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Spatial transformations in Mercedes (Uruguay): representation of industrial agriculture growth and informal settlements.

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Spatial transformations in Mercedes (Uruguay): Representation of industrial agriculture growth and informal settlements.

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Abstract

Using Lefebvre's theory of space, this study describes the interaction between landscape transformations and the increasing financial investments from agriculture industries in Mercedes, Uruguay. I gathered secondary data and produced analytical maps to understand the recent changes produced in the urban-rural space of Mercedes. I also had informal conversations with local and national government staff about plans and policies. The interaction between plans, policies, and foreign investments related to industrial agriculture and social mobility has created new orders and spaces in the city. The most vulnerable sectors of the society have not benefited from these new orders in space. Capital has increased the fragmentation of space between the inner city and the periphery and/or informal settlements. Recommendations center on how governmental institutions can develop new policies and regulations to improve and change critical aspects of Mercedes' growth.

PART I

Chapter 1: Overview

Rural areas of Soriano, Uruguay, that traditionally depended on agriculture are currently facing many changes related to rural-urban migration and the development of industrial agriculture. Globalization, agricultural industrialization, rural migration, social and spatial fragmentation, economic growth, and local and national policy have contributed to this transformation. This study is an attempt to explain the processes of transformation as they are spatially manifested. It explores how land ownership evolution, farm structure, changes created by industrial agriculture, and the distribution of wealth in the capital of Soriano, Mercedes, are transforming the local social space.

In recent years, global agricultural networks have expanded their operations to include remote areas in the developing world, such as in Soriano, Uruguay. Being technologically more specialized than traditional agricultural practices (ARU 2009)[1], global agricultural companies and corporations induce a process of transformation that has, in the last two decades, changed Soriano's rural and urban landscape and reshaped the profile of local communities. In Soriano and western Uruguay, agriculture historically influenced the infrastructure of towns and their surrounding areas. Today these areas are being subjected to new governmental policies and projects which attempt to accommodate the operations of international companies

[1] Asociacion Rural del Uruguay (ARU) stands for Rural Association of Uruguay

interested in moving their headquarters from developed countries and establishing new ones in developing countries like Uruguay. Archer Daniels Midland Company and Cargill are two examples of the globalization of agricultural corporations; they have historically carried major operations in Iowa and now have established facilities in Soriano. Today multinational agricultural commodities are often associated with national and regional companies, such as Barraca Erro and Crop of Uruguay. Since 2003, Archer Daniels Midland, a company originally based in the U.S. Midwest, has increased its presence in South America by adding grain origination and storage silos, most of which are in Brazil.[2] In 2005, Cargill International Company, also originally based in the Midwest, became associated with Hiperinsumos S.A., and together they created the company Crop Uruguay.[3]

The landscape of Mercedes has undergone many changes that have affected its spatial configuration, such as the modification of land ownership and rent from national farmers to foreign investors, uneven economic growth within the city emphasizing the spatial gap between the privileged and unprivileged, and changes in land uses. The result of those changes is the location of silo facilities and informal settlements on the urban fringe of Mercedes, causing the deterioration of existing transportation infrastructure and the built environment.

[2] Archer Daniels Midland Company History - 2000-present

[3] Cargill Crop Uruguay History

According to the Census of the National Institute of Statistics (INE)[4], from 1996 to 2004, twenty-six percent of the rural population of Soriano moved to urban areas. Around fifty percent of the rural labor force lives in urban areas in small towns and cities including Mercedes and Dolores, among others. The formation of the first informal settlements in Mercedes in the 1980s was a consequence of rural migration brought about by the financial crisis, among other critical factors. The first squatters migrated into the city from rural areas seeking job opportunities. Those who could not find work or became unemployed could not afford places to live in the city, and ultimately many ended up occupying public land along the banks of the Daca Stream which floods at least once a year. The Daca Stream is in the west area of Mercedes and flows into the Negro River.

In the Eighties the Uruguayan economy started adopting neoliberal policies and strategies like tax incentives and revenues in order to be open to business with international investors. The total farm land used for agricultural purposes remained the same between the years of 1990 and 2000 (Grosskoff et al. 2003), but in order to maximize profits, farming practices shifted to those of industrial agriculture, changing from traditional practices to the use of sophisticated technology and machinery. This change was characterized by monoculture and mechanized farming, using fewer laborers. Money invested in agriculture machinery like tractors and other equipment was an important factor in the industrial agriculture transformation. This investment in machinery aggravated the inequalities between

[4] Instituto Nacional de Estadistica (INE) stands for National Institute of Statistics

farmers that were not able to invest and capitalist farmers/international corporations that expanded their technological investments (Grosskoff et al. 2003).

In summary, the 1980s marked the beginning of the process that continues in Uruguay today, seen in the transformation of land ownership characterized by a decrease in the number of farmers and an increase the size of farms. In addition, landownership shifted from family farmers to joint stock companies and foreign investors. Since the Nineties, industrial agriculture has encouraged the economic growth of the city. However, that growth has not been reflected upon the majority of the population and its more vulnerable sectors, and the low-income population in particular has not benefited by the gross economic outcomes. As proof of that phenomenon, we can see how informal settlements have expanded in the last two decades in Mercedes, creating socio-economic and spatial segregation.

Mercedes, Soriano

Uruguay is subdivided into nineteen administrative-political regions called Departamentos,[5] one of which is Soriano. In 1857 Mercedes became the capital of the Departamento of Soriano. As one of the main destinations of international industrial agriculture companies seeking headquarters in Uruguay, Mercedes benefits from being directly connected to farmland and transportation infrastructure

[5] Departamento is an administrative-political subdivision of the country. Uruguay has nineteen Departamentos, and each of them has its own capital city. The governments of the Departamentos are called Intendencias Municipales. The Intendencias Municipales are in charge of the rural and urban areas within the Departamentos, and the headquarters of the Intendencias are located in the capitals of the Departamentos.

connecting to the port of Nueva Palmira. Additionally, it is a medium-sized city with clearly defined socio-economic classes, a fact directly reflected in its use of space.

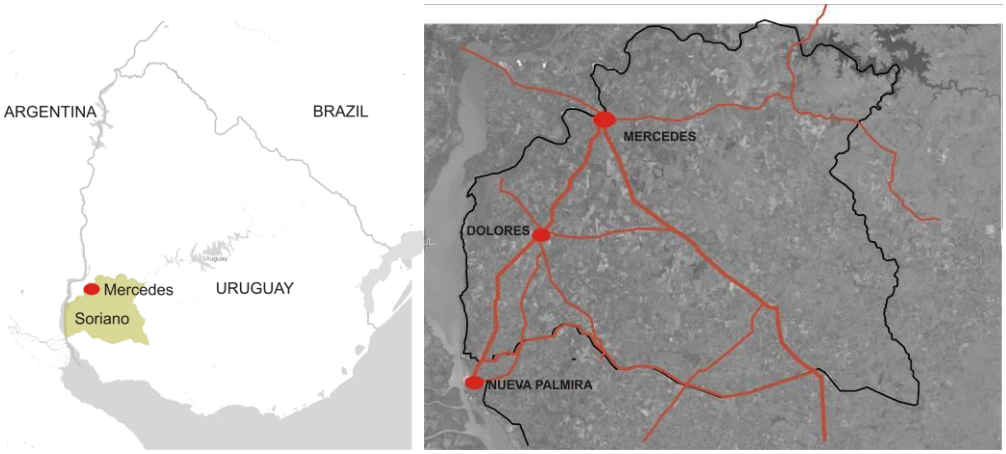

Figure 1- Uruguay and Soriano maps. Drawn by the author based on satellite image.

Located along the Negro River, the city of Mercedes, originally called “Capilla Nueva de las Mercedes,” was founded in 1788 by a priest named Manuel Antonio de Castro y Careaga. The city’s foundational map was based on the “Law of Indies,” which established the hierarchical spatial relationship center-periphery through the grid. The Law of Indies plan located the church and the institutional buildings around a central plaza (Lejeune and Centre international pour la ville l'architecture et le paysage. 2005, 18-29). The orthogonal base grid of the Law of the Indies plan is the base foundational map of Mercedes today. The orthogonal grid was rapidly expanded from the central plaza and the cathedral.

Close to ninety percent of the Uruguayan population lives in cities and towns. The population of the Departmento of Soriano is around 84,563. The population of

Mercedes, 42,032, comprises almost half of this[6]. However, the urban populations are economically dependent on the rural areas. The economic and productive activities are related to forestry and the food industry, including cattle, dairy, horticulture, wheat, sunflower, and more recently, soybeans. The agriculture industry is therefore one of the main sources of jobs in both the cities and towns of this Departmento.

Moreover, the city of Mercedes has been largely associated with agricultural production. Most of the economic activities in Mercedes depend on agriculture and the different sectors of its value chain. The Departmento of Soriano has been characterized by its traditional agriculture and livestock production, but recently industrialized agriculture development has significantly increased in that region. Watersheds and geology have been favorable for the presence of fertile soils in that region. Because of its amount of cereal production and yield production per acre since the Eighties, Soriano has become the most important cereal grain producer in the country, producing wheat, barley, and sorghum, among other grains.

The city of Mercedes is comprised mainly of four different geographical areas, and different socioeconomic statuses can be observed in each. These areas include the center, the *rambla* or riverside boulevard, traditional neighborhoods, and the periphery (see figure 2). The center is the historical area and is used in a variety of ways, including for residential units, commercial buildings, and governmental and financial institutions. The residents in the center are comprised predominantly of a

[6] Data obtained from the 2004 Population Census, INE, National Institute of Statistics, Uruguay.

medium socioeconomic class. The rambla is the neighborhood located on the Negro riverside, and the activities in this area are basically residential and recreational involving the river. The rambla is occupied by people from the highest economic class of the city. The traditional neighborhoods form the urban fabric of Mercedes and are inhabited by the working class. Corporations and facilities related to industrial agriculture activities are located in the peripheries of the city next to the informal settlements.

