

PAISAJES URBANOS HÍBRIDOS-DISPERSOS. TECNOVACIÓN EN GESTIÓN URBANA SOSTENIBLE

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Resumen

El creciente proceso de dispersión territorial de las ciudades latinoamericanas y venezolanas (Maracaibo), deriva de la expansión incontrolada de la periferia urbana por ausencia o trasgresión de las restricciones físico-geográficas y legales y es consecuencia de la migración, el laissez faire territorial, la poca capacidad de gestión y la ausencia de cultura de sostenibilidad. Resulta de formas de producción del hábitat -paisajes urbanos híbridos-dispersos, donde coexisten y se mezclan en un continuo espacio-temporal desarticulado, fragmentos urbanos con diferentes códigos genéticos (urbanización espontánea y planificada). Este patrón de ocupación y desarrollo urbano, basado en tipologías extensivas de bajo rendimiento-intensidad de uso, genera fuertes presiones frente a las que parece no existir capacidad de respuesta institucional o a las que muchas veces no se quiere responder por razones políticas e ideológicas. La dispersión urbana en Maracaibo se ha traducido en el aumento de los costos de urbanización, del incremento del déficit de los servicios infraestructurales, de las asimetrías en la distribución espacial de calidad de vida y la precariedad. Este modelo disperso-insostenible que caracteriza a Maracaibo - con 1,6 millones de habitantes - ha desbordado los límites de la ciudad, ocupando los bordes de los corredores urbanos metropolitanos que desde la ciudad atraviesan la Zona Protectora (ZP). La ZP es un green belt plurimunicipal de 20.800 Has, que bordea y define el límite-frontera urbana del Archipiélago Metropolitano de Maracaibo (AMM). La ZP fue decretada en 1989 por el Ministerio del Ambiente (MARN) para frenar la expansión anárquica de Maracaibo y actuar como agente

regulador del clima y el medio ambiente en beneficio de la calidad de la vida urbana y como política-contenedor del crecimiento urbano de la ciudad, actualmente en proceso de ocupación por rituales urbanos en expansión. La ponencia presenta la metodología -estrategia de planificación-evaluación innovadora- (EPE+i) y resultados de un Estudio realizado para el Ministerio del Ambiente, con el fin de decidir sobre la desafectación total o parcial de la ZP. Con ese propósito se evalúa el impacto de los posibles futuros escenarios de ocupación urbana de la ZP, en la sostenibilidad del AMM. La EPE+i llena el vacío de la planificación-gestión urbana en Venezuela, asumiendo el principio de sostenibilidad y trenzando estratégicamente el proceso de Planificación-Gestión Urbana (PGU), con el modelo Presión-Estado-Respuesta (PER) y el apoyo de Tecnologías de Información Geográfica (TIG) -imagen satelital y SIG- para desarrollar modelos urbanos y atributos e Indicadores de Sostenibilidad Urbana (ISU) específicos. La sostenibilidad y gobernanza (participación-interacción política y social multinivel), se asumieron como principios clave del estudio, para la toma de decisión ética y construir una visión-hipótesis territorial integral y concertada de futuro para el conjunto urbanos ZP-AMM. La ponencia concluye presentando el resultado de la aplicación de la estrategia metodológica, EPE+i = [PGU+PER+TIG] (tecnovación creativa), donde los modelos SIG de vulnerabilidad, consolidación y conformidad de uso y el modelo síntesis, conformidad-adequación ambiental y legal de la ocupación urbana de la ZP, constituyen los atributos e ISU de Estado; los escenarios se transforman en atributos e ISU de Presión y la gobernanza, evaluada a través de tres variables, legitimidad por desempeño, gobernabilidad y participación, conforman los atributos de Respuesta y seleccionado como política urbana y visión-hipótesis territorial integral para el conjunto ZP-AMM, el escenario E2: Corredores de Expansión Tendencial, porque organiza la ocupación lineal urbana actual, a lo largo de los corredores metropolitanos, manteniendo las áreas intermedias como zonas verdes de protección.

