Case Study on Local Cluster in San Diego
Preliminary Insights from Cluster-led Initiative Analysis
Working Package No. 3: "S3: Social Innovation and Territorial Milieu"

Giada Anversa/Laura Biancuzzo/Virginia Borrello/Gianmarco Cantafio/Giuseppe Cantafio/Giuseppe Pronestì/Luana Parisi
PAU unit

06.07.2017
San Diego State University, CA, USA
School of Public Affairs

Part I
Preliminary Analysis
Working Package No. 3: "S3: Social Innovation and Territorial Milieu"

Giada Anversa/Laura Biancuzzo/Virginia Borrello/Gianmarco Cantafio/Giuseppe Cantafio/Giuseppe Pronestì/Luana Parisi
PAU unit

Quick facts on San Diego's Economy

Source: San Diego Regional EDC

- Innovation
- Tourism
- Military
- Health Care
- Education
- Government
- Trade, Transportation, Utilities, Services
- Financial & Professional
- Construction, Real Estate
- Manufacturing

Source: Authors' elaboration

Source: Cluster Mapping.us

Methodological Framework

Source: Authors' elaboration

Land Use/NAICS Association

County level

Zip Code level ———— NAICS

Zip code
- *Minimum territorial unit* within the analysis;
- Spatialization of establishments;

NAICS 2007 (*North American Industry Classification System*)
- "Standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing and publishing statistical data related to the US business economy".

Sources : United States Census Bureau - http://www.census.gov

Land Use/NAICS Association

Main sources for comparing NAICS 2007 with Land Use:

- American Planning Association (2005), *Practice Land-Use Classification.* Zoning Practice. 9, p. 1-12.
- Land Development Code Commerce City, Colorado (2015), Article V. Uses and Accessory Structures. P. 1-111.
- Horning, J., Geneidy, A., Krizek, K. (2008), Access to Destinations – Parcel Level Land Use Data Acquisition and Analysis for Measuring Non Auto-Accessibility. 6, p. 1-43.

Financial Services	522000 - Banking	522110	Commercial Banking
		522120	Savings Institutions
		522130	Credit Unions
			Other Depository Credit
		522190	Intermediation
	521000 – Other Financial/Insurance	All other Financial and Insurance (520000) classifications	

Source: Technical Report: Access to Destinations – Parcel Level Land Use Data Acquisition and Analysis for Measuring Non Auto-Accessibility, July 2008.

Marie Sklodowska- Curie RISE
MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies
for Local Economic Development
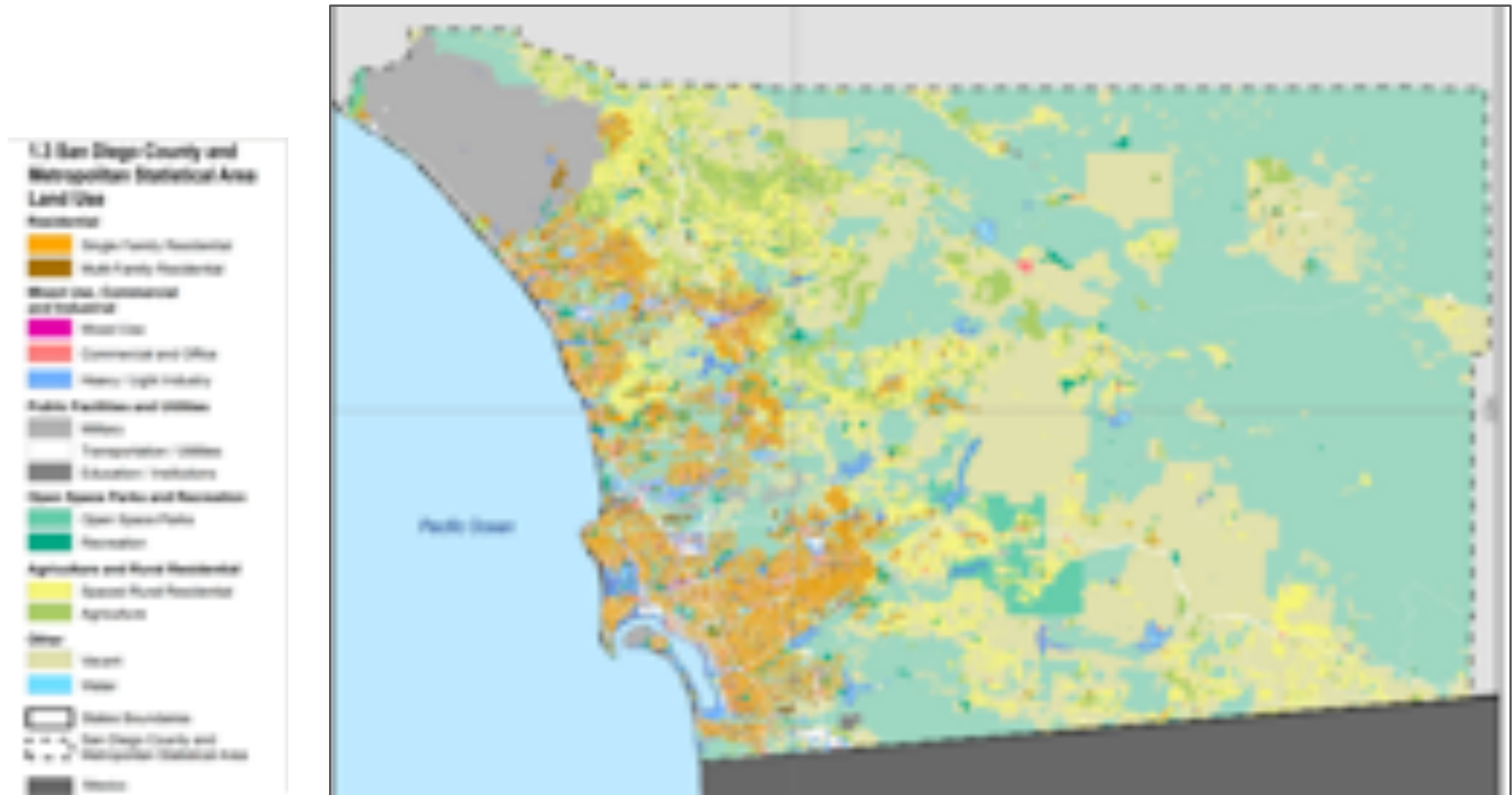
HORIZON 2020

Land Use/NAICS Association

It has been used the open access Land Use of the County of San Diego provided by SanGIS together with the San Diego Association of Governments (SANDAG), a public agency serving the role of regional decision-making, coordinating 18 cities and county governments (SANDAG, 2015).

The regional Land Use data source is up to date as of the year 2013 and reflects the land resources and types of land use in the national economy. Its pattern is based on the Regional Growth Forecast of the SANDAG Public Agency, guided by the principles of Smart Growth, that push to have more efficient and environmentally-sensitive pockets of development, able to spur compact communities, reducing the existing suburban sprawl phenomenon (SANDAG, 2015).

The table lists a sample of land uses associated with their main Macro categories.

LU CODE	LAND USE DESCRIPTION	MACRO CATEGORIES
1000	Special Rural Residential	AGRICULTURE AND RURAL RESIDENTIAL
1100	Single Family Residential	RESIDENTIAL
1110	Single Family Detached	
1120	Single Family Multiple Units	
1190	Single Family Residential Without Units	
1200	Multi-Family Residential	
1280	Single Room Occupancy Units (SRO's)	
1290	Multi-Family Residence Without Units	
1300	Mobile Home Park	
1400	Group Quarters	
1401	Jail/Prison	PUBLIC FACILITIES AND UTILITIES
1402	Dormitory	
1405	Military Barracks	
1404	Monastery	
1409	Other Group Quarters Facility	
1500	Hotel/Motel/Resort	
1501	Hotel/Motel (Low-Rise)	
1502	Hotel/Motel (High-Rise)	
1550	Resort	
2000	Heavy Industry	MIXED-USE, COMMERCIAL AND INDUSTRIAL
2100	Light Industry	
2101	Industrial Park	
2102	Light Industry - General	
2104	Warehousing	
2105	Public Storage	
2106	Extractive Industry	
2301	Junkyard/Dump/Landfill	

Land Use/NAICS Association

Source: Authors' elaboration

Land Use/NAICS Association

	Local Industrial Products and Services		
NAICS	**NAICS Name**	**Subcluster Name**	**Land Use Category**
811210	Other Electronic and Precision Equipment Repair and Maintenance	Industrial Repair Services	Industrial Park
423930	Recyclable Material Merchant Wholesalers	Industrial Products and Services Wholesaling	Other Retail Trade and Strip-Commercial Wholesale Trade
423990	Other Miscellaneous Durable Goods Merchant Wholesalers	Industrial Products and Services Wholesaling	Wholesale Trade
332710	Machine Shops	Industrial Machinery and Distribution	Light Industry - General
532210	Consumer Electronics and Appliances Rental	Miscellaneous Equipment Rental and Leasing	Arterial Commercial
532310	General Rental Centers	Miscellaneous Equipment Rental and Leasing	Arterial Commercial

Land Use Category/NAICS Association. Cluster Name: Local Industrial Products and Services. Source: Authors' elaboration based on the data from the U.S. Cluster Mapping Methodology and SANDAG (n.d.).

Land Use/NAICS Association
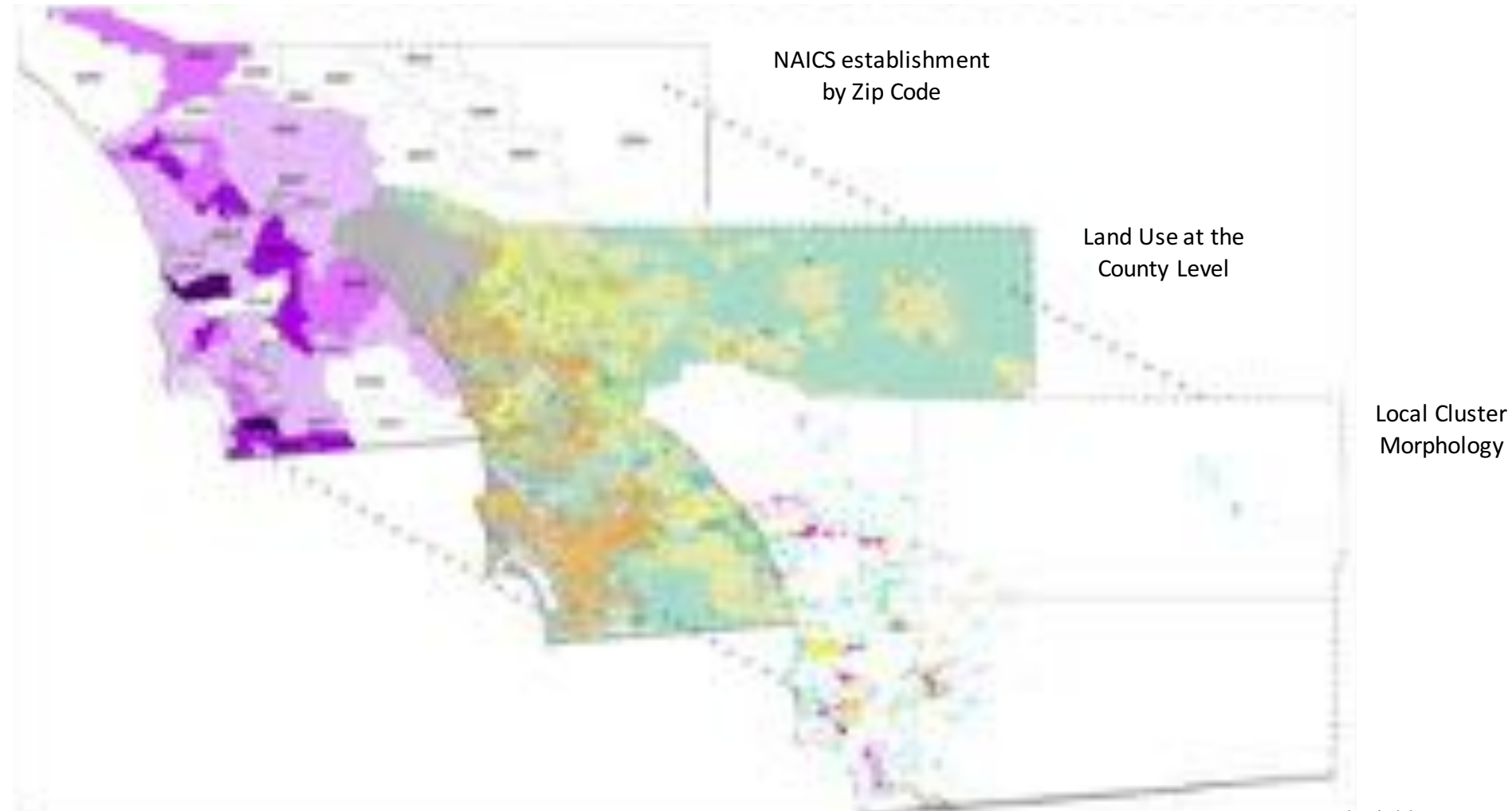
NAICS establishment
by Zip Code

Land Use at the
County Level

Local Cluster
Morphology

Source: Authors' elaboration

Part II
Local Cluster Analysis
Working Package No. 3: "S3: Social Innovation and Territorial Milieu"

Giada Anversa/Laura Biancuzzo/Virginia Borrello/Gianmarco Cantafio/Giuseppe
Cantafio/Giuseppe Pronestì/Luana Parisi
PAU unit

MAPS-LED Second Mid-term Meeting
06.07.2017
San Diego State University, CA, USA

Analysis of the indicators

- *Establishments* — **COMPOSITION**

- *Location quotient*
- *National employment share*
- *Employment*
- *Wage*

ECONOMIC STRUCTURE

- *Poverty rate*
- *Job creation*
- *Patent count*
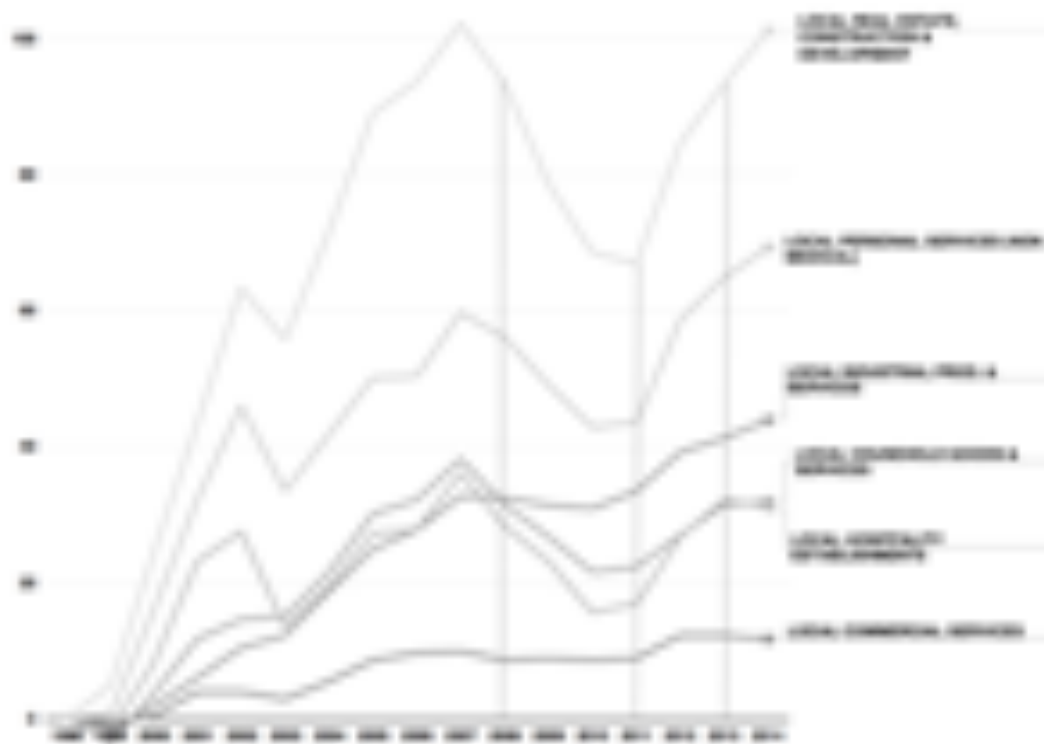- *Patent count growth*

PERFORMANCE

- *Venture Capital per $10,000 GDP*
- *Total receiving high school diploma or more*
- *Total with some college or associate degree*
- *Total completing a bachelor's degree or more*
- *Cluster strength*

BUSINESS ENVIRONMENT

INNOVATION ECOSYSTEM

Marie Sklodowska- Curie RISE
MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies
for Local Economic Development

MAPS-LED
2015 - 2019
Multidisciplinary
Approach to Plan Smart Specialisation Strategies
for Local Economic Development

Economic Structure | Establishments

Percentage change in establishments by clusters from 1998 to 2014 (1998 index)

Number of establishment by cluster
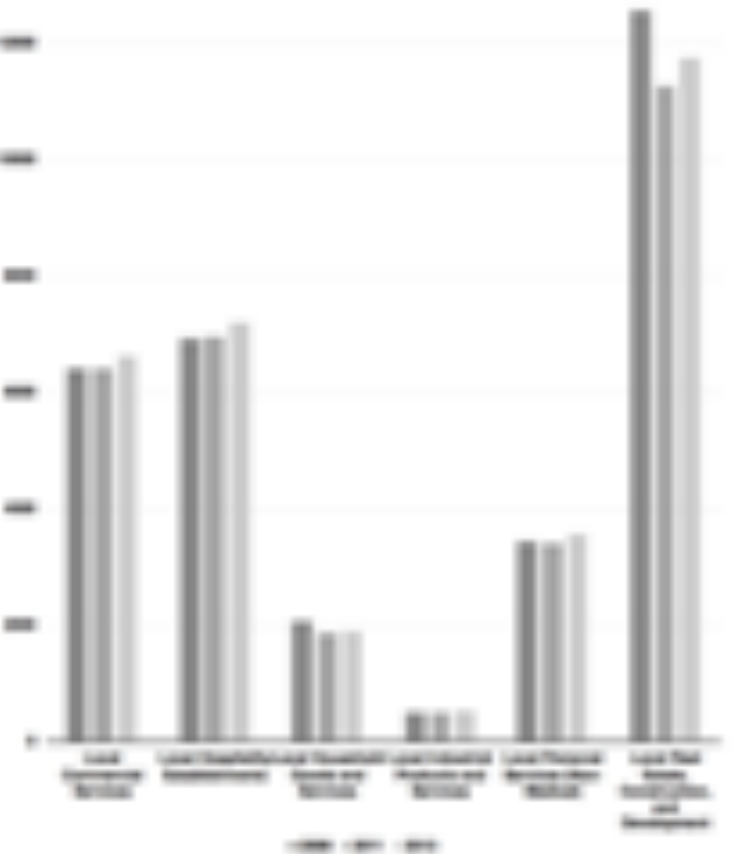
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Analysis of the indicators

