Housing in Uruguay

Towards dynamic processes for low-income housing

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1 Shelter Situation Analysis

1.1 Basic General Data

Geography and Administration

Uruguay is a Latin American country situated by the South Atlantic Ocean between Brazil and Argentina. It is a Republic State with Democratic System. The Central Government has three independent Powers. The country is divided into 19 Provinces (Departamentos).

It has 176,220 km2 of plains and mild hills beneath 500 meters almost all covered by pastures with plenty of fresh water form rivers and creeks. It has four seasons which are characterized by mild weather all year round.

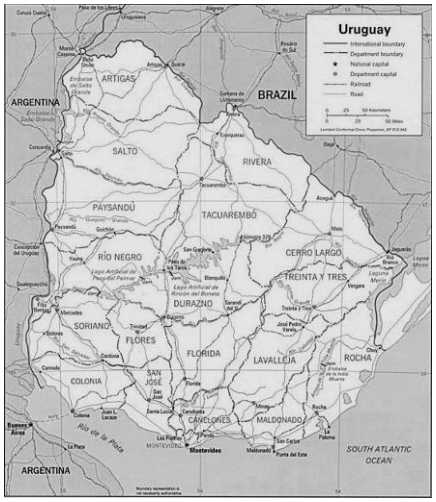

Fig 1. Political Map of Uruguay.
Source: www USCentral Intelligence agency

Economy

The country's geography facilitates viable livestock (cattle and sheep breeding) and agriculture (wheat,

corn and soya) industries. Recently, there has been a significant production of wood, mainly utilized in the paper industry.

Transport is done mainly by roadways. Roadways to the capital city (located in the south of the country and hosts the important shipping port) are very good. Train connections are possible, but the railways (owned and operated by the state) has experienced a long period of deterioration.

Table 1. Gross Domestic Product, by activity

Year 2005

ACTIVITY	$Urug. (millions)	U$S (millions)
Gross Domestic Product	411 042	17 127
Agriculture	36 653	1 527
Fishing	1 411	59
Mining	1 004	42
Manufacture industry	91 053	3 794
Electricity, Gas and Water	20 226	843
Construction	15 663	653
Shops, restaurants y hotels	53 831	2 243
Transport y comunications	39 278	1 637
Finance	32 574	1 357
Services	49 636	2 068
Goverment Services	34 227	1 426
Other services	39 609	1 650
Remuneration due to Finance	-27 616	-1 151
Import Duties	23 487	979

Source: Banco Central del Uruguay

Demography and Health

Spanish is the language of the 3.31 million population. Most people live in urban areas with almost half of the total population in Montevideo. The vast majority of the population are descendants of various European immigrations, approximately 6% are African-descendents and 0,4% are descendents of Native Americans.

Table 2 – 3. DEMOGRAPHICS OF URUGUAY.

Year 2006

	All	Males	Females
Population	3 314 466	1 541 890	1 772 576
Urban Population	3 101 685		
Rural Population	212 781		
% Over 65 years	13,4	11,0	15,6
% Under 15 years	23,7	25,1	22,4
Growth rate	0,284		
Birth rate	14,76		
Death rate	9,39		
Average age	32,40	30,70	34,10
Life exp. At birth	75,72	72,12	79,52
Child deaths (on 1000)	13,88	15,51	12,16
Childs per couple	2,0304		

source:www. ine.gub.uy

Year 2006

Ages	Total	Urban	Rural
All	3 314 466	3 101 685	212 781
0-4	244 381	229 914	14 467
5-9	268 264	251 875	16 389
10-14	272 349	255 898	16 451
15-19	265 003	249 578	15 425
20-24	249 073	234 556	14 517
25-29	244 385	229 687	14 698
30-34	230 158	215 518	14 640
35-39	207 722	193 600	14 122
40-44	209 200	194 907	14 293
45-49	199 775	186 126	13 649
50-54	181 825	168 669	13 156
55-59	157 692	145 452	12 240
60-64	141 915	130 917	10 998
65-69	125 013	115 661	9 352
70-74	115 404	107 887	7 517
75-79	93 453	88 252	5 201
80-84	61 121	57 999	3 122
85-89	31 768	30 124	1 644
90-94	11 905	11 232	673
95 +	4 060	3 833	227

