and Urban Development and the U.S. Department of Agriculture require that *colonias* be designated as populations located within a 150-mile border region, while the Environmental Protection Agency (EPA) requires that *colonias* be within a 100-kilometer (or 62-mile) border-region zone. *Colonias* are also defined in policy arenas by several economic characteristics, primarily as “economically distressed areas” lacking in infrastructure (potable water, paved roads, sewage, affordable housing, etc.).

The spatial dynamics of the border are important for understanding population settlement patterns. As U.S.-Mexico borderlands settlements, *colonias* are located within geographic corridors used by generations of regional and transnational migrants. Geographically, *colonias* in southern New Mexico are in the path of one of the most important streams of Mexican migrant populations entering the United States. The region of study is approximately forty miles north of Las Cruces, New Mexico and some ninety miles north of one of the most important border crossings in the world: El Paso, Texas and Ciudad Juarez, Chihuahua. These populations are also within a 3 to 3.5 hour driving distance from two of New Mexico’s prominent urban centers: Albuquerque and Santa Fe. The *colonia* communities surveyed are also located along major transportation routes, and are embedded within an important agricultural region in southern New Mexico. Their strategic location along the border of New Mexico hierarchically links these settlements to national and international markets, as well as to regional and transnational migration routes.

The location of *colonia* communities along important trade and migrant transportation routes is significant in an era of heightened border enforcement. Heightened border security measures in the United States, particularly after September 11, 2001, have trapped migrant populations (Andreas 2000; Núñez and Heyman 2007) who are no longer able to fluidly cross the border back and forth seasonally. Timothy Dunn (1996) has documented the increased militarization of the border region through Federal Reserve troops, night-vision cameras, and motion-detection sensors. In fact, the borderlands have become regions of refuge (Vélez-Ibáñez 2004) for residents who are unable, unwilling, or simply averse to taking the high risks (health, safety, high costs involved in human smuggling, etc.) involved in crossing the U.S.-Mexico border without legal authorization. Thus, the location of *colonias* throughout the U.S.-Mexico borderlands offers opportunities for immigrants to work and stay with family members or co-patriots until they can find a way into other regions of the U.S. offering more favorable labor opportunities.

SOUTHERN RURAL SOCIOLOGY

As to their spatial composition and housing characteristics, *colonias* range from being constituted by clusters of mobile homes to more established communities (Núñez 2006; Richardson 1999; Ward 1999). As U.S.-Mexico border settlements, *colonias* also vary in their rural and urban characteristics. Some *colonias* are located alongside agricultural lands and dairies, while others are located in communities closer to large urban centers and often serve as bedroom communities—hosting laborers at night, while they commute to work in the border region’s urban core. The housing stock in these communities includes a mixture of housing structures ranging from adobe homes, site-built homes, manufactured homes, stand-alone mobile homes, and mobile homes with added-on rooms. From an outsider’s perspectives, these communities might seem humble; however, for many *colonia* residents’ these homes represent the fulfillment and materialization of the Mexican and the American dream of home-ownership. In fact, *colonia* residents have a higher rate of home-ownership than mainstream Americans.

Colonias are to a certain extent, highly contested spaces; located on a rural-urban continuum, primarily as rural communities in the process of urbanizing, and possibly being absorbed in the future into larger urban cores. However, because of their geographic location on the peripheries of larger urban centers and in great part because of their social-economic and ethnic composition as primarily working-class Mexican populations, *colonias* are disenfranchised populations in need of social and physical infrastructure investments (schools, workforce retraining, healthcare, paved roads, sewerage systems, affordable housing, etc.). As communities physically and politically on the peripheries of power, *colonias* receive less attention from policy makers and researchers than larger urban centers along the U.S.-Mexico border. Their contributions as population settlements and communities is significant in that *colonias* house thousands of households along the U.S.-Mexico border corridor that house the laborers and citizens that contribute to region’s economic and cultural vitality. Understanding these communities, and other communities like these throughout the nation, is important to the understanding of rural-urban dynamics, transformation of rural landscapes and economies, and the revitalization of aging farming communities infused with all of the cultural, linguistic, political and economic dynamics of new cultural and ethnic enclaves.

