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Fractal Modelling of Partition Habitable Areas in Urban Environment Overcrowds in Democratic Rep. Congo in Sub-Saharan Africa

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Abstract

In this investigation, the behavior of an irregular tendency to minimize the dwelling space for a family makes that the norms of architectural reflection and the style of life are put back into question. The house and/or spaces of dwelling is an institution and not only a structure created for a complex whole of intentions.

The active goal is to create an environment that either best adapted, in other words, to the quality of the life of people, the techno-social and sanitary space in civil engineering and urbanism. A challenge to raise is to predict and to see the urban and out-of-town concentration facing the demographic growth and climatic warming up with the partition of the areas. In the continuation, we develop the fractalization of areas habited, the genesis of the concentration to the tentative of extension, the coupling of a number of a square meter per capita of the habitable space to the interfaces of the social ecology for urban development, opposite the estimable norms that motivate this study of thesis.

Keywords — *Model, simulation, fractal, partition, areas, habitat, overcrowding, Environment.*

I. INTRODUCTION

The partition is a process of occupation of the space and social functioning. It is, therefore, a process amplified by a demographic strong and social pressure in a space limited. Although to develop the cities while taking into account the needs of the population of the planet, such as the challenge of our research in social ecology, in civil engineering and urbanistic [1].

The demarcation at the time the oldest on our days of such an axis of research focuses on the fact to understand the society in an urban development respectful of the Environment facing the sanitary norm requirements in engineering. Although he/it lacks some researchers and professionals in sciences applied and human to make the ties between the inhabitants, the leaders, and the architects, that is the reason of the good founded of this original investigating. The tendency to apply geometry to architecture was the perpetual object of recent research [2]. And that will be Encamaçao et al. [14] exploited the fractals[5] in the urban cartography, but less without landing the problem of the partition of it.

How to relieve information in the districts concerned by the inhabitants and to make carry up the reflections by the administration while knowing how to counsel the two parts. The human groups discern and shape their natural environments according to their beliefs, their particular cultural values, and their social structures[3]. From there, while making that to observe, the style and model to stay that the different societies created for themselves some rules or principle of the urbanistic history of the big agglomerations in the world [4].

We will get used to history going from the old Egypt with the Jewish migration of the antique again while passing by the Romance controversial time at the domination of the Arabic, turquoise and the present time in the modern city vision toward the perspectives of globalization and internationalization

We limit ourselves in Sub-Saharan Africa take out again the Democratic Republic Congo of restraint that survey stays for the urban city of Kinshasa where the partition of the areas took a size to the tendency to bring back the surface (S) toward the limit zero. We let the factors that influence the surface to build to the technicians for the approach of soil. The variation of (S) duct to the relation (1)

$$\lim_{\Delta s \to 0} \frac{\left(f(s+\Delta s) - f(s)\right)}{\Delta s} \tag{1}$$

Where S is the surface, l is the width, and L is the length, what orients toward the total differential of the hopeless surface or

$$S = S(l, L)$$

And that

$$dS = 0 \Rightarrow \frac{\partial S}{\partial l} dl + \frac{\partial S}{\partial L} dL = 0 \quad (2)$$

Actually, the - Verbal suits of the partitions are the object of jurisprudence in the resolution of the earth conflicts in the urban environment.

This work contains in its whole the fractalization [5] of the inhabited surface, the genesis of the concentration, the reason of the surface minimization habitable, and some proposition of the norms.

II. CONCENTRATION

A simple observation is a report to see that the areas are parceled out from day today. What implies the principle of the paving of Dirichlet or the diagram of Voronoï [6] in fundamental on the division of a domain from a set of points. A house of dwelling shelters the number of inhabitants foreseen by the architectural norms. From where the tendency to go in inadmissible number by the sanitary and hygienic norms. The concentration in the urban Environment raises numerous factors bound to the quality of life.

Would it be necessary to adopt the fractale geometry [7] for the scientific understanding of such a social phenomenon automatically? Won't the architecture be confronted to the problems of rate of no one by m^2 of life? Is that can one pass natural elements to the habitable area at the fractalization [8-9]? Let's start with the historic approach.