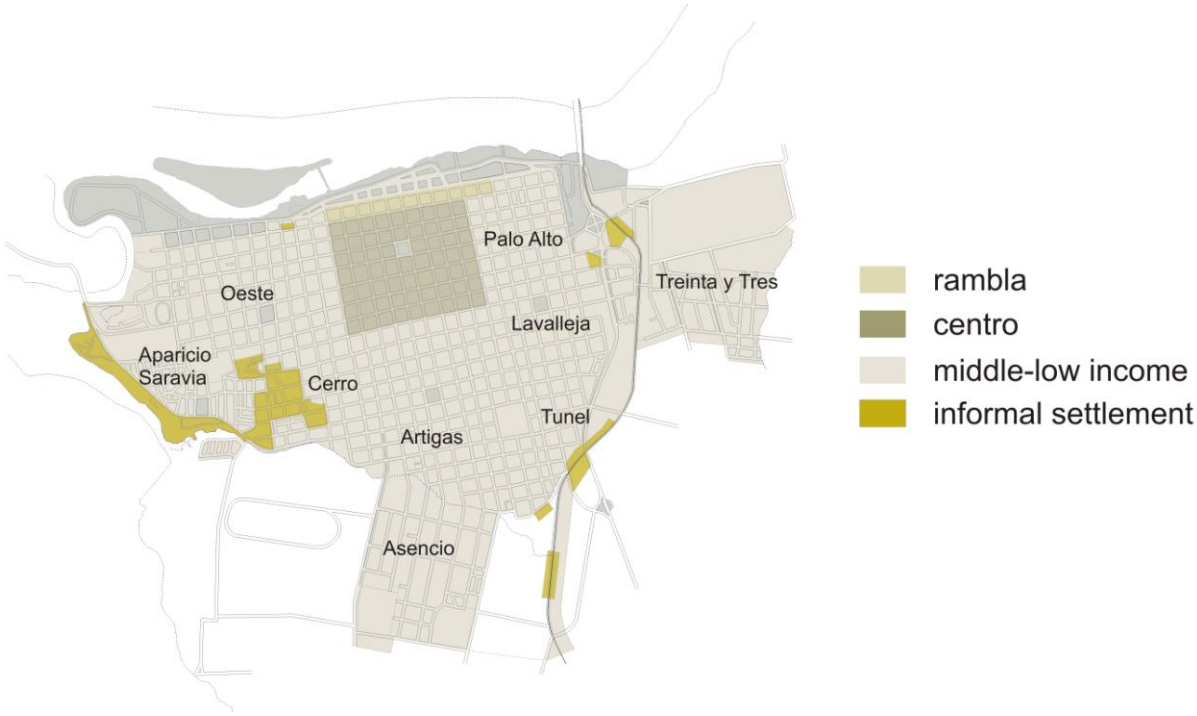

Figure 2- Neighborhoods of Mercedes. Map drawn by the author.

The real estate value for the different neighborhoods reflects the income level of the population. For example, today the property values in the Riverside Rambla are over eighty dollars per square foot, the values in the Treinta y Tres neighborhood are

around eleven dollars per square foot, and the values in Aparicio Saravia and Tunel are less than four dollars per square foot.[7] (See figure 2)

Current challenges

As mentioned the census of the National Institute of Statistics (INE), from 1996 to 2004, twenty-six percent of the rural population of Soriano moved to urban areas. [8] While the population in rural areas is decreasing following the national trend, the outskirts of Mercedes and other small cities in Soriano have increased in population. Around fifty percent of the rural labor force lives in urban areas, including small towns and cities such as Mercedes. The depopulation of the countryside and the decline of the urban area are associated with the growth of formal and informal settlements in Mercedes, amounting to seven percent of the population of Mercedes in 2004.

In Uruguay there are two clear trends of rural population mobility.[9] First, the urban areas are expanded to the detriment of rural areas because the rural population has migrated to urban areas. Secondly, the rural population directly involved with agriculture practices is decreasing. This second trend has unpredictable consequences (MEVIR *El escenario en el que opera mevir 2008/2009*) which can be attributed to different social, economic, and cultural aspects related to the transference of agriculture knowledge between generations.

[7] Real estate data obtained from Uruguay inmobiliaria.com

[8] Data from the Population Census of 1996 and 2004, INE, National Institute of Statistics, Uruguay.

[9] Movimento para la Erradicacion de la Vivienda Insalubre Rural (MEVIR) is the Honorary Commission for Eradicating the Unhealthy Rural Housing, whose main purpose is to generate a sustainable habitat for the population that lives and/or works in the rural areas of Uruguay.

Additionally, rural migration could be explained as a result of the disintegration of rural society rather than the dynamism of urban society (Castells 1979, 44).

In the last decade, the Departmento of Soriano has been challenged by the emerging changes in agro-industrial production and socio-economic changes of the population. Although Soriano has experienced important economic growth, most of the financial capital is concentrated in higher socioeconomic classes and, more recently, in international corporations, so this growth has had little impact on the low-income sectors of society.[10] The low-income sectors of society provide cheap and seasonal labor in areas where industrialized agriculture has recently expanded.[11] Although the income per capita in rural areas has increased around thirty percent from 2006 to 2008, that income is lower compared to the income per capita in urban areas. For example, the lowest income per capita in rural areas is around one hundred dollars, whereas the medium income per capita in urban areas is twice as much at around two hundred dollars.[12] Thus, the rural migration could be explained by people searching for higher income opportunities in the city. In Mercedes, the economic benefit of being the headquarters of industrial agriculture companies has not been directly reflected upon the population. The growth of the informal settlements demonstrates that the lower-income classes receive little or no benefits

[10] Data from agriculture statistics, Direccion de Estadisticas Agropecuarias (DIEA) and the Chamber of Industry and Commerce demonstrate that most of the production of soybeans is for exportation.

[11] Field notes from informal chats with staff of the local government of Soriano, Intendencia Municipal de Soriano (IMS)

[12] Average Income per capita with housing value in the rural areas from 2006-2008. National Institute of Statistics, Instituto Nacional de Estadistica (INE), Uruguay. See Appendix.

from the economic growth, limiting their access to housing and to public infrastructures and services.

In addition, the formation of informal settlements in Mercedes has been caused by the impoverishment of urban workers and the lack of affordable housing and money for rent.[13] This increase in poverty can be attributed to the regional economic and financial crisis that Uruguay faced from 2001 to 2003. For example, many people living in the city who lost their jobs during the economic crisis could not afford to pay rent and had to move to informal settlements.[14] Affecting all the sectors of the society, the economic crisis created problems that had never been seen before, and these were accompanied by the rapid and critical expansion of transnational capital that targeted niches in vulnerable populations. Hence, with the growth of informal settlements in Mercedes, the most vulnerable sectors of the society have been negatively affected and become even more exposed to spatial transformations. When a family moves to an informal settlement, the following generation tends to remain there negotiating the challenges of being socially, economically, and culturally isolated from the rest of society (Sanchez R 2006).

[13] Based on data from local government of Soriano, Intendencia Municipal de Soriano (IMS)

[14] Field notes from informal chats with municipality employees (IMS)

Goals of this study

This research aims to provide insight on the spatial transformations and challenges of Mercedes in the past two decades. It is an attempt to analyze the processes and transformations related to the growth of industrial agriculture practices and facilities in Mercedes and surrounding areas, rural migration to the city, and the growth of informal settlements.

This study informs future academic studies and policy makers of rural-urban planning about challenges related to industrialized agricultural practices and facilities in rural-urban communities in Uruguay that may also be applicable in other developing countries.

The following questions guided the research:

- How and why has the city of Mercedes and its rural areas been transformed? What have been the key elements in this transformation?
- How do industrial agriculture activities and facilities operate on the landscape? What are their logistics, and what is their relationship with the infrastructures? How have the facilities evolved through time?
- Why has the rural population migrated to Mercedes? Are changes in land ownership related to rural migration?
- How is Mercedes socially and spatially fragmented?

- What are the causes of the formation of informal settlements? How have they evolved through time?
- What are the challenges for Mercedes and its sustainable development?

Organization of the thesis

The thesis is structured in three parts and six chapters. The first part includes three chapters called “Overview,” “Theoretical Framework,” and “Methods and Procedures” respectively. This part introduces the basis for the research.

The second part is called “The social space in Soriano, Uruguay.” This part includes analysis and results of the research. It contains two chapters: “Abstract Space: Policy and Map Making” and “Spatial Practices.”

The third part of the thesis includes conclusions and recommendations for future research and projects. Finally, the appendix covers the tables that inform the analytical part of the thesis, and it also includes the Iowa State University Institutional Review Board Research Decision.

Chapter 2: Theoretical Framework: Abstract space

The way space is organized embodies a relationship of power between those who are advantaged and those who are disadvantaged. This relationship defines social structure and organization. In the words of Lefebvre, “The space of a (social) order is hidden in the order of space” (Lefebvre 1991, 289). In “The Production of Space,” Lefebvre (1991) brought to urban discourse the role of the state and politics in determining people’s relation to the built environment. Thus, space is understood not just as a built environment, but also as a force of production and an object of consumption. The space consequently produced is an instrument of thinking and action, which is also a consequence of control, domination, and power. Space expresses the material and political priorities of societies; each society produces its own space.

The Capitalist society has produced abstract space which includes “the world of the commodities,” its logic, and its worldwide strategies (Lefebvre 1991). Although abstract space seeks to achieve homogeneity through the simplification of social reality to a determined plan or idea, it is complex and polymorphic. Lefebvre describes abstract space’s constitutive dualities as the result of being produced as geometric space and being productive.

The neoliberalist approach to economic and social policies is a global phenomenon in the capitalist society. It proposes free individual competition within an institutional framework of private property rights, free market, and free trade. A significant problem of abstract space under the neoliberal approach is that while the

state produces legislation and policies benefiting corporations like agri-business, it withdraws from welfare supply, leaving segments of the population exposed to impoverishment (Harvey 2005, 70-80).

In the globalization process, societies become integrated by networks that blur the boundaries of the autonomous state (Castells *The rise of the network society* 2000). Castells (Toward a sociology of the network society 2000, 694) defines globalization as "the technological, organizational, and institutional capacity of the core components of a given system (e.g., the economy) to work as a unit in real or chosen planetary scale." Hence, the state institution is transformed as a result of the global economic networks; the states reorganize in networks of supranational, regional, and local governments. The global economy networks are based on information, financial transactions, markets, and production sites. Those networks are flexible and are able to spread without limits. For being part of the global economic networks, the regions have to add value through the input of human resources or raw material, among other ways (Castells Toward a sociology of the network society 2000). For example, Mercedes is part of the global network because it provides raw material to the global market.