CHANGING ECONOMIC FORCES IN SOUTHERN NEW MEXICO

The historical, economic, and physical transformations of southern New Mexico’s natural resources provide a clear indication of the factors that have driven

formally migrant populations to seek either temporary refuge or a more permanent stay in these borderland communities.

An analysis of state and economic policies influencing human migration from Mexico to the United States is important in linking the global and the national to local communities. In particular, the agricultural and dairy industries, influenced by the global market, free trade, and changes in agricultural technology, are located along New Mexico's border and play a significant role in pulling people to the region in which labor opportunities are largely agriculturally based—mainly season farm-work and year-round dairy employment. Agricultural production in the region has historically pulled generations of laborers from across the Mexican border. Migrant laborers have contributed their labor and their lives to the fields of this region, and have moved on in search of other harvests. Local populations have depended on seasonal farm-work for making a living from the land as wage laborers (see Figure 1). The number of farms in Doña Ana County is growing while the size of individual/family farms is decreasing. The clear trend in the county is toward smaller but more numerous farms. This is significant because small acreage operations may prove more susceptible to being sold off for rural residential development than large established enterprises.

Figure 1. IMAGE OF A YOUNG FARMWORKER CARRYING A BUCKET OF NEW MEXICAN CHILES.



Photo by Mary Holguin commissioned by Guillermina Gina Núñez and Ramona Lee Perez 2004.

Mechanization of Farm Work

The region of study has long been recognized for its valuable role in the agricultural production of the state's best known crop, New Mexican chile. Self-designated as the "Chile capital of the world," the Hatch Valley is an important

economic hub that has attracted migrant and seasonal farmworkers since the Bracero period (1942–1964). Agriculture in northern Doña Ana County and in the Hatch Valley specifically, has been primarily a family enterprise. Several ranching families in the region have also joined efforts to invest in agricultural technology, onion sheds, chile pepper dehydrating plants, grain, and dairy plants. In the late 1980's, Almaraz (2004) reported that the acreage devoted for onion production grew from approximately 4,500 acres to 7,500 acres, while chile production grew from 15,000 acres to 23,000. The expansion of the chile industry into the northern part of Doña Ana County and into Luna County, further contributed to the growth of *colonias* north of the Mesilla Valley. Currently, this region in southern New Mexico is experiencing major shifts in its agricultural production. The mechanization of farmwork in the region began with the development of the cotton-picking machine. Within the last seven years, machines have been developed to pick onions from the fields, displacing hundreds of families in the region. Prototype equipment is also being used to select and thin-out the region's prized chile. Hence, the agricultural base that has provided labor opportunities for thousands of local and seasonal migrant farmworkers is no longer able to support this workforce.

The mechanization of farmwork in the region has had several consequences on the local labor force and on *colonia* populations. Mexican farmworkers have long contributed to the economic development of northern Doña Ana County, but much like the *braceros* in the 1940's to 1960's who were displaced by mechanization, the present migrant and seasonal farmworkers in the region are also facing displacement. In the race to survive in a global market, local area farmers turn to research and technology to maximize profits by reducing labor costs and increasing their reliance on farm machinery. Meanwhile, regional economic development initiatives focus on the search for alternative sources of revenue.

The Hatch Valley in northern Doña Ana County, like many agricultural regions in the United States, is in a global competition with other countries to produce at a lower cost. Local experts talk about the need to transition from growing crops into value-added production activities, which add more value to raw products by transforming them into items that have a higher return on investments. By 2006, the region faced many challenges associated with globalization as other regions of the world, like China, India and Mexico which produce similar agricultural products at lower costs. This translates to fewer jobs and economic opportunities for the region's farmers, farmworkers, and agricultural-related or supported businesses. Laborers, who have spent a significant amount of their lives working in the agricultural fields, are now finding themselves in an economically and socially

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depressed region. There are more laborers than there are jobs in agriculture, and the world market is forcing farmers to seek more high-tech means of producing at lower per-unit costs. These circumstances contribute added stress to an aging and tired farm-working population.