Abstract

Urban sprawl in Latin-American and Venezuelan cities derives from uncontrolled urban expansion of the periphery, due to the absence or infringement of geographical and legal restrictions through planned and spontaneous urban occupation (hybrid urbanization). This in turn results from migration and territorial *laissez faire*; limited urban management capacity and sustainability culture in public, private and community institutions although they perceived and inhabit a precarious environment and frequently protest demanding services, security and houses. For Sempere (2005), it is caused by illegal ways of habitat production based on low density and extensive typologies. This urban pattern generates strong pressures against which there is no institutional capacity or will to respond due to political or ideological reasons. This disperse-unsustainable model in Maracaibo (capital of the Zulia State, located at the western extreme of Venezuela) has led to the explosion of the city boundaries, and the occupation of the edges of the metropolitan urban corridors, which run from the city across the Protective Zone (PZ). The PZ is a green belt of 20.800 Hectares, decreed in 1989 to act as a policy-container of urban growth by defining the city west boundaries and is in the process of transformation-mutation by urban rituals in expansion. It is the territorial expression of the contemporary forms of making city which result from the practice of the visible management government (VMG) in metropolitan Maracaibo, referred by Ferrer and others (2005) as Maracaibo's metropolitan archipelago (MAM). The paper describes the method, innovative planning-evaluation strategy (IPES) and the results of a study that evaluates the impact of sprawl -urban occupation of the Protective Zone (PZ)-, in Maracaibo's -hybrid metropolitan archipelago- (HMA) sustainability. The IPES fills the gap of the local urban planning assuming the principles of sustainable development (SD) by means of braiding the urban planning process (UPP) with the Pressure-State-Response Model (PSR) and Geographical Information Technologies (GIT) -satellite images and GIS- to develop urban models, specific attributes and urban sustainable indicators (USI). The IPES (UPP+PSR) is a multilayered-relational model that works, within the PSR model and grasping this model with the UPP. In this model, the causes of environmental changes, Pressure are correlated with the urban-spatial scenarios, their effects State, with the diagnose synthesis and, the Response with the multilevel government and stakeholders, urban projects, actions and policies, proposed and undertaken to deal with these changes. To reach an ethical decision, a concerted vision of the future scenarios and to build an integral territorial hypothesis for the PZ-HMA, sustainability and governance -stakeholders' participation- were the key principles of the study. The paper concludes presenting the IPES model (creative technovation), where the GIS models of vulnerability, consolidation, conformity of usage and the model synthesis, environmental and legal conformity-adequation of the urban occupation, serve as specific State Attributes; the envisioned urban-

spatial scenarios constituted the Attributes of Pressure and urban governance, measured through three variables, legitimacy by performance, governability and participation, configured the Response Attributes and selecting as policy and integral hypothesis –vision for the PZ-MAM the E2 Scenario: Corridors of Tendencial Expansion because controls, adjusts and organises the present lineal urban occupation along the metropolitan corridors maintaining intermediate areas of green protection and re-creates a new hybrid sustainable urban landscape, a compact, dense and multifunctional-polycentric PZ-MAM.

1. Introduction

Latin America and the Caribbean is the most urbanized region in the developing world (UNCHS-Habitat, 2001). It has 519 million inhabitants of which 75% or 391 million live in cities and 160 million in rural areas. The proportion of urban population is particularly high in Argentina (89.8%), Uruguay (91.3%) and Venezuela (86.9 %). Moreover, urban agglomerations of Buenos Aires, São Paulo, Rio de Janeiro, Mexico City and Lima are already among the 30 largest cities in the world.

In LA and Venezuela, together with a modern sector, connected with the world market, a marginal sector coexists that grows continuously. This double face of the LA cities (dual city) characterized as "one-two city" by Cilento (2005), highlights the existing socioeconomic inequalities and the spatial-territorial segregation, clear expression of a restricted citizenship, where (super) populated neighborhoods with important deficits of services, basic infrastructure and quality of life coexist together with more established-consolidated urban fragments (hybrid city urban genome). This ambivalent-hybrid phenomena "modernization-marginalization" and the ruptures-fragmentation of the urban space - which we conceptualized and recognized as **hybrid city** – or **hybrid disperse urban landscapes**, are issues that threaten the political stability and governance in the medium and long term. The main challenges of the Latin-American and Venezuelan cities are the acknowledgment-acceptance of the *hybrid condition* of its urban fabric -spatial and temporal coexistence of mixed fragments with different genetic codes-, governance and sustainable urban development and management.