All societies are interdependent, but the interdependent relationships are asymmetrical (Castells 1979, 39-63). Those asymmetrical relationships within the globalization process entail an important problem of abstract space. The asymmetrical relationships among societies could be understood as relationships of domination and dependence. Castells (1979, 44) describes three types of

domination. The first type is colonial domination, which is based on the direct exploitation of resources. Mercedes was founded under colonial domination. The second type is capitalist-commercial domination through exchanging raw materials from developing regions and selling manufactured products to them. The third type is imperialist industrial and financial domination by the creation of local industries and investments following international trusts and the global market.

Abstract space has formal properties, but the approach to spatial problems should not depend upon one formal method. The reflections of Lefebvre (1970) about politics of space suggest a method for approaching the spatial problems. The spatial approach has to be based on a “dialectical method” that explores spatial contradictions in society and the contradictions of physical manifestation and the use of space (Lefebvre, Brenner, and Elden 2009, 167-182).

Abstract space embodies elements of Lefebvre’s “perceived-conceived-lived” triad, which consists of the spatial practices and representations of space in its constitutive duality. Thus, abstract space implies a hierarchical arrangement of elements and places by integrating and excluding them (Lefebvre 1991, 287-289). For example, the foundational plan of Mercedes based on the colonial grid imposes a relationship of power between the central plaza with the cathedral and the rest of the city.

The abstraction of space represents an act of violence because it implies the destruction of complex reality with the purpose of imposing a spatial order. Thus, it

embodies the contradiction that it seeks to solve. Nature and social reality become abstracted by a homogenous gaze that ignores parts and details (Lefebvre 1991, 286). In that sense, a commodity represents an abstraction of the activity of production and the human need; its market value is prioritized. The commodities embody the networks of exchange and the world market. Thus, the global market and the global economy produce abstract space at different scales: local, regional, and global, as well as in different forms, including housing, land, and transportation, among others.

Space is a social product and the social construction of space implies this process over time (Lefebvre 1991). Social space is the intersection of spatial practice, the representation of space, and representational space, where all exist together. In the words of Lefebvre:

> (Social) space is not a thing among other things, nor a product among other products: rather, it subsumes things produced, and encompasses their interrelationships in their coexistence and simultaneity – their (relative) order and/or (relative) disorder (Lefebvre 1991, 73).

Spatial practices are the production and reproduction of the relationship between society and/or the individual and space. Spatial practice is an everyday practice and embodies the physical manifestation of space; through spatial practice, society produces and appropriates space (Lefebvre 1991, 38).

Representations of space embody the conceptualization that the relations of productions make on space. This implies the abstraction of space constructed by

scientists and technocrats through maps, plans, and policies, among other ways. Those representations of space enforce a type of order (Lefebvre 1991, 38).

Representational space, the meaning of space for individuals and society, is related to social identity and culture. It is space lived through complex symbols and it overlays physical space, making uses of space that are symbolic (Lefebvre 1991, 38).

Lefebvre describes the implications of social space as a social product. The first implication is that natural space is disappearing. Nature is perceived as the raw material with which productive forces have forged their particular spaces, conforming abstract space. The second implication is that each mode of production produces its own space. From that point of view, social space contains three kinds of relationships: the social relations of reproduction, the relations of production, and the reproduction of the social relations of production. First, the social relations of reproduction, such as bio-physiological relations between the sexes, different age groups, and family, are components of spatial practices. Secondly, the relations of production such as the division of labor and its hierarchical social functions embody spatial practices. Finally, the social relations of production that are sought and imposed embody the representation of space. These kinds of relationships are intrinsically connected to each other (Lefebvre 1991, 30-33).

Capitalism and the state have produced abstract space that is fragmented and disarticulated from society and its needs (Lefebvre 1991). As is illustrated later,

space in Mercedes is shaped by the industrial agriculture operations and practices and by the different policies driven by different levels of state government, both national and local. In the 1980s and 1990s, the Uruguayan economy was driven by neoliberal economic practices. In 2005, concern for social equity brought the government to attempt to solve issues regarding the distribution of wealth through economic practices and social justice policies such as the Emergency Plan and income tax. Still, this has not been enough to counteract the effects of neoliberal practices.

As a result of neoliberal economic practices, as well as state and municipal policies, the society of Mercedes is spatially segregated into classes. The social justice approach and claims of the right to the city are the counter-points to neoliberal economic practices. The spatial approach to social justice is constructed by society as a whole; it implies the spatial redistribution of resources and ensures the access to urban infrastructure for the entire society (Harvey 1973, 14-15). Additionally, the right to the city is the right to transform urban processes through collective action:

> The right to the city is far more than the individual liberty to access urban resources: it is the right to change ourselves by changing the city. It is, moreover, a common rather than an individual right since this transformation inevitably depends upon the exercise of a collective power to reshape the process of urbanization (Harvey 2008, 23).

Although the right to the city is the most ignored of the human rights, it is the most valuable (Harvey 2008, 23-40). The informal settlements in Mercedes represent the

claims to that right, which include access to housing and public infrastructure, among others.

This research focuses on the social construction of abstract space in Mercedes, which implies the social relations of production, the representations of space, and spatial practices and their physical manifestations. It analyzes, through elements of Lefebvre's triad (1991), spatial transformation and challenges Mercedes faces related to the development of industrial agriculture, rural-urban migration, and the growth of informal settlements. Finally, it explores the way maps, policy, and plans have transformed the physical manifestation of space and the use of space by the society of Mercedes.

Chapter 3: Methods and Procedures

This research focuses on the spatial transformation of Mercedes that has been produced by neoliberal economic practices, capitalism, and the state. This phenomenon is analyzed through the concepts of the representation of space and the spatial practice of Lefebvre's spatial triad (1991) (see chapter 2). This study is based on secondary data obtained from the Agricultural Census, Population Census, online press and websites, maps, policies, and other sources. The discourse is informed with field notes from informal conversations about plans and policies with staff of the local government Intendencia Municipal de Soriano (IMS) and the Ministerio de Transporte y Obras Publicas (MTOP), or Ministry of Transportation.

The representation of space is conceptualized space; it implies an abstraction of space which is constructed by space scientists and technocrats, planners, urbanists, and engineers, among others (Lefebvre 1991, 38). For this section of analysis, data was gathered from historical and contemporary maps, satellite images from Google Earth, the current strategic plan of Mercedes, and past and current policies related to land use and development.

Spatial practice refers to the physical manifestation of space. A society's spatial practices determine that society's space. Spatial practice produces and appropriates the space. Thus, in a capitalist society, spatial practices are materialized through routes and networks that connect places for work, living, and leisure (Lefebvre 1991, 38). For this section of analysis, data was gathered from the

2002 Agricultural Census, the Population Census from 1996 and 2004, and the Relocation and Regularization Program of informal settlements in Mercedes. Additionally, local and national media, online-newspapers, websites of the agriculture industries located in Mercedes and Soriano, and several bibliographic resources were analyzed. The farm structure section in this research is based on Piñeiro's (1991) definitions of family farms in Uruguay. In addition, the spatial practices in Mercedes that respond to the exportation and intern consumption markets can be understood in the words of Piñeiro (2003), who describes the agriculture practices for Latin America as agriculture in two different speeds:

> Today there is agriculture in two speeds: agriculture with the strong use of chemists and mechanics, and biotechnology related with agribusinesses, whose agents are agricultural entrepreneurs, and the main destination for this agriculture production is exportation. The agriculture of peasants and family farmers with lower technological development oriented to the domestic market, which is less dynamic… (Piñeiro 2003, 28). Translated by author

Finally, the findings of this research are shown through maps on satellite images that illustrate the social construction of space and spatial practices. Additionally, the maps attempt to decipher what Lefebvre calls the society's "secret" space under capitalist practices (Lefebvre 1991, 38).

This research had limitations due to the location of the city studied and the lack of primary resources, especially from the population of the informal settlements. Other limitations were the lack of academic studies related to agricultural transformations in that region, and particularly the lack of studies, maps, and demographic data related to both rural and urban growth.

PART II: The Social Space in Soriano, Uruguay

Chapter 4: Abstract Space through Policy & Map Making

Abstract space is the result of the social and economic relations of the modes of production and the way these relations formulate knowledge, signs, and codes (Lefebvre 1991). Maps and policies are some of the tools that establish the "order" that produces abstract space.[15] According to a study done by Jacob and Dahl (2006, 273-274): "The power of maps resides in the new kind of visibility it provides for a very familiar space, even if limited in extent. The maps share the prestige of glasses, filters, and microscopes: like all these optical mechanisms, it allows the invisible to be seen," and in the maps the visible could become absent from discourse.

Thus, the power of maps and policies depends on the ability to make reality simply by representing something or by ignoring it. Although at some degree policies are influenced by agencies, maps and policies produce and reproduce spatial and human relationships among power agencies, including top-down relationships between those who produce policies and those who are subjected to them. This section is an effort to overlay the history of land ownership in Uruguay, as well as the policies, plans, and maps, with the analytics of spatial dialectics.

[15] In the traditional evolutionist model, geographical knowledge is represented by successive levels of coherence, architecture, normative value, and authority. Thus, thought and knowledge become a simplification of the complex reality, and the maps represent a "view of the world" of a specific epoch. Jacob, Christian and Edward H. Dahl. 2006. *The sovereign map : Theoretical approaches in cartography throughout history*. Chicago: University of Chicago Press. Maps represent concepts about the world; they are statements about the physical world. They imply a specific view of world and time, present, past, and future (the way the physical reality should be). Jacob, Christian. 1996. Toward a cultural history of cartography. *Imago Mundi* 48: 191-198.

Land ownership evolution & the commoditization of the land

Unlike most of the countries in Latin America, Uruguay did not have an Agrarian Reform; the transfer of land in Uruguay occurred through inheritance. Over the years the land was subdivided through inheritance from the landlords of colonial times.

The attempt of Agrarian Reform in Uruguay took place between 1811 and 1820 under the Artiguista revolution. Radical and avant-garde for its time, the Agrarian Code of 1815 pursued the redistribution of the land owned by the Spanish and Criollos *estancieros*, or landlords. The code recognized the primary rights over the land belonging to the indigenous people. However, the Portuguese Invasions, supported by the Spanish and Criollos *estancieros*, stopped and reversed that process. From 1820 to the end of the nineteenth century the indigenous groups and gauchos were moved off of the land they had acquired during the Agrarian Reform.