Class Mobility and Heightened Vulnerabilities

Colonia residents in northern Doña Ana County have shown evidence of class mobility by transitioning out of seasonal employment in agriculture into year-round employment working in dairies (Núñez 2006). One of the state's and country's largest dairy farms is located in the Las Uvas Valley, immediately adjacent to the Hatch Valley. The dairies in this area provide a more stable supply of labor for the local population. Dairies have three shifts, offering work in the mornings, days, and nights, with differentially higher pay for evening and night workers. During one household interview, a *colonia* resident employed in a local dairy indicated that bonuses were paid to employees according to the various shifts they worked. For example, morning-shift employees get weekly bonuses of \$10, evening-shift employees get \$20, and night-shift employees receive \$30 on top of their hourly-wages. Agricultural farmwork wages, primarily paid by the bucket (60 cents) or by the burlap sack (80 cents), have not significantly improved since the 1980s, making this type of labor one of the worst compensated jobs in the region, thus making dairy work more enticing for local residents.

The local dairies provide a higher salary compared with seasonal farmwork, although the risks involved in working close to cattle and to dairy machines also poses several health and physical risks. Yet while the health and environmental impacts of the dairy industry on *colonia* residents are purely speculative, the health and environmental impacts associated with dairies does not paint a healthy picture for human settlements already lacking water and sewage treatment services. Throughout the household interviews, dairy employees complained that they were often afraid of being stepped on or brushed upon by cattle. Other informants complained of skin rashes caused through their constant exposure to the animals and to the chemicals or antibiotics used in the dairy industry. In another interview, a woman who fell from a cattle-feeding ramp injured her back and was unable to collect disability unemployment or any other compensation for her injuries. She indicated that she had been turned away by several attorneys who did not want to challenge the local dairy and one of the largest employers in the region. Some attorneys had indicated that representing the laborer in a worker compensation

claim would have been a conflict of interest given that several of these dairies where also their legal clients.

Throughout the ethnographic interviews conducted during this study, informants interviewed who worked in the local dairies often remarked that they felt undervalued as individuals and believed that their labor was underappreciated. For example, during one household interview, a male employee indicated that while working at a local dairy, he lost part of his finger while repairing a milking machine. He indicated he had a great need to go back to work because he and his family were unable to survive on the disability insurance compensation he had received during the length of two weeks. This ethnographic example points to the risks and vulnerabilities laborers are exposed to while working in dairies, primarily during a time of what laborers consider “tough economic times and limited labor opportunities.” Dairy laborers interviewed often compared their lives with the lives of dairy cattle, and indicated that their lives and bodies were perceived by their employers to be of lower value because so many people needed a job in the region. As one woman noted during her household and labor interview, “in this land, people are worth less than cows.” Overall, dairy related employment offered a combination of risks and opportunities for local residents; while the economic benefits might seem higher than farm-work, the health and environmental costs of dairy-related employment merit further analysis.

ENVIRONMENTAL CHALLENGES IN THE *COLONIAS* OF SOUTHERN NEW MEXICO

The human and ecological environments of *colonias* in New Mexico relate to the human-environmental nature of the state’s southern region. This area is arid, rural, and scantily populated. As with many desert climates, southern New Mexico is characterized by variations in climate: extreme cold in the winters and extreme heat in the summers, drought, flash flooding, and occasional hail storms. An average of 197 frost-free days makes a long growing season for agriculturally based economies and for the dairy industry, which has gradually relocated many of its dairy farms from states such as Wisconsin and California. The northern Doña Ana County and Hatch Valley region is characterized by a fertile landscape, where chilies, pecans, cotton, and onions are produced. Outside the Valley’s fertile region, the natural habitat is primarily defined by a desert landscape.