1.2 Shelter Related Fact and Figures

Access to Shelter & Basic Services/Infrastructure

In the last decade, there was a 5,4% increase in occupied houses, but also a remarkable 88% increase in unoccupied houses (such as those offered for rent, for sale or are off-the-market). But the number of homes (as against houses) did not follow this rates mostly due to the strong emigration that the country suffered during the economic crisis of 2002.

More than half the population lives for more than 12 years in the same house, and this is evidence of the durability of the houses. The material of the houses are mostly masonry and concrete. Wooden, prefabricated or any other kinds of technology which does not have long durability, are resisted by the market.

Sixty-one and a half percent (61.5%) of houses are owner-occupied an 15% are rented. The frequency of houseownership increases at a higher rate in the segments of the population with higher incomes.

Housing is considered a problem for the 20% of population of low-incomes.

There is an explosion of illegal settlements (in the past five years) by working class people but with very low income and irregular jobs. There is also a decrease in the incomes of the lower-middle class who are the principal beneficiaries of social housing programmes.

Approximately 6% of the total population lives in illegal settlements (approximately 196,000 persons in 53,700 houses). However, in the capital, this is 11% of the population. The materials of the self-made housing are usually remenants of mayor construction projects and are gathered at low costs, but in almost all cases, do not satisfy hygienic standards. The actual numbers of the increase in this last period was not determined.

Uruguay has a strong culture of land-ownership and this usually occurs on government lands in urban areas which are idle or are in unsuitable areas (such as the boundaries of rivers or streams, susceptible to flooding). Based on the consideration and location of these settlements it is prohibited for the government to provide the required infrastructure (such as: potable water supply and sewage treatment, electricity, security, emergency access, transportation, etc).

1.3 Housing Policy

Housing has a central importance in the collective image of the Uruguayan society. Accordingly the Right to House is in the Constitution. However, this does not assure access to proper housing.

Traditionally the Uruguayan State has sponsored Social Housing Policy as an important aspect of quality of life, strongly associated to the "Welfare State". It was focused on low-income workers although finally used by the middle-income sectors. However, there has been drastic changes in this Policy at the beginning of the 90s, that modified the social behaviour and the role of civil and state actors. There was a change in the function and vision of the Housing Programmes and the role of the State Institutions related to them. The Ministry of Housing Land Planning and Environment (MVOTMA) was created, and the Mortgage Bank of Uruguay (BHU) emerged as the major actors in Social Housing[1]. In the meantime social exclusion and expulsion phenomena occurred. The situation has been worsened by a severe economic crisis suffered by the country in 2002.

The relatevely small allocation of the national budget to housing has been decreasing. Additionally, it is the organized groups that lobbies the government that benefits most from subsidized housing. Non-organized groups or non-formal[2] groups are more vulnerable and tend to be on the edge of the Housing Policies as their capability to state demands is almost non-existent.

1.4 Actors in Shelter Delivery and their Roles

There are several actors in the shelter delivery process, usually there is little coordination in their actions or policies. The following list outlines their perspective roles:

Government (central) - The central government is responsible for establishing, developing, monitoring and supporting the country's housing policy, actions and guiding principles. This includes legislations and regulations, financial support, facilitating access to tenure and services.

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[1] The target group is subdivided in two, according to their income: Group 1 (income higher than 60UR) to BHU; Group 2 (less than 60 UR) to MVOTMA.

[2] E.g. People with non permanent incomes or jobs.

Government (provinces) - The province government is partially responsible for housing policy, actions and guiding principles in the province area.

