

Experimental Housing in Puerto Rico and Cuba: Crossings Between Form Innovation and Traditional Habitation

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The architectural practice that constituted modern architecture in the islands of Puerto Rico and Cuba during the years 1964-1969 developed hand in hand with socio-political and economic reformations. At the heart of these processes, innovative experimental social housing became the *raison d'être* of urban, scientific and technological research. Even though many ingenious projects proposed by local as well as foreign architects were praised for their technological and form making innovations, they failed as models for future housing developments. Following Martin Heidegger's *Building Dwelling Thinking*, the crisis of these experimental dwellings revealed the disarticulated relation between housing form and socially shared modes of dwelling and habitation.

INTRODUCTION

The architectural practice that constituted modern architecture in the Caribbean islands of Puerto Rico and Cuba during the years 1960-1969, developed hand-in-hand with the socio-political and economic reforms that assumed architecture as a cognitive process fundamental to the transformation of utilitarian requirements into built form. At the heart of these policies, experimental housing became the *raison d'être* of government sponsored innovative urban, scientific and technological research. Its functional demands, freed from the prevalent limitations of conventional architectural practice and traditional modes of building, articulated an autonomous construct of idiosyncratic projects capable of growing and transforming through time. Significant technical advances in housing ranged from the design of experimental low-cost units and building modules, to the complex assemblage of material and spatial configurations.

During the first half of the 20th century, in both Puerto Rico and Cuba, a massive migration of farmworkers moved from the countryside to the city in search of new opportunities and better living conditions. By the 1930's shantytowns with buildings constructed of wood, zinc and cardboard occupied the coastal

lines of San Juan¹ and the outskirts of Havana.² Lacking any basic infrastructure, the increased density and exponential growth of these settlements resulted in compromised health and sanitary conditions, malnutrition, and extreme poverty. Suffering from political neglect, the physical state of these communities only made evident the absence of any structured policy with which to deal with the increasing problem of urban housing conditions.

In Puerto Rico, the government of Luis Muñoz Marín (1948-64) followed by that of Roberto Sánchez Vilella (1964-68), entrusted the Public Housing and Urban Renewal Corporation (CRUV) with the task of developing a grand scale urban renewal initiative to clear San Juan of its massive urban slums. While effective in relocating families from San Juan's *arrabales*, the prevailing federally funded public housing compounds did not depart from the strict confines of HUD's Minimum Property Standards and Design Guidelines.³ As a counterpoint to these standardized housing projects, a number of governmental agencies developed alternative experimental projects that challenged the common precepts already featured in social and mass housing.

In Cuba, following the overthrow in 1959 of Fulgencio Batista's regime, Fidel Castro's revolutionary industrial era posed the question of what constitutes the utopian vision on dwelling under the intertwined ideals of the socialist 'new' man and the scientific and technical advancements prevalent in the post-war architectural discourse of late modernism. The reevaluation of these principles allowed for the Ministry of Construction to establish specific housing policies grounded, among others, on experimental proposals that highlighted unique features of the housing system including new building techniques, site-planning strategies, and occupant participation, that expanded the production of modern architecture beyond the pre-revolutionary dominance of private developments.

ALTERNATIVE FORMS OF DWELLING

In January 1968, Progressive Architecture magazine announced the winners of its annual PA Design Awards.⁴ The first and second awards were conferred to two innovative experiments in low cost public housing in Puerto Rico. The First Prize was awarded to Jan Wampler's La Puntilla Housing project (1966-68) in Old San Juan,