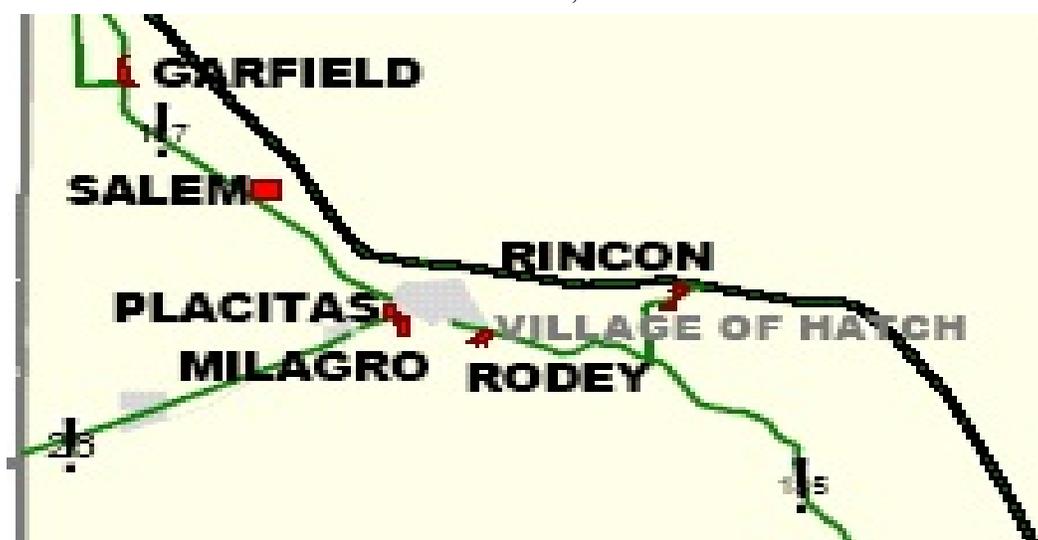
The region’s economic development has relied on significant irrigation and agricultural technological investments. The waters from the Rio Grande/Rio Bravo have been diverted by dams, canals, and old channels known locally as *acequias* to

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grow the region's cash crops. The border region of Southern New Mexico (Figure 2) has been historically influenced by the presence of the Rio Grande/Rio Bravo, one of the most important rivers in the United States and of the U.S.-Mexico borderlands. The Rio Grande River has influenced the histories of these present-day *colonias*, particularly as many of these have been flooded and destroyed by the river since the late 19th century. The history and ecology of this region has long required people to organize to build and reshape their communities over time and space.

Figure 2. *COLONIAS* SURVEYED ADJACENT TO THE RIO GRANDE/RIO BRAVO IN NORTHERN DOÑA ANA COUNTY, NM.



Source: Doña Ana County Planning Department 2003.

In the region of study, the location of *colonias* along the Rio Grande makes these settlements vulnerable to floods and inundations as many of these are built in or near natural *arroyos* (small streams). The economic and political forces that pull residents to live in *colonias* often force them to live in marginal living conditions. Many *colonia* residents live at or below the national poverty level, making mobility difficult for many who cannot afford to live elsewhere or do not have the physical means to move elsewhere (e.g., non-operating vehicles, physical disabilities, or immigration status). The physical and social marginalization of these populations forces many *colonia* residents to live in locales exposed to raw sewage, dilapidated housing, and other environmental hazards associated with living near agricultural fields and dairy farms.

Flash floods are common in this desert region; within hours a seemingly dry desert environment becomes engulfed in torrential currents of water, mud, and waste. Residents are often stranded in their homes or outside their communities, unable to enter or leave given the settlement's physical location and limited physical infrastructure (unpaved roads, no sidewalks, no drainage, etc.). These seasonal floods pose many environmental and ecological challenges. Stagnant water leads to an increase in mosquitoes and dead animals that mix in with overflowing human waste coming from cesspools (see Figure 3). Contamination of the natural environment consequently affects the human and environmental health of these populations with high rates of hepatitis, asthma and gastro-intestinal diseases (to learn more about the region's environmental health risks, see Southern Area Health Education Center 2002).

Figure 3. HOME WITH AN OVERFLOWING CESSPOOL IN A SOUTHERN NEW MEXICO *COLONIA* EXPOSING RESIDENTS TO NUMEROUS HUMAN AND ENVIRONMENTAL HEALTH THREATS.



Photo taken by author in 2002.

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Although modern water distribution technologies exist to control and channel the flow of the Rio Grande, the region's local settlements remain vulnerable to seasonal flooding. In fact, the most devastating floods in northern Doña Ana County's Hatch Valley took part in the summer of 2006 with the flooding of the Placitas Arroyo. During this environmental disaster, residents of the incorporated village of Hatch, New Mexico, were displaced from their households and relocated in FEMA trailer homes in the nearby *colonia* of Rincon. This most recent environmental disaster was caused by the flooding of irrigation canals, which caused rain waters to be channeled into a heavily populated community. This event led to the massive organization of human power, involving local residents, volunteers, and the National Red Cross. One consequence of the 2006 floods was the flooding of farmworker apartment complex, which forced families to relocate to other communities. According to Paterson (2006), more than 400 homes and businesses and 500 people were displaced. Local businesses and homes that were insured qualified for aid; however, most residents who rented property or lacked insurance were left without many options. A section of these displaced residents had mixed-immigrant status households, that is, several family members were not documented and thus were unable to qualify for state-funded resources. This example, points to the heightened vulnerabilities faced by certain minority populations to environmental disasters in the United States.