Developers (**Private & Public) -** Developers carry out the design and construction of housing solutions, mostly on a "For Profit" basis. The government institutions mainly focus is on the low-income earners, while the private sector focuses on the middle to upper-income earners.

Other agencies and service providers – They are responsible for service development plans, implementation, monitoring and maintenance of the basic services. Among them: OSE, UTE, ANTEL, etc.

Financial Institutions (construction, mortgage and insurance) - Provide loans, primarily for the construction of housing estates and individual units and the purchase of completed housing and serviced lots.

They also act as saving institutions, primarily for housing acquisition and housing development. Private institution loans are mainly market based, while public institutions (such as the BHU) provide loans targetting middle-income market. They develop housing projects through construction contractors works and provides lines of credit to clients.

Construction Contractors and Design Consultants - Supply technical and physical support to developers and government on a "For Profit" basis. They carry out design and construction. They also perform roles as housing estate developers.

Non-Government Organizations (NGO), Community Based Organizations (CBO) Cooperatives (Coop) - Focuse on the low-income sectors of the housing market and self-help projects. The principal Cooperative Association is FUCVAM. They develop housing projects on a self-help and/or saving basis. It obtains loans and grants from government and repay on continuous installments.

Real Estate Agencies, Valuator, and Lawyers – Offer technical support to most players in the housing sector on a 'For Profit' basis.

1.5 Shelter Design

New programmes of social shelter design appeared due to a change of the governments vision. The Basic Evolutive Nucleus (BEN) are low cost houses with minimum requirements, in which the beneficiary is able to continue the improvement or the expansion of the house. The projects utilizes various forms and technologies.

Being financial constraints of government, and the needs to adquire lands for low-income housing development, the focus is in areas that are on the periphery of the cities with reasonable prize. However, these areas require substancial infrastructure (civil and social). This phenomenon is especially evident in Montevideo and recently in other cities, and expands the urban area with few increment in the total population.

The MVOTMA cannot fullfill the actual needs in relation to social housing and the design of urban space to incorporate what exists. Actually the projects and programmes have uniform situations, disregarding users identities and project needs in building and urban scale. This fact simplifies the decision making for the government which undertakes the construction and selects the beneficiaries of the houses.

Regarding building profiles, construction is usually in masonry employing the traditional skills of the labourer, however, some cases of innovative technology have been utilized. In both cases the construction costs are very high[3] compared with similar construction done by the private sector[4]. Also, the performance results of the use of alternative technologies varies substantially between private sector and governmental projects. In addition, the beneficiaries are not involved in the construction process and though lack the knowledge for adequate maintenace of the housing unit.

[3] Data sources: INE, 2006. See Table 4.

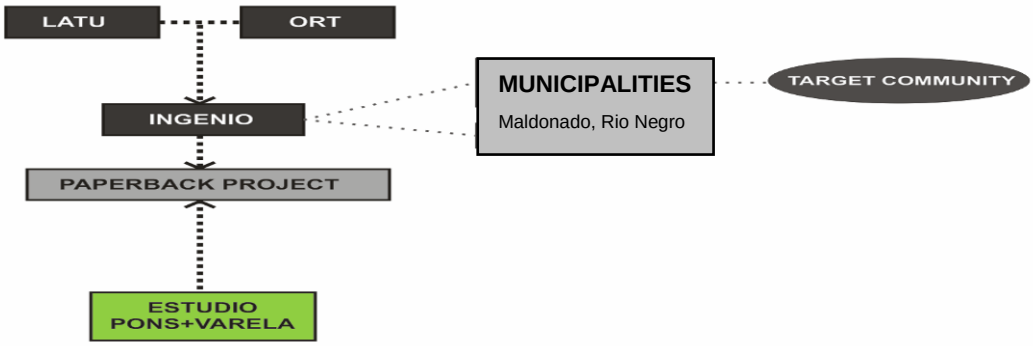
[4] One reason for this problem is that the contractors consider the government as a bad or slow refunder, including that financial cost in the price