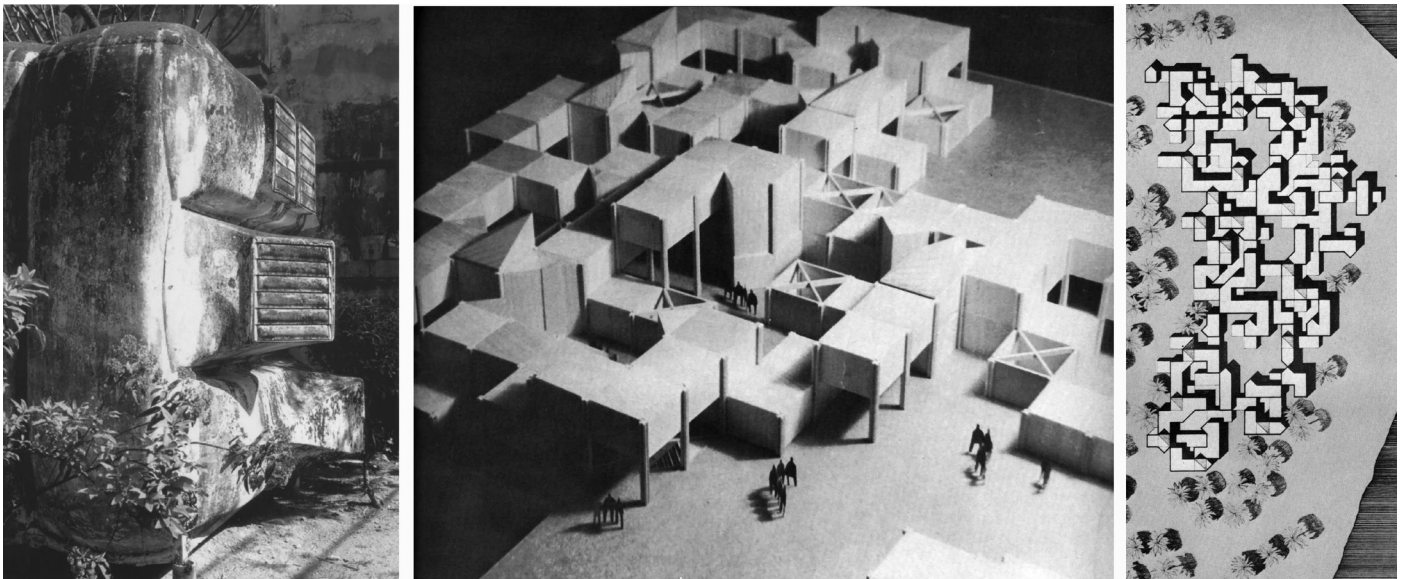


Figure 1: Capsule and Mega-Structure – left: Asbestos Cement Housing Modules (Cuba, 1964-68), Hugo D’Acosta and Mercedes Álvarez, Architects. center and right: Prototype Fishing Villages (Puerto Rico, 1967-68), Francisco Javier Blanco and Robert Oxman, Architects. Model and Site Plan.

sponsored by the Urban Renewal and Housing Administration of the Government of Puerto Rico. A Second Prize was awarded to Francisco Javier Blanco and Robert Oxman’s Prototype Fishing Villages (1967-68) for the Puerto Rico Lands Administration. By the end of the year, Moshe Safdie’s Habitat Puerto Rico (1968-73), also a government promoted experimental housing project recognized by the Canadian Architect journal with the Award of Excellence, began construction.⁵

Meanwhile, in the island of Cuba, Castro’s revolutionary ideals fomented government sponsored innovative design projects to support a renewed set of public policies concerning housing and habitation. Recognizing housing as a citizen’s right rather than a real estate commodity, the government sought to curtail speculation with the support of the National Institute of Savings and Housing, the Construction Department, and Cuba’s new Law of Urban Reform. Some of the developed projects included Hugo D’Acosta and Mercedes Álvarez’s Asbestos Cement Housing Modules (1964-68), Antonio Quintana and Alberto Rodríguez’s Girón High Rise Building (1967), and Fernando Salinas’ award winning Multiflex Prefabricated Housing System (1967). While the experimental projects in both islands addressed the housing crisis in terms of geopolitical and cultural forces outside of the architectural realm, they also shared ideas of prefabrication, support and infill, citizen participation, and mat-building assemblages that challenged both, conventional form-making and traditional modes of habitation.