Many of the region's urban residents have to deal with societal shortfalls, insecurity of tenure, and inadequate access to affordable transportation, environmental degradation; high levels of violence and increasing social and spatial segregation. The main pressures on the environment and natural resources are poverty, increasing inequality of incomes, informal urbanization, urban sprawl, limited planning and management especially in urban areas and high dependence of many economies on natural resources exploitation. This reality impacts the urban environment and therefore needs to be evaluated through urban sustainable indicators (USI) to overcome its deficits. Urban sprawl in Latin-American and Venezuelan cities derives from uncontrolled urban expansion of the periphery, due to the absence or infringement of geographical and legal restrictions through planned and spontaneous urban occupation (*hybrid urbanization*). For Sempere (2005, is caused by illegal ways of habitat production based on low density and extensive typologies. This urban pattern generates strong pressures against which there is no institutional capacity or will to respond due to political or ideological reasons.

This disperse-unsustainable model in Maracaibo (capital of the Zulia State, located at the western extreme of Venezuela) has led to the explosion of the city boundaries, and the occupation of the edges of the metropolitan urban corridors, which run from the city across the Protective Zone (PZ). The PZ is a green belt of 20.800 Hectares, decreed in 1989 to act as a policy-container of urban growth by defining the city west boundaries and is in the process of transformation-mutation by urban rituals in expansion. It is the territorial expression of the contemporary forms of making city which result from the urban praxis of the visible management government (VMG) in Maracaibo, referred by Ferrer and others (2005) as Maracaibo's metropolitan archipelago (MAM).

The VMG builds city so citizens can inhabit comfortably the hybrid archipelago. In this process the VMG is legitimized by performance and through the improvement of citizen's life quality, creates confidence, social capital and citizen's empowerment, and therefore fortifies local governance. In agreement with the previous statement, the VMG desirable formula is: Government by Policies (G/P) + Good Government [Legitimacy=political marketing and capital] + Governance. For Uvalle (in Ferrer 2003) "to govern by policies" (G/P) implies to respond to civic interests and to recognize the plurality and the competitive

character of the citizens demands. The VMG governs by policies, projects and actions and focuses strategically its action in “visible urban structural interventions” to improve the quality of life. For Chaqués (in Ferrer 2005), is also to give visibility to the ideas through public debate, where the degree of idea elaboration is not as important as its capacity of conviction in a context of uncertainty, in which new solutions to social problems are sought. Following Ferrer (2005) the VMG is = *G/P+* GOOD GOVERNMENT (LEGITIMACY) + GOVERNANCE.

The *metropolitan archipelago Maracaibo* (MAM) is the territorial expression of the municipal division policy executed since 1995, in Maracaibo by the Legislative Counsel of Zulia State (LCSZ) when the city was divided into two municipalities: Maracaibo and San Francisco. This fragmentation-municipalisation process has implied the transformation of “the city of Maracaibo” from an urban continuum to its division in municipality-islands where their local governments -through a visible management- seek to re-create new identities and urban images. This first fragmentation resulted in the concentration of population and activities in the Municipality of Maracaibo. To overcome these asymmetries the LCSZ proposed in 2002 the division of Maracaibo into two new municipalities, Maracaibo East and Maracaibo West (Table 1).

Table 1. New Scenario Maracaibo HMA

Municipalities- islands	Inhabitants	Territory (Hectares)	Activities
MARACAIBO EAST	720.000	7.600	Commercial, financial, governmental administrative, residential, tourist, historic, patrimonial center, airport, port. Commercial, financial, administrative, tourist, residential, recreational.
MARACAIBO WEST	680.000	7.833	Commercial, financial, administrative, tourist, residential, recreational, governmental. New centralities.
SAN FRANCISCO	350.000	7.567	Commercial, governmental administrative, residential, wholesale market, industrial park, residential areas, Bridge of Maracaibo.
TOTAL	1.750.000	23.000	

Source: Ferrer et al, (2005)

Maracaibo, according to the Local Urban Development Plan (LUDP 1994) registers an average density of 70 inhabitants/hectares and occupies approximate 24.970 hectares, including the occupied areas of the PZ (2.170 hectares). This area is two times larger than the Valley of Caracas and shelters approximately half of the population of Caracas (LUDP 1994). On the other hand, approximately 400 poor neighbourhoods (product of land invasions) occupy 60% of this territory. These poor neighbourhoods are located mostly in the western and northwest periphery of the city and in the Protective Zone.