Table 4 *COST OF BUILDING 1m2 ACCORDING TO ORIGINAL TIPOLOGIES*

TIPOLOGIES	2006 $U / m2	Brief description
1 **Individual economic 1 floor**	11 614	Mainly Private sector
2 **Individual economic duplex**	11 904	
3 **Individual standard**	19 483	
4 **Individual luxurius**	24 509	
5 **Colective economic 1 floor no infraestr.**	10 428	Mainly Govermental sector
5a **Idem 5 with infraestructre**	14 568	
6 **Colec. Econ. 3 floors no infraestr.**	9 807	
6a **Idem 6 with infraestructure**	11 136	
7 **Colec. Std duplex no infraestr.**	12 185	
7a **Idem 7 with infraestructure**	14 166	
8 **Economic tower with lift**	10 093	Mainly Private sector
9 **Standard tower with lift**	10 568	
10 **Luxurius tower with lift and heating**	16 688	

2 Organisation

Estudio Pons+Varela is an architectural agency, currently designing and developing "Paperback Project" for innovative Low-Income Housing, prized and sponsored by the **Ingenio Program of Laboratorio Tecnologico del Uruguay (LATU) and ORT University**. At this stage, Ingenio Program has lobbied to two Regional Governments in order to construct housing prototypes.



The **LATU** was established in 1965 as a result of the joint effort of public and private sector. It promotes sustainable development in the country and its international relations through technological innovation and adequate management. It is directed by delegates of Executive Power, Commerce Chamber and Bank of the Republic of Uruguay.

Ingenio Program is a business incubator in the Technology field, established as a joint initiative of the LATU and ORT University with financial support of the Inter American Development Bank. The Ingenio Programme fosters the development of

technology, mostly in the information and communication field, as key to the economic growth of the country.

Paperback project. In 2006, the Ingenio Program organized an architectural contest of innovative shelter design for low-income housing, aimed at identifying new ideas to be proposed to the government as an alternative to improve actual housing for vulnerable sectors. Paperback project was among the prized projects. The selected prototypes are now in the execution stage. A reduced number of prototypes will be constructed and inhabited by low-income families. The construction process and practice in use will be tested, evaluated and certified to determine feasibility for large scale construction.

At this stage, the introduction of Self-Help Construction process is being evaluated as an added value to social housing, as it could help develop the skills of the users and improve their possibilities of labour insertion. For this, a Strategic Plan is still needed.

3 Shelter Problem

New challenges of social housing should be followed towards the improvement of the quality of life of the low-income people. In particular, the governamental housing projects involving innovative technologies usually have poor performance. The role of strategically designed housing programs and projects is fundamental in this issue, since it can tackle adequate use of innovative technologies.

Among others, the **principal problems** detected are:

a- innovative technology use

- Bad performance of the housing units (mostly because beneficiaries are not involved in the construction process).
- High cost of construction in comparison with the private sector.

b- housing design

- Projects and programs uniform situations, disregarding users identities and needs in building and urban scale.

c- housing development

- Housing policies do not cover the demands of certain low-income sectors
- Many different governmental agencies are poorly coordinated.
- Low budget for investments.

Ingenio Program aims to provide innovative shelter project for low-income housing, to be proposed to government (central and provinces) in order to improve actual housing designs. As far as the organisation is concerned the "Paper-back Project" is a proposal for improving the Housing Program, since it it flexible, and takes into consideration user identities and the relation to the house construction technology and maintenance. This could be an opportunity to develop working skills of the target community. For this a strategic plan must be designed.

Paperback Project is a Housing System that aims to address the following:

1. Alternative technology use (in particular, soft technologies)
2. Include user identities and needs through a wide variety of housing options.

This paper will focus in the improvement of housing processes, so as to skip the conventional **Static Process** of Housing into a **Dynamic Process**[5], particularly in the case of Paperback Project. For this, It will tackle the integration of the dweller with an active role in the housing design and development scheme.