The proposed projects were praised for their technological and form-making innovations, but failed as models for future housing developments. Although financial and technical support limited the advancements and maintenance of these experiments, the real downfall derived from the unfamiliar expression of the architectural object; the non-traditional building assemblage and its effect on the re-interpretation of private property limits; and the perception of an

incomplete living apparatus demarcated by the complex interaction between the structural frame and the immateriality of form. The gap between the occupant’s expectations and what the building actually provided rendered dwelling as an un-codified and remote material conglomerate without meaning and significance to the user.

In his text *Building Dwelling Thinking*, Martin Heidegger glimpses into the association between dwelling and building, where the notion ‘to dwell’ reveals the manner in which we exist. For Heidegger “not every building is a dwelling”.⁶ Building is not just a functional demand for shelter nor a tectonic or constructive system but is the basis from which to inquire on what it means to dwell and how the building belongs to the act of dwelling. In the specific case of Cuba and Puerto Rico, the act of dwelling is deeply rooted in their cultural context as Caribbean islands with a tropical climate and a shared Spanish and African heritage. Individual and collective culturally coded habits condition diverse modes of habitation. Reciprocally, buildings and their material and spatial qualities, potentiate and inform the way we inhabit, how we dwell. For Heidegger, it is through language as a semiotic system, that the fundamental understanding and approximation to the act of dwelling becomes part of one’s being. The author’s reflection on the tri-partite relationship *building-dwelling-thinking*, underscores the limitations of understanding ‘building as dwelling’ as a system that lies disguised behind the tectonics of architecture and political discourse.

Three themes serve to frame the analysis of these experimental projects: 1) *Capsule and Mega-Structure* explores the inter-relation between the basic habitable housing unit and its assembly into a larger collective form; 2) *Supports as a Frameworks for Citizen Participation* looks into modes of design control and the limitations of an incomplete structure as an instrument for future growth and change; and 3) *Modular and Aggregate Structure* examines the



Figure 2: Supports as Frameworks for Citizen Participation – left: Multiflex Prefabricated System (Cuba, 1967), Fernando Salinas, Architect (photo courtesy of Roberto Segre. right: La Puntilla Project (Puerto Rico, 1966-68), Jan Wampler and the ARUV Urban Design Studio (photo: CRUV / Archivo Andrés Mignucci).

challenges of individual's identification in the context of large-scale high density aggregate structures.

CAPSULE AND MEGA-STRUCTURE

As part of a design competition, D'Acosta and Álvarez's Asbestos Cement Housing Modules responded to the development of mass produced affordable housing. According to the architects' project brief – "in order to solve the great housing deficit it would require a complete reconceptualization of the notion of what constitutes 'habitat' both in terms of programmatic organization as well as methods of construction."⁷ The use of a flexible asbestos reinforced cement sheets defined a living 'cell' that, through repetitive aggregation, would create a rigid framework.

The architects proposed the massive industrial production of a building system based on the use of asbestos ferro-cement modules. Each unit was delineated with a flexible 6-millimeter thick asbestos-cement sheet with double curvature to insure a solid structure. Easily transportable and relatively lightweight, the modules could be located in both urban and rural contexts. Its rigid framework allowed it to be stacked in a vertical arrangement forming a large multi-story assembly capable of growing both vertically and horizontally in the spirit of Yona Friedman's mega-structures and his *Ville Spatiale* of 1957.⁸ The interior was outfitted with primarily built-in furniture components formed by a single mold that could be re-used several times. Only a few modules were constructed, of which only one remains.