In 1946, Law No.10.866 for Towns was adopted. This law gave the department governments the power to subdivide rural land in order to create new urban areas. The local governments are in charge of the design and construction of streets and blocks; they are also responsible for providing infrastructure services such as potable water and electricity.[16] Before the 1946 law, the subdivision of rural land was done without any infrastructure provisions. The law was an attempt to ensure the equal distribution of infrastructure among the citizens, prevent land speculation, and protect rural land from non-agricultural development.

[16] Ley 10866 de Centros Poblados or Law of Towns, Uruguay, 1946.

Industrial agriculture companies have pressured the land market in the western and southern areas of Uruguay, including Soriano and Colonia. The pressure on small family farmers is increasing because the biggest farms have already been sold or rented, so most of the land remaining available is from small family farms that are based on family labor (MEVIR *Algunos componentes del escenario de actuacion de mevir* 2008). While the average price of land in Soriano was 448 dollars per hectare in 2000, in 2009 the price increased to 3,507 dollars per hectare (DIEA Serie "precio de la tierra" compraventas 2009). This change in prices was directly related to the high international price of grain and the international expansion of this agricultural commodity. However, it is difficult at this point to quantify the amount of land that has been transferred from family farms to serve industrial agricultural purposes.

There are at least two types of land transaction: one between the industrial agriculture companies and small family farms, and another between companies and capitalist farmers. The type of transaction between the industrial agriculture companies and the capitalist farmers takes place when these farmers rent their land to the companies (Arbeletche and Carballo 2006). Instead of losing land, the farmers increase their capital by renting land. In addition, the rent paid to the farmers has been increasing from 28 dollars/hectares per year in 2000 to 218 dollars/hectares per year in 2009 on average, with Soriano seeing the highest rent in the country in 2009 (DIEA Serie "precio de la tierra". Arrendamientos primer semestre 2009). The other type of transaction takes place when family farmers sell land to industrial

agriculture companies. After a small family farm is sold, the farming there becomes industrial, with soybeans being the main crop produced during the summer.

An important impact of the change from traditional farming to industrial farming is the reduction in the demand of human labor. For example, while a dairy farm employs around twenty workers in one thousand hectares (DIEA 2010), a soybean enterprise only needs between 2.8 to 3 workers in the same area (Oyhantcabal and Narbondo 2008, 101-102). Thus, the decrease in rural population might be related to the shift to industrial agriculture, which by nature demands fewer farming-related jobs.

According to Piñeiro et. al. (1991), in Uruguay the agro-industries, their international networks, and the concentration of capital have allowed the growth of agricultural production. In other words, the association between international and local capital has facilitated the development of industrial agriculture.

Plan of Mercedes: the rational paradigm

Pragmatic rationality is a form of reasoning that attempts to solve problems and foresee the future, and it is a linear process (Brooks 2002). Rationality constitutes an abstraction and simplification of the real world in order to make reality more understandable and measurable. Thus, pragmatic rationality is a model of thinking which is in the realm of the representation of space (Lefebvre 1991) and is reproduced by scientists and planners.

Rationality embodies the contradictions between planning theory or research and current practice. Planning theorists have largely discredited the notion of planning as an exercise of rationality. However, today rationality is still the hegemonic paradigm in planning practice (Brooks 2002). One of the main reasons for the perpetuation of the rationality paradigm is that it is the dominant planning practice within traditional governances, such as the government in Mercedes. Since rationality is linear and attempts to be apolitical and uncritical of context, it fits into the capitalist mode of the production of space.

The Comprehensive Rational Planning Model, also called the Strategic Plan, is a set of prescribed steps and goals within the rational paradigm. There are different variations of the Comprehensive Rational Planning Model, but all of them include the following steps: 1) establish the goals and visions that are likely to be achieved, 2) analyze all possible alternatives, 3) evaluate the positive and negative consequences of all the alternatives, 4) choose the alternative which is most suitable to the goals and visions, 5) implement the plan, and 6) evaluate the plan according to the goals and visions (Brooks 2002). The Strategic Plan of Mercedes was created under the rational paradigm by a planning agency consisting of different governmental and non-governmental institutions. The governmental institutions involved were the local government, or IMS, and the Ministry of Housing, Land Management and Environment – National Direction of Land Management, or

MVOTMA-DINOT[17]. The non-governmental organization that participates in the planning process is called Anacahuita and is defined as an environmental and social network. The professionals in the planning agency were mostly architects and community planners, as well as a lawyer, a social worker, and an agronomist. The plan remained within the planning agency during the creation and design process. The ability to influence policies and maps through the Strategic Plan of Mercedes demonstrates the top-down power relationship between the planning agencies and the common population, which in general is not part of the planning process.

Based in Mercedes, the local government of Soriano, or IMS, has carried out a comprehensive rational planning model called the "Plan de Desarrollo y Ordenamiento Territorial Microregion de Mercedes," or "Plan for Development and Land Management for the Region of Mercedes." The plan is related to other plans for three different micro-regions of Soriano (see figure 3). The micro-regions were defined accordingly with their identity and production:

…this idea of the three micro-regions is related to the traditional identity of each region…when you are closer to the Negro River and the San Salvador River, the production is more agricultural than that of southern Soriano, which was traditionally more cattle production. However, today if you drive on the secondary roads, you will see few cattle in the Departamento. Cattle production has decreased, so land that traditionally produced cattle is now agricultural land. In southern areas of Soriano where dairy farms were important, in recent years they have decreased, and production has shifted to soybeans, maize, barley, and sunflowers…The region of Mercedes is the principal grain storage area, but that is also increasing in the south… (Field notes from informal chats with Municipality staff) translated by author

[17] Ministerio de Vivienda Ordenamiento Territorial y Medio Ambiente (MVOTMA) stands for the Ministry of Housing, Land Management and Environment. Direccion Nacional de Ordenamiento Territorial (DINOT) stands for National Direction of Land Management

While the Junta Departamental has not yet approved the plan,[18] during 2010 the plan has been reviewed in order to meet the requirements of National Law 18308, known as the "Land Management and Sustainable Development" law. The Plan of Mercedes is described as a strategic document for public knowledge and discussion. It provides goals and visions for the city of Mercedes, and it presents strategic guidelines for achieving those goals. In addition, it explains in detail through maps and urban plans the way the strategic plan will be implemented. The plan is focused on issues related to informal settlements, economic development, industrial development, and historic preservation. Thus, it provides land use and zoning ordinances for the urban core and the urban fringe of Mercedes. Although the plan has not been implemented, it is important to highlight the way this plan will transform the built environment in Mercedes and the spatial relationships of power which will modify social relationships.

[18] Junta Departamental is the legislative council of the Intendencia Municipal, and it is integrated by elected officials.

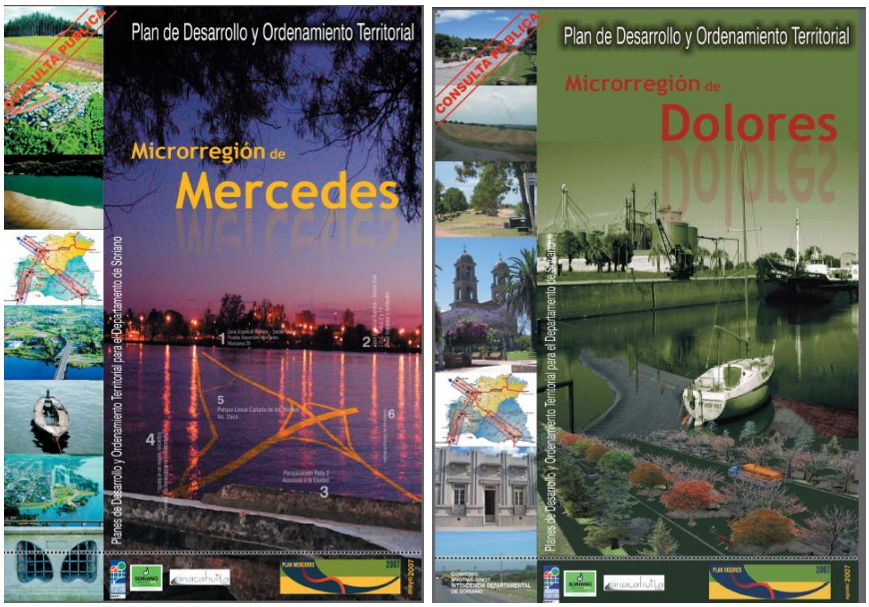

Figure 3- Plans for Development and Land Management for the Region of Mercedes and Dolores respectively.

The Strategic Plan of Mercedes, like most of the strategic plans, is based on an analysis of strengths, weaknesses, opportunities, and threats, known as a SWOT analysis for short. The methodology of the planning process is described as participative because it incorporates the input of fifty interviews of residents (IMS and MVOTMA-DINOT 2007). However, the majority of the population does not know about this plan. The accessibility to documents relating to the plan is obtained on the Internet or by appointment with the city hall planner. Although Internet is broadly used in this city, a large number of people do not have access to it because of economic issues or the lack of access to information and infrastructure.

Although the strategic plan described some kind of community participation during planning, the agency remained enclosed during the planning process. Though the plan describes its methodology as participative because it involved 180

stakeholders of Soriano (IMS and MVOTMA-DINOT 2007, 10), community participation was low; less than 0.1 percent of the population was involved. Even though there were attempts to involve the community during the planning process, the comprehensive rational model does not allow community input because the decision-making is done by the planning agencies; they are the experts that foresee the visions and goals of the plan. In contrast, community input implies a collaborative planning process where planners and local citizens co-produce the data gathering and analysis with each needing the other to get the adequate information.

The Strategic Plan of Mercedes develops a set of action strategies for dealing with informal settlements. The “Habitat Program” is a program of prevention, integration, regularization, and relocation of the informal settlements. Thus, it provides the specific relocation of informal settlements within the urban fringe of Mercedes. For example, some parts of the settlement known as “Aparicio Saravia” will be regularized, and other parts are designed to be relocated in the area surrounding the hippodrome and on the outskirts of the city. Like all of the strategic plans, it is an abstraction and simplification of reality, so it does not consider the social and economic networks existing within the informal settlements. Thus, social and economic networks such as waste classification are fundamental for the survival of the people in the settlements, and the population is at high risk when the networks are broken. The types of economic and social networks that make reality a complex phenomenon are not taken into consideration in any comprehensive rational model because the nature of the model is to simplify reality.

Additionally, in strategic planning the purpose of simplification is to focus on limited aspects of society in order to make them measurable, controllable, and malleable (Scott 1998, 9-53). Although any type of planning is schematic, the comprehensive rational model does not succeed at representing the spatial practices of society; its main problem is that ignores the importance of community knowledge.