- *Establishments*
  }— **COMPOSITION**

- *Location quotient*
- *National employment share*
- *Employment*
- *Wage*
  } **ECONOMIC STRUCTURE**

- *Poverty rate*
- *Job creation*
- *Patent count*
- *Patent count growth*
  } **PERFORMANCE**

- *Venture Capital per $10,000 GDP*
- *Total receiving high school diploma or more*
- *Total with some college or associate degree*
- *Total completing a bachelor's degree or more*
- *Cluster strength*
  } **BUSINESS ENVIRONMENT**
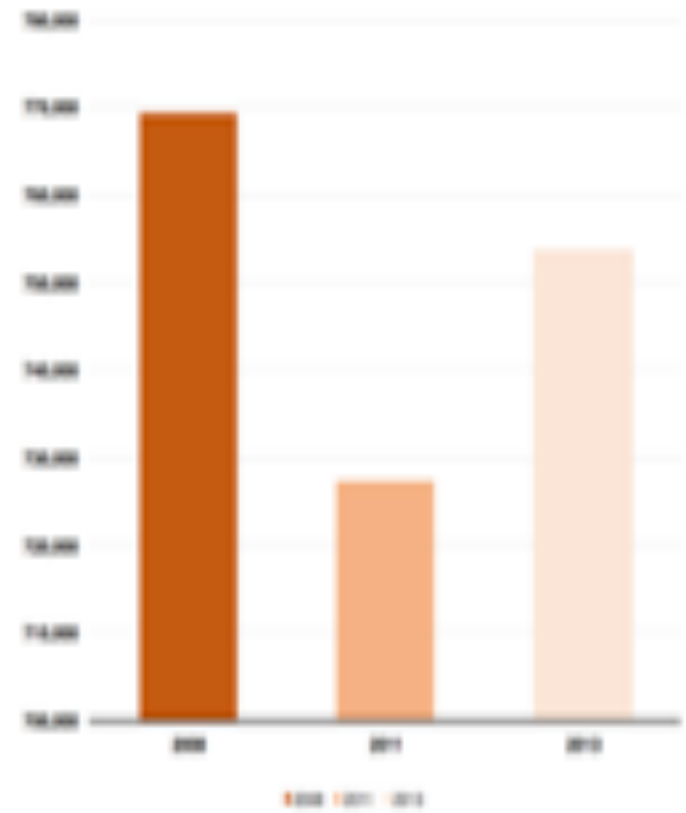
} **INNOVATION ECOSYSTEM**

Economic Structure | Employment

Percentage change in employment by county (all clusters) from 1998 to 2014 (1998 index)

Employment by County in the years 2008-2011-2013

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | Employment

Percentage change in employments by clusters from 1998 to 2014
(1998 index)
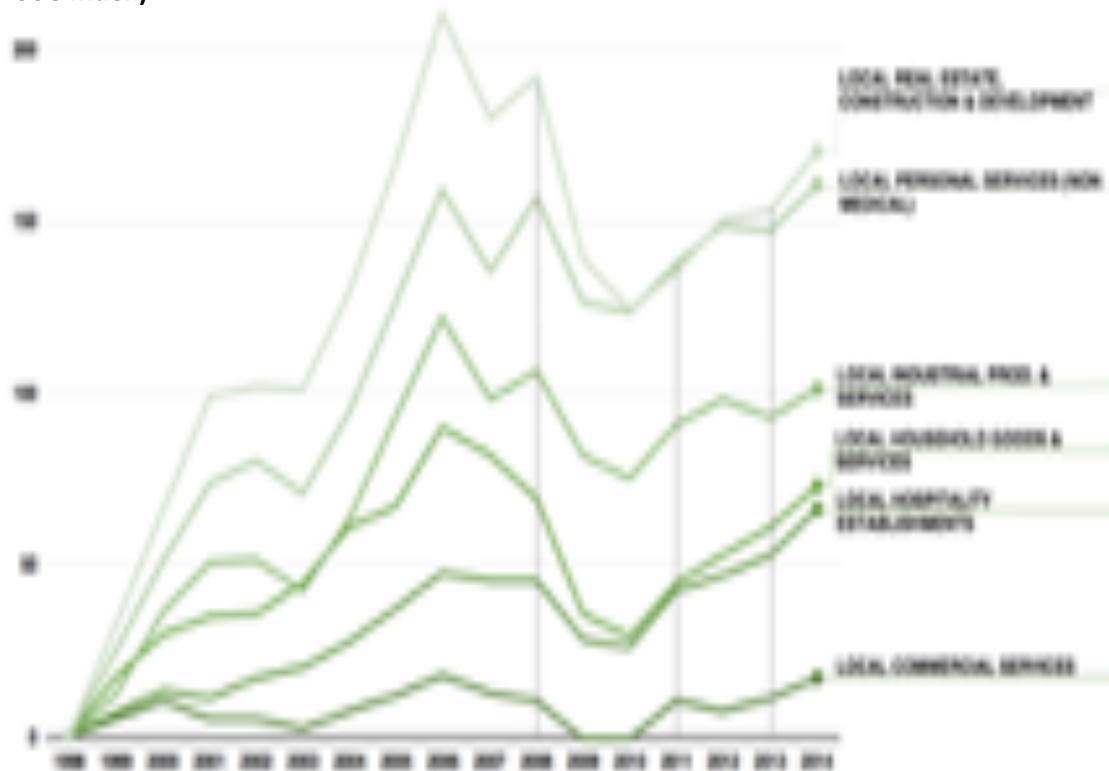
Employment by cluster in the years 2008-2011-2013
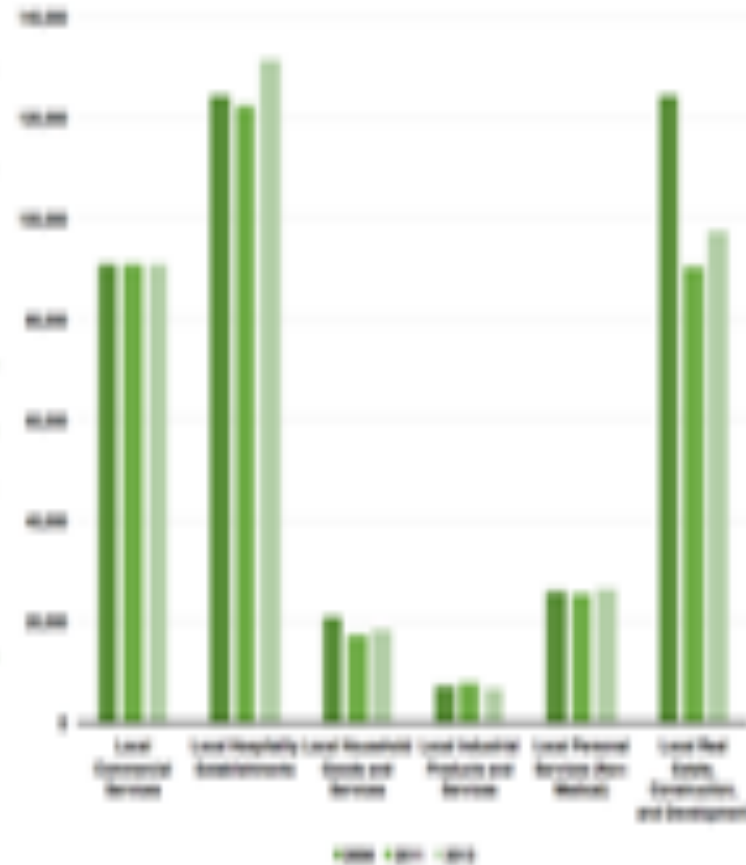
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | Wage

Percentage change in Wage by county from 1998 to 2014 (1998 index)

Wage by County in the years 2008-2011-2013
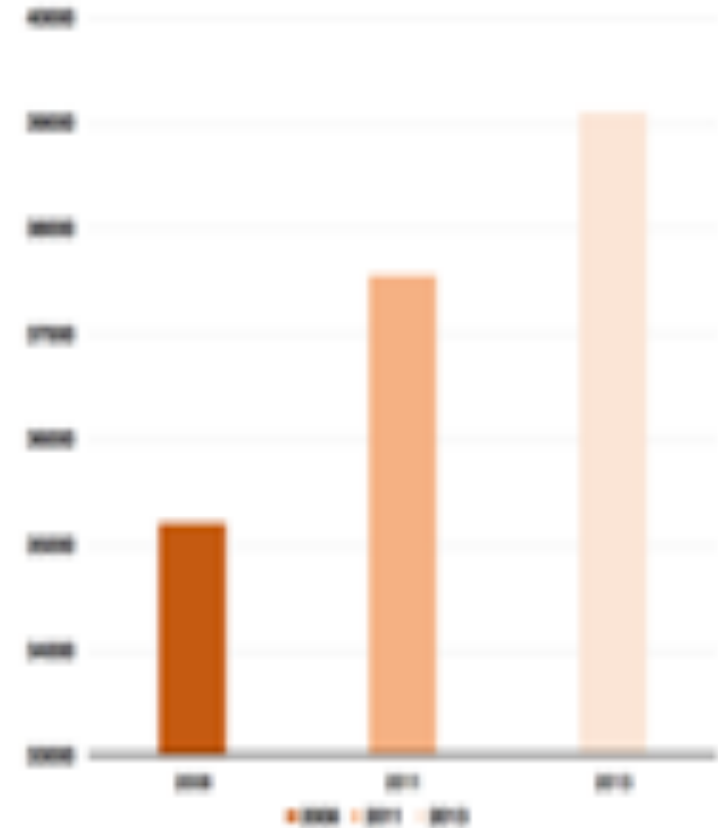
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | Wage

Percentage change in Wage by clusters from 1998 to 2014 (1998 index)
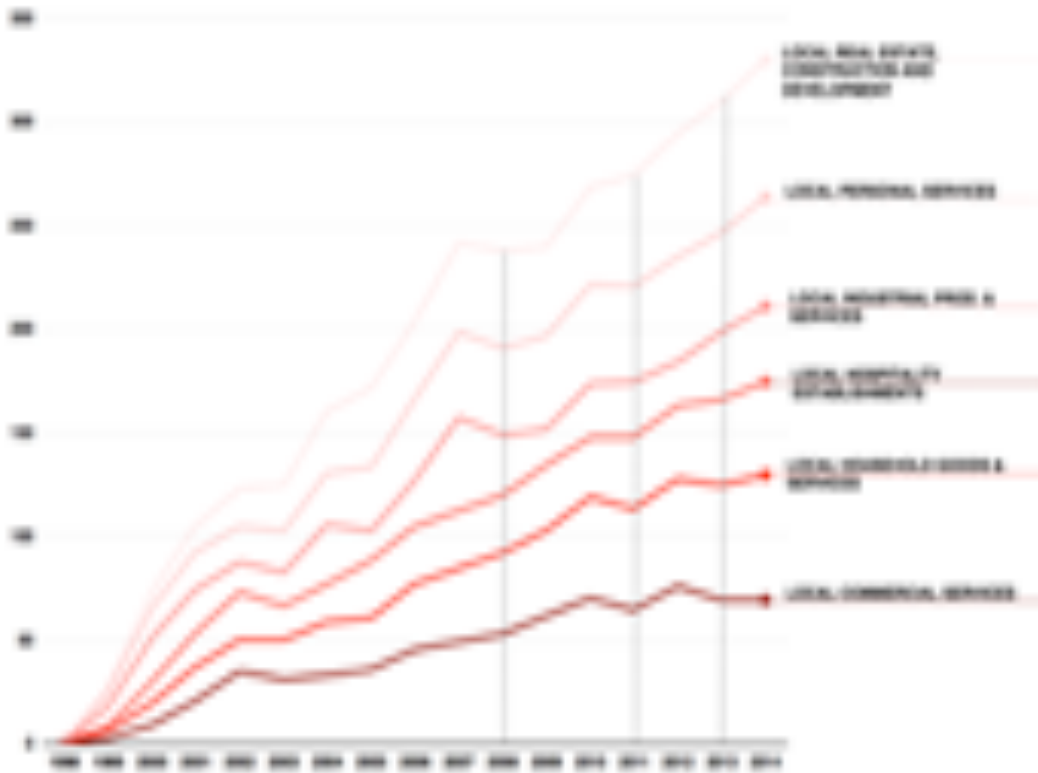
Wage by cluster in the years 2008-2011-2013
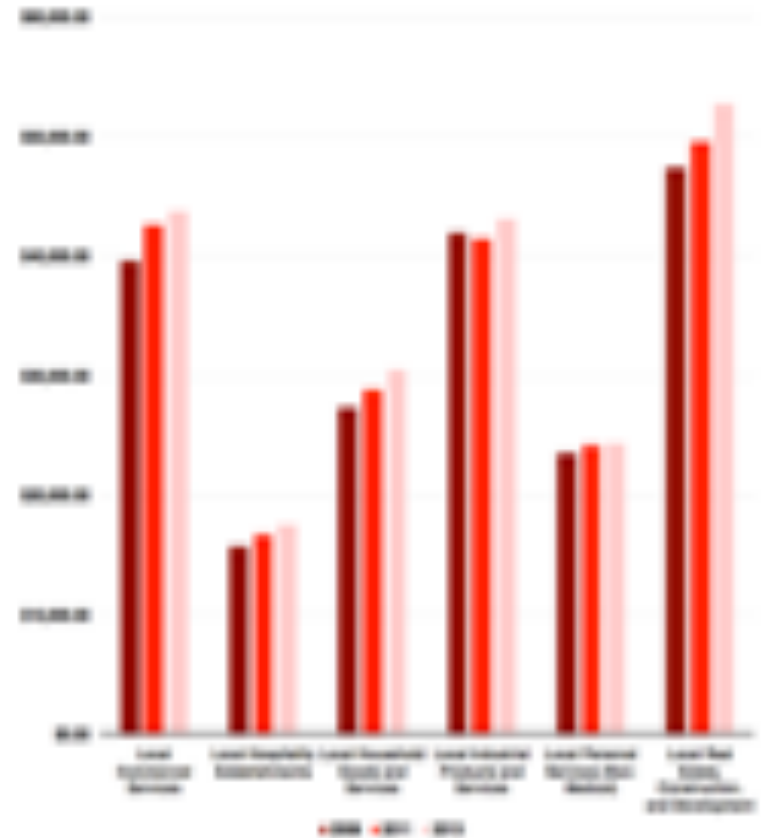
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | Patents

Percentage change in Patents by County from 1998 to 2014 (1998 index)

Patents by County in the years 2008-2011-2013
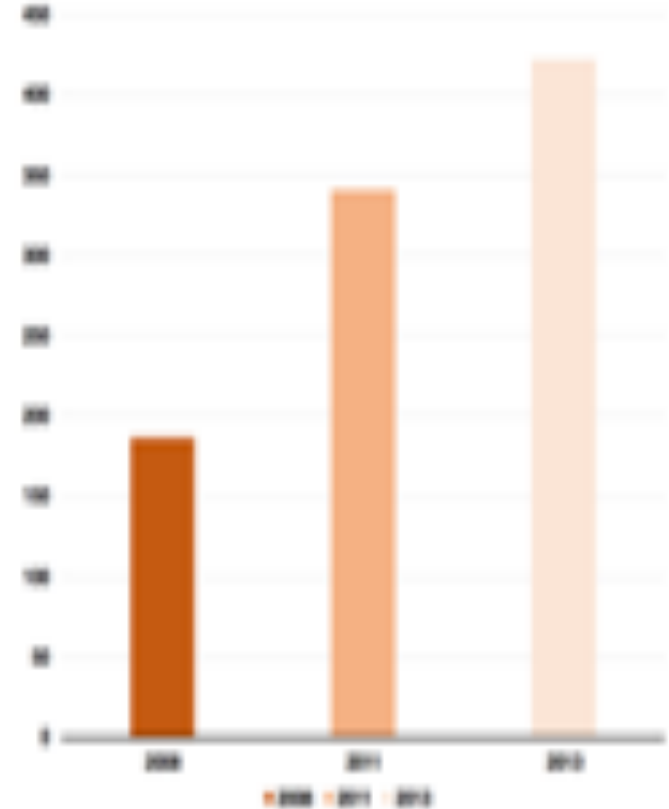
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | Patents