4 Proposal for Change and Improvement

Paperback Project tackles housing as a system integrating a wide range of activities in a flexible design. It introduces aspects of *frame, panel and box systems*[6], allowing different ways of mounting. However, it is a Static Housing Process and the proposal is to turn it into a Dynamic Process by actively including the user in the housing design and development scheme.

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[5] Based on PhD. Rachelle Navarro Astrand lecture: "Integrating Innovative Building Systems in The Housing Process: A sustainable stategy" 2007:

[6] Based on Mayzub "structural aspects of systems", 1980.

Paperback Project is a Housing System works with 3D components that result from the analysis of basic activities: each unit can be distributed according to different series of plans, and each plan forsees later additions. Different textures-materials can be used as finishing.

This **housing system** allows:

- Personalize low-cost housing (activities and appeareance).
- Improve the quality comfort conditions of the house.
- Reduce the construction timetable
- Reduce the pathologies derived from construction process.
- Different construction processes

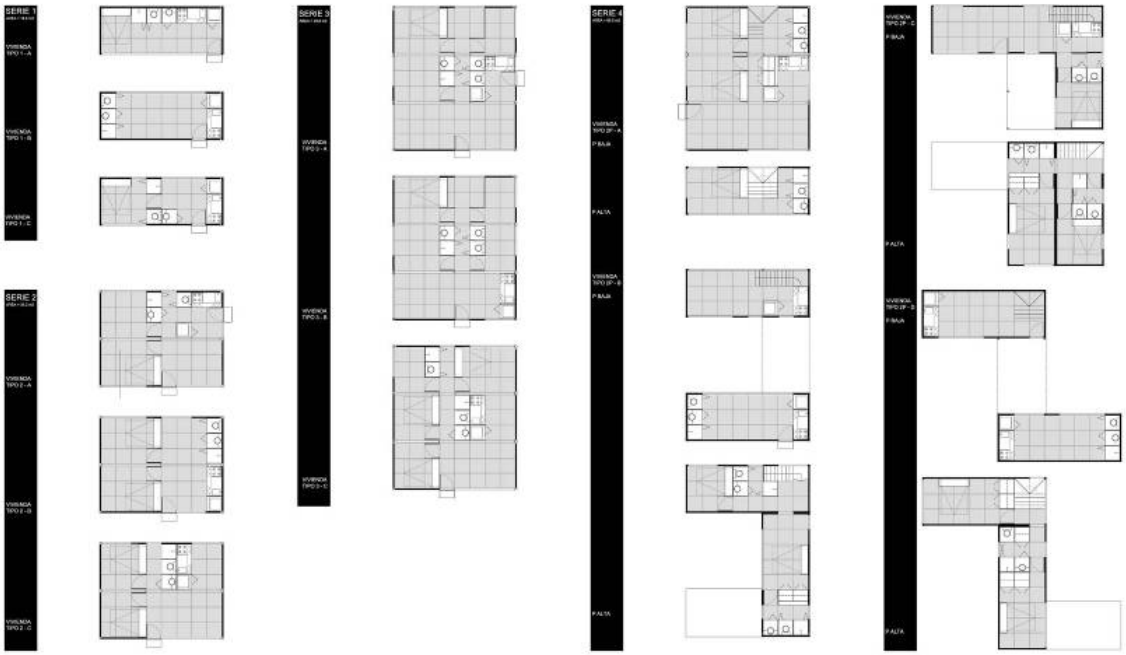


Fig. 2 - Some of the ***series*** of Paperback Project. They allow different housing options for different users. Every series provides indications for enlarging the housing unit.