2. Hybrid city, fragmentation- city archipelago, urban periphery

2.1 Hybrid City (HC)

The transformation of Venezuela from rural to urban was initiated with the petroleum exploitation in 1917, as well as a particular form of occupation of the territory that remains to the present time and whose genesis goes back to the colonial city. This colonial city form or territorial occupation involved the “formal” city in grid (following the law of the Indies-Spain) and the indigenous spontaneous settlements located in the periphery. An updated version of this form of city building can be traced in the construction of “closed petroleum camps” by foreign companies (Shell, Creole, Standard Oil) in the periphery of existing Venezuelan cities, in places of petroleum production or close to them, around which immigrants attracted by better incomes developed spontaneous settlements. This form of “city building” is the origin of the contemporary Venezuelan city where fragments of the planned city coexist with fragments of the spontaneous city (*hybrid city*).

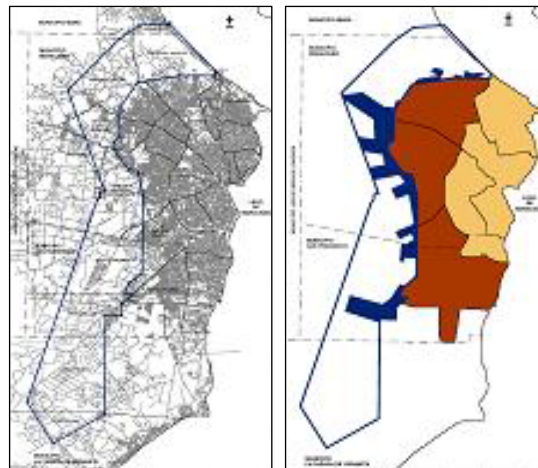
From the previous considerations and adapting to the city what Garcia Canclini (2000) understands by hybridization a “*socio-cultural processes in which structures or discreet practices that existed in separated form are combined to generate new structures, objects and practices*”; we built the concept of “Hybrid City”. The HC is the result of the sustainable governance-dialogues between different socio-political

stakeholders and the combination of different forms-urban praxis (*typological genes - genetic codes*) of “building city”. Is a multilevel interaction-communication and co-responsible process of city building and a complex mixture of territorial fragments with different *typological genes* that configure the hybrid city *urban genome* [morphological, socioeconomic, cultural, political-institutional and environmental aspects], that coexist and juxtapose in a re-defined spatial-temporal urban continuum. These different and mixed *typological genes-genetic codes* mutated-evolved -in time- creating a new, more articulate and better structured *urban genome* as the result of the implementation of sustainable re-habilitation urban policies and projects.

2.2 Maracaibo's Periphery

In the eighties Maracaibo initiated a process of periferization and thereby increasing exponentially the areas of irregular habitat that are a dominant pattern -*genetic code*- of occupation and urban expansion of the city. In 1985, poor neighbourhoods occupied 41% of Maracaibo's territory, ten years later 60% of its territory was occupied by 400 poor neighbourhoods. The second periphery is adjacent to PZ and has with similar characteristics according to Barroso and Mustieles (in Ferrer 2003). Is an urban collage of fragments with diverse characteristics. The PZ residential occupation configures the third periphery of Maracaibo (Map 1 and 2).

Maps 1-2. PZ and the 3 Peripheries of Maracaibo



Source: From Arquiluz, IFAD, MARN, (2005)

3. Urban management technovation: innovative planning-evaluation strategy (i + PES)

The i+PES fills the gap of the local urban planning by assuming the principles of sustainable development-management (SDM) by means of braiding the urban planning process (UPP) with the Pressure-State-Response Model (PSR) with the support of Geographical Information Technologies (GIT) -satellite images and GIS- to develop urban models, specific attributes and urban sustainable indicators (USI). The i+PES (UPP+PSR+GIT) is a multilayered-relational model that works within the PSR model with the GIS models developed and grapping them with the UPP.