Percentage change in Patents by clusters from 1998 to 2014 (1998 index)
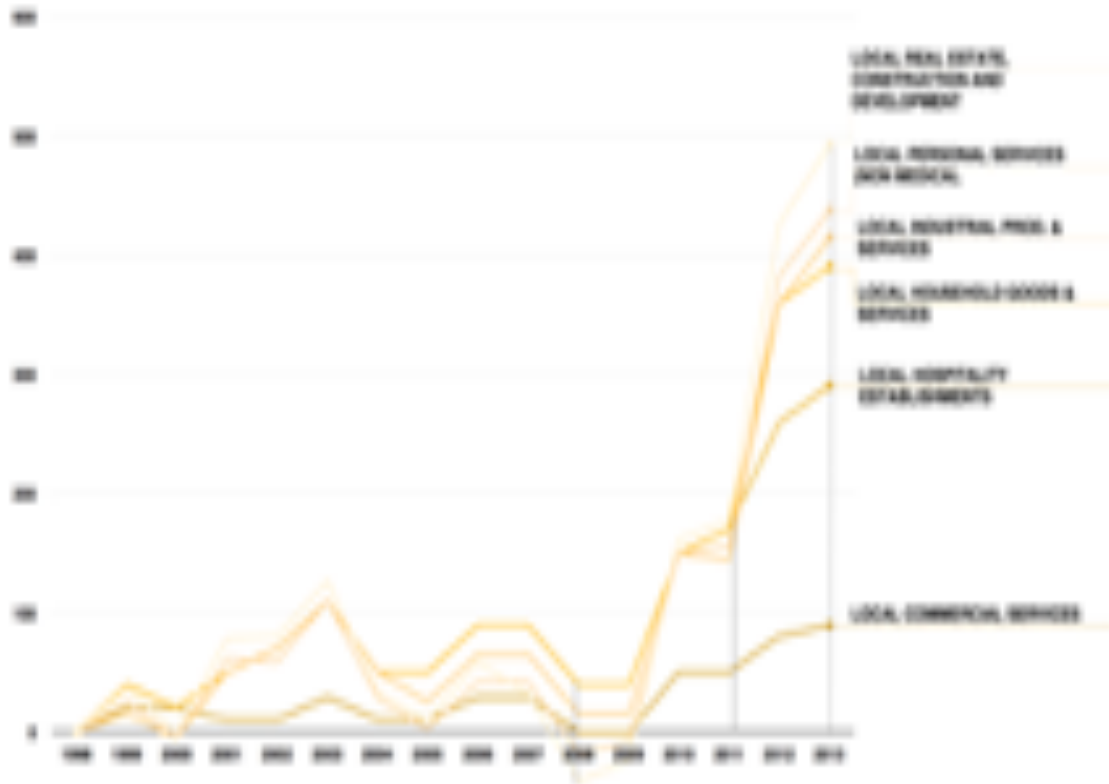
Patents by cluster in the years 2008-2011-2013
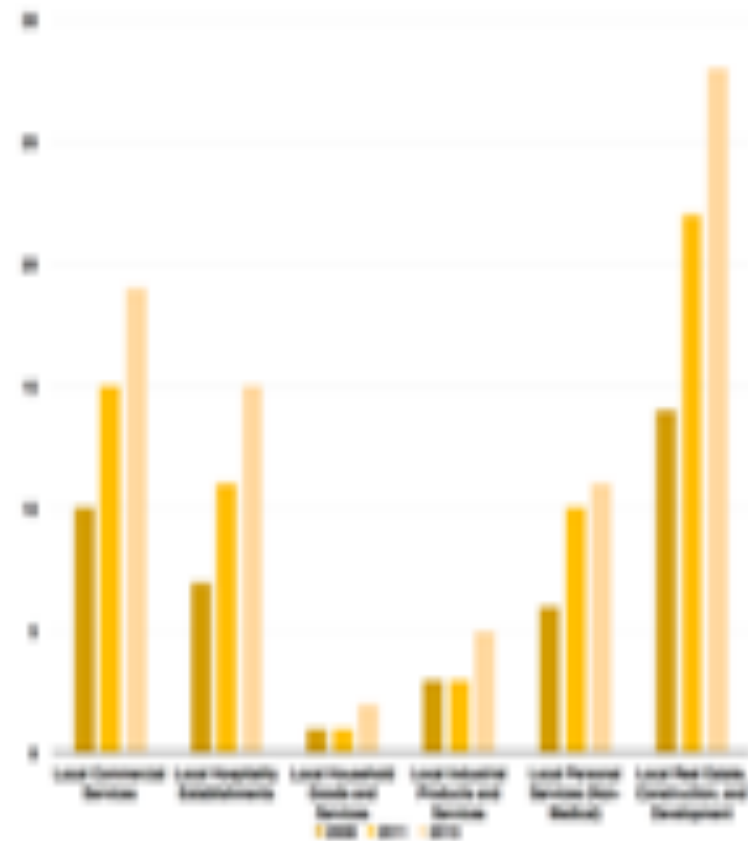
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic structure | National Employment Share (Specialization)

Percentage change in National Employment Share by county from 1998 to 2014 (1998 index)

National Employment Share by cluster in the years 2008-2011-2013

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure | National Employment Share (Specialization)

Percentage change in National Employment Share by clusters from 1998 to 2014 (1998 index)

National Employment share by cluster in the years 2008-2011-2013

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Economic Structure I Location Quotient (Specialization)

Percentage change in Location Quotient by clusters from 1998 to 2014 (1998 index)

Location Quotient by cluster in the years 2008-2011-2013
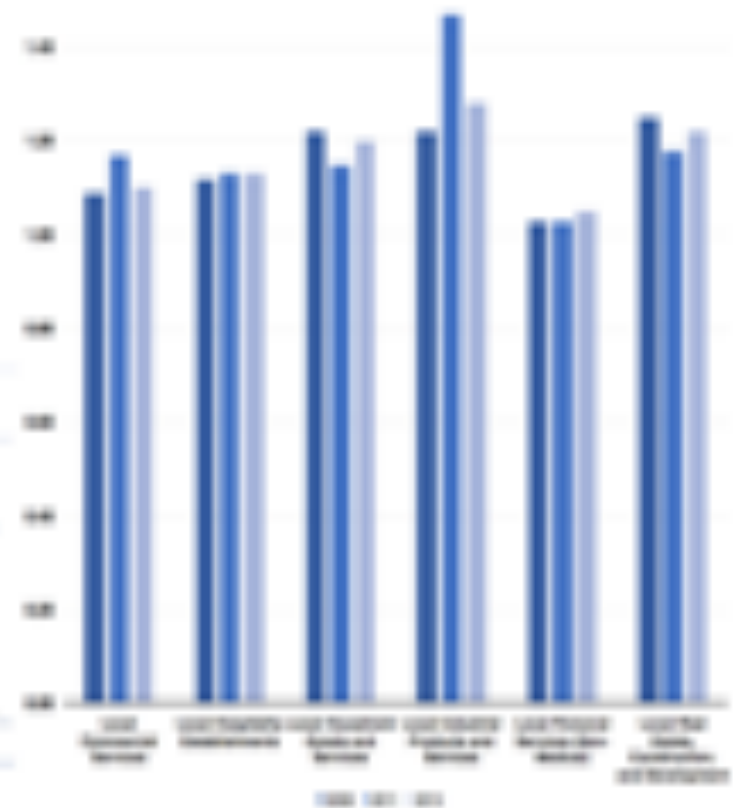
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Analysis of the indicators

- *Establishments* **COMPOSITION**

- *Location quotient*
- *National employment share*
- *Employment*
- *Wage*

ECONOMIC STRUCTURE

- *Poverty rate*
- *Job creation*
- *Patent count*
- *Patent count growth*

PERFORMANCE

- *Venture Capital per $10,000 GDP*
- *Total receiving high school diploma or more*
- *Total with some college or associate degree*
- *Total completing a bachelor's degree or more*
- *Cluster strength*

BUSINESS ENVIRONMENT

INNOVATION ECOSYSTEM

Innovation ecosystem | Performance
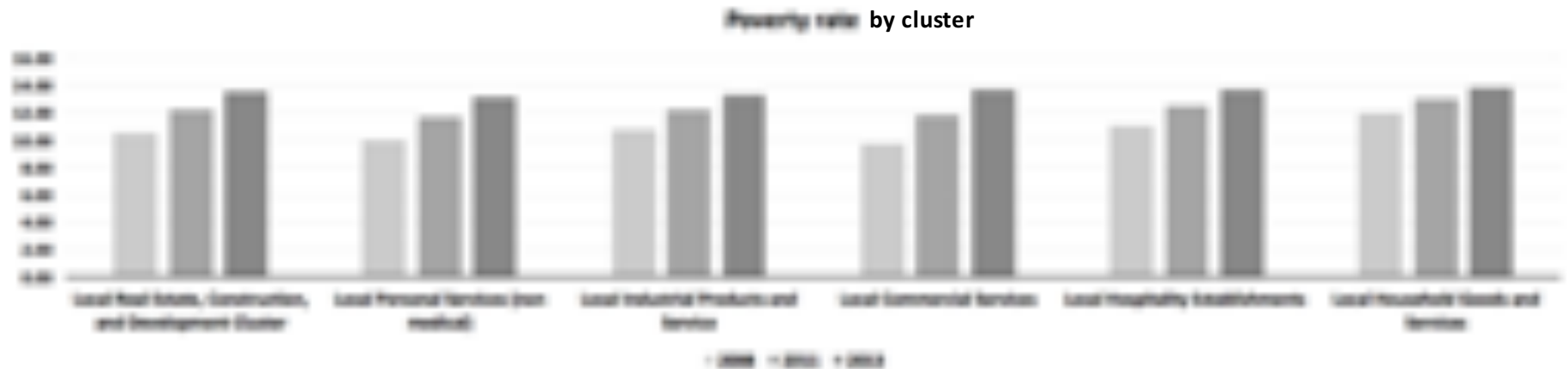
Poverty rate by cluster

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Job Creation by cluster

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Marie Sklodowska- Curie RISE
MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies
for Local Economic Development

MAPS-LED
2015 - 2019
Multidisciplinary
Approach to Plan Smart Specialisation Strategies
for Local Economic Development
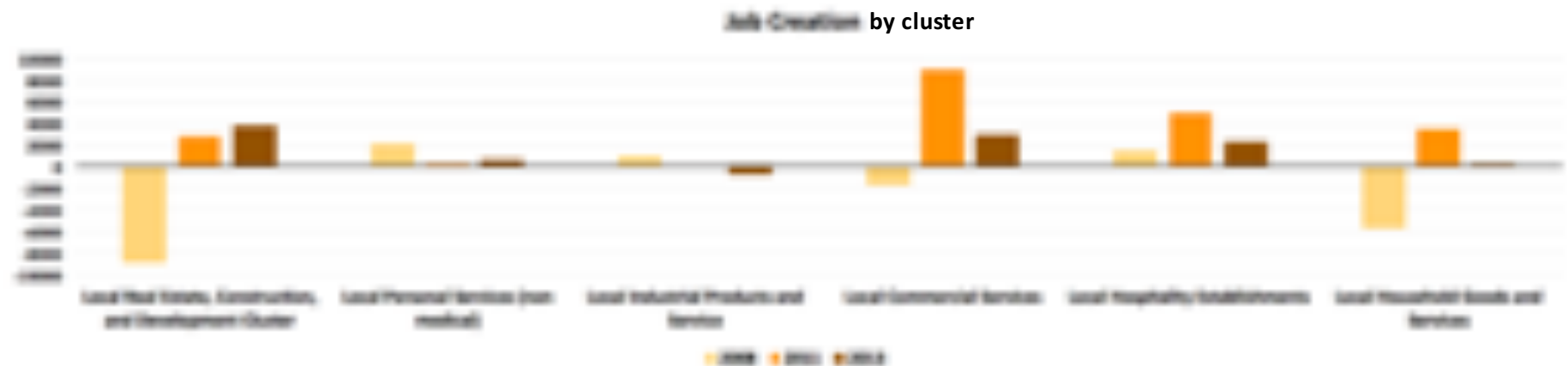
Innovation ecosystem | Performance

Patent Count **by cluster**
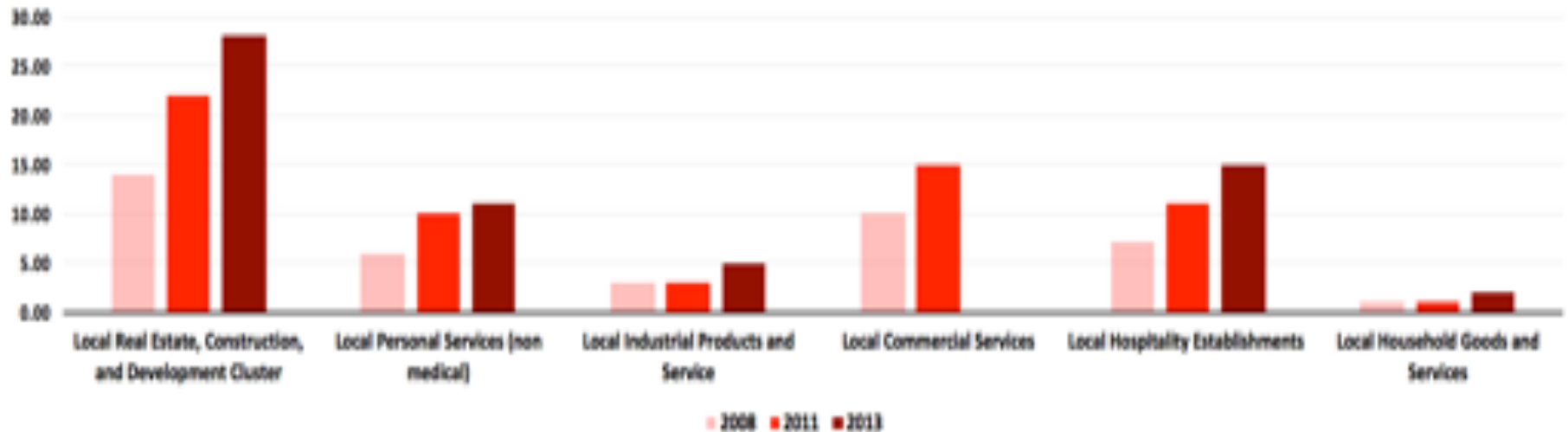
Innovation ecosystem | Business Environment

Venture Capital per $10.000 of GDP **by cluster**
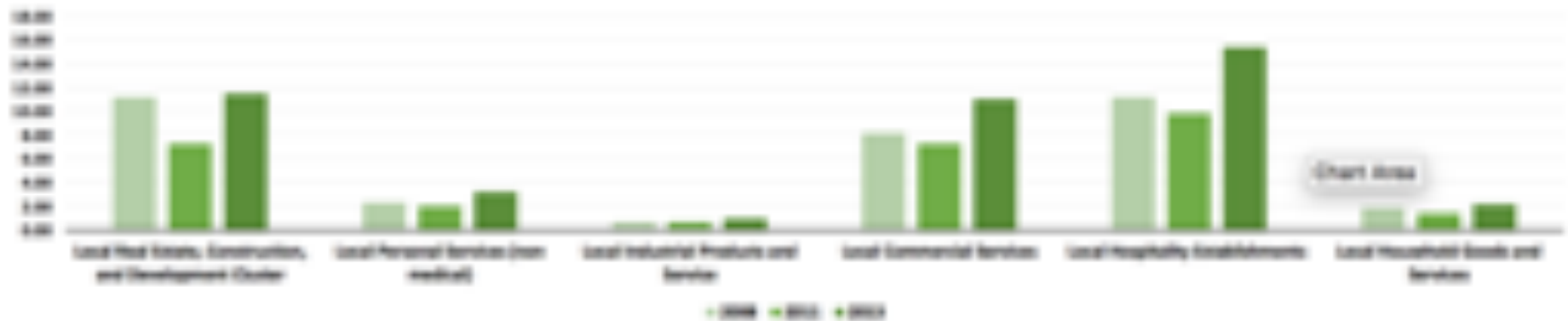
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Total with some college or associate degree **by cluster**

Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Innovation ecosystem | Business Environment
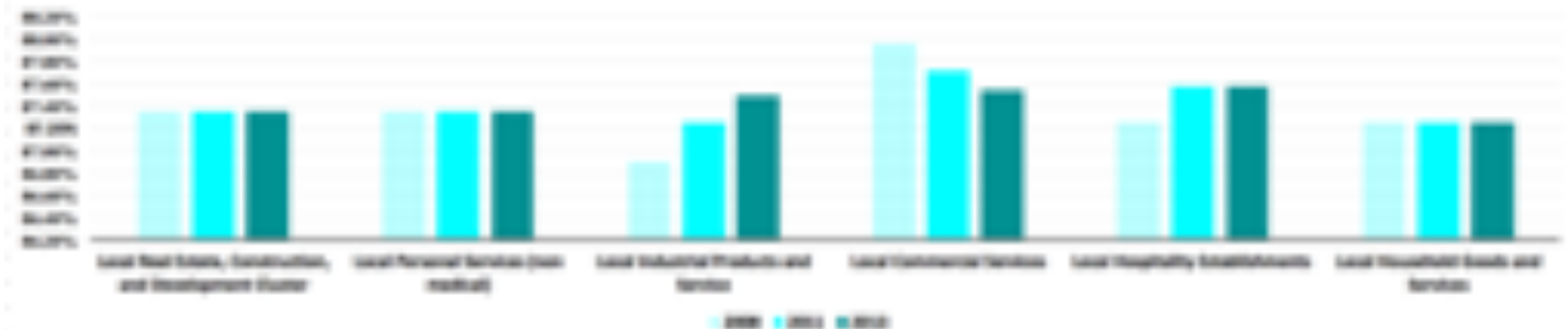
Total with some college or associate degree **by cluster**

Authors Elaboration. Data originally sourced from http://www.clustermapping.us
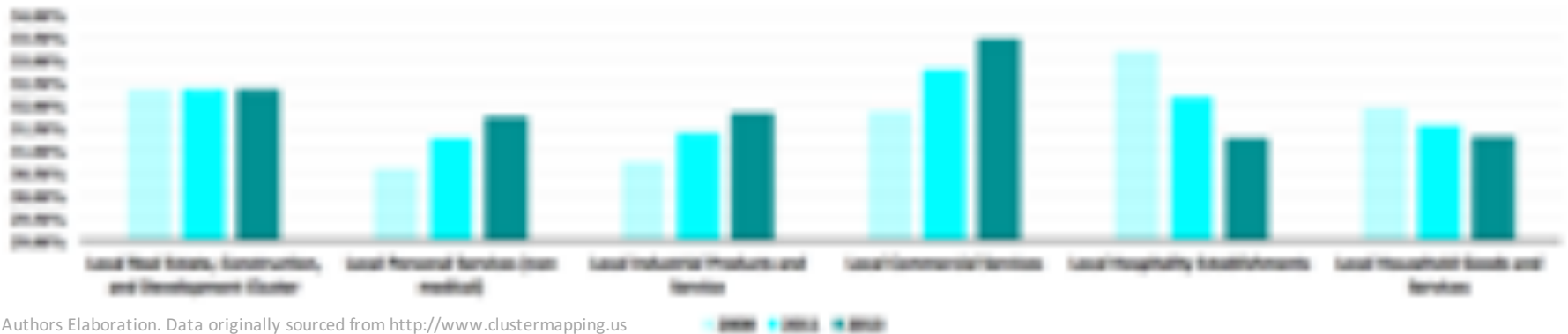
Total completing a bachelor's degree or more **by cluster**
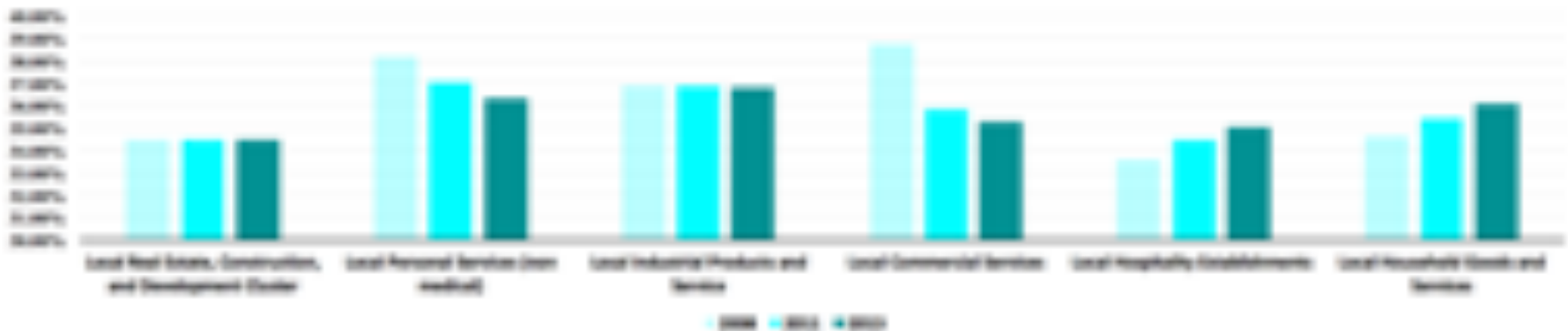
Authors Elaboration. Data originally sourced from http://www.clustermapping.us

Innovation ecosystem | Business Environment

Total with some college or associate degree **by cluster**

Mapping the Local Cluster on GIS

Source: Authors' elaboration

The investigation has focused on the San Diego County area which corresponds to the San Diego MSA.