Policy, norms, and regulations: Law 18308 "Land Management and Sustainable Development" and Regulation 349/005 "Environmental Impact Assessment and Authorization"

In June of 2008, National Law 18308 known as the "Land Management and Sustainable Development" law was approved. The objective of this law was to serve as a general framework for the entire country and to help coordinate the different regional and local plans of municipal governments. It provides the planning tools and strategies that local government should follow for preserving national public interest. Thus, the overall intention of the law is to coordinate and orient local plans for pursuing national goals.

The Land Management law deals with issues of urban sprawl. The law tries to protect suburban and rural areas next to the urban fringe by local plans that restrict the size of parcel subdivision. In the past in Mercedes there was no definition of the areas called *huertos*.[19] There was no specific definition of the minimum and

[19] Huertos are the small farms used for horticulture purposes.

maximum size of parcels, nor was there a definition regarding which was the huertos area. In 1999, a local government regulation specified that the huertos area was considered in a radius of 1.5 miles from the urban boundary, and it allowed the parcels subdivisions from 3.7 acres to 12 acres. In 2010, the Mercedes Plan reduced the radius of the huertos areas from 1.5 miles to a smaller area, but it kept the same minimum and maximum parcel size to meet the requirements of the Land Management law (IMS 2010). This was an attempt to prevent urban sprawl and preserve the rural land for agriculture purposes and characteristics of the huertos. [20]

One of the innovations of the law relates to rural construction, which includes industrial agriculture storage facilities. In the past it was not mandatory for these types of constructions to be declared to the Intendencia Municipal, or municipal government. Now with the new law, the Intendencia has to control, approve, and regulate rural construction, especially that which is industrial.[21]

Another innovation in Uruguayan policies related to rural construction is the requirement of an environmental impact assessment and authorization. In 2005, the Decreto 349/005 regulation of environmental impact and construction authorization was approved; this was addressed by the National Environmental Direction, or

[20] Field notes from informal chats with municipality employees (IMS)

[21] Field notes from informal chats with municipality employees (IMS)

DINAMA.[22] After the approval, rural industrial constructions such as silo facilities were required to have an environmental impact assessment. In order to get the environmental impact evaluation approval, companies have to present a form and documentation to DINAMA. In addition, the industrial agriculture facilities that existed before the regulation must get an environmental impact assessment, and if it is not approved, the companies must address the issues by following environmental specifications and requirements.

Policy for encouraging the foreign investments

Since the late Nineties, the Uruguayan government has promoted a new policy approach for encouraging foreign investments. Law 16906, approved in 1998 and called the "Law of Investments," promotes investments and national interest. The goal of the law is to attract the attention of foreign investors to Uruguay by opening the Uruguayan economy to the international market, encouraging exportation and giving benefits to the investors. While benefits include incentives and tax exonerations, the incentives are related to extensions on time; they are not subsidies. The law benefits the industries of agriculture, forestry, mining, and tourism.

In order to match the growth of the agriculture industry and add to Soriano's comparative advantages, the Ministry of Transportation has invested in Highways 2

[22] Direccion Nacional de Medio Ambiente (DINAMA) is the National Direction of Environment, which is part of the Ministerio de Vivienda Ordenamiento Territorial y Medio Ambiente (MVOTMA), or the Department of Housing, Land Management and Environment.

and 21. These highways absorb freight transported from the majority of the silo facilities in Soriano to the exportation ports of Nueva Palmira and Montevideo (see figure 4). During the harvest season the freight of grain increases on roadway infrastructure. According to staff from the Ministry of Transportation, “In Uruguay the grain freight is around five hundred trucks per day. We have to consider that that is seasonal, but at some times of the year there is freight of four hundred to five hundred trucks per day of just one product without processing.” (Field notes from informal chats with MTOP staff) translated by author

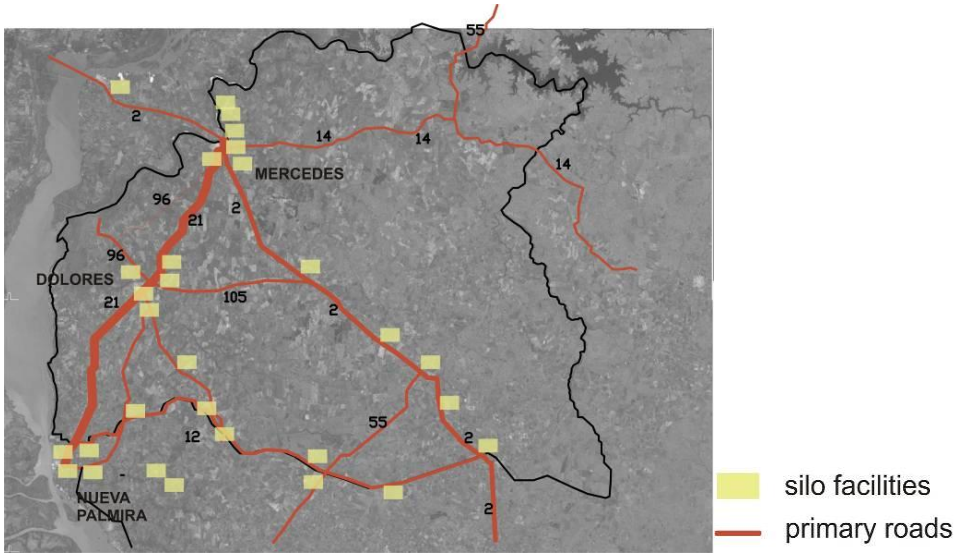

Figure 4 - Map drawn by author based on data from the MTOP and MGAP

The highway improvements became an element of attraction for the development of new industrial agriculture facilities. The plans of the Ministry of Transportation put the priority of investments into the main highways, the primary roads in southern Uruguay, and the transversal primary roads that connect East and West. However, those improvements have not been enough following the growth of that industry. Over many years, the Ministry of Transportation has attempted to

rehabilitate the railroad infrastructure in order to relieve pressure on the highways (see figure 5). That would require collaboration between the state and private capitals because the state budget is constrained; however, the private capitals have not demonstrated any interest in that kind of collaboration.[23]

Figure 5 - Railroad infrastructure in Mercedes. Photography by author

Additionally, the secondary roads are maintained by the municipal government. Soriano has around 3,500 kilometers of secondary roads under the responsibility of the Intendencia. The maintenance of the rural roads represents a very important cost for the Intendencia. The pavement of that roadway is made of gravel, and because of freight and weather conditions, occasionally some sections of it have to be repaired two or three times per year, while other secondary roads are only maintained once each year.[24]

[23] Field notes from informal chats with staff of the (MTOP) or Ministry of Transportation

[24] Field notes from informal chats with staff of the local government of Soriano (IMS)

Chapter 5: Spatial Practices

> Spatial practices embrace the production and reproduction, and the particular locations and spatial sets characteristic of each social formation. Spatial practice ensures continuity and some degree of cohesion. In terms of social space, and of each member of a given society's relationship to that space, this cohesion implies a guaranteed level of competence and specific level of performance. (Lefebvre 1991, 33)

This section focuses on the production and reproduction of space. The farm structure, the ambiguity of producing for the internal and external market, and the physical result of an economic system that concentrates wealth will demonstrate that despite the economic growth, the quality of daily life for most of the population of Soriano is declining.

Farm structure

The farm structure guarantees the production and reproduction of the capitalist economy and reinforces the power relationship between labor and capital. The modernization of agriculture production has been reflected in changes in the farm structure and production. Piñeiro (1991) explains that the expansion of the capitalist agriculture in Uruguay displaced other types of farm production. In the U.S. farm structure was also the key factor in the transition to capitalism (Headlee 1991).

Piñeiro (1991) defines three types of family farms in Uruguay which are similar to Headlee's definition (1991) of family farms in the U.S. The main types of farmers in Uruguay are the capitalist farmer, the semi-employed farmer, and the family farmer. The capitalist farmer is the one able to accumulate wealth and invest in

technologic improvements in order to maximize profits. A semi-employed family farm occurs when part of the family labor force goes to work outside their farmland and is employed in towns or industries. The semi-employed farmer is often at an economic disadvantage because when faced with competition from industrialized operations, this farmer usually abandons the rural area. Family farmers use only family labor; their farms are subsistence farms, and they are usually unable to accumulate wealth (Piñeiro et al. 1991). This is not the case in U.S., however.

Today the international corporations have developed at least three types of relationships with local capitalist farmers and industrial farming cooperatives. The first type of relationship is when the farmers are members or owners of cooperatives. The second type is when farmers that are not members sell their crops to the co-op. Finally, the third and least common type of relationship is when farmers rent a space in the co-op facilities in order to store grain before it is sold.

In the agricultural production of grain, when the capitalist farmers are unable to compete with the industrial agriculture companies because of scale issues, they become renters while still maintaining their capitalist status. The capitalist farmers rent the land to the industrial agriculture companies that are able to capture other farmers in the same situation (Oyhantcabal and Narbondo 2008, 98-99). Instead of representing a negative situation for the farmer, that relationship gives farmers the opportunity to increase their capital because of rises in rent prices.

A historical perspective of the production of the space: Internal Market (local) vs. External Market (global)

The production of space in rural areas of Soriano and in cities like Mercedes is the result of two different agriculture production systems that respond to different markets, the exportation market and the intern consumption market. The industrial agriculture system, which is based on agro-industrial complexes and international corporations, is basically oriented to the exportation market. In contrast, small scale agriculture is oriented to the intern market (Piñeiro 2003).

In the past in Mercedes, the *Mercado Central*, or central market, was supplied with fruits and vegetables from rural huertos areas and *chacras*[25] that were next to the town. That local food system shifted to a centralized regional food system based on intermediate retailers who transport produce in the central market of Montevideo. Produce is then distributed from Montevideo to the rest of the country. Both the local and the centralized regional systems supply the intern demand of the country.

The Mercado Central in Mercedes was built in the Fifties to provide the town with fresh and affordable food. During the Seventies and Eighties that local food system suffered a strong decline. In 1981 in Mercedes, there were around eighty horticulture farms with an average size of nineteen acres (Piñeiro 1981). In 2008, the Mercado Central was re-inaugurated, but currently just ten horticulture farms are supplying the market (Ramirez 2008).

[25] *Chacras* are small farms.