A. Historic

Let's leave at the time from the biblical period contemporary for reference known of all. It dates of more than two millennia, during which there is the cohabitation of the Jews with the Egyptian people. Egypt shelters, since 650 before the common area, of the Jewish soldiers used by Psammétique 1st. She also welcomes many refugees of the kingdom of Juda when King Joaquim rebels against the kingdom of Babylon. The number of inhabitants increases in relation to the surface of the dwelling. The communities of the diaspora and the academies of the earth of Israel and Babylon restart by playing a role of the first plan in the Jewish intellectual life, the Aged Means, so much for the rabbis and their disciples that for the objectors. The Karaïteses that found one of their main centers there until the recent history or the habitable surface distribution causes some concerns. A migration of the Jewish Arabic (gramophones) come to join during the centuries several Jews waves from the Iberian Peninsula, of the territories of the Ottoman empire, and finally of Europe. The communities Jewesses are, to the picture of Egypt of before the war, cosmopolitan, having tied some ties with England, Italy, or France by the slant of the universal Jewish alliance (AIU). For the research of the place to live in all security [10, 11]. For reasons of economic, sanitary order, and sécuritaire, the people crams for the research of one better life, from where the concentration of population that is a migratory phenomenon taking the size in the big cities until this day. Some nation history in the world declares some former capitals but doesn't explain the order of the size of rate of concentration of people by inhabited areas of the elders in relation to the news.

B. Reasons and effects of minimization of the habitable areas

Can one affirm that the concentration has for economic order reason, the wars, the famine, the illnesses, to find a middle to live better? Although the cities raise the questions of the lodging politics, that have because of the cohabitation of the different race peoples, cultures to extol the multi culturalité in Urban Environment. Is it necessary to reexamine the conditions of the distribution of the surface habitable m^2 /person in a certain city in relation to the partition of the parcels?

At the controversial and Roman time where the concentration of the inhabitants in the foundation of Alexandria makes that the areas will owe to the limit. It is there that Pythagore developed its thesis of the doctorate the hypotenuse (HS) being equal to the root squared of the sum squared of length (L) and of width (l)

$$H = \sqrt{L^2 + l^2}$$

Of this relation, at the present time, all shapes of the parcels are sold and parceled out below in different fractal shapes Fig.1: Of this relation, at the present

time all shapes of the parcels are sold and parceled out below in different fractal shapes Fig.1

Fig. 1: Shapes of parcels going from A1 in A7

The tendency drives to a variety of parcel A_i *ou* $i = 1,2,..,7.$

The accessibility to kinds of the parcels poses problems of mobility, security, hygiene, and Environment bound to the climatic warming up.

III. CRITERIAS OF URBANISM FACE TO THE CONCENTRATION

Urban Boom

The problem of the acquirement of the social lodging and his/her/its possibilities of evolution or evolutionary us have permitted us to affirm without risk the exaggeration that all countries of the world faced, under a shape or under another, a challenge of lodging and of habitat. This problem can, in some cases, reach the dimension of a " crisis. " But the majority of the countries didn't become aware of the existence of such a crisis that lately, at the time of launching of the objectives of the millennium.

However, these evolutions have important consequences on the shapes and the organization of the cities. The mass of population that disembarks in the urbanized spaces requires the construction of lodgings that contributes to the urban display. However, the multiple difficult reasons to modéliser the reason of partition of the parcels and/or the concentration in urban Environment, explain himself according to the time searches for of the tranquillity " quiet time."

A. Concentration before the world war

The very little country was sensitive to the question of lodging, and therefore rare were the countries that had a " ministry of habitat. " some governmental administrations charged of the urban scheduling and the assignment of permit to construct, limited at the big cities, existed at most.