The **main territorial unit** for the data gathering process, is the 5-digit zip code. In detail, data have been collected, analyzed and processed for the **185 zip codes** composing the San Diego MSA, namely **from the zip code 91901 to 92199**

Mapping the Local Cluster on GIS

1.3.b San Diego Land Use (2013)

Residential
- Single Family Residential
- Multi-Family Residential

Mixed Use, Commercial and Industrial
- Mixed Use
- Commercial and Office
- Heavy / Light Industry

Public Facilities and Utilities
- Military
- Transportation / Utilities
- Education / Institutions

Open Space Parks and Recreation
- Open Space Parks
- Recreation

Agriculture and Rural Residential
- Spaced Rural Residential
- Agriculture

Other
- Vacant
- Water
- States Boundaries
- San Diego Metropolitan Statistical Area - San Diego County
- Mexico

Pacific Ocean

Source: Authors' elaboration

Mapping the Land Use
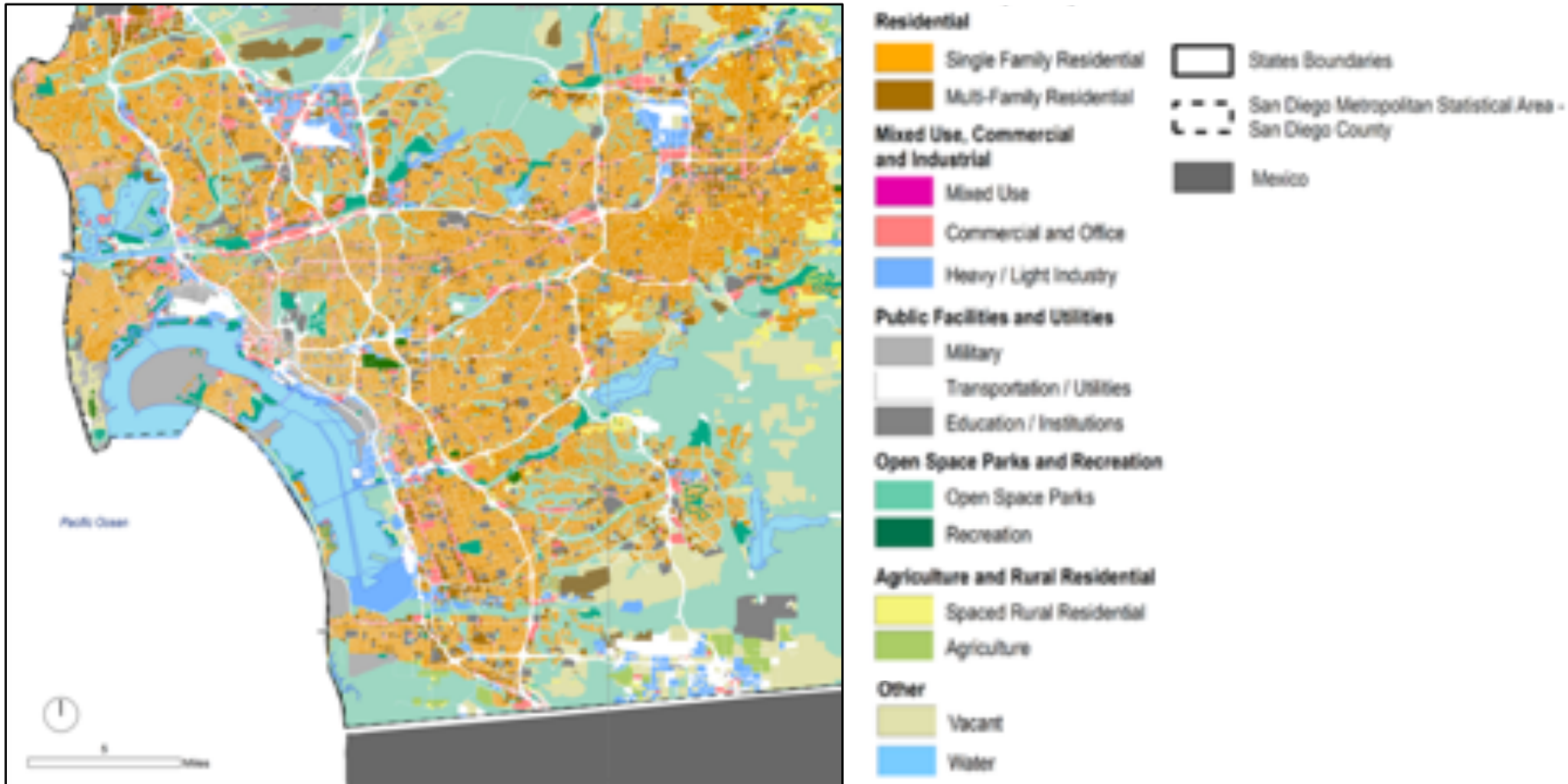
Source: Authors' elaboration

Mapping the Transportation Network
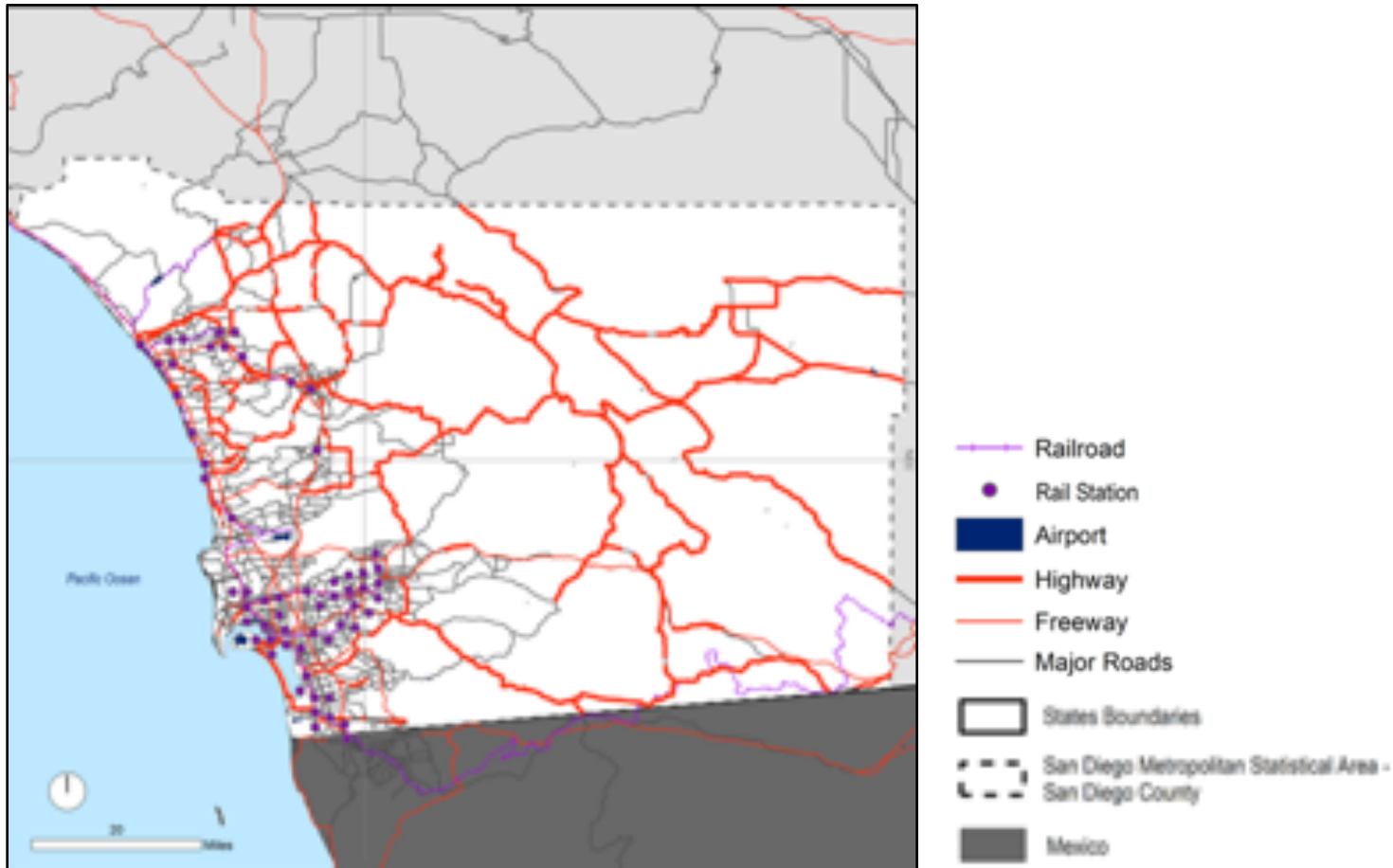
Source: Authors' elaboration

Mapping number of establishments per Zip Code | Local Real Estate

Source: Authors' elaboration

Mapping the transportation system allowed the authors to thoroughly investigate the location of transportation infrastructure.

It can be seen that **transportation network tends to concentrate more in the coastal area of the county**.
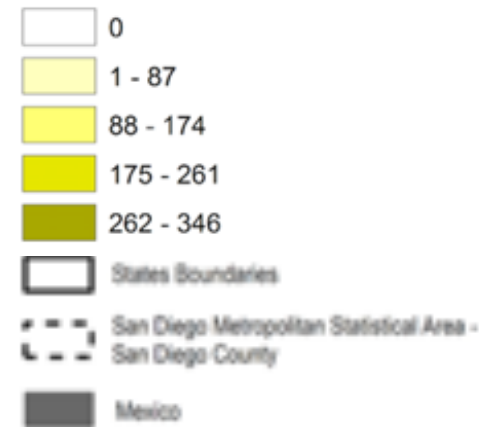
Mapping number of establishments per Zip Code | Local Industrial Services
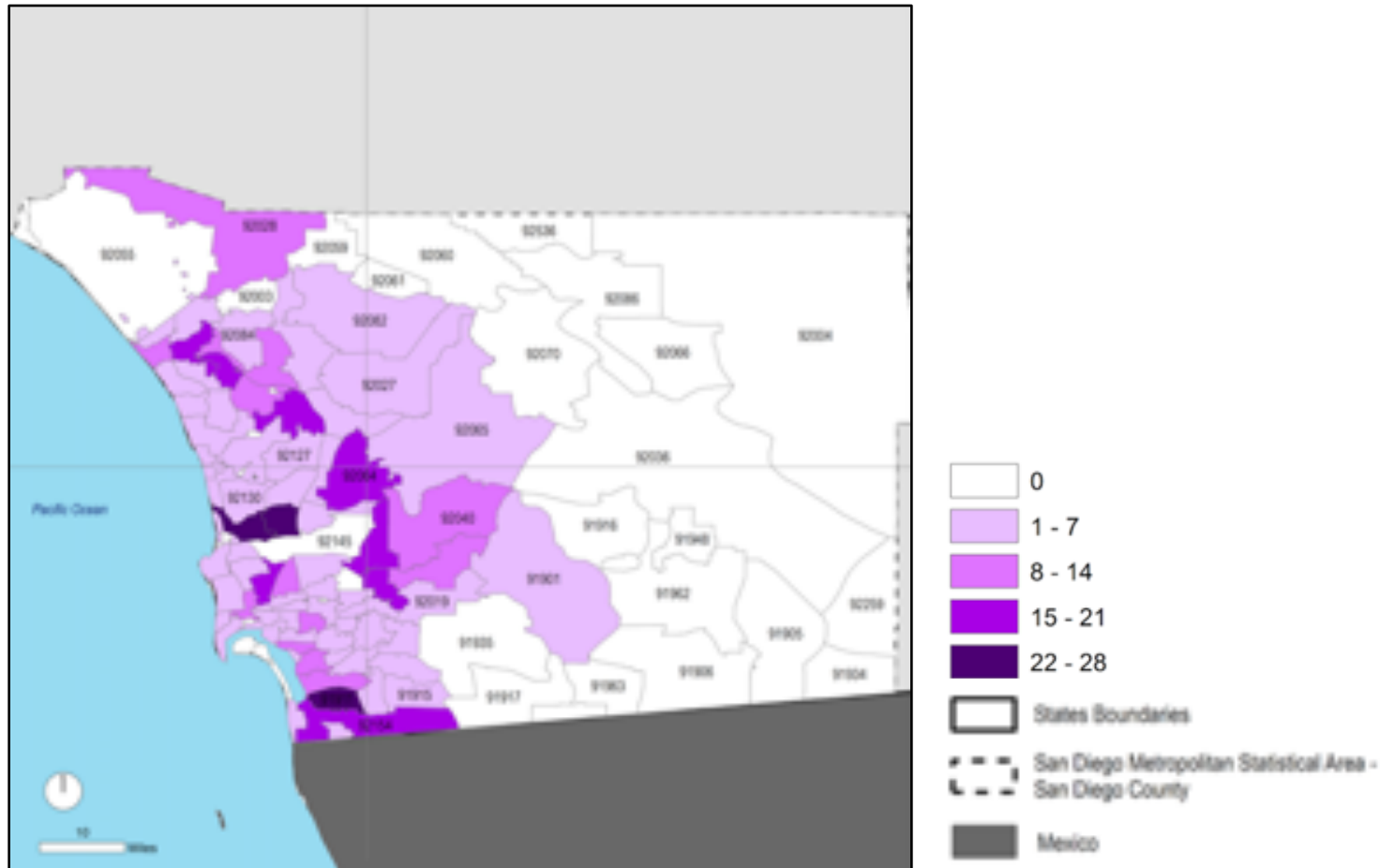
Source: Authors' elaboration

Mapping number of establishments per Zip Code | Local Households Goods & Services
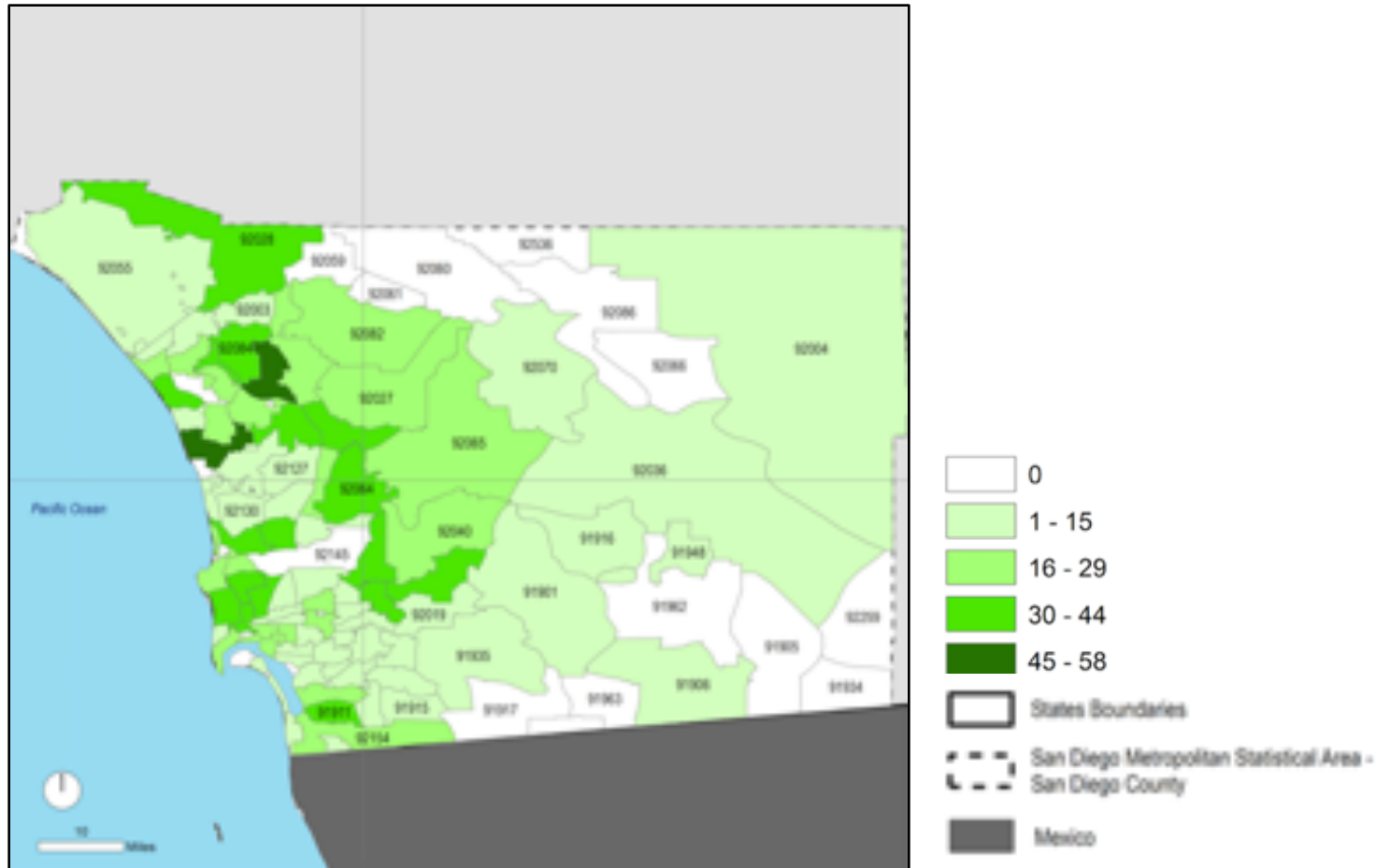
Source: Authors' elaboration