The distribution patterns of the old local food system were based on the area of small chacras around Mercedes. The farmers transported the produce themselves without any intermediaries to the Mercado Central through rural and secondary roads. Figure 7 shows a type of central distribution to the Mercado Central in the inner city.

On the other hand, the industrial agriculture system is based on the international market. Soriano and Uruguay have experienced the expansion of monoculture farming based on the production of soy since late Nineties (see appendix). Monoculture farming is associated with the presence of multinational corporations in the country. In 2008, seventy-three percent of the soy exportation from the port of Nueva Palmira was under the control of four multinational companies, including Cargill (Crop Uruguay S.A.), Louis Dreyfus Commodities, Garmet S.A., and Archer Daniels Midland Company (Barraca Erro) (Oyhantcabal and Narbondo 2008, 81). In general, Uruguay exports the raw materials of grain and imports processed materials such as wheat and oil; it also imports fertilizers, seeds, and agro-pests. Thus, there is an increasing dependence on multinational companies in both the input and output of agriculture production.

One agent of Barraca Erro, a company associated with Archer Daniels Midland Company, states that it is expected that soy farmland will reach a million and a half hectares in Uruguay by 2015. This agent also explains that the rapid growth of agriculture production has been caused by three important factors: the

incorporation of new technology to the soy crops, tillage, and the international market (Olaverry 2009).

Figures 8 and 9 show the industrial agriculture system distribution patterns, which rely on primary roads, ports, and storage facilities. In Mercedes, silo facilities, which are used for drying, processing, and storing grain, are located along the transportation network consisting of Route No. 2, Route No.14, Route No. 21, and an abandoned railway. The distance from the farmland to the grain facility is always less than seventy kilometers. In Soriano grain is transported by trucks from the storage facilities in rural areas to the port of Nueva Palmira, from which it is exported on ships to countries around the world. Hence, Route No. 21 connecting Mercedes, Dolores, and Nueva Palmira is the principal agricultural transportation route. This explains why for the last five years the government focused its transportation infrastructure investment on Route No. 21. However, government investment is not enough for addressing the needs caused by the rapid growth of the agricultural industry. Today, the primary and secondary rural roads in Soriano are largely deteriorated because of the amount of truck traffic and the lack of maintenance (see figure 6).

Figure 6- Secondary roads in the outskirts of Mercedes. Photography by author

Figure 7 - Historical Chacras and Central Market. Map drawn by the author based on satellite image

Figure 8 - Industrial agriculture distribution system. Map drawn by the author based on satellite image

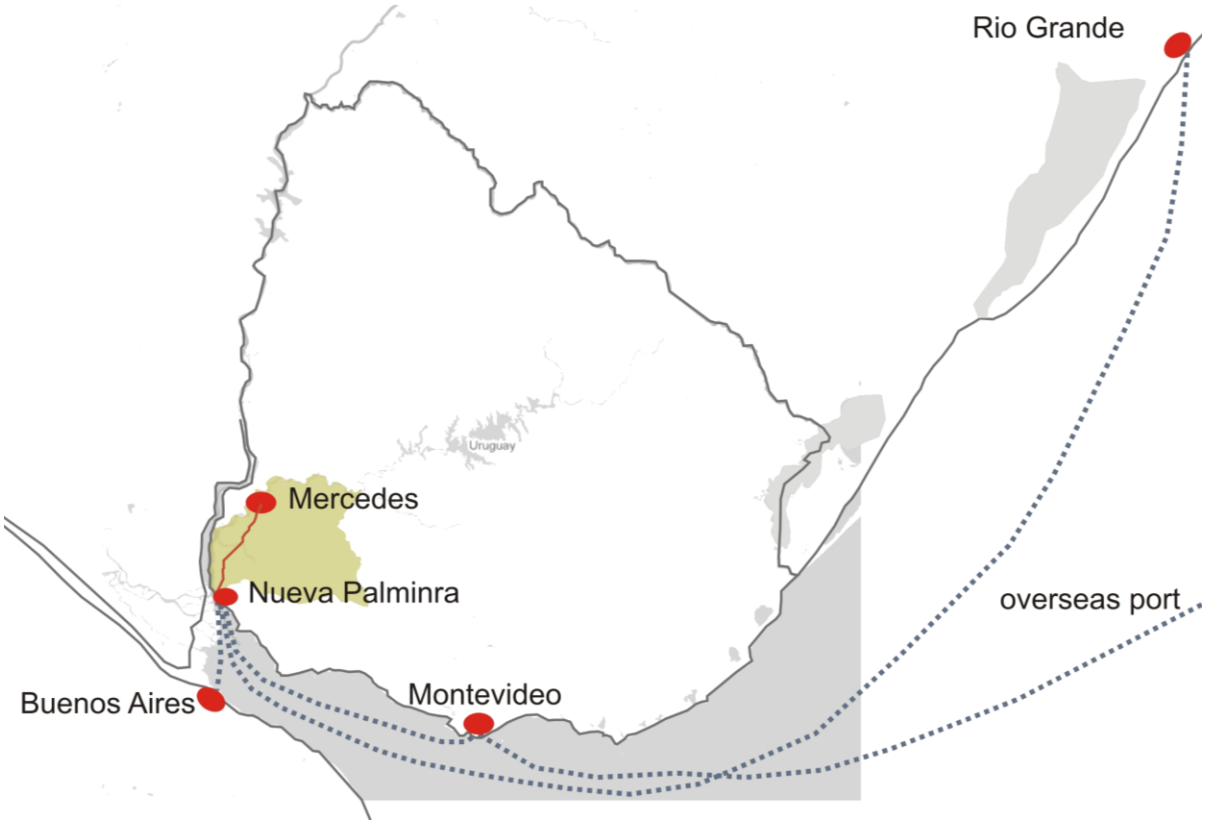

Figure 9 - International grain shipments. Map drawn by author

The 'growth' of Mercedes (economic and spatial expansion of the agro-industry & the expansion of the informal settlements)

As a result of rural migration, economic crises, unemployment issues, and other problems, in the early Eighties the outskirts of Mercedes began to be appropriated by squatters, and rapidly this space was transformed into informal settlements. These informal settlements grew rapidly from 1982 to 2008, which was the date of the latest survey, and they shaped new and existing neighborhoods in the periphery of Mercedes. According to the National Institute of Statistics, informal settlements are defined as follows:

> Informal settlements are groups of ten homes or more, located on public or private land, constructed without any authorization from the landowner in informal conditions without following the subdivision regulations. These groups of homes lack basic urban infrastructure and accessibility to social services. (INE 2005-2006, 2) translated by author.

The precariousness of the quality of life experienced by the inhabitants of informal settlements implies they had little access to urban infrastructure such as water supply, electricity, sewage, and transportation. Additionally, those inhabitants have had to face issues regarding poor access to education and health services. Unsafe building structures and the use of inappropriate construction materials make the informal settlements places where human life is constantly in danger. For example, the use of unsafe electric installations has caused several fatalities due to electrocution and fires.

Socio-spatial segregation and urban poverty are associated with a poor quality of life, limited access to education and knowledge, and violence, among other issues. The growth of informal settlements, the lack of job opportunities, the physical danger workers face at their jobs, and extreme socio-economic differences among residents all imply the loss of cultural capital and citizenship identity, as well as social exclusion.

On the other hand, the overall economy and consumption in Mercedes have grown. This is reflected in the renewal of the city center, which features new businesses and shops. Since the late Nineties, Mercedes has been the destination of several international companies, and they have installed high-tech silo facilities on the outskirts of the city. In 2000, sixty-two percent of national soybean production

took place in Soriano (DIEA 2000). In 2009, agro-industrial production for the entire country was 3.841 million dollars (DIEA Uruguay rural en cifras 2009), which constitutes around sixty percent of the total exportations of the industry.

The municipality and the national government state their concern about the challenges of Mercedes being the location of agro-industries, as well as social inequality:

> The Department of Soriano is facing challenges related to the production, the emergent agro-industries, and the socio-economic inequalities of its population. Facing those challenges means highlighting the complements with the territorial neighbors, having close links with the departments of the region, and defining strategies at national and regional levels with neighbor countries. (IMS and MVOTMA-DINOT 2007, 11) translated by author

Thus, the challenge of Mercedes is to encompass the economic growth of the agro-industries and the distribution of wealth in order to face up to the social, economic, and spatial inequality among the most vulnerable sectors of its population.

Currently there are two major informal settlements in Mercedes, the Aparicio Saravia and the Tunel, also called AFE[26] because of its proximity to the railroad. The Aparicio Saravia started in 1982 in the west area of Mercedes along the Daca Stream and the Aparicio Saravia Road. That land was the property of the Intendencia Municipal de Soriano (see figure 10).

[26] Administracion de Ferrocarriles del Estado (AFE) stands for National Railroad Administration

Figure 10 - Aparicio Saravia informal settlement. Map drawn by the author

In the beginning, the first settlers of Aparicio Saravia were impoverished families from the rural areas of Soriano. The informal settlement grew mainly with the biological reproduction of new generations that were raised there, in addition to new settlers who came from impoverished urban families from the low-income neighborhoods of Cerro and Artigas. [27]

The other important informal settlement is the Tunel, or AFE. Located along the railroad, this informal settlement started in April of 2002 (see figure 11). Settlers vacating their previous residences were the main origin of the Tunel. According to the 2008 IMS Survey, the settlers declared that their main interest in the Tunel was the possibility that they would become eligible for social subsided housing. The informal settlement then grew rapidly as a housing solution for the impoverished and low-income population.

[27] Field notes from informal chats with staff of the local government of Soriano (IMS)

Figure 11- Tunel, AFE informal settlement. Map drawn by the author

Most of the population in the informal settlements is either unemployed or employed temporarily. Around the thirty-five percent of the population has unstable jobs called *changas.* Changas are precarious jobs with high worker turnover, with jobs ranging from construction and rural employment to maids and trash pickers. In 2008, only four percent of the population of informal settlements declared rural employment as their main source of income (IMS 2008).