In this model, the causes of environmental changes, **P**ressure are correlated with the urban-spatial scenarios, their effects **S**tate with the diagnose synthesis and, the **R**esponse with the multilevel government and stakeholders, urban projects, actions and policies, proposed and undertaken to deal with these changes. To reach an ethical decision, a concerted vision of the future scenarios and to build an integral territorial hypothesis for the PZ-MAM, sustainability and governance -stakeholders' participation- were the key principles of the study. The method was structured in five phases: Phase 1: Elaboration of the Base Map from satellite images. Phase 2: Territorial Diagnosis and GIS models formulation and management. Phase 3: Model Synthesis of Occupation of the PZ. Phase 4: Formulation of alternative Spatial Scenarios and scenario pre-selection and Phase 5: Post-prospective, evaluation of scenarios with the Commission of the PZ and the Ministry of the Environment (MARN). Urban sustainability and the

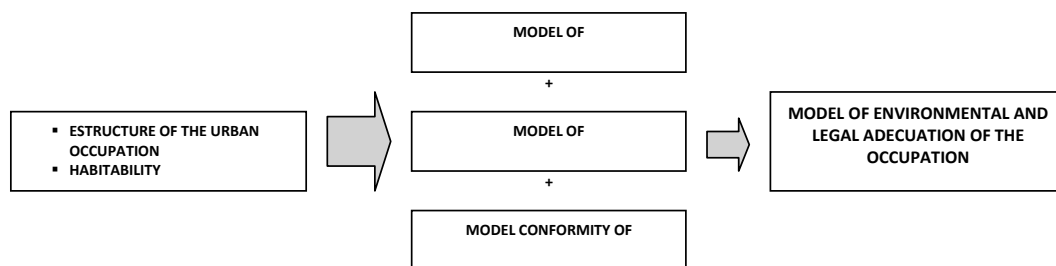
participation of stakeholders constituted the principles of the study for the purposes of reaching an ethical decision and envisioning in a concerted way, different scenarios and an integral territorial hypothesis for the PZ and the HMAM urban complexity.

3.1 IPES: BRADING Urban Planning & Management with the PSR MODEL

3.1.1 CORRELATING the PZ Diagnosis Synthesis with USI of State

The Model of Environmental and Legal Occupation is the territorial expression of the diagnosis synthesis and results from the superimposition (multilayered) of three Models: Physical-Geographical Vulnerability, Consolidation of the Occupation and Conformity of Usage. These three models are assumed as State attributes in the framework of the PSR. The Model of Consolidation integrates two state attributes: structure of the urban occupation and habitability (Figure 1).

Figure 1. Diagnosis Synthesis

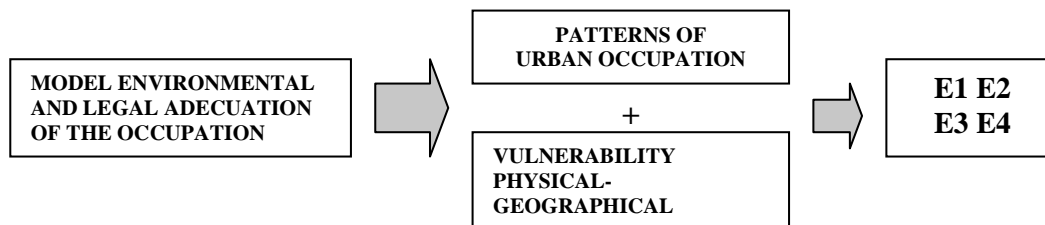


Source: From Arquiluz, IFAD, MARN, (2005)

3.1.2 Correlation of the PZ Scenarios with USI of Pressure

The definition of the scenarios results from the combination of the existing pattern of urban occupation (Model of Consolidation) and the Model Vulnerability (Figure 2).

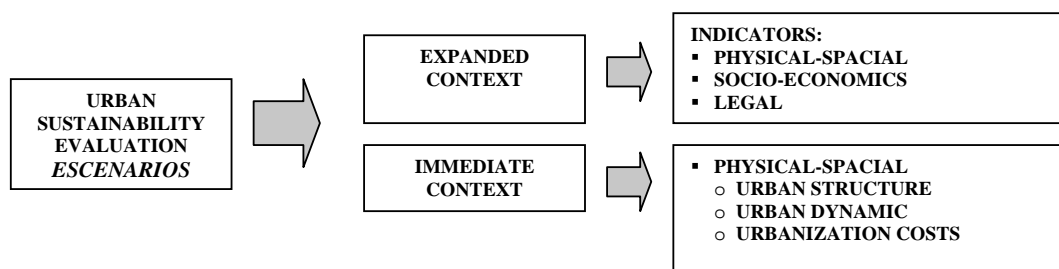
Figure 2. Spatial Organization-Scenarios of PZ



Source: From Arquiluz, IFAD, MARN, (2005)

To formulate and evaluate the scenarios two levels of analysis were considered: the expanded and the immediate context of PZ (Figure 3).