Mapping number of establishments per Zip Code | Local Hospitality Establishments
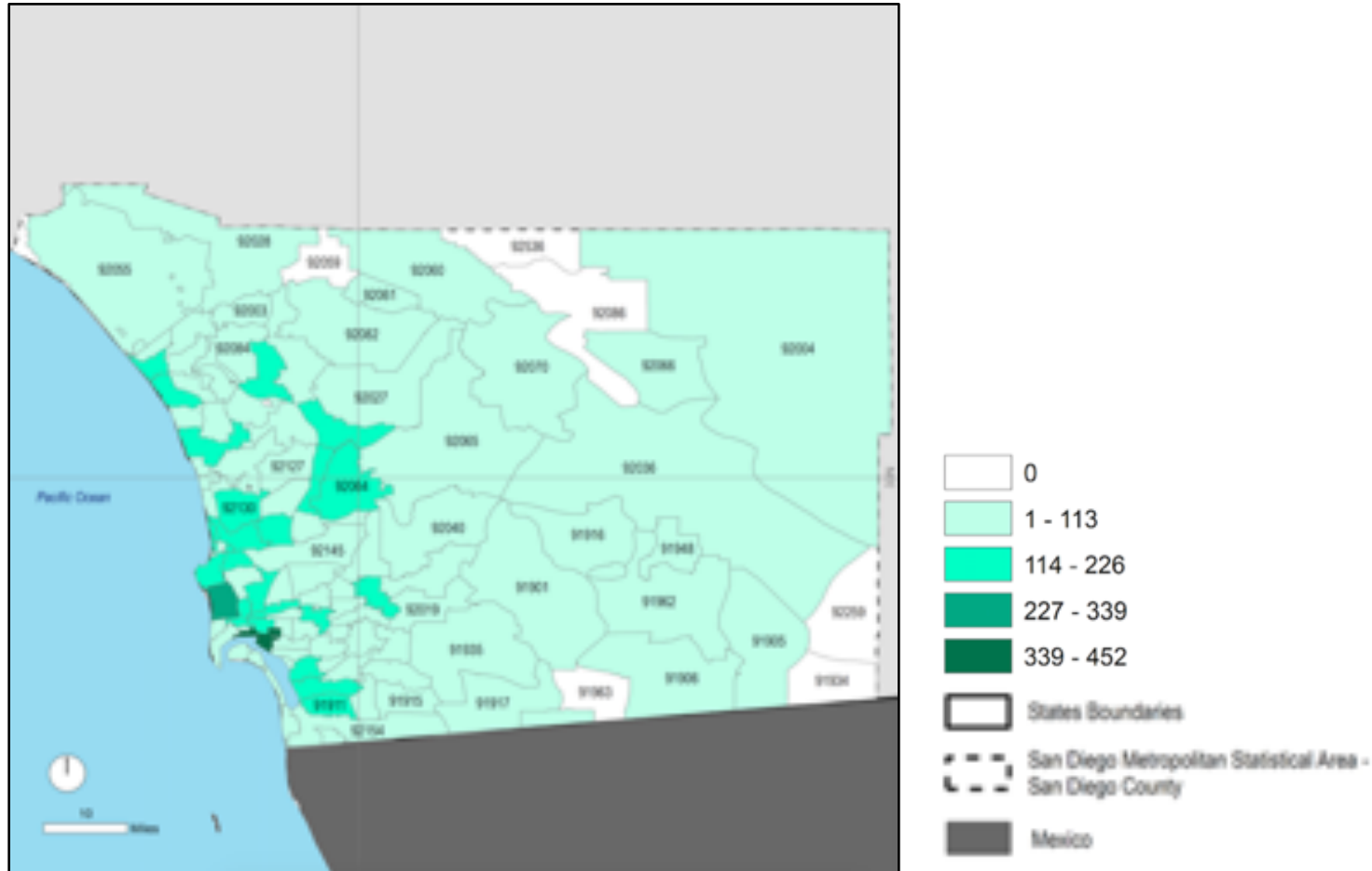
Source: Authors' elaboration

Mapping number of establishments per Zip Code | Local Commercial Services
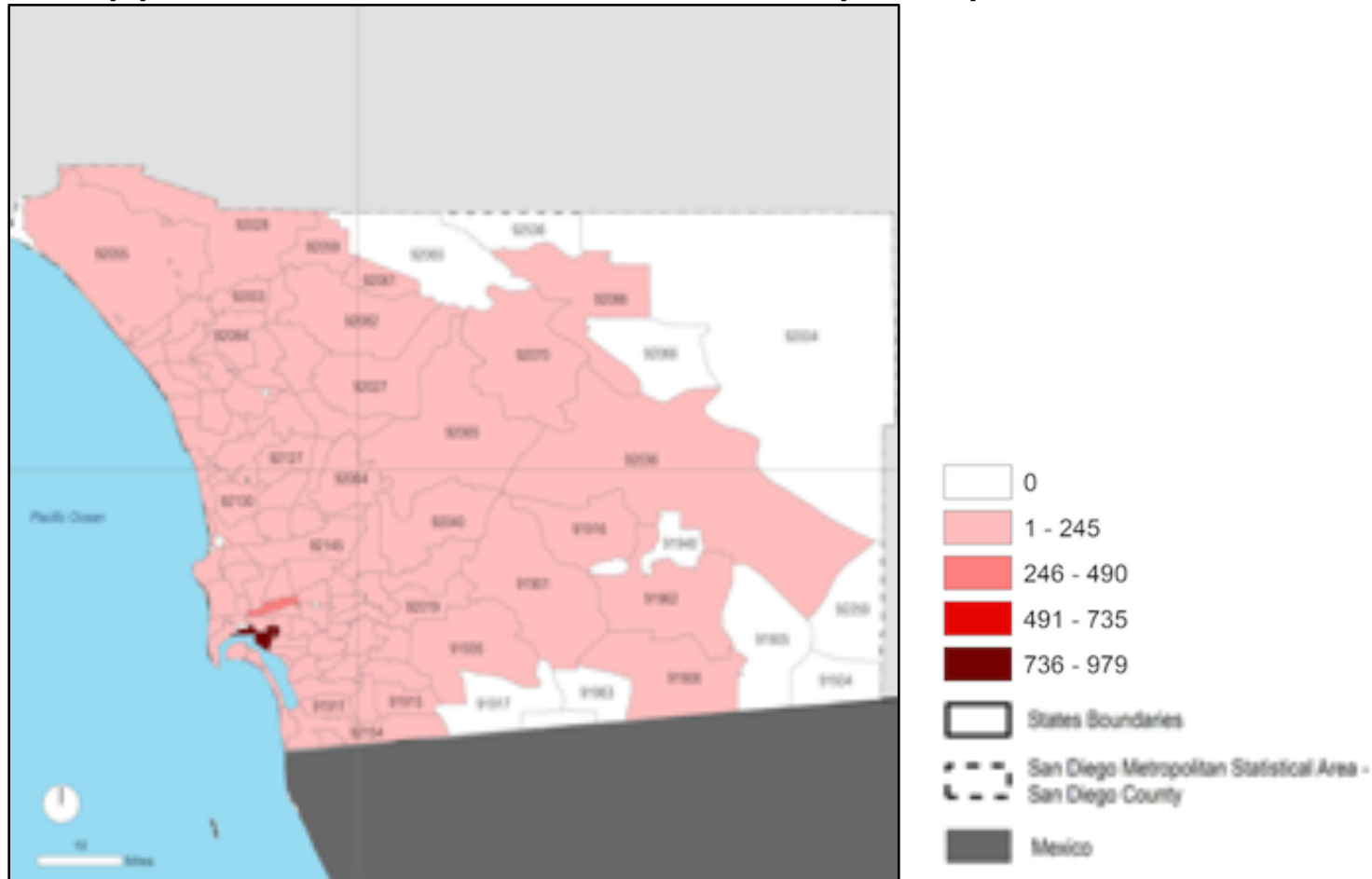
Source: Authors' elaboration

Mapping number of establishments per Zip Code | Local Personal Services
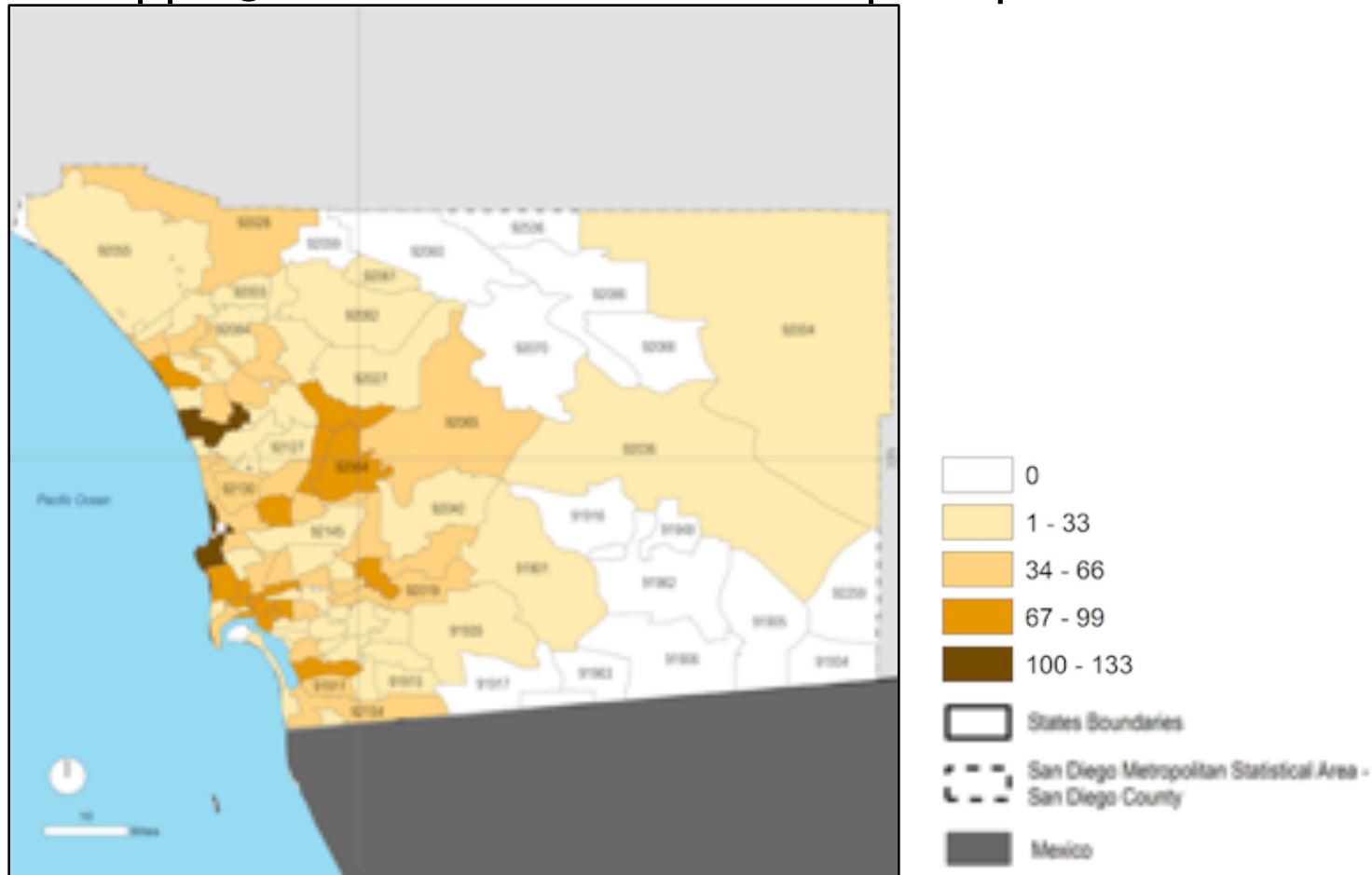
Source: Authors' elaboration

Mapping local cluster | General
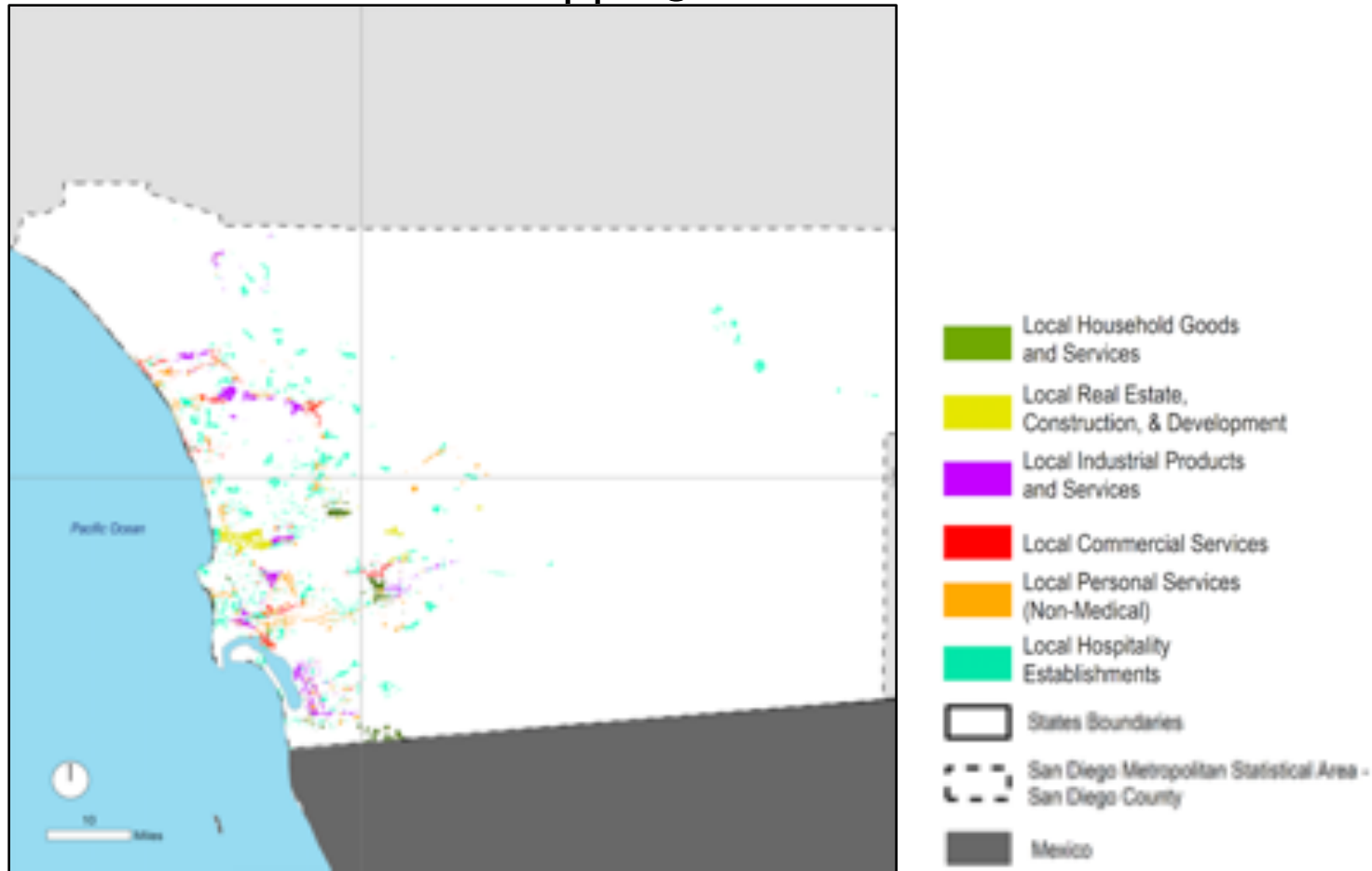
Local Household Goods and Services

Local Real Estate, Construction, & Development

Local Industrial Products and Services

Local Commercial Services

Local Personal Services (Non-Medical)