a) After the world war

The second war and his/her/its striking destruction cortege Europe, all as Russia and Japan, dragged important changes. First of all, a big part of the resources of every country has the to be affected to the construction the lodgings, the districts, and the cities. This is how the hundreds of districts saw the day and that the decades 50 and 60 were those of an urban boom without precedent. On the other hand, the years 70 recorded an enormous recession concerns building, all happening as if the Occidental Europa - since it is essentially about this one - could have satisfied the demand of all citizens in this domain and didn't have new construction need, of new buildings, anymore. Otherwise, the objective to reach on the extension of the individual property, sustained by the concession of subsidies, was dedicated by the practice. It is about a general phenomenon that touches the industrialized world - either Europe, the USA, and Japan. That has not been put back nor in reason by the conservative parties, nor by the socialists, even though he/it exists or varies them between one and the other: gain of seeing electoral accommodating!

b) Vestigial impact of the world war on the habitable surface in Europe of the East

The block of the East underwent quasi - total destruction of the capitals, and the big cities were disfigured entirely. It was necessary to elaborate economic, political, and social plans, therefore, to assure distribution balanced of the investments between the different sectors of habitat services and notably with regard to the lodging and the construction. Report " Of the millions of families has been forced then to cram in narrow lodgings or to share with others the same apartment. "

This state of thing lasts, but the objective searched for by the countries of the East is very clear: to assure to every family a lodging - certainly of small surface - but of individual occupation. This objective, for what is from Russia, had to be reached at the beginning of decade 90.

c). Lodging habitable surface to the west

The big power with the best urbanistic city of the world as New York; did the United States undergo a crisis of the lodging also in spite of the fact that the second war didn't affect their soil? The reformists have included very quickly that the political stability was extensively dependent on the standard of living assured to the population. Several programs have been proposed having notably for common object the resorption of the unsanitary dwelling zones in the black districts. He/it doesn't

remain less while 42 million people dedicate again today more of the third of their incomes to the payment of their lodging, that 12 million families live again in buildings ruined menacing to collapse. And the problem of the lodging represents again at the present time among the priorities of the Republican electoral programs as democrats - on a federal scale as to the one of each of the States. Some rents are always frozen, and the regional authorities don't have the power to raise this measure. This one comes back to the elected legislative assemblies when he/it doesn't prove to be necessary as it was the case in Virginia - decrees of sovereignty whose stake is enormous to the look of the interests fundamental of the society are to resort to the referendum of blockage and freeing of the rents and are submitted to the popular assent under a necessarily democratic shape. To the western country triumphing, the federal government grants help and subsidies to the states, so that they are able to facilitate to the citizens deprived the access at the lodging. These benefits, according to the cases of grants or loans, to the reduced interest rate. Otherwise, the federal government guarantees the loans thrown by the population to allow the various organisms of the Étatses of the union to assure a lodging to the more disinherited (sale or renting according to the individual resources).

d). Habitable surface in Asia

The approach of Africa by the report of China, he/it is true that in China thirty-eight years after the Maoist Revolution, the government of popular China come at the end of the food problem - decides to give the absolute priority to the question of the lodging considered understandably as the most important challenge than it has to raise at the present time. Lodging for every family, such as the objective that will only be reached to the beginning of the 18th century in spite of massive investments in the sector of the popular " habitat ": it is about accommodating people billion...! " Except unforeseeable political event, declared the Chinese minister of the habitat in Peking, every family possèdera an independent lodging in 2010 ". While waiting, 5% of the families living in the city only have 2 m^2 for each of his/her/its members is 2 m^2/habitant.

If the industrial countries are shaken by the question of lodging, are some of the countries in development or Africa in particular?

B. SURFACE OF PARCELS IN THE COUNTRIES IN DEVELOPMENT

The exodus of the countries toward the cities, gone to the recovered demographic growth drags a galloping and anarchical urbanization. The organization of the growth of the agglomerations inhabitable areas enter in zones of habitat, zones of activity, collective facilities and infrastructures of transportation, raise three types of politics: A politics of scheduling of the space; A politics of operational urbanism; A fundamental politics [6]

Among the political priorities of the countries of the Third-world, the question of the lodging is located in general, is a good place shortly after one of the food resources.