Figure 3. USI of Pressure - Scenarios Evaluation



Source: From Arquiluz, IFAD, MARN, (2005)

4. Explanatory framework: IPES = UPP+PSR+GIT

4.1 Diagnosis synthesis

The Territorial Diagnosis is synthesized in three Models: Physical-Geographical Vulnerability, Consolidation of the Occupation and Conformity of Use (Figure 4).

Figure 4. Models of Vulnerability, Consolidation, Conformity of Usage



Source: From Arquiluz, IFAD, MARN, (2005)

Figure 5. Model Synthesis. Enviromental and legal adequation of the occupation




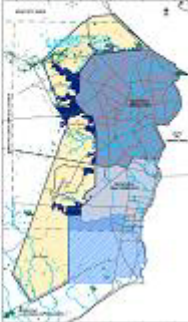
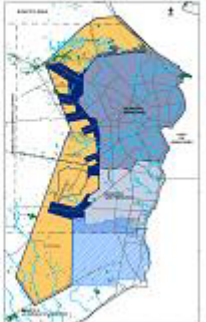

Source: From Arquiluz, IFAD, MARN, (2005)

4.2 Spatial scenarios of the PZ = Attributes and USI of pressure

The spatial occupation options are presented as scenarios of territorial occupation and policies for managing urban sprawl. The scenarios formulation considered the Model of Physical-Geographical Vulnerability and the Model Synthesis of Legal and Environmental Occupation.

With this vision that combines the pattern of existing occupation, the physical-geographical restrictions and the legal and environmental occupation, the following 4 scenarios were identified **E1**: Incorporation of occupied areas. **E2**: Corridors of tendencies expansion. **E3**: Regularization of the urban continuum. **E4**: Incorporation of PZ as area of urban expansion with regularization of usages (Table 2).

Table 2. PZ Spatial Scenarios

SCENARIO	OCCUPATION OF THE TERRITORY OF ZP	SCENARIO	OCCUPATION OF THE TERRITORY PZ
<p>E1: INCORPORATION OF OCCUPIED AREAS</p> <p>Recognizes the existing occupation and incorporates the compatible consolidated uses</p>		<p>E2: CORRIDORS OF TENDENCIAL EXPANSION.</p> <p>Normalizes the tendencies of growth that are produced along metropolitan corridors. The areas among the corridors maintain the legislation of PZ.</p>	
<p>E3: REGULARIZATION OF THE URBAN CONTINUUM.</p> <p>Reaffirms the urban use of the corridors of expansion proposed in the E2 and includes an adaptation of the uses of the zones between corridors.</p>		<p>E4: INCORPORATION OF PZ AS AREA OF URBAN EXPANSION WITH REGULARIZATION OF USES.</p>	

Source: From Arquiluz, IFAD, MARN, (2005)

- The evaluation matrix of the scenarios is a simple matrix of cause-effect (Table 3).

Table 3. Scenarios Evaluation

SCENARIOS	E1	E2	E3	E4
<i>INDICATORS OF PRESSURE</i>				
<i>BROAD CONTEXT (HMAM)</i>				
<i>Physical –Spatial Aspects</i>				
<i>Socio-Economic Aspects</i>				
<i>INMEDIATE CONTEXT (PZ)</i>				
<i>Physical –Spatial Aspects</i>				
<i>Socio-Economic Aspects</i>				
<i>Legal Aspects</i>				
TOTAL	-5	-12	-33	-53

Source: Giusti, R. and Ferrer, M. - IFAD/LUZ (2005).

5. Synthesis = IPES [UPP+PSR+GIT]

The attributes proposed are the following (tables 4, 5 and 6):

Attributes of State: consider the physical-geographical vulnerability, the structure of the urban occupation, the habitability-consolidation of neighbourhoods and the conformity of the occupation.

Attributes of Pressure: consider the pressure of urbanization, habilitation, legalization of poor neighbourhoods and urban transportation.

Attributes of Response: consider urban governance, measured through three variables, legitimacy by performance, governability and participation.