Issues related to land availability and rent have contributed to the origin and growth of the informal settlements. The housing rent prices are expensive for the low-income population and there is a lack of land for building affordable housing. [28]

[28] Field notes from informal chats with staff of the local government of Soriano (IMS)

Figure 12 - Evolution of informal settlements and the growth of silo facilities in Mercedes. Maps by the author based on data from IMS, INE, satellite image and agro-business websites

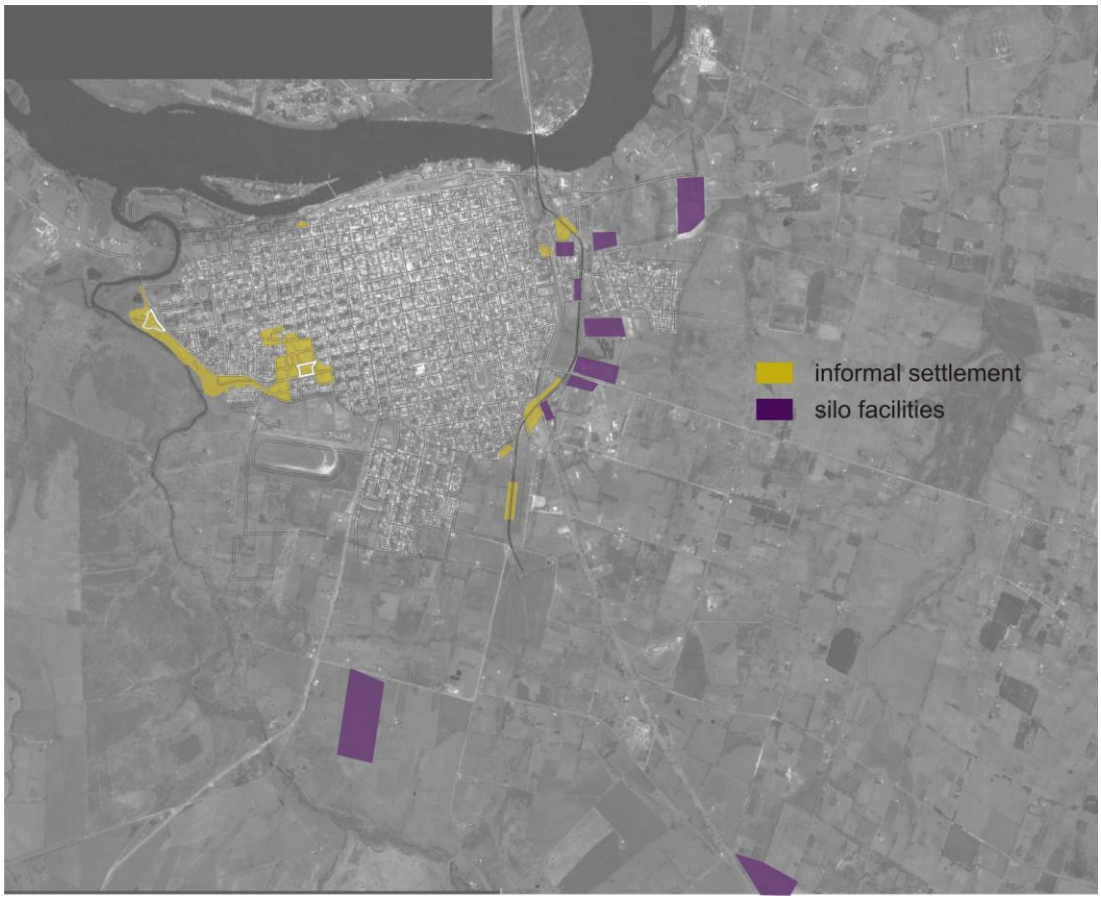

Figure 13 - Informal settlements and the silo facilities in Mercedes in 2008 and 2010. Maps by the author based on data from IMS, INE, satellite image and agro-business websites

Table 1 – Historical evolution of informal settlements and agro-industries. Elaborated by author based on data from IMS survey and agro-business websites

	Informal settlements	Agro-industries
1947		Barraca Erro
1950		Calmer
1980		
1985	Ap Sa. 100families 430p	
1990	Ap Sa. 155 families 665p	
1993		Agro apoyo (ex Arinsa)
1995	Ap Sa. 265 families 1140p	Alpino
1997		Agroterra S.A, Silopin S.A
2000	Ap Sa. families 1343p*	
2001		Louis Dreyfus Commodities
2002	AFE	
2004/2005	Ap Sa. 373 families 1546p	ADM associates BE, Garmet
	AFE 133 families 299p	Cargill associates Crop Uy
2008/2010	Ap Sa. 380 families 1161p	Alpino, Cargill, and Nidera
	AFE 597p	new plant approved

There have been two frustrated attempts to regularize the informal settlements, one in 1999 and another in 2004. Currently the local government, in coordination with the national government, is carrying out a program for the re-localization and regularization of the informal settlements (IMS and MVOTMA 2009).

Today, one and a half years after the implementation of the re-localization and regularization of the informal settlements, 263 families have been relocated into new social housing (see figure 14). These families represent around sixty-five percent of the population included in the plan. The plan includes 1,758 people surveyed by the Intendencia in 2004, 2005, and 2008 (Difilippo 2010).

However, not all the population of the informal settlements was surveyed by the Intendencia and entered into the plan. According to the 2004 Population Census, at the time of the survey there were 2,815 people living in the informal settlements, but only 1,758 were surveyed by the Intendencia, meaning that 1,057 people were not entered into the re-localization and regularization program.

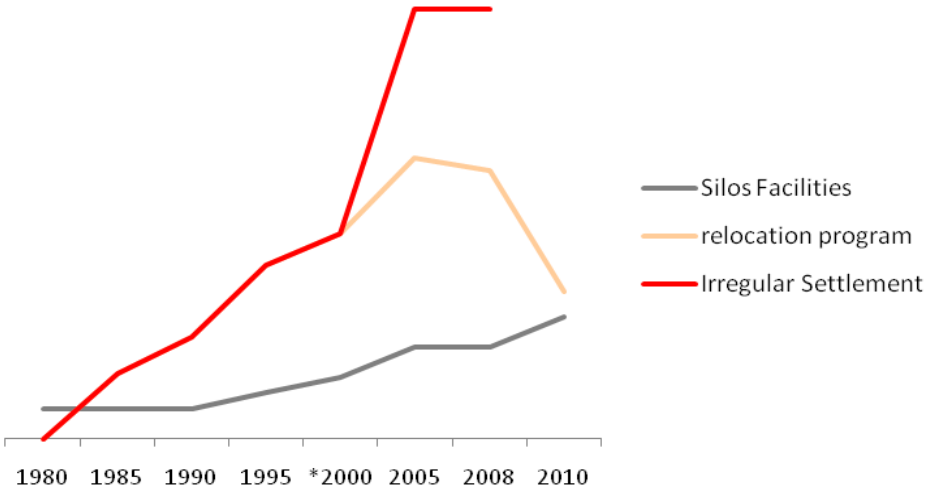

Figure 14- Elaborated by author based on data from INE, IMS, and agro-business websites

The opportunity to achieve social justice and spatial equity resides within the informal settlements. For example, squatter communities have been empowered with the purpose of gaining legal rights over the land they inhabit, as well as access to affordable housing and urban infrastructure. In addition, since 2005 the national government has made great efforts to integrate the informal settlement population into whole society. Some examples of this are the Plan de Emergencia and Rutas de Salida,[29] which provided job opportunities to people living in poverty. However, those efforts have not been enough to overcome the global forces of capitalism.

Informal livelihood strategies as consequences of external forces

The rural areas of Uruguay are characterized by a very low-density population. Uruguayan economy is based on cattle, agriculture, and forestry. Although the productive chains rely on rural areas and labor, those economic activities are extensive and tend to be highly technologically industrialized, using fewer laborers. Migration from rural areas to towns and cities is a consequence of the lack of job opportunities in the rural areas. Rural unemployment is a problem for both the rural and urban population because migration to urban areas unbalances the job market, causing urban unemployment. In general, the rural population that migrates becomes part of the unemployed urban population (Piñeiro 2003).

There are several livelihood strategies for rural areas, including semi-employed farmers, multi-employment, living in rural areas and commuting to towns

[29] Social Plans carried out by the National Government. Plan de Emergencia was the emergency plan that provided economic subsidies to people living in poverty conditions. Rutas de Salidas was the plan that followed the Plan de Emergencia; it provided job opportunities to people who were part of the previous plan by the association of ONG with public administration jobs.

for work, and changas. As was previously mentioned, the semi-employment of farmers is a consequence of the farmers being economically and technologically disadvantaged (Piñeiro et al. 1991), and these farmers become employees for capitalist farmers or international companies as a result (Arbeletche and Carballo 2006).

The multi-employment strategy is a consequence of the lack of capital for investment in technology, so the farm cannot sustain an entire family anymore. Multi-employment means that some members of the family work in towns and commute to the rural residences, working part-time on the farm.

Finally, the most precarious type of job is when the *peon rural*, or rural worker, relies on changas and temporary work. The peon rural does not own land, and when he works in changas, he usually moves from farm to farm looking for job opportunities. For hundreds of years, this type of worker has been the most disadvantaged of the economic system in Uruguay. The National Constitution of 1830 stated that the peon rural would not be recognized as citizens, saying "The citizenship is suspended…for the status of servant wage earner, peon rural, simple line soldier, person notoriously lazy and legally implicated in a criminal case in which corporal punishment may be applied, or otherwise infamous…" (1830) translated by author.

In 2008, after 178 years, Law 18441 regulating the labor wages and vacations of the peon rural was approved. It expressed the government's intentions of

correction, acknowledged rural labor, and regularized informal rural employment. The law was a controversial issue among different elected officials and social classes. There was debate regarding the applicability of the law; one important concern was that the *peones rurales* did not have information about their rights, especially those who were from isolated and remote areas. The law was an important step towards recognizing the most disadvantaged rural workers and attempting to regulate the informal livelihood strategies in rural areas.

In addition, in urban areas the population of informal settlements is composed of the most vulnerable sectors of society that have been historically displaced by external forces like the power of capital. The livelihood strategies used by these vulnerable sectors are based on value chains that are informally created rather than on the new opportunities that new capital can create. New capital related to industrial agriculture mobilizes the economy in general terms and creates few direct job sources like staff positions in silo facilities and the truck industry.[30] One example of this is the direct job positions that generated the new industrial agriculture enterprise. For example, the new silo facility of Cargill [31] will need only ten workers full time for operating the plant. This demonstrates that these types of investments do not generate new job opportunities for the most vulnerable sectors of society because they operate with high technology and few laborers.

[30] Data obtained from the application form for the environmental impact assessment DINAMA.