The exam of the reality puts in evidence some likeness in the question of the lodging as it presents itself of a country to the other: the acuteness of the crisis, the raised phenomenon importance essentially varying according to the conjuncture, of history, the climate, the culture, and the economy. It makes that the French-speaking Sub-sah The exam of the reality puts in evidence some likeness in the question of the lodging as it presents itself of a country to the other: the acuteness of the crisis, the raised phenomenon importance essentially varying according to the conjuncture, of history, the climate, the culture, and the economy. It makes that the French-speaking Africa Subsaharienne in relation to English-speaker has a disparity of the " density of soil " occupation are Africa in relation to English-speaker has a disparity of the " density of occupation of the soil."

a) African approach of the partition of the parcels

The African states knew exponential urbanization and a noncoherent politics of lodging and cadastral. The African, Asian and Latino-American Étatses have all to cope, of way more or less dramatic, with the problem of the lodging. It is not here about the continuations of World War II, but the question is bound - a curious paradox - to the accession of these countries to independence. Indeed, governments and new nation citizens only had an ambition: to improve a fast and sensitive way the standard of living of the layers the more disinherited. So food, lodging, instruction, health appeared like as many priorities in the different program's policies.

The habitat is a sensitive question in the big African cities, this notably of the deficit of the offer to the lands arranged for the claimants of lodging. He/it followed himself/itself a development of it spontaneous and anarchical s of some spaces, in the big cities as Kinshasa, Dakar, Abidjan, Accra, Lagos, Bamiléké (Cameroon) where one notes a big number is importing irregular districts with the urban district display. The thin of the policies of habitat programs remained a broken head with difficulty in general soluble for the sub-Saharan African authorities. The partition and the fundamental concentration in Cameroon remain the case hitting 2 toward the formation of two types of territories: a territory of partition and territory of fundamental concentration, all around of coffee

b). THE REASON THE REDUCTION OF SURFACE

The picture indicates some pages sample below to lead us in conformities of the reasons and the aforementioned effects that drove to the concentration of the cities in relation to the farming exodus in the world, to the effects of habitable surface minimization.

World	temporal Activities	Duration	Observations
Africa	- Contact Egypt and Jews -RD Congo with squatting -RSA (Soweto Jones Bourg)	16th century 2005-2011 1997,2005on this days	The new city of Alexandria
ASIA	-Dubaï (trade) -Chine		Limitation even the number of the domestic births
EU	- static and production-Infrastructure	- of the real estate After 2nd world war on this day	Rehabilitation of lodging and creation of new cities

IV. SIMULATION AND FRACTAL MODELLING

A. Simulation of the model

The rate of occupation of the number of habitats by m^2 remains difficult to normalize. It would be necessary to draw by the out-of-town and urban farming surroundings in the fashion of occupation of the parcels in the fashion of construction.

It is necessary to recall first of all that the construction in the farming environment is characterized by the recourse to local materials and by the very simple technique use. In the case of sub-Saharan Africa and in the case of Kinshasa, the fashion of very widespread construction - known of the Sudanese under the name of al - Qatiyya - is characterized by walls gone up in bricks rises in the water level, circular and of a height of 1,50 m to 2 m permitting to stand up or slightly tilted as well as by a roof constituted of trunks of trees recovered in the villages near of Kinshasa. In the villages, one uses the stems of bamboos pushing along the streams and channels. The farming civilizations created the brick made of silt and various products of culture, these last preventing that she/it splits herself/itself in the sun. Others use the leaves of the banana trees, and one bruises them in straw. Although the cement of Portland was not discovered in 1817, Louis Vicat doesn't have a patent of his/her/its invention. In the same way, in the mountainous zone, the men knew how to construct their lodging while using the local materials: stones and blocks of stone cemented with the help of a mixture makes sand and quick lime, or with the help of clay.

The construction of lodgings, on the whole of the developing countries as the Democratic Republic of Congo, had a price of comes back very little elevated insofar as this one used present materials in abundance on the local market and that it didn't have to call on a specialized hand - d'œuvre. One constructed his/her/its lodging outside of the seasons of culture or hunt, with the help of the family and neighbors. What attracts the population toward the cities was only the drinking water, the worn-out water evacuation, electricity, a work of quality,…

A tacit social pact was adopted then: the state assigned to bring the leisure but imposed in counterpart his/her/its ideology and insured of the means to spread it. It is only later than a video recorder and movie video permitted to the population to reduce - partially of course - the hand put of the state on the mass media, what comes back currently to the TIC.