Local Hospitality Establishments

States Boundaries

San Diego Metropolitan Statistical Area - San Diego County

Mexico

Source: Authors' elaboration

Mapping local cluster l Local Real Estate, Construction & Development

Local Real Estate,
Construction, & Development

Municipal Boundaries of San Diego

States Boundaries

San Diego Metropolitan Statistical Area -
San Diego County

Mexico
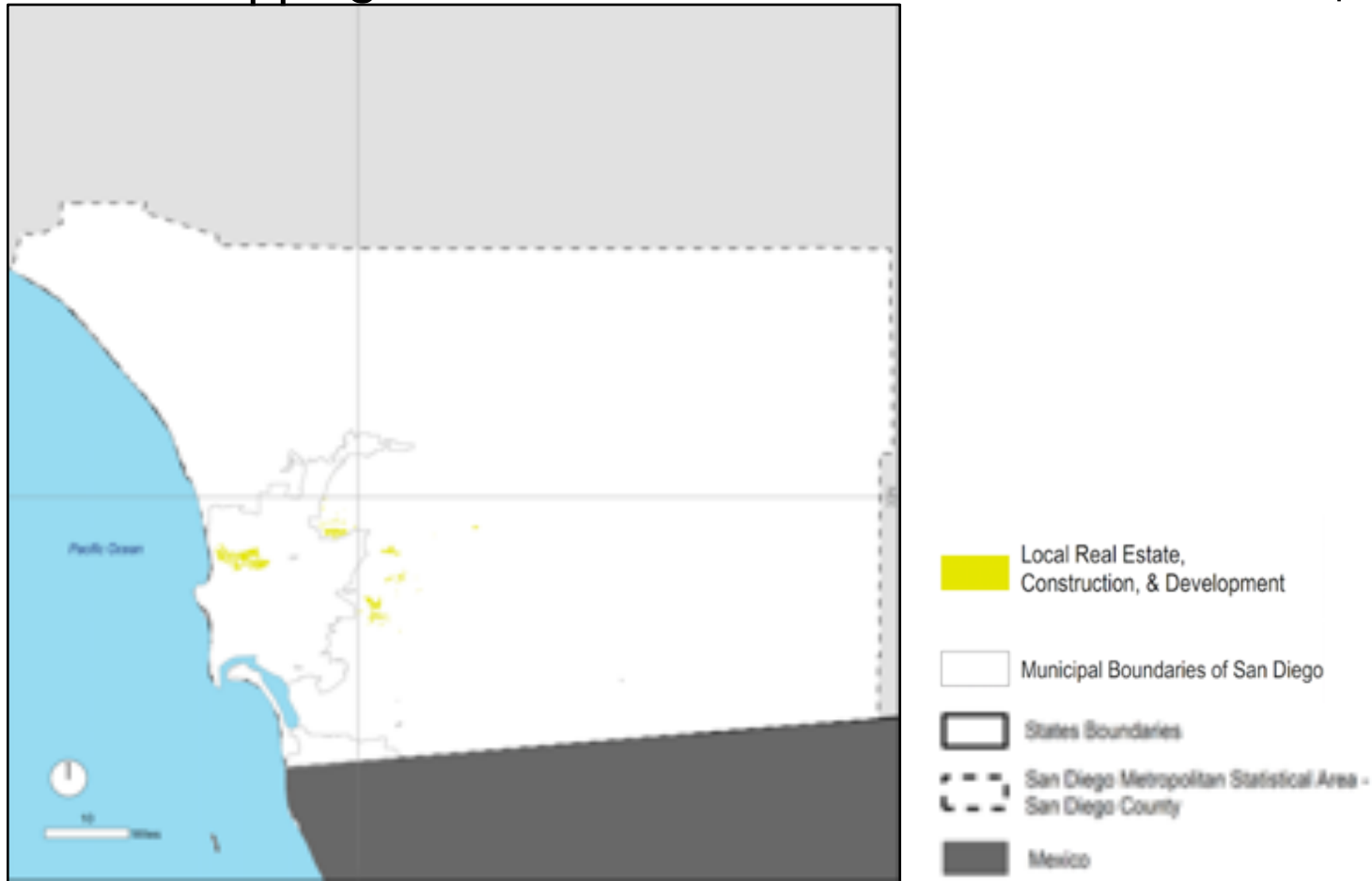
Source: Authors' elaboration

Mapping local cluster | Local Industrial Products & Services

Source: Authors' elaboration

Legend:
- Local Industrial Products and Services
- Municipal Boundaries of San Diego
- States Boundaries
- San Diego Metropolitan Statistical Area – San Diego County
- Mexico
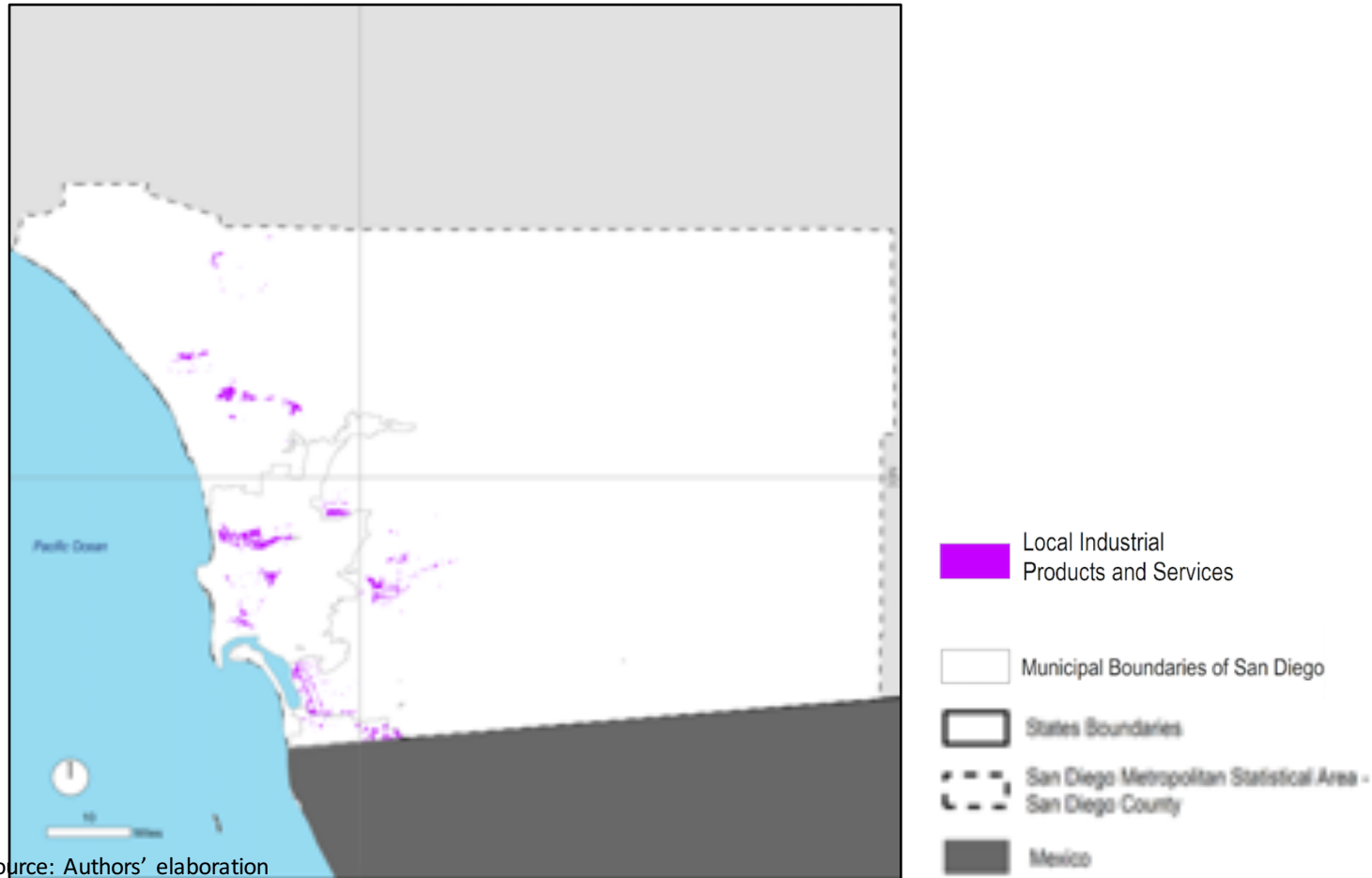
Mapping local cluster | Local Household Goods & Services

■ Local Household Goods
and Services

☐ Municipal Boundaries of San Diego

☐ States Boundaries

⌐ ┐ San Diego Metropolitan Statistical Area -
└ ┘ San Diego County

■ Mexico
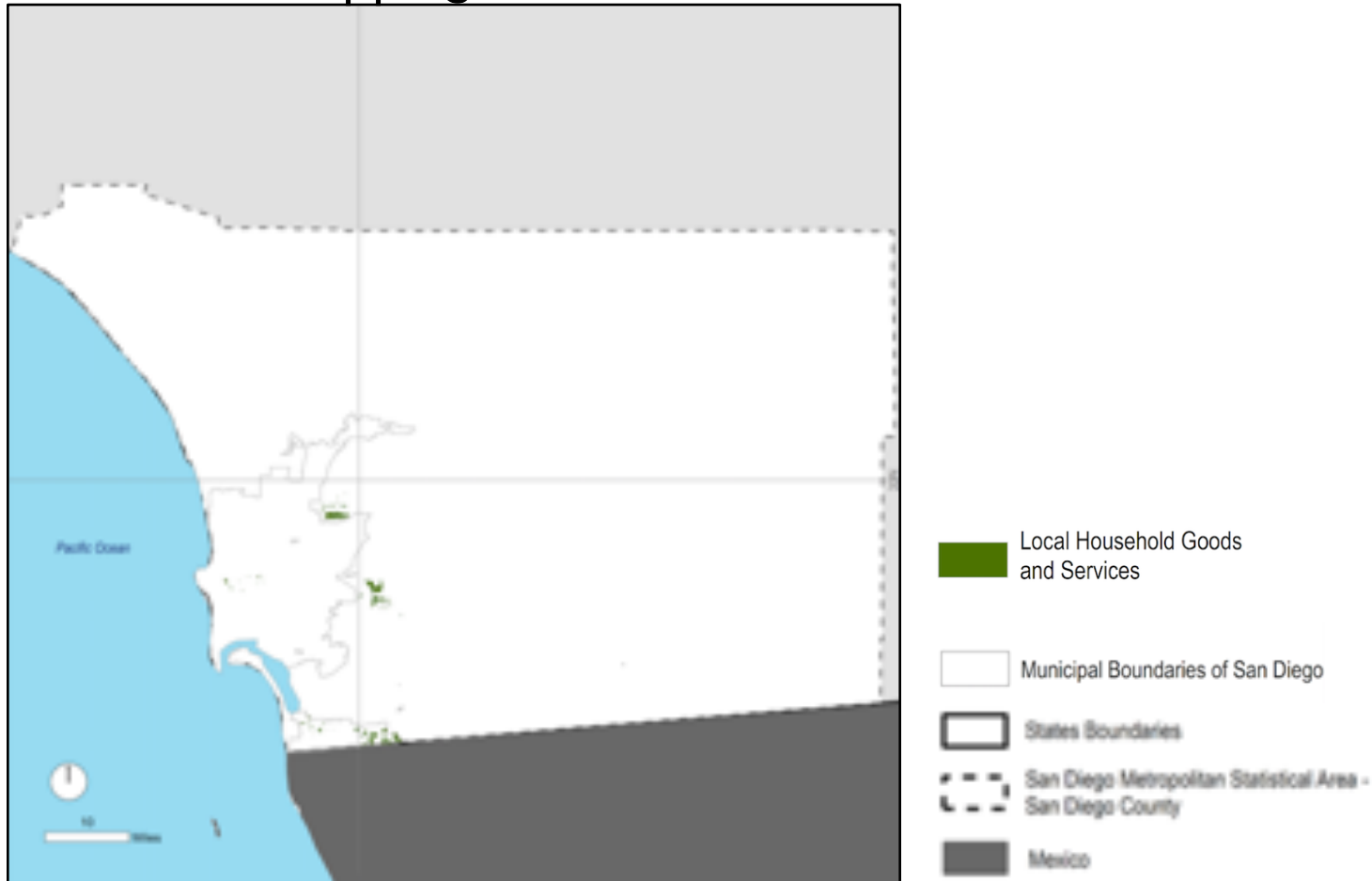
Source: Authors' elaboration

Mapping local cluster | Local Commercial Services
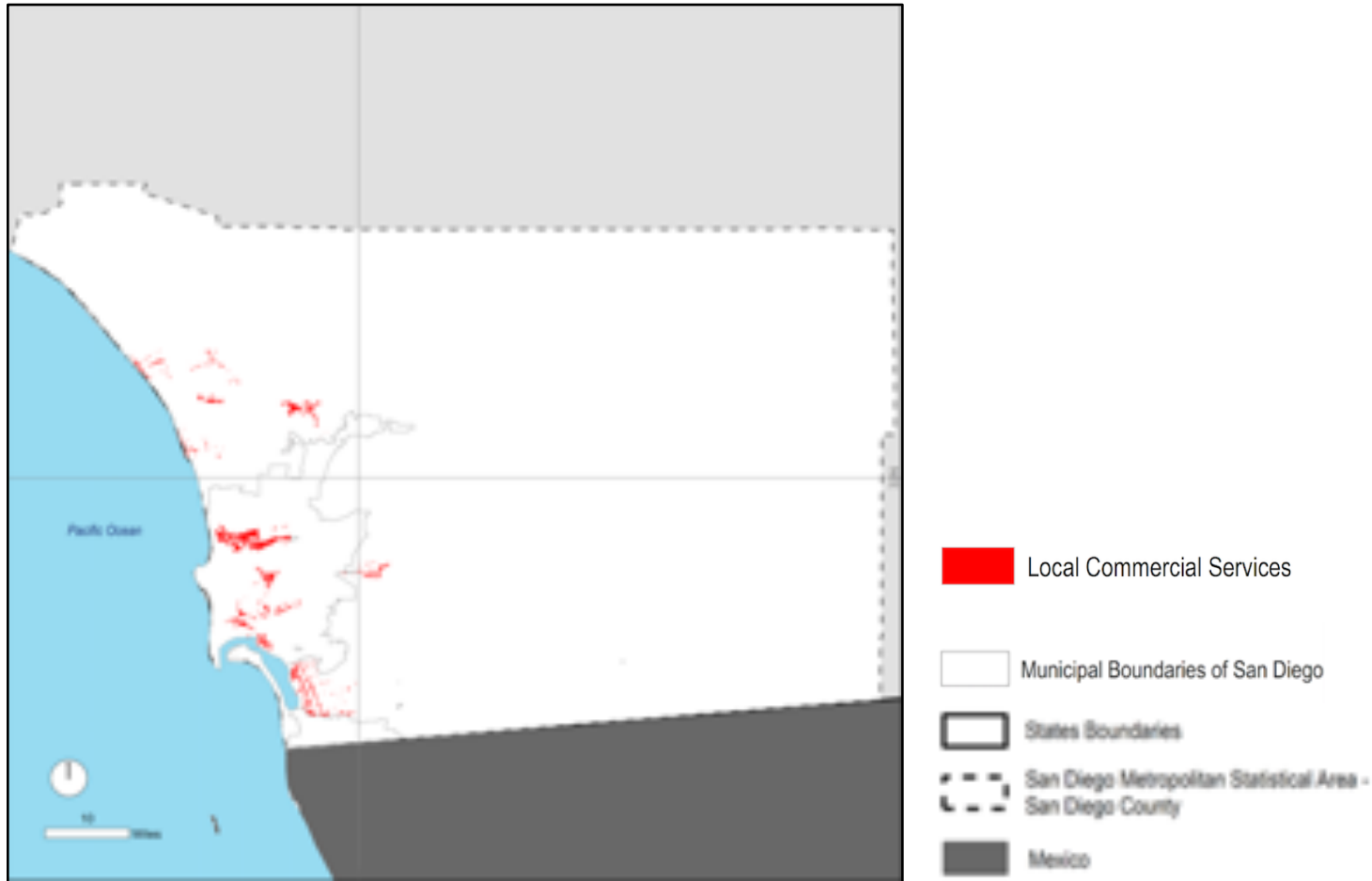
Source: Authors' elaboration

Mapping local cluster | Local Personal Services (non medical)

Source: Authors' elaboration

Local Personal Services
(Non-Medical)

Municipal Boundaries of San Diego

States Boundaries

San Diego Metropolitan Statistical Area -
San Diego County

Mexico
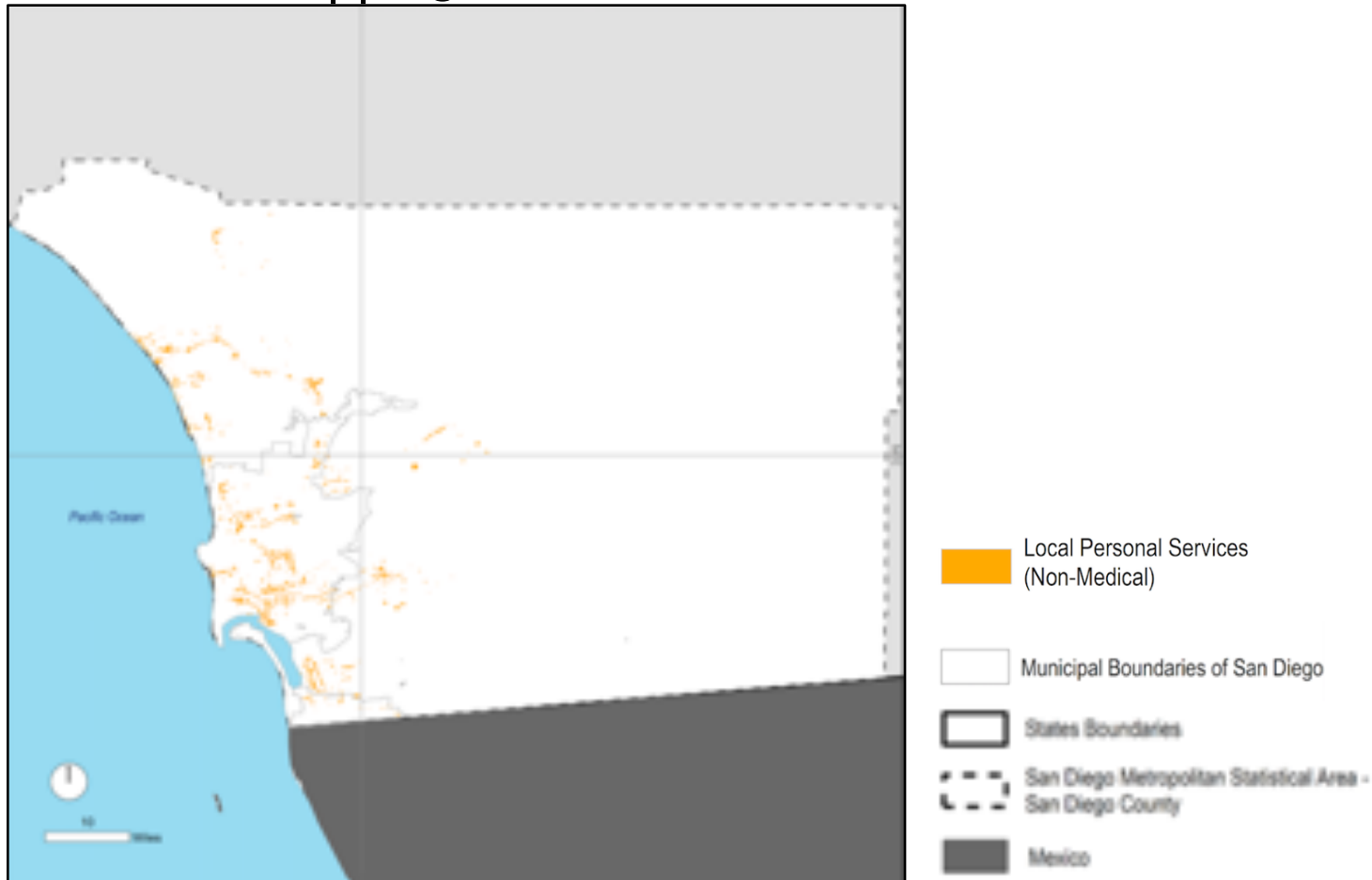
Mapping local clusters and community planning areas | General
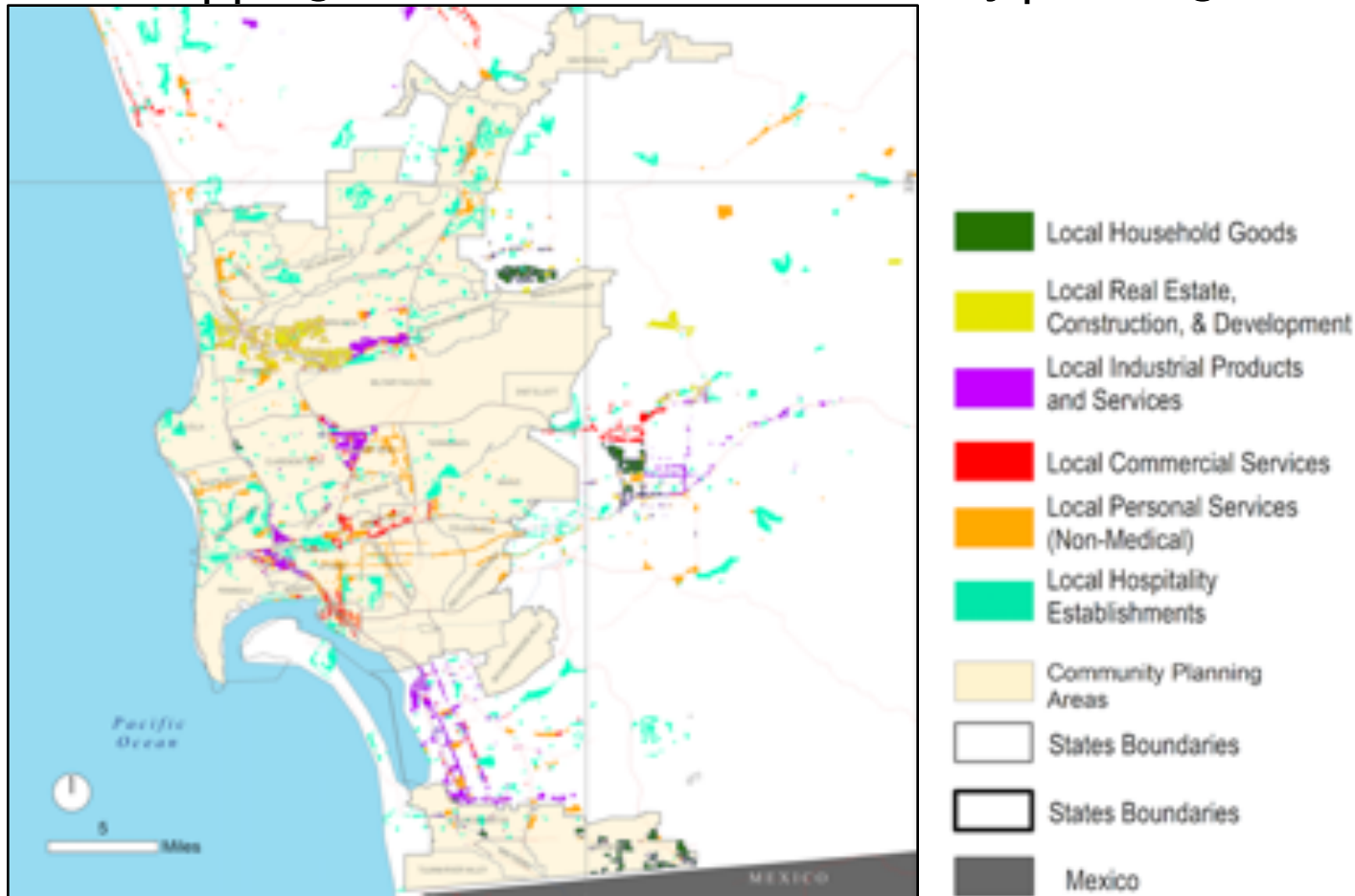
Source: Authors' elaboration