While the Cuban prefabricated proposal combined both, the capsule module as the basic unit of habitation and the space frame as primary vehicle for stacking and aggregation, in Puerto Rico, the Lands Administration of the Puerto Rican Government experimented with a large scale prefabricated structural matrix intended to house conventional residential construction. The project, designed by

Blanco and Oxman, was developed using fishing communities located in the coastal municipalities of Patillas and Aguadilla as distinct physical contexts for experimentation. The project evolved as a three-dimensional skeletal grid composed of precast concrete columns, beams, and slabs assembled with welded connections, that set up territories arrayed with standard housing units of one or two levels, together with communal spaces.⁹ In their interior, units would be outfitted with wood partitions and infill panels together with a prefabricated kitchen-bathroom core. According to the PA Award jury, one of the project's positive particularities was the proposed assembly method that was generated by alternating modules, thus "eliminating vertical–horizontal property limits".¹⁰ This characteristic, considered as an affliction of modular construction but praised by the jury, marks a fundamental schism between design intent and user perception —the user's inability to recognize his territory of habitation creates a distance, compromising any potential sense of identity and belonging between user and the living unit.

SUPPORTS AS FRAMEWORKS FOR CITIZEN PARTICIPATION

Fernando Salinas' award-winning Multiflex Prefabricated System was developed in collaboration with a group of students at the School of Architecture at the University of Havana.¹¹ Building on the notion that the housing unit is primarily a cultural construct, Salinas defined the dialectical character between primary structure and infill components as stemming from changing economic conditions together with the specificities of the family's composition, preferences, needs and habits. Following John Habraken's Theory of Supports¹², Salinas divided the project into two distinct spheres of intervention —a *support structure*, formed by central columns that hold up 6-meter by 6-meter panels, and an *infill system* of exterior building skin components and interior prefabricated elements. In terms of design control, the support structure would be provided



Figure 3: Edificio Girón (Cuba, 1967), Antonio Quintana and Alberto Rodríguez, Architects.
left: Exterior View (photo: Leonardo Finotti), right: Open lobby, stair and access bridges (photo: María Isabel Oliver).

and constructed by the government while the exterior and interior infill elements would still be provided by the government, but assembled and manipulated by the users. The independence between the structural support and infill systems set up a built-in flexibility that allowed for the project's change and transformation according to the economic conditions and convenience of its users. In practice, however, the size and weight of the infill panels, as built in the prototype housing units in the suburbs of Wajay, southwest of Havana, and in the Isla de Pinos, proved too heavy and complex to be manipulated effectively by the users and residents.

Following similar theoretical underpinnings, but at a larger scale, the 'La Puntilla' project in Old San Juan, was developed by the Urban Design Studio, directed by Jan Wampler, for the Urban Renewal and Housing Administration (ARUV). La Puntilla, located outside the city walls, and adjacent to the port in the San Juan Islet, was selected as the relocation site for the residents of La Perla, a slum located outside the city fortification in the northern portion of Old San Juan. At the time, it was estimated that the slum had a population of around 3000 residents.¹³

La Puntilla consisted of a 5-story mat-building structure with interior courtyards of different sizes and hierarchies. Inspired by the plaza and courtyard schemes of Old San Juan dwellings, Wampler proposed an open building framework within which residents would complete their unit according to their means and possibilities. The ambitious building program, targeted for a population of 5000 residents, included 1000 units of housing together with an elementary school, church, community hall, services, commercial facilities, and offices. The design pursued a mixture of income and social groups within the project, dedicating 500 units as replacement housing for the residents of La Perla and 500 units to private affordable housing.¹⁴

Wampler's mat-building framework presupposed that the occupants would finish their accommodations themselves. As Wampler states in the project brief, "hopefully, they will endow their living arrangements with much of the same touches of individuality and taste that are often found in La Perla. They may even bring tar paper and wood from old dwellings to serve as the outer walls and interior partitions of the new".¹⁵ The mat building structure was to be built of cast-in-place concrete columns and beams, together with a two-way concrete floor slab system with native hollow clay tiles. Painted concrete block would be used between apartments and for utility core walls.¹⁶

The award-winning experiment on self-help came to a halt when authorities of the Municipal and Central Governments realized that the image of the government's new housing would be completed with the user's re-purposed zinc, wood panels and found materials. Both, the government as public sponsor as well as the relocated dweller, aspired to a sense of newness and completion, not to an incomplete framework for them to rebuild and interpret. Coinciding with the change in government resulting from the 1968 elections, the disconnection between the individual aspirations of the users, the government's image of its *oeuvre* and legacy, and the architect's visionary and idealistic intentions sealed the fate of one of Puerto Rico's most important experimental projects.