After the independence, the inhabitants of the countries flowed massively toward the cities, fleeing unemployment and a too precarious standard of living. (while also fleeing of hardly and several reasons), as in Goma concentrated to the East of DR Congo and those of Kasaï concentrated in Kikwit.

The urban infrastructure was not able evidently to face this " surprised " emigration and was prepared there by no means. These new newcomers could not reach the existing lodgings because of their cost, they gaze at therefore to construct, according to their means, and without a permit, provoking the casual district emergence grasping the cities, elevated lodgings to the hurry, from the residues of the city, junks, and cardboards, to which are added the brick sometimes. In some cases, these constructions took back the shapes of traditional lodgings. This aspect is visible even in the city of Kinshasa in the district named " Pakandjuma " in Funa.

a) Fractalisation of the habitable surface.

It can pull her it's source primary many authors [1-3] is fundamental, of which our contribution on the idea of minimization of the habitable surface will drive a measure as 4m^2 /hab.

1) Introduction to the fractalisalisation

The geometry of nature so-called fractal of the Latin " fractus " that means " irregular or broken "; this irregularity in the habitable areas on the earth is well a simple fraction, like 1/2 or 5/3 and even an irrational number as 1,2618, etc. to define in the D-2>0 inequality; D>0 of where D Ao: est the initial habitable surface, n, is a number of partition[10-11].

The fractal has its strength by his/her/its interdisciplinary character, the fact that it réssortisse to nearly all domains of the science and knowledge to offer attractive illustrations, as the case of minimization of the habitable areas [7]. The classic probability going from 0 to 1 by his/her/its extension fractale of 1 to 2 and even of 2 to 3, justify the inequality

2) The application of fractal Tragram

Poverty incited the partition of the parcels, while wealth causes the acquisition of the farms of big habitable areas, that the standard of the norm should impose themselves in the urbanism and the architecture of this 21éme century in order to confront the challenges of climatic warming up and night-light soil planet.

The tangram is a game that the owners use currently for the partition of their parcels, the investigations on the city of Kinshasa open numerous geometries of the areas, simple rectangles, trapezes, parallelogram, squares, etc.

From where a parcel of dimension is, it has been parceled out in 3, 4, 5, 6, 7. Case of the townships urbanized, as Limete, Lemba and as much a lot of other townships, because reasons are multiple.

b) Paving of Whitney

A habitable surface is a plan himself lon Claude Tricot in an E whole of U. basis The parcels bound in known Cns in complementary agglomerations, and one can affirm that Von Kock in a compact proposes [11-12]:

$$E = \overline{U - UC_n}$$

U where the element already finished triangular or oblong precise to the point (2.2) as shapes of any parcels going from A1 in A7

$$e(C_n) = \Delta(E)$$

If the paving in a f network of closed squares of the type

$$\left[j2^{-n},(j+1)2^{-n}\right]*\left[k2^{-n},(k+1)2^{-n}\right], j,k,n$$

One takes for the distance the one of the maximum:

$$d(x,y)=\max\{|x_1-y_1|,|x_2-y_2|\}$$

that on-time stretches toward zero. 6.5 m < d < 10m.

B. Formulation of the fractalization of the habitable areas

The tendency of the partition of the parcels enters in our African habits that it is for the farms and the habitable areas. The illustrative cases of the R.D.Congo and Cameroon testify it, [1,2].

In this context, the reflections coupled the architect, the urbanist, and the civil engineer confronted to the numerous parameters of which one cannot classify for every group, but that converge toward the research of the well-being of all.

We admit that variable non-negative that contribute to equations that we suppose linear that will be well on the constraints met to raise the challenges of the 21st active century until the m=17 like variables.