Table 4. Attributes and USI for the VMG-HMAM

	ATTRIBUTES		USI ASPECTS TO CONSIDER
	Level 1	Level 2	
VMG-MAM Good Government GOVERNANCE	BUILDING CITY Shared Management	<ul style="list-style-type: none"> - Beating geographical vulnerability. - Urban structure: toward a more compact city, polycentric, and competitive city - Urban Habilitation: Integration of poor neighbourhoods to the city; life quality improvement. - Legal Conformity - Urban Occupation 	<ul style="list-style-type: none"> - Habilitation and integration of poor barrios: - Access to the periphery, integration of the east and west of Maracaibo with San Francisco. - New centralities in the west and north of the city (employment) and public spaces - Improvement of the natural & built environment: - Recreational green belts in the north and west - Transport: extension of Maracaibo's Metro - Energy Savings: execution of norms. - Control of the urban limit, density increase in the periphery and control of invasions.
	LEGITIMACY By results	<ul style="list-style-type: none"> - Quality of life: fair distribution of better living conditions - Social well being - Economic growth - Urban Productivity 	<ul style="list-style-type: none"> - Decrease of the asymmetries in the endowment of infrastructures and services. - Decrease of the deficit of dwelling. - Noise ordinances design - Urban Security: decrease of criminal indices - Efficient-fair distribution of local finances
	GOVERNABILITY	<ul style="list-style-type: none"> - Opportune & efficient answer to citizen's needs - Shared vision of the future of the city 	<ul style="list-style-type: none"> - Management Transparency - Surrender of accounts. - Services of transportation, highway administration and waste disposal jointly with San Francisco. - Management Plan of the MAM - Promotion of the local identities and patrimony
	PARTICIPATION	<ul style="list-style-type: none"> - Empowerment - Social Capital - New urban culture - LA21 	<ul style="list-style-type: none"> - Promotion of citizenship - Participation in decision making and finances - Social capital and cohesion - Assumption of urban sustainability principles

Source: Ferrer, M (2005 and 2006)

Table 5. USI selected for the VMG-HMAM, PSR Model

Model PSR	ATTRIBUTES		QUALITY OF LIFE
	Level 1	Level 2	
STATE	CITY BUILDING	Urban Structure	<ul style="list-style-type: none"> - Quality of the urban space: zones consolidated / zones not consolidate. - Accessibility: to main services, employment - Urban Equity: spatial distribution of services, infrastructures, public- green space.
		Habitability	<ul style="list-style-type: none"> - Urban poverty: consolidation of poor barrios and quality of life homologation. - Quality of the materials employed, state of conservation and distribution of dwellings - Urban Security: Homicides, abductions, robberies and traffic accidents reduction
PRE SSURE	CITY FUTURE BUILDING	Urban Transport	<ul style="list-style-type: none"> - Urban Motorized Transportation: noise, air quality, building conservation, energy consumption. - Public Transport: New routes - Mobility: traffic tendencies.
		Urbanization Pressure	<ul style="list-style-type: none"> - Urban Growth: urban expansion - Density of population. - Extension of the city: spatial segregation by the decrease of the accessibility. - Floor built by inhabitant.

Source: Ferrer, 2006 from MIMAM (2005:28). Note: Hectare= Hect.