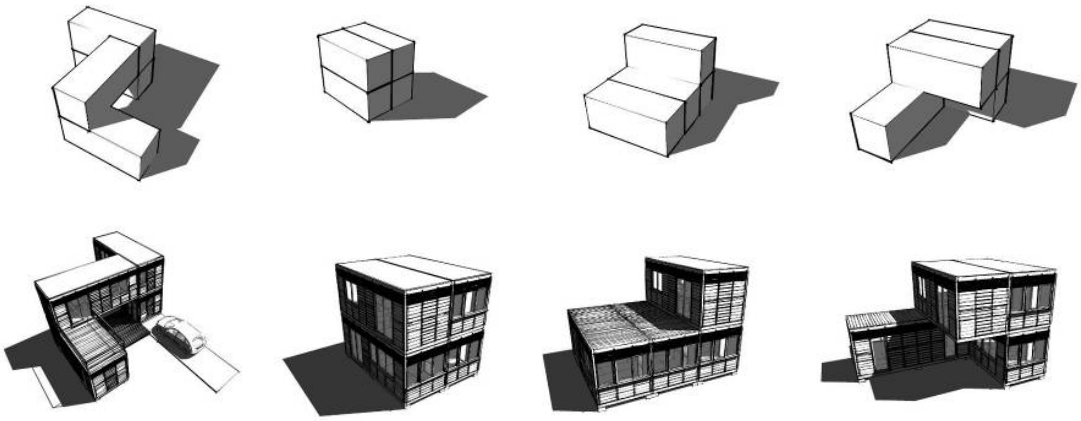


Fig. 3 - Some examples of the ***Serie 2*** of Paperback Project.

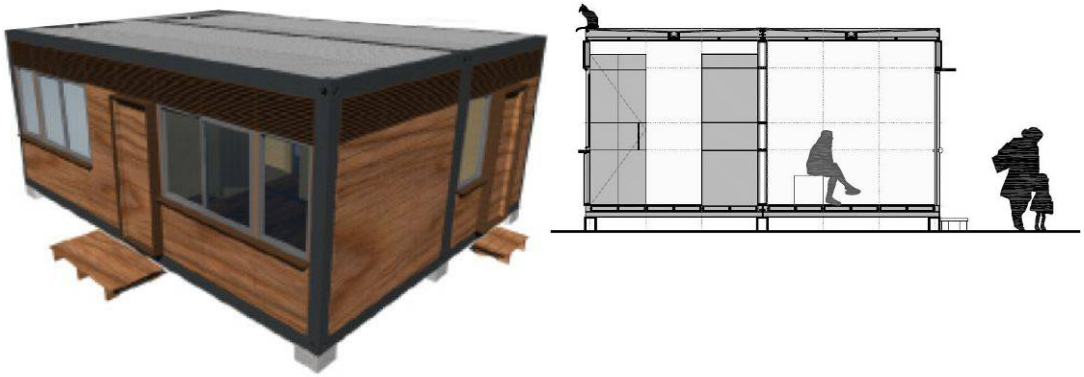


Fig. 4 & 5 - *Serie 2A*: an option of 32 sqm for a 4 to 6 home-group.