The variables are:

X1: the rate of the number of people by habitable m2;

X2: surface normalized of the buildings and buildings;

X3: the surface normalized of the gardens;

X4: the rate of air concentration in a piece;

X5: the dimensionality of the windows and doors;

Xn-1: the demography;

Xn: the farming exodus (effect);

Xn+1: the economic conjuncture (cost of transportation, of food,…);

Let's proceed to the simple formulation (4) below (4):

Where the coefficients $a_{ij}\,(j=1,2,\ldots,n+m), i=1,2,\ldots,m$ *et* $b_i(i=1,2,\ldots,m)$

$$\begin{cases} a_{11}x_1+a_{12}x_2+\cdots+a_{1n}x_n+a_{1,n+1}x_{n+1}+\cdots+a_{1,n+m}x_{n+m}=b_1 \\ a_{21}x_1+a_{22}x_2+\cdots+a_{2n}x_n+a_{2,n+1}x_{n+1}+\cdots+a_{2,n+m}x_{n+m}=b_2 \\ a_{31}x_1+a_{32}x_3+\ldots+a_{3n}x_n+a_{3n+1}x_{n+1}+\ldots..+a_{3,n+m}x_{n+m}=b_3 \\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \\ a_{m1}x_1+a_{m2}x_2+\ldots.+a_{mn}x_n+a_{m,n+1}x_{n+1}+\ldots.+a_{m,n+m}x_{n+m}=b_m \end{cases}$$

Are of numbers on which all challenges to raise will be the object of the particular hypotheses in the partition of the Xns parcels.

Although the objective is to put the human in the conditions the best, this tendency of fractalization is, therefore, a fact the minimization of the habitable surface [12]

(5)

$$Z=C_1x_1+C_2x_2+\ldots+C_nx_n+C_{n+1}x_{n+1}+\ldots+C_{n+m}x_{n+m}$$

The coefficient $C_j(j=1,2,\ldots,n+m)$

To condense the writing, the relations (4) and (5) will be represented like follows:

$$\sum_{i=1}^{n=m}a_{ij}x_j=b_1 \quad i=1,2,\ldots,m \tag{6}$$

And

$$Z=\sum_{j=1}^{n+m}C_jx_j \tag{7}$$

The real fact of the minimization [13] of the habitable surface, some fractalization confers to find a plausible explanation so that the conditions are nonadmissible while making minimal the surface habitable Z given by the relation (7)

The urbanistic criteria of architects and the civil engineers generate inequations of the place of equations or all, showing that the bedroom cannot have less than 1,80 x m 1,80 m in accordance with the norms of architecture.

$$Surface\ doit\ être \geq M\ m^2$$

$$S \geq M\ m^2\ alors\ on\ a\ la\ relation \tag{8}$$

$$\sum_{i=1}^{n=m}a_{ij}x_j=b_1 \quad i=1,2,\ldots,m \tag{8}$$

And

$$Z = \sum_{j=1}^{n+m} C_j x_j \quad (9)$$

The new variable named variables of the gap, all non-negative and as:

The m equations (6)

$$\sum_{i=1}^{n=m} a_{ij} x_j = b_1 \quad i = 1, 2, ..., m$$

Where the matrix [aij] is of rank m by hypothesis and the function:

$$Z = \sum_{j=1}^{n+m} C_j x_j \quad (10)$$

From where we can write under matrix shape

$$Ax = B \quad (11)$$

$$Cx = Z \quad (12)$$

Where

$$A = [a_{ij}],\ X = \begin{Bmatrix} x_1 \\ x_2 \\ . \\ x_n \\ x_{n+1} \\ . \\ x_{n+m} \end{Bmatrix} \quad B = \begin{Bmatrix} b_1 \\ b_2 \\ . \\ b_m \end{Bmatrix}$$

$$C = [c_1,\ c_2,\ ...,\ c_{n+m}]$$

The writing A; to designate has a vector column

$$A_I = \begin{Bmatrix} a_{11} \\ a_{21} \\ . \\ a_{m1} \end{Bmatrix}$$

$$\sum_{i=n+1}^{n+m} A_i x_i = B$$

Then (11) is

$$Z = \sum_{i=n+1}^{n+m} C_i x_i$$

And that (12) becomes

With

$x_i \geq 0 \quad pour \quad tout \quad i = n+1, n+2, ..., n+m, et$

$$B = \begin{Bmatrix} b_1 \\ b_2 \\ . \\ b_n \end{Bmatrix}$$

Have them being m vectors columns of nature TO the n another vector Ajs, j=1,...,n, can be expressed linearly according to the m vectors that constitute a basis of the vectorial space to m measurements