COMMUNITY RESPONSES TO HUMAN-ENVIRONMENTAL CONCERNS
IN *COLONIAS*

Knowing how people refer to the local climate's impact on their communities is significant in understanding the everyday lives of *colonia* residents. Informally, local residents refer to the time of the wind, or *el tiempo de aire*, being from December to April; the time of heat as *el tiempo de calor* in this region as between April and early October; and the rainy season as *el tiempo de la lluvias* being in July, August, and September. For example, the onion and chile harvesting season takes place during the hottest months (April to October) of the year in this region. While the times of high winds, rain and hail affect those residents with older homes, many of whom try to protect their homes by placing used tires on their rooftops to avoid having the thin layers of metal covering their older modeled mobile homes tearing apart from their homes' structure. The use of old tires on rooftops is considered by some to be an environmental hazard because tires hold rainwater, which then becomes fertile ground for mosquitoes. However, local residents who may or may not be aware of

this risk, often favor the risk of mosquitoes and possible West Nile virus infections compared with the alternative of losing the roofs of their homes.

Learning about the various seasons in the region and the types of activities associated with these seasons is important in planning and collaborating in local community events, such as cleanups or *limpiezas*. As one local leader exclaimed “*las limpiezas de la comunidad se hacen después del tiempo del aire. ¿Cómo vamos a andar recogiendo basura durante estos aironazos?*” meaning “We (*colonia* residents) will get the community cleanups going after the windy season is over. How do you expect us to go out and pick up trash during the windy season?” (Author’s translation). The ways in which local residents refer to the local climate are influenced by how climate impacts people’s behavior, life, and labor opportunities. Additionally, climatic conditions also influence people’s interactions with their environments, as people in this region are less likely to spend time outside their homes leisurely when it is too hot, too cold, or too windy. This is significant to note particularly when seeking to understand *colonia* residents’ health concerns and behaviors. For example, during one household interview, I noted how a diabetic elderly woman refused to follow her doctor’s orders to walk thirty minutes a day because she feared the health impacts of the intense desert heat, the high winds, and even the possibility of being bitten by a rattlesnake. Whether the woman’s doctor knew she lived in a *colonia* or not is unknown, but what is important here, is that the woman was clearly aware of and responsive to the environmental hazards existent in her *colonia* community.

As noted earlier, in this New Mexican region of the U.S.-Mexico border, people have resourcefully built their homes nearby agricultural fields and dairies to live closer to their work. Living close to agricultural fields and dairies presents several economic benefits as well as environmental health challenges. In *colonias*, residents employed in farm-work usually live close to the farmlands where they are constantly exposed to dust, pesticides, and insecticides. In addition, *colonias* situated close to dairies are overwhelmed by the stench of manure, cow urine, and a vast amount of flies in the air. For example, the *colonia* community of *El Milagro* (translates into The Miracle) was built on agricultural farm and cattle-grazing land. Residents of *El Milagro* are still at odds with roaming cattle in their community. They complain of having to rush cattle away from their properties to avoid having their trees and home gardens eaten by the cows. Others report having legal troubles with local ranchers and law enforcement officers as they try to protect their properties. As Mr. Dominguez notes “We can’t do anything to the cows, even if they are on our property. In this country, the cows have more rights than people

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in these communities. Local authorities do not listen to the poor; ranchers are allowed to let their cattle roam without a problem.”