Table 6. PZ-MAM, PSR Model

Model PSR	ATTRIBUTES	QUALITY OF LIFE (GIS Variables)	USI
STATE City Building	Vulnerability (model)	- Vegetation - Water courses and topography	E1. Hect. grade concentration. E2. Hect. occupied courses of water
	Urban Structure (model)	- Quality of the urban space: zones consolidated / zones not consolidate. - Accessibility: to main services, employment - Urban Equity: spatial distribution of services, infrastructures, public-green space.	E3. Inhabitants / Hectares E4. Hect. consolidate and not E5. Km. To public services E6. Hect. / inh. Served and not served by Infrastructures
PRESSURE City Future Building	Habitability (consolidation model)	- Urban poverty: consolidation of poor barrios and quality of life homologation. - Quality of the materials employed, state of conservation and distribution of dwellings - Urban Security: risk areas occupation, Homicides, abductions, robberies and traffic accidents reduction	E7. Number of barrios consolidated E7. Housing deficit by type. E8. Hect. of invasion (inh/Hec) E9. No. dwelling improved. E10. Number of homicides, robberies and traffic accidents
	Urban Transportation	- Urban Motorized Transportation: noise, air quality, building conservation, energy consumption. - Public Transport: New routes - Mobility: traffic tendencies. - Urban Growth: urban expansion - Density of population. - Extension of the city: spatial segregation by the decrease of the accessibility. - Floor built by inhabitant.	P1. Cars/Inhabitant and zone. P2. Level of noise / zone P3. Age & quality of the fleet P4. No. of routes.
RESPONSE / GOVERNANCE	Urbanization Pressure	- Urban Planning and Management Measures	P5. Density. P6. Hect. OF Illegal occupation of the Protective Zone. P7. Hect per barrios outside the city boundaries (expansion). R1. LA21 implementation R2. # of new owners, land legalization R3. # of new urban centralities. R4. Hectares of new recreational areas in the periphery R5. Control urban boundaries and expansion. R6. Promotion of high densities in the periphery.
	LEGITIMACY by results/response	Measures for traffic mitigation and accessibility to work, recreational - public-green spaces	R7. Km. new urban transport routes and Metro R8. Km from new centres to the urban periphery R9. Km & M2 / inhabit. of public and green spaces. R10. Expenses of the municipality in protection of the quality of the air and reduction of noise. R11. noise ordinances application. R12. Vehicle control
		Measures for contamination reduction	R13. Expenses of the municipality in environmental education (IMA) R14. Campaigns for environmental consciousness. R15. Number of energy savings permits applied
		Measures of environmental education	R15. Number of energy savings permits applied
GOVERNABILITY PARTICIPATION	- Opportune - efficient answer to the needs of the citizens - Shared vision of the city - Citizens empowerment - Social Capital - New urban culture	R16. Transparency = surrender of accounts. R16. Promotion of local identity. R18. Citizenship promotion and formation. R18. PNLC and Participatory Budgets application. R19. Number of civil societies participating in local management. R20. Mancommunity of Maracaibo-San Francisco. R21. MAM Management Plan.	

Source: Ferrer, 2006 from MIMAM (2005:28).

6. Conclusions: Evaluation of Scenarios and Pos-prospective

In relation with the PZ occupation tendency, the research shows that only the 12, 24% of the territory of the PZ is occupied by residential developments contrary to the thesis of different municipal actors. 38 % of the residents are located in Maracaibo's Municipality. 21% of this area has medium consolidation, 50, 42% medium-low and 17, 6% low consolidation. On the other hand the scenarios evaluation matrix shows that the impacts of any considered SCENARIO in the sustainability of the HMAM are always negative.

In conclusion, the PZ occupation reinforces the unsustainability of the PZ-HMAM- first, because is contrary to the existing regulations established in the Urban Ordering Local development Plan and the Decree of the Protective Zone. Secondly, the new demands of services and equipment of the residential usages in the PZ will accentuate the existing deficits and the low quality of life and the precariousness of Maracaibo's.

Nevertheless the social and human situation in PZ requires normalizing the existing occupations. The regularization in itself does not contribute to organize the territory, but its acceptance involves a series of actions that could modify the occupation to and structured urban expansion. Considering the above statements the Scenario 2 appears the most favourable because it adjusts and controls the existing occupations, creating a vision of the city in which organized penetrations toward the periphery are produced maintaining intermediate areas of protection that function as green belt (PZ).

- Pos-prospective

This final phase of the Study contemplated the presentation and viabilization of the Diagnosis Synthesis and the Scenarios with the PZ Commission (PZC). To achieve this objective a workshop was planned with the purpose of facilitate the PZC to choose a Scenario *-as policy for managing Maracaibo's urban sprawl-* in a concerted way. Due to the absence of some important institutions –stakeholders, a debate was carried out instead of the workshop to reach the previous stated objectives. Nevertheless some agreements were reached concerning the areas of the PZ that had to be preserved; the importance of managing and controlling urban sprawl and the informal urbanization and the need to formulate actions to overcome urgently the services deficits in the HMAM.

Building a *hybrid sustainable urban landscape* in Venezuela is to have a PROJECT OF CITY AND CITIZENSHIP assumed as “instrument of democratic governance”. To achieve this objective is necessary a new local leadership and a new political praxis -VMGI+i- that shares the power with the citizens promoting inclusive and sustainable urban policies, that viabilized the enjoyment of the urban and citizens rights for all.

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