Community Building: A Catalytic Approach *Addressing vulnerability in housing using incremental strategies*

Colonia del Sacramento is a small city on the Rio de la Plata in southern Uruguay:

- It has a population of **28,100 people** (0.8% of Uruguay's total 3.5 million).
- It is the **capital city** of the province of Colonia, the fourth most populous province.
- It is the **oldest city** in Uruguay, founded by the Portuguese in 1680. (pictured below)
- This fact contributed to it becoming a **UNESCO World Heritage Site** in 1995.
- At only **50 km** by boat from Buenos Aires, the city was historically important for military and trading ventures.
- Today, Colonia's history and location have made it a popular **tourist and vacation home spot**.





Student Nan	^{ne:} Andrea Chynoweth	University: Department:	McGill University School of Architecture	Supervisor: Department:	Prof. David Covo School of Architecture	5th i-Rec student competition
Email:	andrea.chynoweth@mail.mcgill.ca	Address:	815 Sherbrooke Street West Montreal, Quebec H3A 2K6	Email:	david.covo@mcgill.ca	Country: Canada
Telephone:	514.451.6323	Telephone:	514.398.6700	Telephone:	514.398.6763	Date: May 22, 2010

The growth of the tourist and vacation home industries have had significant repercussions on the local housing market:

- 2,070 of the 9,321 registered houses (22%) were listed as vacant in the most recent census.
- 70% of this vacancy is due to absentee owners in the vacation home market.
- Land is priced at **\$USD 233/m**² in the city center. ٠
- Land is priced at **\$USD 2/m²** outside the city
- Uruguayan minimum wage is \$4,441 pesos per month, or \$230 USD
- **65%** of the workforce are informal workers and as such are denied access to formal financial markets (including housing loans).
- **33.5%** of the housing stock is in sub-standard condition.
- There are **2** squatter settlements within the Colonia city limits. (pictured below)



(source: National Statistics Institute, www.ine.gub.uy)



Percentage of vacant housing due to: 1) Property for rent, 2) Property under construction, 3) Property with absentee owners, and 4) Weighted distribution, all causes

Residential Demographics and Distribution

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Vacant housing is found in the coastal suburbs and city center, especially in the vacation home market. Most construction occurs in the periphery, where more of the population is located. In general, the city center and coastal areas are characterized by wealthier and higher educated foreigners while the periphery contains families, low-income earners, and local people.

The majority of Uruguayan workers in Colonia are excluded from the formal housing market. Some live in nearby towns, others with relatives or in squatter settlements. All are significantly removed from access to city services and thus must pay more to access them, even though they are the ones who can least afford it.

Construction that does occur displays consistent trends in terms of both material and process :

- **Masonry** is the dominant local construction system.
- **Tall buildings** use a cast in place concrete structure with brick infill. (1 & 4)
- By contrast, **smaller residential** construction is typically done in load-bearing brick. (1)
- Construction in the **squatter settlements** is also in lower cost concrete block. (2)
- Local house construction shows evidence of an **incremental approach**, where components of a house are built separately over time. (3)











Variations in residential density and house type: Single-family detached units at the city periphery (left); side-by-side type units near the city center (middle); and duplex models in more recent suburban housing projects (right).

Residential Density and Building Typology

Density is determined by proximity to the city center. Adjacent units create higher densities in the downtown core while detached units are scattered along the periphery. Successful examples of housing projects use the duplex model to mitigate between land cost and individual plot area.

The goal of the project is to outline a housing development strategy for local Uruguayan workers within the constraints of the present housing market.

This strategy is made up of three principal components:

1) An **project structure** that will provide a financial point of entry into the housing process for informal sector workers.

2) Procurement solutions in terms of **construction methods and materials** that capitalize on both local and external resources.

3) A **design proposal** that will structure the growth and development of a neighborhood community over time.

1. Capacity-building and capital generating: a cooperative approach to housing project structure

- **FUVAAL** (Fundación Universal por la Vivienda en América Latina) is a capacity-building not-for-profit housing organization.
- FUVAAL helps form local housing credit cooperatives, called CooViVi (Cooperativa de Crédito y Consumo por la Vivienda).
- **CooVivi Colonia** is composed of over 400 local families who aspire to better their housing conditions.
- The financial structure of the process is cyclical, allowing the outcomes and consequences of construction to generate capital and contribute to growth.