Community Planning Areas Analysis

A community plan is a public document, included within the City's General Plan, "which contains specific proposals for future land uses and public improvements in a given community... It provides tailored policies and a long-range physical development guide for elected officials and citizens engaged in community development" (The City of San Diego, 2017).

The main elements included are:
- Land Use;
- Transportation;
- Urban Design;
- Public Facilities and Services;
- Natural and Cultural Resources;
- Economic Development (The City of San Diego, 2017).

For each cluster, it will be defined:
- Neighborhoods;
- Community plan;
- Zoning;
- Connection with the main urban fabric characteristics.

Source: Authors' elaboration

Local Real Estate Cluster and Community Planning Areas Analysis

The spatial agglomeration of the cluster emerges in three main areas: **Mira Mesa, Torrey Pines and University.**

The first one is located in the northern coastal region of the City of San Diego close to the MCAS *Miramar*, which constitutes one of the main region's employment hubs.

The *Torrey Pines* area, instead, includes all the research spin-offs of the UCSD campus, while the *University* area has undergone an important change in the last years going from "a student-oriented college town" to an important urban node.

The three community plans together try to encourage the location of scientific research, biotechnology, and light manufacturing uses.

Source: Authors' elaboration
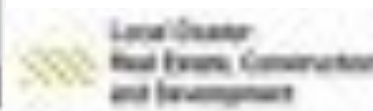
Local Real Estate Cluster and Community Planning Areas Analysis

Two main Land Use categories : *Light Industry* and *Office Low rise*, which allow "office, research and development, and light manufacturing uses".

Major concentration is recognizable **along the I- 805 and the I-5,** two major North-South Interstate Highways in Southern California.

The Railway Line and the Mira Mesa Boulevard trace further the path of the specific Local Cluster.

Its morphology in this area reflects the old typology of the industrial park.

Source: Authors' elaboration

Local Household Goods and Services Cluster and Community Planning Areas Analysis

This cluster falls within two community planning areas: **Clairemont Mesa** and **Otay Mesa**.

The latter, located at the southern limit of the city of San Diego, bordering with Mexico, reveals a greater concentration of establishments, regarding the specific Local Cluster.

The density of this cluster in the specific area suggests an additional question: is there a competitive advantage in locating next to the border with Mexico?

Source: Authors' elaboration

Local Household Goods and Services Cluster and Community Planning Areas Analysis

According to the planned Land Use of the Community Planning of the Otay Mesa area, which designates a quarter of the land area for industrial uses, the Local households goods and services Cluster matches with the two main Land Use categories of *Light Industrial* and *Commercial and Office*.

Following the main strategies of the area that forecast the connection between the main employment centers with the transit system using a compact, pedestrian-friendly orientation, the concentration of the pattern of the Local Cluster can be observed within the *Central Village* area.

Source: Authors' elaboration
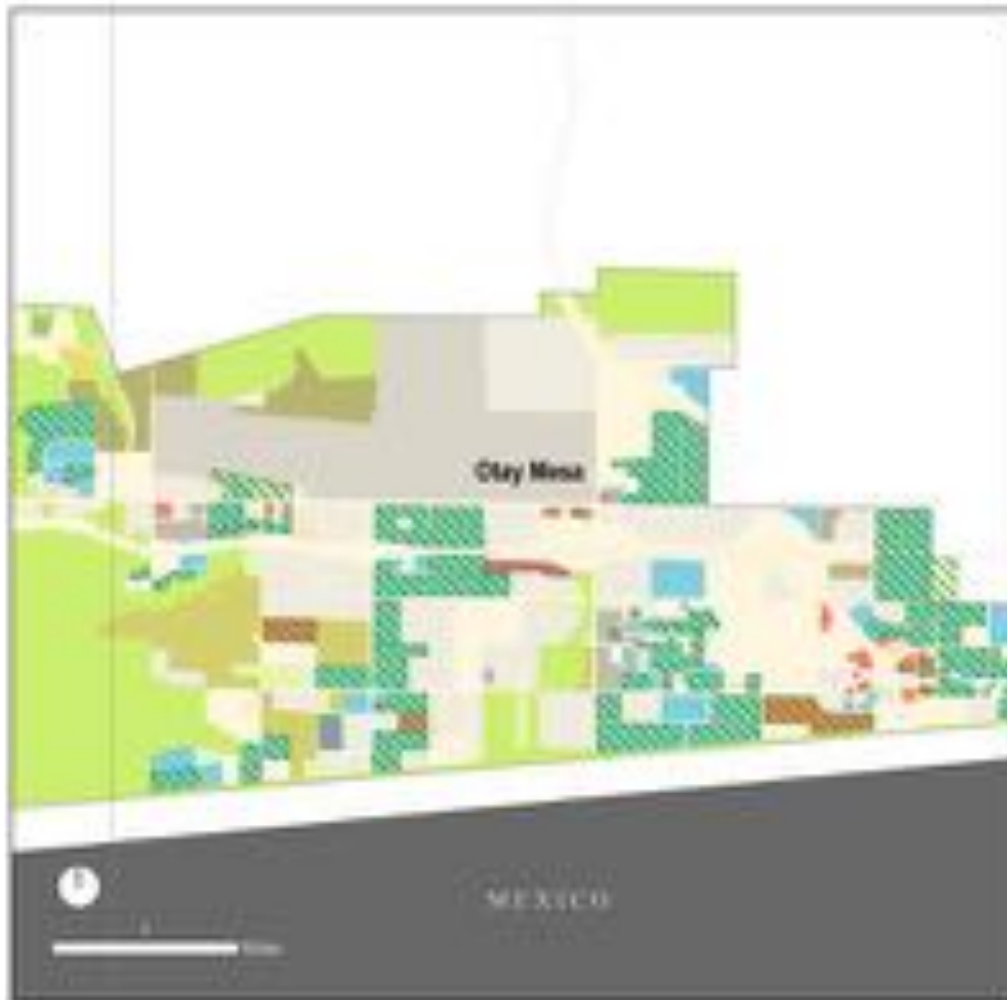
Local Hospitality Establishments Cluster and Community Planning Areas Analysis

This Local cluster emerged with a much less concentrated pattern, if compared with the other ones.

The sector is spread all over the city, since it represents one of the pillars of its Local Economy. It is agglomerated around the main points of interest, e.g. historical spots, scenic routes, historic parks, and all the other natural assets that make the city attractive to tourists.

It fits within the Community Plans of: Downtown area, Balboa Park, Uptown, Greater North Park, Mission Bay Park, Kearny Mesa, LA Jolla, Mira Mesa, Carmel Valley, Torrey Pines and University.

Source: Authors' elaboration

Marie Sklodowska- Curie RISE
MAPS-LED
Multidisciplinary Approach to Plan Smart Specialisation Strategies
for Local Economic Development

European Commission

HORIZON 2020

MAPS-LED 2015 - 2019
Multidisciplinary Approach to Plan Smart Specialisation Strategies for Local Economic Development

Local Hospitality Establishments Cluster and Community Planning Areas Analysis

The cluster matches with the main Land Use categories of *Golf Course, Open Space Parks, Commercial and Offices*.

It is traceable a clear path of the cluster along the Mission Valley Freeway and Friars Road, the central 4th and 5th Ave., University Ave. and El Cajon Blvd. within the Greater North Park area, Garnet Ave. within the neighborhood of Pacific Beach.

The Railway Line and the Mira Mesa Blvd. tracks some further paths of the Cluster.

Source: Authors' elaboration

Local Industrial Products Cluster and Community Planning Areas Analysis

The cluster falls within three main hubs around the areas of Otay Mesa, Mira Mesa and Kearny Mesa.

The Cluster develops along the Otay Mesa Road within the Central Village area of Otay Mesa and the Pacific Highway within the Midway/Pacific Highway Community Plan.

Source: Authors' elaboration
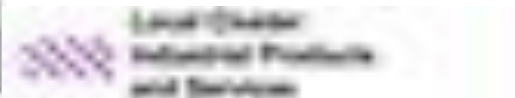
Local Industrial Products Cluster and Community Planning Areas Analysis

This Cluster is located in the north central portion of the City and falls within the four Community planning areas: Linda Vista, Clairemont Mesa, Kearny Mesa and Midway Pacific Highway Corridor.

The Kearny Mesa area present the greatest spatial agglomeration of establishments of the Local Industrial Products and Services Cluster.

On the basis of their planned Land Uses, the specific Cluster fits into the two main Land Use categories of Light Industry and Commercial and Office.
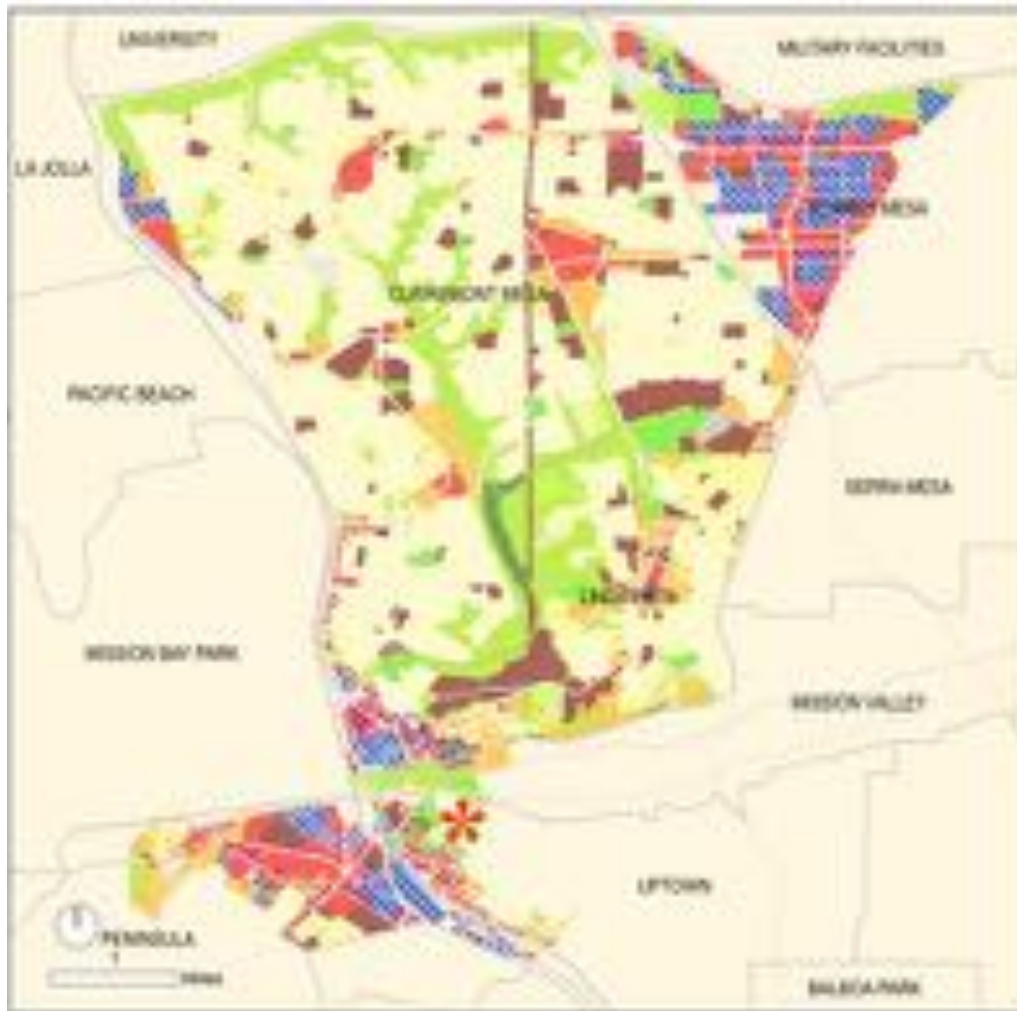
Source: Authors' elaboration

Local Commercial Services Cluster and Community Planning Areas Analysis

By overlapping the Community Planning related to the municipal boundaries of San Diego with the morphology of the Local Commercial Services Cluster, it emerged a physical spatial concentration within three main hubs around the areas of Downtown, Midway, Kearny Mesa and Mira Mesa.

Source: Authors' elaboration

Local Commercial Services Cluster and Community Planning Areas Analysis

The cluster develops along two main roads such as the Pacific Highway and the Mission Valley road.

As in the case of the Local Industrial Cluster, there is a high concertation of establishments in the Kearny Mesa area.

The Kearny Mesa community can be considered a major industrial and commercial center occupying a central location in the City of San Diego.

The Local Cluster matches with the main Land Use categories of Light Industrial, Commercial and Office, Mixed Use.

Source: Authors' elaboration

Local Personal Services Cluster and Community Planning Areas Analysis

The Local Personal Services (Non-medical) Cluster is concentrated around the areas of Downtown, Uptown, Kearny Mesa, Greater North Park, Pacific Beach and Mission Valley.

Source: Authors' elaboration

Local Personal Services Cluster and Community Planning Areas Analysis

The morphology of the specific cluster traces specific paths along the Mission Valley Freeway, Cabrillo Freeway within Kearny Mesa, the Pacific Highway, the 4th and 5th avenue between Uptown and Downtown, and University Ave./El Cajon Blvd./Adams Ave/Park Blvd. within the area of North park.
On the basis of the specific planned Land Uses, the Personal Services Cluster fits within the main Land Use categories of Commercial and Office, and Education/Institutions.

Source: Authors' elaboration

Source: Authors' elaboration

Local Clusters and Economic development initiatives

Economic development initiatives	Start year	Description	Related Clusters
San Diego Regional Economic Development Corporation (San Diego EDC)	1965	"San Diego Regional Economic Development Corporation's mission is to maximize the region's economic prosperity and global competitiveness, It promotes the region, facilitates corporate expansion across diverse industry sectors and supports the talent pool that drives their success." (San Diego Regional EDC website, 2017). - Independently funded non-profit organization	• Local Personal Services (Non-medical) • Local Real Estate, Construction, And Development • Local Industrial Products And Services • Local Hospitality Establishments
Innovate 78	2015	Innovate78 is "the collaborative outcome of five cities - Carlsbad, Escondido, Oceanside, San Marcos and Vista - coming together with a shared vision to boost economic prosperity and innovation along the 78 Corridor" (Innovate 78 website, 2017). The five North County cities have been working together to brand the area and maximize business retention, expansion, recruitment and local job creation.	• Local Commercial Services • Local Personal Services (Non-medical) • Local Hospitality Establishments • Local Commercial Services • Local Industrial Products And Services
Economic Development and Tourism Support (EDTS) Program	2005	The City's Economic Development and Tourism Support (EDTS) program provides "Transient Occupancy Tax (TOT) funds through a competitive merit-based application process to qualified nonprofit, tax-exempt organizations that produce significant programs and events to improve the City's economy by boosting tourism, attracting new businesses and increasing jobs in the area" (City of San Diego website, 2017).	• Local Hospitality Establishments
Small Business Enhancement Program (SBEP) – Citywide Grants	2014	"This program focuses on expanding economic opportunities for small businesses by supporting not for-profit organizations which provide specialized services to small businesses citywide. The intent is that recipients leverage Small Business Enhancement Program funds to enhance small businesses services and create, grow and retain small businesses in San Diego." (City of San Diego website, 2014).	• Local Household Goods And Services • Local Commercial Services • Local Industrial Products And Services

Part III
Conclusions
Working Package No. 3: "S3: Social Innovation and Territorial Milieu"

Giada Anversa/Laura Biancuzzo/Virginia Borrello/Gianmarco Cantafio/Giuseppe
Cantafio/Giuseppe Pronestì/Luana Parisi
PAU unit

OUTLINE

- 1. Objective of the Analysis;

- 2. Introduction to the Dynamic S.W.O.T Analysis Technique (Strengths, Weaknesses, Opportunities and Threats):

  - D-SWOT Analysis Key Principles;

- 3. Endogenous and Exogenous Factors of *San Diego's County* Local Industries:

  - 'Endogenous Factors (Strengths and Weaknesses);
  - 'Exogenous Factors' (Opportunities and Threats linked to S3);
  - Glossary of Terms;

- 4. Case Studies:

  - a. Real Estate and Construction Cluster;
  - b. Industrial Products & Services Cluster;

- 5. Results & Limitations;
- 7. Conclusions;

1. Objective of the Analysis

AIM

Investigate and assess how the expectations of future development provided by the application of *Smart Specialization Strategies* (S3) could contribute to tackle:

– **A. Weaknesses** inherently associated to Local Clusters (Endogenous Factors);

– **B. Threats** entailed by the decisional-making process (Exogenous forces);

2. Introduction to the Dynamic S.W.O.T Analysis Technique
(Strengths, Weaknesses, Opportunities and Threats)

D-S.W.O.T Analysis: Key Principles

DEFINITION

- A Tecnique adopted to critically investigate and assess a *complex system* by analyzing the nature and intensity of the relationship among *ex-ante* identified *Endogenous* (Strengths and Weaknesses) and *Exogenous* (Opportunities and Threats) factors;

METHOD

- 1. Combination of the *n factors* in a square Matrix *n X n*;

- 3. Pairwise comparison among identified *n factors*
- (row X column, i.e. J_{12} X J_{21});

- 4. Scores assigned (threshold $-2 < 0 < +2$) quantify the extent and nature of the relations among the factors;

USE

- As a 'Control tool' which allows to evaluate the validity of a given strategy and the consequent redefinition;

Source: (Bezzi, C., 2005).