El Milagro did not originate as part of an already established community or as a revived dormant community, like other surrounding *colonias* such as Salem, Rincon, Garfield, Las Placitas, and Rodey. The *colonia* community began in the 1980s as 40 acres of land were sold by a rancher to four founding families. Tracks of land were then subdivided and sold to additional families. Upon debating how to name their *colonia* community, residents decided that their community would have to be named according to the residents’ experiences with flooding water engulfing the community during times of flash floods and torrential rains. Residents remember hearing each other hoping for a “miracle” to take place for them to be able to exit their community to go to work. Other names previously considered by residents, included *Acapulquito* (or little Acapulco for its bay-like characteristic during times of floods) and *Sal si Puedes* (Exit if you Can)—ironically, this latter name had apparently already been appropriated by another community in New Mexico. Awareness of the community’s history and current environmental challenges has aided residents in building a more unified sense of community based on shared experiences dealing with environmental threats. Since its origins in the 1980s, residents of *El Milagro* have met with county, state and federal representatives to address and help solve some of their community’s most pressing environmental-health concerns, mainly dealing with the lack of physical infrastructure (the lack of a sewerage system, unpaved roads, and lack of public lighting, etc.).

As Peter Ward (1999) maintains, *colonia* communities’ growth and development are often determined by the residents’ interaction, organization, and mobilization. Ward has argued that *colonias* fare better when they are unified and cohesive entities, integrated vertically on a community level and horizontally with individuals and institutions of power. Ward calls horizontal integration the informal and formal networking strategies that take place among individuals and households in the community, while he calls vertical integration the *colonias*’ ability to link to people and institutions of power that can craft and lead initiatives to support the communities’ growth. Vertical integration emphasizes community links with people and institutions of power and privilege, while horizontal integration refers to inter-community cohesiveness and organization. As such, the physical development of the *colonia* communities’ infrastructure has much to do with the communities’ combined social and political networks as with their political participation and mobilization.

In recognizing their precarious ecological and economic predicaments, *colonia* residents in southern New Mexico have organized at the local community, regional, and state levels to improve their *colonias'* social and physical infrastructure. Participation in community meetings and cleanup efforts has increased pride, consciousness, and notions of citizenship among *colonia* residents. Many *colonias* in New Mexico have organized informally into community counsels, electing or nominating a spokesperson to represent their community at regional meetings and in state-related functions (appropriation meetings, legislative days, etc.). While other *colonias*, with the aid and collaboration of local nonprofit organizations, have increased their knowledge of community development processes, and have gained valuable skills and insights in their interactions and negotiations with local, state, and federal institutions in seeking to leverage support and funds to improve their communities. While building community, several *colonia* communities have opted to form nonprofit organizations (also known as 501(C)3's for their IRS nonprofit tax classification). By organizing into nonprofit entities, communities have recognized their own leverage and power in soliciting funds directly from federal entities and private foundations, while also benefitting from the clout and leverage obtained as organized bodies of private citizens.

CONCLUSION

This study has explored the human-environmental relationships in the *colonias* in southern New Mexico as complex human populations tied into their local and regional histories, ecologies and economies. The historical, economic, political and physical transformations of the northern part Doña Ana County have driven former migrant populations to seek a more permanent stay or refuge in these borderland communities. In particular, the agricultural and dairy industries located along New Mexico's border region play a significant role in generating a more permanent labor market. The region's economy, while being heavily influenced by the global market, free trade, and changes in agricultural technology is also deeply tied to its natural environment and human ecology.

In examining the history of *colonia* development in southern New Mexico, it is important to note that these human settlements have been historically tied to the region's natural resources—mainly the waters of the Rio Grande and the fertile soils of its valleys. Many *colonias* in New Mexico have historical roots in this region of the U.S.-Mexico border. Their histories as population settlements are closely tied to the Rio Grande's contentious path, which has often led to the flooding and displacement of the region's population settlements. The history of *colonias* in New

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Mexico indicates that ecological and environmental threats are not new to contemporary *colonias*, but have been at the root of their development as early settlements along the U.S.-Mexico border.

This study relied on ethnographic research methods such as participant observation and household surveys to inquire on human-environmental factors in *colonias* in southern New Mexico, and the variables that lead to community development processes. By paying attention to daily interactions taking place between *colonia* residents and their immediate home, work, and community environments, this analysis has sought to understand local responses to environmental challenges facing such ecological, economic and socially vulnerable populations on the New Mexican region of the U.S.-Mexico border. For example, one of the study's key findings is the understanding of heightened vulnerability associated with life in *colonias*. In particular, the lack of physical infrastructure in these population settlements exposes *colonia* residents to flash floods, which cause local residents to be trapped in or out of their homes—primarily in communities that do not have paved roads. Although flash rains and flooding might in any other situation seem to be “natural” processes, the economic and political circumstances that lead people to live in communities without physical infrastructure and services, makes residents much more vulnerable to the impacts of natural disasters and to the social stigmas associated with living within ecologically marginal settlements.