CooViVi COLONIA	- Instigator/manager of construction and group credit		
INDIVIDUALS & FAMILIES	- Informal sector workers desiring to be homeowners		

Secondary Stakeholders:

FUVAAL	- Financer, strategic planner, professional resource
MUNICIPAL AUTHORITY	- Representing city interest: approval and permits
NATIONAL AUTHORITY	 Regulator of building codes and standards
MUNICIPAL COMMUNITY	- Town population: lifestyle, culture, social networks
LOCAL PRISON	- Producer of building materials as community service
PRISON INMATES	- Production laborers: work reduces sentence time
LOCAL CONTRACTORS	 Builders of housing and successive growth
SMALL BUSINESSES	- Common additional source of family income
DEVELOPMENT BANK	- Seed funding for project replacing formal mortgages.
Issues of Interest:	
NIATUDAL ENVIDONNAENT	Croop spaces cleanliness play groap

NATONAL ENVIRONMENT - Green spaces, cleaniness, play areas	
CHANGING NEEDS - Main driver of growth and change in a family hom	۱e
WASTE - Natural by-product of construction, life and growt	th
ALTERNATIVE ENERGIES - Waste management, source of utilities and capita	I
BUILDING TECHNOLOGIES - Materials and processes used in construction	



2. External ideas, internal location: facilities and processes that enable construction

- The project provides its own source of **construction materials** by importing the Habitech system, a low-cost system of interlocking concrete blocks and components.
- An on-site production plant creates new jobs, provides community revenue, and ensures that a constant supply of materials are available to support incremental building.
- A parallel strategy is to establish a recycling system to salvage materials to re-use in construction, also creating opportunities for small businesses and innovation.
- Organic waste that cannot be re-used can then be **sold** to a FUVAAL facility to generate more usable products and revenue



(source: Habitech International)





3. Closing the loop: a responsive incremental design plan

- The design takes as a starting point the **largest possible** built volume under the COOVIVI budget: a two story narrow row house. (1,2)
- Without changing total built area, the house is **staggered** about a service core to provide room for future expansions. (3,4)
- This creates a **proportioned and modular** template for new additions without taking away from the potential **variability** among individual houses.
- Thus, the **decision-making power** for the layout of the house rests with the family, who can suit it to their needs as they grow and change over time.





3. Closing the loop: a responsive incremental design plan

- The **roof section** of the house provides for a third story or roof terrace option.
- Overall, the house can more than double in size.
- **Government land** in the coastal suburbs is used. Community facilities near the production plant are proposed.
- **Plot size** responds to the design proportions, allowing density to build up incrementally as families move in.





LONGITUDINAL SECTION: SERVICE CORE



LATERAL SECTION





ROW HOUSE ELEVATION

GROWTH AREAS

POTENTIAL SITE PLAN EVOLUTION (WITH PRODUCTION PLANT PLACEMENT)

Conclusions and implications: Financial effects and design potential

- When compared to a conventional development model, an incremental strategy calls for **less construction** over a larger footprint, reducing the number of households, at least initially.
- However, without changing the overall parameters of the project, then net worth of the finished project is higher than the conventional model, making it a **more efficient** solution.
- The matrix below explores **variations** taken from each construction step of the proposed house design without changing its proportions, should families choose to take these routes.
- From this, it is clear that many options are possible; hence the design acts as true **housing catalyst** rather than a series of prescribed options or steps.



IMPLICATIONS OF INCREMENTAL HOUSING Versus a conventional 2-storey scheme						
	CONVENTIONAL	INCREMENTAL - BUILT	INCREMENTAL - FINISHED			
<u>SITE</u>						
Land area (m²)	61,203.10	61,203.10	61,203.10			
Total construction (m ²)	23,340.00	23,340.00	23,340.00			
Footprint per house (m ²)	43.95	76.14	76.14			
Footprint total (m ²)	12,220.00	17,892.90	17,892.90			
Yard area per house (m ²)	60.00	56.40	56.40			
Yard area total (m ²)	16,680.00	13,254.00	13,254.00			
Infrastructure/roads (m ²)	8,940.00	8,940.00	8,940.00			
Communal areas (m ²)	23,363.10	23,363.10	23,363.10			
Communal facilities (m ²)	500.00	500.00	500.00			
<u>HOUSING</u> Number of houses	278	235	235 (+)			
Individual house size (m ²)	80.00	80.00	134.71			
Saleable built area (m ²)	22,240.00	18,800.00	31,656.85			
Construction cost (/m ²)	\$150.00	\$150.00	\$150.00			
Cost per house	\$12,000.00	\$12,000.00	\$20,206.50			
TOTAL VALUE OF HOUSING	\$3,336,000.00	\$2,820,000.00	\$4,748,527.50			

The "+" sign reflects possible subdivisions/sublets of enlarged units, meaning the capacity to accommodate more households.

The bottom line is a lower investment for FUVAAL and a higher eventual return for families. As the house gains value, families gain a valuable asset that was otherwise not attainable in the existing housing market.