$$A_j = \sum_{i=n+1}^{n+m} x_{ij} A_i \quad pour\ j = 1, 2, ..., n \quad (13)$$

$$Z_j = \sum_{i=n+1}^{n+m} x_{ij} C_i \quad pour\ j = 1, 2, ..., n \quad (14)$$

$$\theta A_j = \sum_{i=n+1}^{n+m} \theta x_{ij} A_i \quad pour \quad (15)$$

$$\theta A_j = \sum_{i=n+1}^{n+m} \theta x_{ij} A_i \quad pour \quad (16)$$

$$\theta (C_j - Z_j)$$

Let's add to the two members

One gets

$$Z + \theta (C_j - Z_j) = \sum_{j=n+1}^{n+m} C_i x_i + \theta (C_j - Z_j)$$

$$\theta Z_j = \sum_{i=n+1}^{n+m} \theta x_{ij} C_i$$

But after

With the solution

$x_1=x_2=....=x_n=0$

$x_{n+1}=b_1$

$x_{n+2}=b_2$

…… ……

$x_{n+m}=b_m$

C. The poor district growth rate

Either two times superior to one of the sets of the city. Most capitals and big cities in the SUB-SAHAR

Saharan Africa were surrounded very quickly by these casual districts whose populations caused the hostility of the inhabitants of the city that feared them and opposed their presence. These districts were razed at the bulldozer, the governments - that didn't give themselves the pain to study the phenomenon and to look for the reasons of it - considering them as an illness, an epidemic.

D. The marriage modeled of iron and the concrete

The genius of the building and the habitable space should construct itself in the norms, quickly and in a cost reduces. The technology of the concrete flowed on the yard and framings tools (framings - tunnels, branches, and tables framings, framings slip) that constitutes one of the shapes of a better production if one parcels out and one increases in height.

It would be necessary to develop the ability in the domain of prefabrication or constructions by components [14].

The manufacture of the concrete requires the presence of sand, stones, and available gravels on the whole surface of the globe that it agrees to mix to water and the cement following simple and easy techniques to master. The cement makes of clay and limestone, also frequent and little expensive matters, demand as for it a very high cooking temperature, what represents an important expense of energy and therefore a price of comes back elevated, especially since the oil crisis. The price of the ton of cement passed from 5 to 30 $during the decade 70, without counting expenses of transportation, what is not the case of the RDcongo where the ton of cement costs vicinities 160 $.

Yet " the cement is to the construction what bread is the man's, "indispensable. And the poor country scientists could have tried to improve the performances of these available raw materials in quantity on the local market... what they didn't make.

The manufacture of iron to concrete came out again to the heavy industry. Rare are the countries of the Third-world capable of uniting the raw materials, the suitable technology, and the necessary investments at a time. They had therefore resort to the import of iron to concrete, and by the backlash, the complex steel-making proliferated by the world. The competition became as Japan, for example, gave up most heavy industries, which being is moreover polluting and dangerous for the Environment and sismic situations[15].

This country played the card of electronics, an industry in which it passed master, then and that assures him an international presence of " terrific economic " power. We only admit about 100 kgs of reinforced concrete fer/m^3. To come back from it iron to concrete, one will want to underline how much the man succeeded there a happy marriage: two materials to the neighboring coefficients of dilation, capable of facing the heat together...! Remain that iron to concrete is expensive. He/it only takes part for 0,5 in 1% of them of concrete armed, in the setting of the plain constructions, but represents yet about half of the price of this m^3.

V. CONCLUSION

Already at the year 2000, the urban zones sheltered more the half of the population of the globe; more than 60 cities (45 for the only Third-world) will count more than 5 million inhabitants, of which the Cairo and Alexandria.

The simulation going from the year 2000 to 2063 started of the objectives of the famous millennium that the urban zones sheltered more the half of the population of the globe. Of 2063, the demographic growth will be about 12 billion people according to Python, and that the climatic warming up question facing the partition of the parcels won't have any analytic solutions in the gouvernabilité of the models of the equations to the partial derivatives, or is the number of no one by habitable surface.