By exploring the regional particulars of the U.S.-Mexico border (Heyman 1994), we are better able to capture the complexity of border dynamics within a political ecology perspective. While many *colonias* in New Mexico have long historical roots in the region, the transformation of contemporary *colonias* from former agricultural and cattle grazing land into population settlements has not been an easy transition. As noted in the ethnographic examples provided in this study, *colonia* residents are often faced with the dichotomies and hierarchies of value in these borderland communities. In particular, several *colonia* residents interviewed expressed their reflections of the concept of “value” by noting how they so often felt undervalued and underappreciated in their daily interactions with cattle at their job sites and on their residential properties.

As communities in transition, *colonias* face the stigmas of being populations on the periphery of larger urban cores in the border region. They also face the many costs associated with the volatilities of a rural landscape in the midst of regional economic transformation, as new agricultural technologies have been put into place to compete with other markets given the pressures of globalization and free trade to produce at lower costs. Global economic integration and free trade have had local

repercussions and consequences in local border communities. While larger urban centers like El Paso, Texas have experienced the loss of jobs caused by the transfer of manufacturing jobs abroad, local rural communities have been greatly affected by the infusion of farm technologies that have caused the loss of employment for long-standing farm-working communities. The need to compete with food producing costs at the global level has led local farmers to seek out new technologies to harvest crops such as onions and chiles faster and cheaper. This in turn, has led to the displacement of hundreds of farm-working families and laborers who have traditionally labored the land in southern New Mexico. Many of these farm-working individuals have migrated to other states like Kansas, Alabama, and Colorado, while others have sought more permanent employment in dairy farms; however, this process has also brought with it several work-related risks associated with working with cattle at close contact.

This ethnographic analysis of *colonias* also provided an opportunity to learn about how residents confront and challenge their economic and environmental vulnerabilities. As *colonia* residents have faced environmental disasters at the household and community levels, they have shared experiences and strategies that have assisted with community development processes. During environmental disasters, *colonia* residents often organize socially and politically to find solutions to their communities' problems. The need for infrastructure (paved roads, sewerage, trash collection services, etc.) has brought residents together to voice their needs and to solicit resources. While some *colonias* are more cohesively organized than others, the *colonias* of southern New Mexico have a legacy of successful community organizing. They have mobilized locally and regionally as part of resident councils and *colonia* coalitions, providing proof of what Ward (1999) calls "horizontal integration." During my ethnographic study, I also documented successful efforts of vertical integration, as *colonia* leaders built strategic allegiances with surrounding *colonias* to solicit financial support from local and state elected representatives and federal agencies. This level of local and regional political organization sheds new light on previous studies of *colonias* as "peripheral" and stigmatized communities. This study also highlighted evidence of citizenship in action, as border residents have responded to their human-environmental challenges with vigor and social agency.

Although this study has mainly focused on *colonias* in the New Mexican region of the U.S.-Mexico border, environmental risks and challenges are being faced by similar population settlements throughout the United States and elsewhere, where immigrant communities settle to provide much needed labor and economic infusion

into local economies. Here, the definition of *colonias* has been tied to the physical and geographic definitions of the U.S.-Mexico border; however, the community development processes often associated with *colonias* are taking place in many other communities undergoing similar types of rural-urban transformations. As migrant populations settle, they too will face several environmental and political challenges associated with the social stigmas so often associated with being considered “newcomers,” “outsiders,” and possibly “intruders.” Many of these new populations will settle close to their labor sites, and will be faced with a slew of human-environmental challenges associated with new settlements without the benefits of the social and physical infrastructure that so often accompany more established urban and rural populations. I suggest an opportunity for future studies to focus on the human-environmental processes that contribute to the marginalization of new immigrant settlements. Understanding these communities, and other communities like these throughout the nation and throughout the world, is important to the understanding how these settlements will organize and respond to the challenges of rural-urban dynamics, transformation of rural landscapes, and the revitalization of aging farming communities.

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