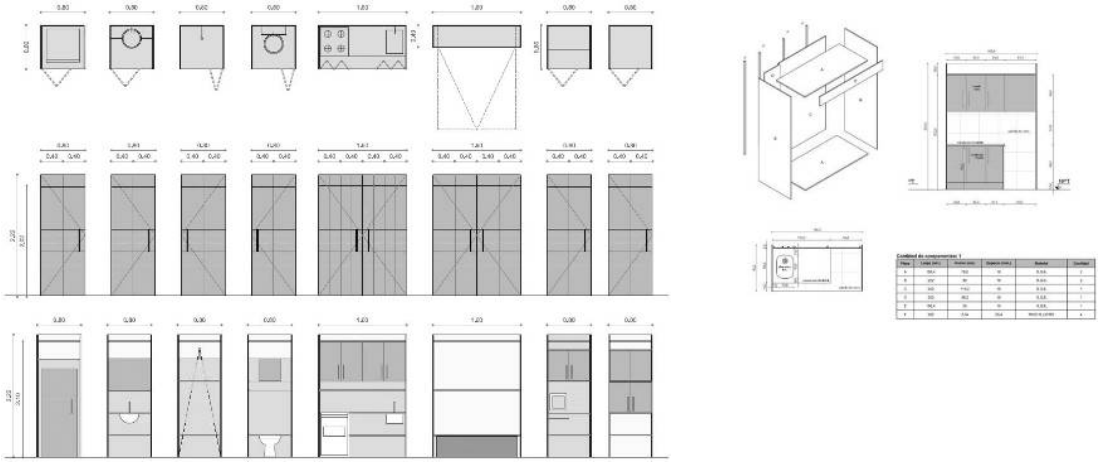


Fig. 6 - *Equipment Modules:* Small parts, easy to ensamble and connect.

Fig. 7 - *Enlarging:* The system allows vertical and horizontal expansions. The modules can be done by the users as it is an open system. Materials can be easily acquired at reasonable cost in the open market (plywood, wood, nails, etc)

Table 5: Possible Paperback construction Processes

	A PRE-CONSTRUCTION	B ON SITE CONSTRUCTION	C SELF-HELP CONSTRUCTION
1 SMALL SCALE	√	√	√
2 LARGE SCALE	√	√	√

The **main goal** is to develop the Paperback Housing System further more, towards the concept of *dynamic housing processs* by integrating the dweller with an active role in the housing design and development scheme.

Aspects to be tackled to **achieve** the main goal:

I. **Develop thorougtly A-B-C processes** (pre-construction, on-site construction and self-help construction).
II. **Technology Transfer** (at community and technicians level).
III. **Settlement Design** (with a similar concept Paperback Project at house level, develop a Settlement System)

This paper Action Plan will focus in Technology Transfer in the A-B-C processes for Prototype and Housing system construction.

PAPER BACK Project - Strengths Weakness Opportunities Threats ANALYSIS:

STRENGHTS	**OPPORTUNITIES**
Highly Developed Construction Technique Light frame construction or Balloon frame which has been successfully developed and improved in the northern countries for nearly 200 years.	***Expensive costs of low-income housing*** Traditional construction methods has proven to deliver high cost houses.
Low cost building This technique has proven to be cheaper than traditional buildings in Uruguay. Higher cost in materials but much lower in labor hours and taxes.	***The use of wood in construction*** Wood is widely available from the new forest in Uruguay.
Self-build capable 100 % of the construction can be achieved by 2 persons on the site with the appropiate tools.	
Industry capable 80% of the construction can be achieved in highly controlled conditions in a factory and the components transported to the site.	
Customized – Flexibile Easy to modify fulfilling the user's requirements.	
Expandable Each unit can be expanded incrementally.	
WEAKNESSESES	THREATS
High maintenance costs The user has to implement a strict schedule of maintenance tasks to avoid	***Low acceptance of light frame technology*** Traditional construction has strong roots

higher future restoration costs.	in Uruguayan culture.
High Transport cost if Industry manufactured Transportation cost in Uruguay are high based on distance and location.	***Burocracy*** Strict housing codes and unwilling burocrats to develop knowledge to adapt to changing environment.

Analysis

Strengths: This method of construction can result in much lower cost based on the strengths outlined.

Opportunities: should be exploited by encouranging the use of available wood and highlighting to low-income users, the structural and functional integration of this system at relatively low costs. The wearcovers of high costs can be addressed by providing maintenance manuals to the users and technology transfers workshops with the potential users.

Weaknesseses: To avoid transport cost, in case of pre construction, small factories should be located in high demand areas and there can be mobile factories as it is soft construction with simple materials and modules.

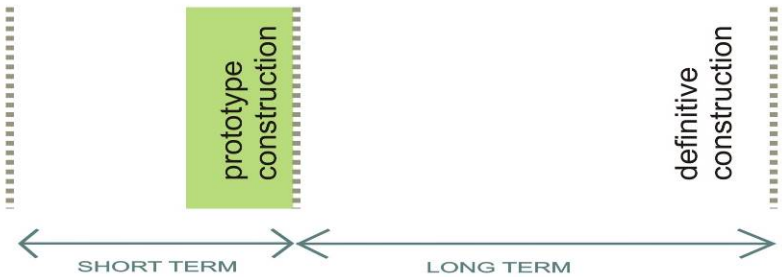
Treaths: An effective public campaign with the potential users should be done in order to address the threats.