MODULAR AND AGGREGATE STRUCTURE

The intrinsic complexities of these experimental projects, developed at the level of the housing cell, the large-scale structural system or the mid-rise mat building, presented limitations regarding the sheer production of housing units required and the speed of production necessary to meet public policy goals. Marked by its brutalist expression, monumental sculptural articulation, and ingenious constructive system, the seventeen-story Experimental Housing



Figure 4: Habitat Puerto Rico (Puerto Rico, 1968-73), Moshe Safdie, Architect.
left: Site Model (courtesy of Safdie Architects); right: Puerto Rico Ja...Ja...bitat comic strip by Enver Azizi (1969).

Building at Malecón and F street, better known as the Edificio Girón, designed by Quintana and Rodríguez, represents a shift in scale and an experimental *tour-de-force* in social housing. The project completes Quintana's trilogy of modern buildings in the Vedado district of Havana: Edificio Odontológico (1950), Edificio de Seguros Médicos (1950) and the Edificio Girón (1967).

The Girón building served as a testing ground for the application of new construction methods and the use of high-rise building typology in social housing. Quintana and Rodríguez, in collaboration with the students at the School of Architecture in Havana, experimented with prefabricated panels and, for the first time in Cuba, with a slip-mold construction system that dramatically increased the speed of construction and the efficiency of production costs.¹⁷ From a construction point of view, the building would serve as a model for future high-rise residential towers in Cuba, and later in Puerto Rico.¹⁸

The building is organized around six main areas: the lower open plan, the elevators, the stairs, the horizontal bridges, and the slabs for two and three bedroom apartments. Located in a privileged waterfront site, the brutalist structure dedicated to low-class housing constituted a critique to the *bourgeois* neighborhood of Vedado. The building's two main features are the unique character of the open ground floor plan that integrates the building's access to the urban fabric of the city, and the separation of vertical and horizontal circulation with respect to the structural slabs holding the housing units. This separation afforded an increased sense of privacy by the elimination of corridors in front of the units, and a correlate increase in the effectiveness of natural light and cross ventilation.

These two design strategies, innovative and functional from an architectural point of view, underline a fundamental discontinuity between architectural intention and people's understanding and association with the building. While architects in general have

declared the Girón Building as one of Cuba's paradigmatic examples of late modernism, the public often describes the building as unwelcoming, monstrous and cold. The open ground floor plan, lacking an enclosed vestibule or other signs of spatial control, erases the traditional understanding of the territorial thresholds that structure public-private relationships from the scale of the city and neighborhood to the scale of the building and the dwelling unit. At the same time, its aggregate structure splits the building's image and façade composition into a large slab with limited features associated with residential design —windows, balconies and terraces— and another, containing the vertical access systems, conceived as an imposing monumental scale and devoid of signs of inhabitation.

Moreover, due to its construction system, exposure to sea salt winds and lack of maintenance, the building is not structurally sound with respect to current seismic codes. Despite of its utopian constructive and efficient intentions, Girón revealed the prevalence of the urban foreign 'object' that would never repeat again.