*To make itself/themselves " open and " the doors of the civilization and the progress. " They are not conscious of the reality hidden of the thing. It will be necessary to warn or to anticipate the coupling of the big urban city and the social ecology in the partition of the parcels in the urban environment.

*The Fractalisation[16] helps towards the scientific understanding by the different geometric shapes of the various areas

*The partition and the concentration reach importable doorsteps so that the conflicts explode in broad day-

light with the perverse effect of hygiene, of climatic warming up, of sanitary,

*The demographic growth and the farming exodus are the factors that encourage the minimization of the living conditions on the surface of the overcrowded urban Environment.

*The political will concerning lodging and cadastral would be a priority of tomorrow better [17]. The display and the creation of new cities respecting the norms could answer the preoccupations of our consistency any between the simulation and the present model fractal. We hope in the future to simulate variational of distances, perimeter, and the section habitable in bidimendimensional approach and volume for the IGH "Immeuble de Grandes Hauteurs" for minimax appropriated surface 9 m*10m (See Annex figures).

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REFERENCES

[1] Laetitia Of Alora Schwartombruber - Jean Michel Torrent, The big book of the concretes Ed. The MONITOR.,124.
[2] Aristide Yammafono, Partition and fundamental concentration: of the complex realities in Bamiléké country. The example of the department of the Bamboutoses (Cameroon). Parceling and land concentration: actor and complex realities in the Bamiléké country places of Bamboutos division (Camerrom). University of Dschang-FLSH-Dpt Geography, P.O. BOX. 49 Dschangs, mod promenade ayemmafouofono x yahoo.fr, 16 pages(od) in International, Symposium the fundamental of the question fundamental At the frontier of land issues, Montpellier, (2006).
[3] The breakage and al (acls), the appropriation of the earth in black Africa, Paris, Kanthala, (1991).
[4] The R Roy, the fundamental securitization in the African context of imperfect mechanization of the earth: in, version, fundamental territory tensions, Blau-Pamard CS and Cambrézy LS (eds) Paris ORSSON,(1995),455-472.
[5] P.Buser, E. Tosan, Y. Weinand, Fractal geometry and its applications in the field of construction,EPPLIL/SMA, LYON/Liris, Epf:l, Ibris (Ad).
[6] Mr. Hemberg, V.M.O/killy, P. Nordin, TO design Tool heart surface generation, Gecco, (2001).
[7] B. Mandelbrot, the fractal geometry of nature, Freeman, (1982).
[8] P. Frank Hausser, The urban structure fractalité, Anthopos, Paris, (1994).
[9] M.F. Barnsley, Fractals Everywhere, Academic Near, Orlando, (1998).
[10] Pierre Frankhausser, The approach fractale: A new tool of reflection in spatial analysis of the urban agglomerations, Population, 1005-1040, 41997.
[11] C. Bovill, Fractal Geometry in architecture and Design, School of University architecture Manyland of, Boston, (1996).
[12] E. Guerin, Z. Tosan, I. Zammouri, iterative Model and areas of subdivision, GTMG 2005, Days of the workgroup in geometric modeling, Poitier, AFIG, GDR ALP and French chapter of Eurographics, (2005),121-135.16-17.Frederick S. Hillier, Gérald J. Lieberman, Introduction to operations research, Ninth Edition, Mc Graw Hill, Higher Education, New York, (2010).
[13] Sara Encamaçao et al., Fractal cartography of urban areas, Scientific plottings 2:527 DOIS:1038 Sneps 00527.
[14] Roch Babi, Stabilité des ouvrages du Génie civil dans une zone à haut risqué sismique, Thèse de doctorat, Université Libre de Bruxelles, (2000).
[15] Culling W.E.H&Datko, Mr., the fractal geometry of the soil-covered landscape Earth Surface Processes and landforms 12,369-385,(1987).
[16] Mbambu Kabeya Shaloom, Centre des energies renouvelables, TFC d'architecture,ESU/ ISAU Gombe, 2015-2016 et Rapport de Stage al'AEC Sprl.

Annex : Minimax Area of Habitacle (9m*10m).