Annex: Action Plan

The action plan should be focused on what should be done to implement the project. This should include: meetings with users and interest groups, creating awareness on the system, redesigning in order to improve the housing unit in terms of costs and requirements.

Techology Transfer

A- Short term Goals	Stakeholder	B- Long Term Goals	Stakeholder
1. Design and develop thorougly A-B-C processes	Architects, municipality	**1. Redesign** according to evaluation and feedback.	Architects, municipality, users.
2. Settlement Design	Architects, municipality, users.		
3. Presentation Workshop of Paperback Project to Community for further feedback and redesign	Architects, municipality, users.	**2. TrainingWorkshop** for technology transfer.	Architects, municipality, users.
4. Elaboration of **Manuals** for maintenance and expansions	Architects		



A- Short term goals – Paperback Prototypes

Design improvement:

In the short term the design improvement will be held in two stages:

- *Before Prototype construction*: According to Study visits, interviews to users and qualified technicians. (stage actually in process)
- *During Prototype construction*: According to construction evaluation.

1. Design and develop thorougly A-B-C processes

Analyse the proper housing requirements of the users (housing needs) to establish an adequate typology and its possible expansions.

Define accurately the house design (technical details, type and quality of materials) and the house construction process (pre-construction, on-site construction or self-help construction).

2. Settlement Design

Analyse proper settlement requirements and define accurately all the aspects for application in consolidated or peripheric urban areas, either small or large scale construction.

Technology transfer:

3. Presentation Workshop of Paperback Project to Community

- What is the project
- How to personalise homes according to individual family needs and requirements
- Why it is better in terms of life quality, space, flexibility, economy.
- How it can be used
- How to improve / expand
- What are the costs of extending
- What technical advise is needed in short and long term phases.

3. Elaboration of **Manuals** for maintenance and expansion

   User-friendly and clear communication of technical aspects of the house, including graphics (2 and 3 dimensions) and simple explanations.

B- Long term goals

Design improvement: Paperback Housing System

1. **Redesign** according to evaluation and feedback.

   Analyse and diagnose the using period of the house according to the actual dwellers requirements and use. Redesign aspects related to better durablity, cost reduction and life quality.

Technology transfer:

2. TrainingWorkshop for technology transfer.

Analyse and diagnose the prototype construction (done by qualified workers), to adapt the construction processes for self help housing or partial self help housing (combined: construction of modules, ensamble,etc).

References

Bertullo, Jorge; G Isola; D Castro and M Silveira

2003 *El Cooperativismo en Uruguay.* Montevideo: Universidad de la Republica.

Bras, Laura

N/D *Catalogo de Sistemas Constructivos no tradicionales utilizados por el MVOTMA.* Montevideo: IC, Facultad de Arquitectura – *material inedito, disponible para consulta.*

Di Paula, Jorge

2003 *Politicas Habitacionales en Uruguay.* Montevideo: UPV, Facultad de Arquitectura, Universidad de la Republica.

Di Paula, Jorge

N/D *Aportes de la UPV en relacion con habitat y vivienda social.* Montevideo: UPV, Facultad de Arquitectura, Universidad de la Republica.

Gilboa,Felicia; B Nahoum; N Alonso, M Bracesco, M Calone, L Bozzo, MCampoleoni

1999 *La Vivienda Social. Evaluación de programas y tecnologías* . Montevideo: Facultad de Arquitectura, Universidad de la Republica – Sociedad de Arquitectos del Uruguay.

Magri, Altair

2002 *Una Refroma "exitosa": la politica de vivienda en Uruguay entre 1990 y 2000.* Montevideo: Boletin CF+S.