Habitat Puerto Rico was designed by Moshe Safdie in 1968.¹⁹ The project was sponsored by the Puerto Rico Cooperative Development Administration as a public-private partnership with developers Fred Epstein and Haim Eliachar of Development International Corporation. The project was commissioned as a prototype for providing low-cost housing to moderate-income families and developed for two different sites between 1968 and 1973. The first version of the project (1968-69) was designed for a twenty-acre lot on a 250-foot high hill in the San Patricio sector of San Juan. The design foresaw the construction of 800 hexagonal modules, arranged in clusters of 12, to form 264 dwellings set within the steep slope of the site. Due to the impact of the site's topography and soil conditions on development costs, the first site was ultimately rejected by the FHA in favor of a second, known as the Berwind Farm. The smaller, less ambitious second scheme



Figure 5: Habitat Puerto Rico (Puerto Rico, 1968-73), Moshe Safdie, Architect. Photo by Miriam López.
 left: Architectural Model (courtesy of Safdie Architects); right: Modules repurposed as cow sheds in Camuy, Puerto Rico (Archivo Andrés Mignucci).

(1969-1973) consisted of 300 pre-fabricated hexagonal units, also clustered in groups of 12. The basic shape of the modules was a split-level hexagon that would form a 14-story high-rise tower. Each unit featured a private terrace and garden located on the rooftop of the module below. A prefabrication plant was built on-site and the project began construction in March 1969.²⁰ Both the form of the housing unit and certainly the collective form of the overall assembly challenged the public's understanding of Safdie's design. Even before construction began, an illustration by cartoonist Enver Azizi, featured in a local newspaper, summarized the public's puzzled commentary on the project.²¹

The intended location of Habitat Puerto Rico on an underdeveloped hilly terrain was a significant reason for the scheme's failure. In contrast with the construction site of the original Habitat, built on the flat waterfront site of Montreal's Expo 67, in Puerto Rico, Safdie looked to use the site's topography to build and support the impressive three-dimensional massing of the aggregate structure. The steepness of the site posed particular construction problems, which added to the overall cost of the proposal making it ultimately unfeasible in the context of low-cost housing. Under the pressures of the 1973 financial crisis, the government withdrew its support forcing the developer to abandon the project with only 30 modules produced and in place.

Since, some of these modules have found their way to different locales in Puerto Rico being repurposed and reinterpreted by new owners with uses as diverse as a private residence in Arecibo or a corral and shelter for cows in Camuy. Others remain abandoned; still in place in their intended site as featured in the recent photographic exhibit *In the Forest* by David Hartt.²² The act of re-appropriation of these structures serves to bring into focus the remoteness between design intent, built form, and the capacity for eliciting a sense of

identity and proximity, that could lead to a sense of belonging by the general public and potential users and residents.

CONCLUSION

The six projects presented in this article — the La Puntilla Housing project, the Prototype Fishing Villages, and Habitat in Puerto Rico, together with the Asbestos Cement Housing Modules, the Girón High Rise Building, and the Multiflex Prefabricated Housing System in Cuba— constituted avant-garde experimental projects that put both islands in the forefront of architectural experimentation and theoretical discourse at the time. That they were all government-sponsored projects aimed at shaping housing policies on behalf of the urban poor makes them even more remarkable in their ambition, scope, and risk-taking charge. Explorations with new materials, construction methods, assembly systems, modes of incorporating the user in processes of citizen participation, and alternative models of achieving high level building densities, all formed part of a complex and rich agenda of design-based research and exploration that attempted to balance a visionary spirit of experimentation with the those of a *reale architektur*, an 'architecture of the real', capable of meeting the immense challenges that both countries faced regarding the issue of building housing for the poor.

Lost in the translation between the visionary and the real, the agency of the subject in the act of dwelling, the inhabitant, is superseded by the remote architectural language of the object. The resulting construct yields an unsettled understanding of property limits, an ambiguous demarcation of territorial control, and an unclear disclosure of 'completeness' that compromised any potential sense of identification and association. In Heidegger's terms, the possibility of inhabiting a radically reimagined housing filled with unrecognizable symbols of identity, the building in which to dwell,

became an un-codified architectural linguistic structure without meaning and significance to the user.