D-S.W.O.T Analysis: Key Principles

- Non-unidirectional relationship: When we assess how every row element S_2 X S_1 is influenced by the corresponding column element and vice-versa (S_1 X S_2), a *dependency relation* is assigned;

The extension of this concept to the D-SWOT is:

(S2;S1) ≠ (S1;S2) => row score ≠ column score

		S		W		O		T		tot row analysis
		S1	S2	W1	W2	O1	O2	T1	T2	
S	S1	-----	S1;S2	S1;W1	S1;W2	S1;O1	S1;O2	S1;T1	S1;T2	
	S2	S2;S1	-----	S2;W1	S2;W2	S2;01	S2;O2	S2;T1	S2;T2	
W	W1	W1;S1	W1;S2	-----	W1;W2	W1;O1	W1;O2	W1;T1	W1;T2	
	W2	W2;S1	W2;S2	W2;W1	-----	W2;O1	W2;O2	W2;T1	W2;T2	
O	O1	O1;S1	O1;S2	O1;W1	O1;W2	-----	O1;O2	O1;T1	O1;T2	
	O2	O2;S1	O2;S2	O2;W1	O2;W2	O2;O1	-----	O2;T1	O2;T2	
T	T1	TI;S1	TI;S2	TI;W1	TI;W2	TI;O1	O2	-----	TI;T2	
	T2	T2;S1	T2;S2	T2;W1	T2;W2	T2;O1	T2;O2	T2;T1	-----	
	tot column analysis									

Methodological Framework
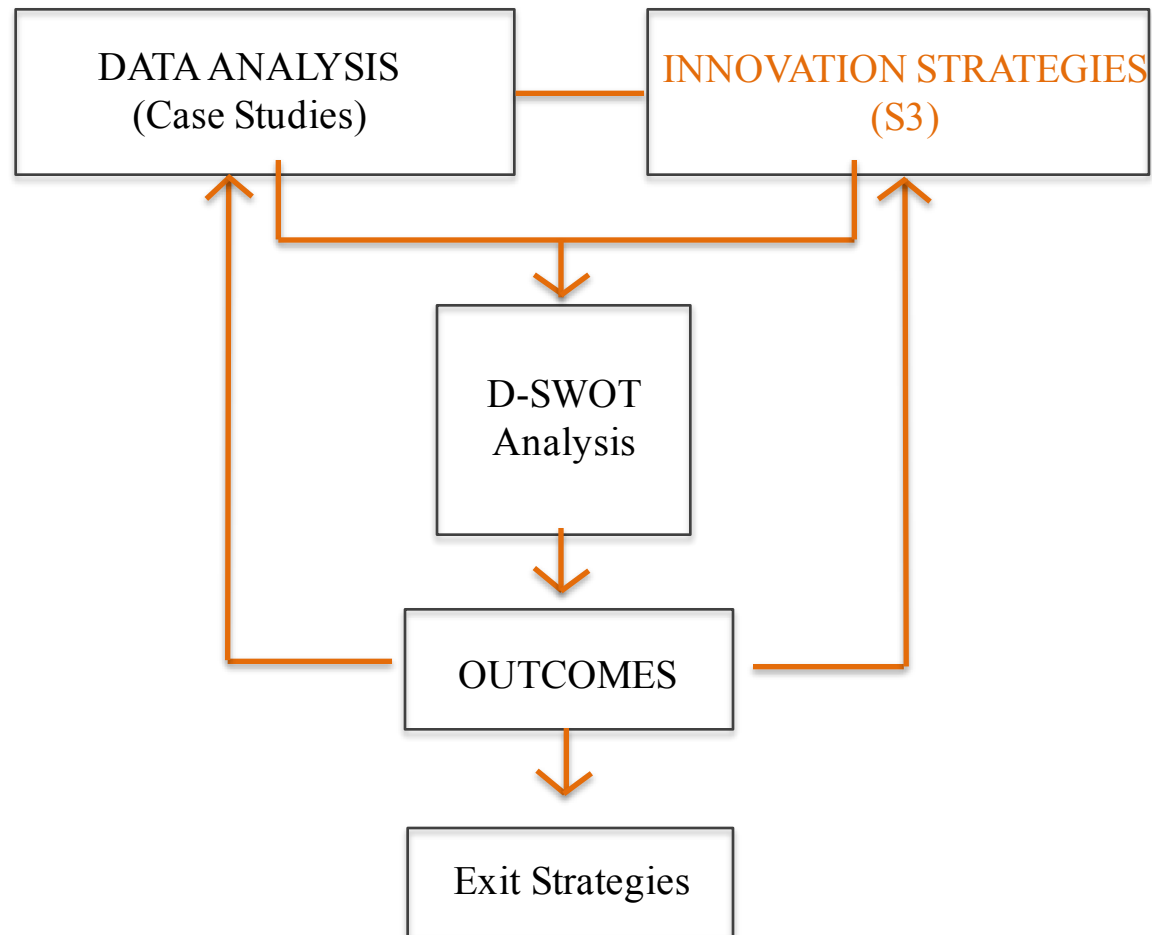
3. Endogenous and Exogenous Factors
of *San Diego's County* Local Industries

'Endogenous' Factors

Economic Indicators

(Quantitative Data)

S

-Job Creation   Productivity; Labor pooling; Labor Supply;
-LQ   Employment; Specialization;
-Innovation   R&D; Patenting;

W

-Poverty Rate   Unemployment; Low income;
-Wages   Productivity; Regional Prosperity;
-Job Destruction   Lower Productivity; Lower Labor Supply;

'Exogenous' Factors

Strategies(S3) & Unexpected Environmental Effects

('Concepts')

O

-Modernization   Technologic Change; Efficiency; Innovation;
-Inter-sectorial Activities   Cross-pollination; Knowledge spillover;
    Inter-labor mobility; innovation; ED;

T

-Lock-In Dynamics   Hyper-Specialization; path dependency;
-Risk-Adverse behavior   Low credit Access; High capital cost;
    Absent Venture Capital;
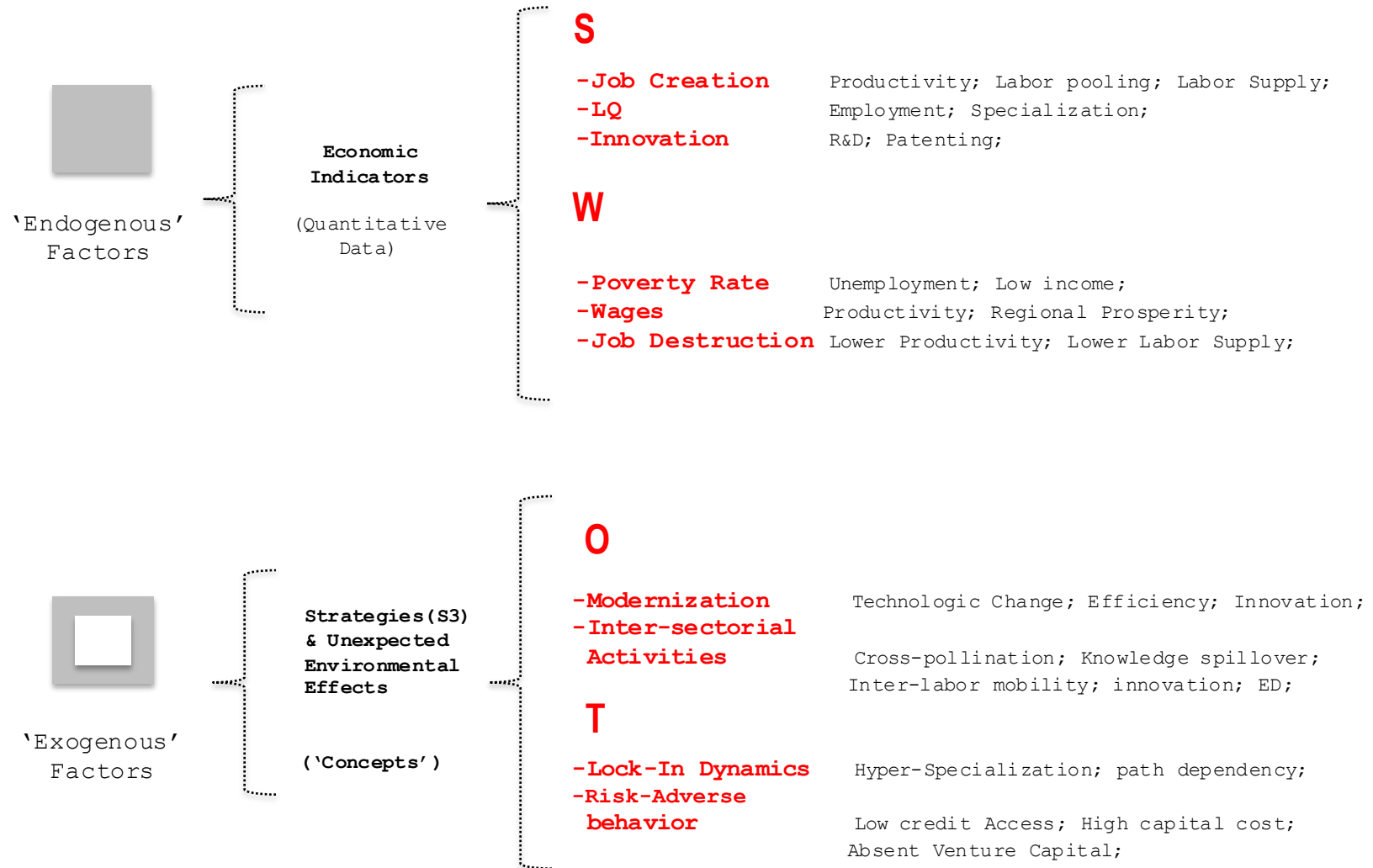
4. Case Studies

Local Real Estate and Construction Cluster

ENDOGENOUS FACTORS	
S	W
Job creation	Poverty
Innovation*	Low LQ

EXOGENOUS FACTORS	
O	T
Modernization	Lock-in
Inter-sectorial activities	Risk-Adverse Behavior

– 2 = line item is heavily hindered, or even canceled, by column;

– 1 = Line item is blocked by column, but it still fails develop their own effects, even in a reduced form;

0 = the two elements are independent or the same;

+ 1 = The line item sees to increase its effects due to synergy made by the column element;

+ 2 = Line item achieves a remarkable increase due to the element of columns;

Local Real Estate

		S		W		O		T		
		Job creation	Innovation	Poverty Rate	Low Location Quotient	Modernization	Inter-sectorial activities	Lock-In Dynamics	Risk-Adverse behavior	Tot
S	Job creation	-----	1	-1	-1	1	0	-1	-1	0
	Innovation	2	-----	-1	-1	2	0	-2	-2	-1
W	Poverty Rate	-1	0	-----	1	-1	-1	1	2	-1
	Low Location Quotient	-1	-2	2	-----	-1	-1	2	0	-2
O	Modernization	2	2	-1	-2	-----	2	-2	-2	-1
	Intersectorial activities	2	1	-1	-1	2	-----	-1	-1	2
T	Lock-In Dynamics	-1	-2	1	2	-2	-2	-----	2	1
	Risk-Adverse behavior	-1	-2	1	1	-2	-2	2	-----	-1
	Tot	-1	2	1	0	-2	-4	-1	0	

Figure 1.0 – Dynamic S.W.O. T: ' Comparative Matrix' of Endogenous and Exogenous Factors.

Endogenous Sub-Matrix

It is defined by the relationship among the endogenous elements of cluster (**Strengths** and **Weaknesses**).
It shows what synergies or limitations act into the cluster, without the effects of exogenous contributions (Opportunities and Threats).

Endogenous Matrix 1b Loc. Real Estate		S	S	W	W	
		Job creation	Innovation	Poverty Rate	Low Location Quotient	
S	Job creation	-----	1	-1	-1	-1
S	Innovation	2	-----	-1	-1	0
W	Poverty Rate	-1	0	-----	1	0
W	Low Location Quotient	-1	-2	2	-----	-1
		0	-1	0	-1	

Exogenous Sub-Matrix

It shows the relationship among the external environment without the
influence of the structural factors of cluster (Strengths and Weaknesses).

Exogenous Matrix 1a Loc. Real Estate		O		T		Tot
		Modernization	Inter-sectorial activities	Lock-In Dynamics	Risk-Adverse behavior	
S	Modernization	-----	2	-2	-2	-2
	Inter-sectorial activities	2	-----	-1	-1	0
W	Lock-In Dynamics	-2	-2	-----	2	-2
	Risk-Adverse behavior	-2	-2	2	-----	-2
		-2	-2	-1	-1	

Characteristic Sub-Matrix

- Provide the relationship among the endogenous and exogenous elements of cluster.
- Describe the effects of exogenous elements on strengths and weakness without the benefits of internal synergic effects.

Characteristic Matrix 1a Loc. Real Estate

		O		T		
		Modernization	Inter-sectorial activities	Lock-In Dynamics	Risk-Adverse behavior	
S	Job Creation	1	0	-1	-1	-1
	Innovation	2	0	-2	-2	-2
W	Poverty	-1	-1	1	2	1
	Low LQ	-1	-1	2	0	0
		1	-2	0	-1	

Characteristic Matrix 1b Loc. Real Estate

		S		W		
		Job creation	Innovation	Poverty	Low LQ	
O	Modernization	2	2	-1	-2	1
	Inter-sectorial Activities	2	1	-1	-1	1
T	Lock-In Dynamics	-1	-2	1	2	0
	Risk-Adverse behavior	-1	-2	1	1	-1
		2	-1	0	0	

Local Industrial Products and Services Cluster

ENDOGENOUS FACTORS	
S	W
Job creation	Low Innovation
Location Quotient	Moderate Poverty Rate

EXOGENOUS FACTORS	
O	T
Modernization	Lock-In Dynamics
Intersectorial	Risk-Adverse

- 2 = line item is heavily hindered, or even canceled, by column;

- 1 = Line item is blocked by column, but it still fails develop their own effects, even in a reduced form;

0 = the two elements are independent or the same;

+ 1 = The line item sees to increase its effects due to synergy made by the column element;

+ 2 = Line item achieves a remarkable increase due to the element of columns;

Industrial Product

		S		W		O		T		
		Job creation	Location Quotient	Low Innovation	Moderate Poverty rate	Modernization	Intersectorial activities	Lock-In Dynamics	Risk-Adverse behavior	Tot
S	Job creation	-----	2	0	-2	2	1	-1	-1	0
	Location Quotient	1	-----	0	-1	2	1	-2	-1	-1
W	Low Innovation	0	-1	-----	1	-1	-1	2	1	-1
	Moderate Poverty rate	0	0	0	-----	-1	0	1	0	-2
O	Modernization	2	2	-2	-1	-----	2	-1	-2	-1
	Intersectorial activities	2	2	-1	-1	2	-----	0	-1	2
T	Lock-In Dynamics	-1	-2	2	1	-2	-1	-----	2	1
	Risk-Adverse behavior	-1	-2	1	1	-1	-1	2	-----	-1
	Tot	-1	2	0	0	-2	0	-1	0	

Figure 1.0 – Dynamic S.W.O. T: 'Comparative Matrix' of Endogenous and Exogenous Factors.

Endogenous and Exogenous Sub-Matrix

Characteristic Sub-Matrix

Characteristic Matrix 2a Local ind. Product

		O		T		
		Modernization	Inter-sectorial activities	Lock-In Dynamics	Risk-Adverse behavior	
S	Job creation	2	1	-1	-1	1
	Location Quotient	2	1	-2	-1	0
W	Low Innovation	-1	-1	2	1	1
	Moderate poverty rate	-1	0	1	0	0
		2	1	0	-1	

Characteristic Matrix 2b Local ind. Produc

		S		W		
		Job creation	Location Quotient	Low Innovation	Moderate Poverty rate	
O	Modernization	2	2	-2	-1	1
	Intersectorial activities	2	2	-1	-1	2
T	Lock-In Dynamics	-1	-2	2	1	0
	Risk-Adverse behavior	-1	-2	1	1	-1
		2	0	0	0	

5. Limitations and Conclusions

Limitations

- **Moderate Degree-of-freedom in score assignment:** An ex-ante Analysis Hierarchic Process (AHP)is highly recommended in order to define the rank of the variables, thus avoiding the risk of a subjectivity Bias;

Conclusions

- D-SWOT is a useful tool to analyze and compare – simultaneously - the relationships with forecasted strategies and the actual composition of local economies;

Thank you!

Giada Anversa/Laura Biancuzzo/Virginia Borrello/Gianmarco Cantafio/Giuseppe Cantafio/Giuseppe Pronestì/Luana Parisi
PAU Unit

Marie Curie ER/ESR – MAPS_LED Project