[31] Cargill (associated with Crop Uruguay) initiated the environmental impact assessment in 2010 in order to build a new silo facility in rural areas next to Mercedes. The environmental impact assessment document describes that after the period of construction, the silo facility will need ten workers full time and in harvest season it will need two more workers.

The *intendente municipal*, an elected official of Soriano, has a different perspective about the new silo facilities which he declared to local media press:

> In the last few hours I was asked to be interviewed, and I held an interview with representatives from the Cargill firm, who in the next few days will be officially presenting the form to the Intendencia… in order to carry out a project of installing dryer plant silos, as well as providing seed classification and input services. The operating plant will supply between sixteen and twenty job sources. It makes us happy that our people have job opportunities and investments in this Departamento… (Cargil instalará planta de silos que dará ocupación a entre dieciséis y veinte personas, Diario Accion, May17 2010) translated by author

This demonstrates the expectations surrounding the job opportunities that international investments in Soriano and Uruguay can generate.

Furthermore, in the informal settlements, informal livelihood strategies like waste pickers are driven by the dynamic use of space and the limited access to the public goods of the city. This increases gaps between socioeconomic classes and creates segregation and stigmatization. Paradoxically, most of the silo facilities have been installed surrounding the periphery of the city, and the informal settlements have grown around them (see figure 13). That physical proximity entails the major contradiction of spatial practices in Mercedes.

PART III

Chapter 6: Conclusions

This chapter is a dialectical interpretation of the spatial transformation in Mercedes. It explores the way representations of space (maps, policies, and plans) impact the spatial practices that are composed by the flow of people and goods and how they relate to each other (Lefebvre 1991).

As Castells (Toward a sociology of the network society 2000) describes, regions need to add value through the contribution of human resources, natural resources, or raw materials in order to become part of the global economic network. The foreign investments law promoted the insertion of Uruguay in the global economy. As a result, Uruguay oriented its agricultural production to the export markets.

Because of the growth of the industrial agriculture system, land has been highly commoditized, causing an increase in the land market prices and rent. This has changed the traditional roles of farmers, including the shift of new capitalist farmers from producers to renters. Today, many farmers have gone from owning land to selling it, and they are sometimes multi-employed on the same land by others. Additionally, pressure on landowners has changed the relationship between international agriculture companies and local capitalist farmers. Capitalist farmers have not been entirely disadvantaged by the industrial agriculture system; their different forms of adaptation to the system have allowed them to increase their

profits and financial capital (Oyhantcabal and Narbondo 2008). On the other hand, the shift from traditional to industrial farming practices has reduced the need for human labor, an issue that has provoked rural migration and created a need for changes in the livelihood strategies of rural workers.

The industrial agricultural system oriented to the exportation market produced a built environment that relies on transportation infrastructure. In that system, highways, primary roads, and secondary roads play the principal role by connecting the productive areas (farmland) with the storage facilities (next to urban areas) and to the ports for exports. In addition, the public investments in roadway infrastructure improvements and maintenance are an attempt to mitigate the infrastructure decline. At the same time, those investments became an attraction for setting new industries connected to roadway infrastructure in good conditions.

In 1999, a local government land use regulation in Mercedes (IMS 2010) encouraged the location of industrial agriculture facilities on the outskirts of the city by allowing parcels subdivisions of 3.7 acres in a distance of 1.5 miles from urban boundaries. From 2000 to 2010, the establishment of new silo facilities and the expansion of the existing ones occurred within the 1.5 mile buffer area, and they have altered the profile of the existing neighborhoods including the Treinta y Tres neighborhood (see figure 12). Currently in 2010, the new silo facilities authorized are not located in the huertos area as a result of the application of the Land Management Law and environmental impact assessment regulation, which encouraged the construction of the silo facilities next to the primary roads away from

the urban fabric (see figure 13). Additionally, to meet the requirements of the environmental impact assessment regulation, the existing silo facilities had to make building improvements such as the incorporation of new filters and the extension of truck parking areas for mitigating the conflict between agro-industrial activities and other productive activities.

The economic system concentrates wealth, maximizes profits, and privileges private property rights; it is materialized through the socio-spatial segregation of citizens who are advantaged regarding space and those who are disadvantaged, as well as through urban and rural poverty (Harvey 2005). It is the community's right to reshape and transform the urbanization process and development to ensure social and spatial equity and access to urban infrastructure and services, education and knowledge, and affordable housing (Harvey 2008). Therefore, informal settlements are an expression and manifestation of this community's right.

The Mercedes Plan and the regularization and relocation program attempt to alleviate the growth of the Aparicio Saravia and Tunel-AFE settlements (see figures 10 and 11). The growth of informal settlements is a complex problem; the settlements reflect the lack of urban planning and lack of affordable land and housing, among other issues. Thus, the squatters have settled where public land is available in western Mercedes (Aparicio Saravia), on the local government's property and on the public administration's railroad land in eastern Mercedes (Tunel-AFE). The regularization program will provide public infrastructure for some areas to be regularized in the Aparacio Saravia. Because of flooding conditions, the informal

dwellings next to the Daca Stream are unable to be regularized. Those informal dwellings, as well as the AFE informal settlement, will be relocated to public subsided housing in the south of the city. However, legitimizing and regularizing the informal settlements will not prevent the formation of future settlements, nor will it ensure that the quality of life of the squatters will improve. Thus, the regularization and relocation program is an attempt to solve the physical consequence of the problem but not the causes of the informal settlement.

Since 2005,[32] policies have attempted to alleviate the social and spatial fragmentation caused by neoliberal practices and the past lack of government regulation. Examples of this include the Land Management and Sustainable Development Law, the Environmental Impact Assessment and Authorization Regulation, and the Working Hours and Vacation Benefits Law, which recognizes and regulates rural employment and social plans like the Emergency Plan. However, the social policies and public investments have been unable either to accommodate the development of the private sector in relation to industrial agriculture and the exportation of commodities, or to solve the growth of informal settlements. Despite good intentions, Uruguay, like many other developing countries, is behind in regard to regulation policies related to private capital and urban-rural poverty.

In order to produce space with social and spatial equity, planning strategies and policies should deal with the redistribution of infrastructure investments and

[32] Since 2005 the national government shifted from the conservative party to a coalition of socialist and left-wing parties.

ensure rights to the entire population of the city, especially the most spatially disadvantaged and vulnerable sectors of society. Thus, legislation plans and policies are essential for reinforcing those rights and for recognizing and regulating informal livelihood strategies in rural and urban areas as well as regulations within the private spheres. Although globalization has blurred the boundaries of the sovereign nation-state, the state role should be reinforced to guarantee sustainable development and more resilient communities.

Observations and Evaluations

The Strategic Plan of Mercedes is the first planning attempt to organize territory, and it provides guidelines for future development. It is a form of institutional spatial regulation. However, that form of abstraction carried by most of the bureaucratic institutions will never represent the complexity of social processes, but it will impact them. The logic behind the simplification is to make social processes more controlled, managed, and predictable. Hence, in that logic entails the risk of failure in institutional spatial regulations. Future policies and research need to evaluate the way policy and planning impact social processes from a complex perspective

Future policies related to tax revenue need to address the issues of the distribution of infrastructure investments and social and spatial fragmentation. Local government needs to receive some of the revenue from the industrial agriculture companies that have facilities in Mercedes. Potential policies are supposed to attempt to close the social and spatial gap between beneficiaries and those deprived

of space. These taxes will need to be invested in infrastructure in low-income neighborhoods, social housing, public transportation in the city, and infrastructures like secondary roads in rural areas.

Moreover, future research related to the social and environmental impact of silo facilities would be suitable. During the management and processing of soybeans and other types of grain, the silo facilities release a toxic dust that is hazardous to humans, causing chronic diseases such as asthma and allergies. Many silo facilities in Mercedes are within the urban fabric, especially in the Treinta y Tres neighborhood. Because of this, future investigations of the existing facilities would be appropriate. Although DINAMA requires an environmental impact evaluation for the new construction of silo facilities, it is necessary that the usage of adequate dust aspiration mechanisms and filters be controlled and monitored. It is also necessary that a minimum required distance between the location of grain storage facilities and any human settlements be considered.

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Appendix

Soy-bean Production in Uruguay

		Exportations	Exportations Tons.	Farmed Land Hectare	Farmed Land Acre
1997	$	169,000	608	7,560	18,681
2001	$	1,592,000	10,848	12,000	29,653
2002	$	10,055,000	61,636	28,948	71,532
2003	$	36,357,000	179,465	78,940	195,065
2004	$	82,620,000	229,350	247,096	610,588
2005	$	100,678,000	477,401	277,961	686,857
2006	$	138,167,000	631,595	309,100	763,803
2007	$	209,326,000	773,142	366,535	905,728
2008				461,900	1,141,380
2009				577,800	1,427,775
2010*				847,700	2,094,712

*sowing intention
Source: data obtained from DIEA.

Average Income (without housing value)

			Average household Income	Number of people per household	Income per capita (pesos)	Income per capita (dollars)
rural areas	Upper limit of the 20% poorest	2006	5,404	2.9	$ 1,863	$ 93
		2008	7,153	2.9	$ 2,467	$ 123
	Medium	2006	9,709	2.9	$ 3,348	$ 67
		2008	13,132	2.9	$ 4,528	$ 226
	Lower limit of the 20% richest	2006	17,259	2.9	$ 5,951	$ 298
		2008	22,852	2.9	$ 7,880	$ 394
urban areas	Upper limit of the 20% poorest	2006	5,772	3	$ 1,924	$ 96
		2008	7,697	3	$ 2,566	$ 128
	Medium	2006	10,813	3	$ 3,604	$ 180
		2008	14,402	3	$ 4,801	$ 240
	Lower limit of the 20% richest	2006	19,664	3	$ 6,555	$ 328
		2008	26,036	3	$ 8,679	$ 434

Note: the dollar value was calculated based on an average of 20 pesos

Source: data obtained from INE

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The Co-Chair of the ISU Institutional Review Board (IRB) has reviewed the project noted above and determined that the project:

☐ Does not meet the definition of research according to federal regulations.

☒ Is research that does not involve human subjects according to federal regulations.

Accordingly, this project does not need IRB approval and you may proceed at any time. We do, however, urge you to protect the rights of your participants in the same ways you would if IRB approval were required. For example, best practices include informing participants that involvement in the project is voluntary and maintaining confidentiality as appropriate.

Please also know that **any change** to this project must be communicated to the IRB to determine if the project has become research with human subjects requiring IRB approval.

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