In conclusion, the crisis of these experimental dwellings reveals a disarticulated relation, a fundamental disconnect, between housing form and socially shared modes of dwelling and habitation. The challenges of associating the concept of ‘capsule’ with ‘house’ and ‘mega-structure’ with ‘neighborhood’; the difficulties of identifying with an incomplete structure as part of a process of citizen participation; and the inability to recognize the territorial boundaries of one’s dwelling within a modular and aggregate structure; rendered these extraordinary projects as governmental impositions and architectural caprices eclipsing their potential as viable innovative experimentations.

ENDNOTES

1. Andrés Mignucci. “Modern Urbanism in Puerto Rico: from abstract doctrines to concrete landscapes,” in *Ambivalent Spaces: Memory and Oblivion in Modern Social Architecture*, ed. Jorge Lizardi and Martin Schwegmann (San Juan: Ediciones Callejón, 2012), 130.
2. Roberto Segre. “Arquitectura Cubana.” *Cuadernos Summa-Nueva Visión* 46-47 (1970): 55.
3. HUD is the acronym for the United States Department of Housing and Urban Development.
4. “15th PA Annual Design Awards.” *Progressive Architecture*, Vol. 49, no. 1, (January, 1968): 90–103.
5. James A. Murray. “Project ’68: Annual Awards Program.” *Canadian Architect Yearbook* 13, (Dec 1968): 35-63.
6. Martin Heidegger. “Building Dwelling Thinking.” *Poetry, Language, Thought*, (1971): 145-161.
7. Eduardo Luis Rodríguez. *La Arquitectura del Movimiento Moderno. Selección de Obras del Registro Nacional* (La Habana: Ediciones Unión, 2011), 160-161.
8. Roberto Segre. *Arquitetura e Urbanismo da Revolução Cubana* (São Paulo: Nobel, 1986), 95.
9. “15th PA Annual Design Awards,” *op. cit.*, 98.
10. *Ibid.*
11. Segre, *op. cit.*, 99.
12. N.J. Habraken. *Supports: An Alternative to Mass Housing* (London: Architectural Press, 1972), 10.
13. Jan Wampler, and ARUV’s Urban Design Studio. *La Puntilla Report* (San Juan: ARUV, 1968), 5.
14. Wampler, *op.cit.*, 7.
15. “15th PA Annual Design Awards,” *op. cit.*, 92.
16. *Ibid.*
17. Segre, *Arquitetura e Urbanismo da Revolução Cubana*, 92.
18. During the 1960’s and as a result of the Cuban Revolution, a great number of Cuban architects, engineers and developers immigrated to Puerto Rico, greatly influencing the island’s construction industry.
19. Habitat Puerto Rico was developed by Fred Epstein and Haim Eliachar of Development International Corporation as part of a public-private partnership with the Administración de Fomento Cooperativo de Puerto Rico (Puerto Rico Cooperative Development Administration) under executive director Abimael Hernández González. The project was funded by the Federal Housing Authority (FHA) under HUD’s Title 236 moderate-income housing program. Moshe Safdie was the Architect. R. A. Perez-Marchand and George Z. Mark, served as Associated Architects, with Conrad Engineers and Capacete Martin y Asociados as consulting engineers.
20. Moshe Safdie, *Beyond Habitat*, Cambridge: MIT Press, 1970, and the Moshe Safdie Archive at the Canadian Architecture Collection at McGill University: <http://cac.mcgill.ca/moshesafdie/fullrecord.php?ID=10820&d=1>.
21. The cartoon *Puerto Rico Ja-Ja...bitat* by Enver Azizi was published in 1969, the year Habitat Puerto Rico began construction.
22. Artist David Hartt’s exhibit, *In the Forest*, commissioned by the Graham Foundation, documents the abandoned remains of Safdie’s Habitat Puerto Rico, together with images of the repurposed housing modules in the towns of Arecibo, Camuy, and Guayama.