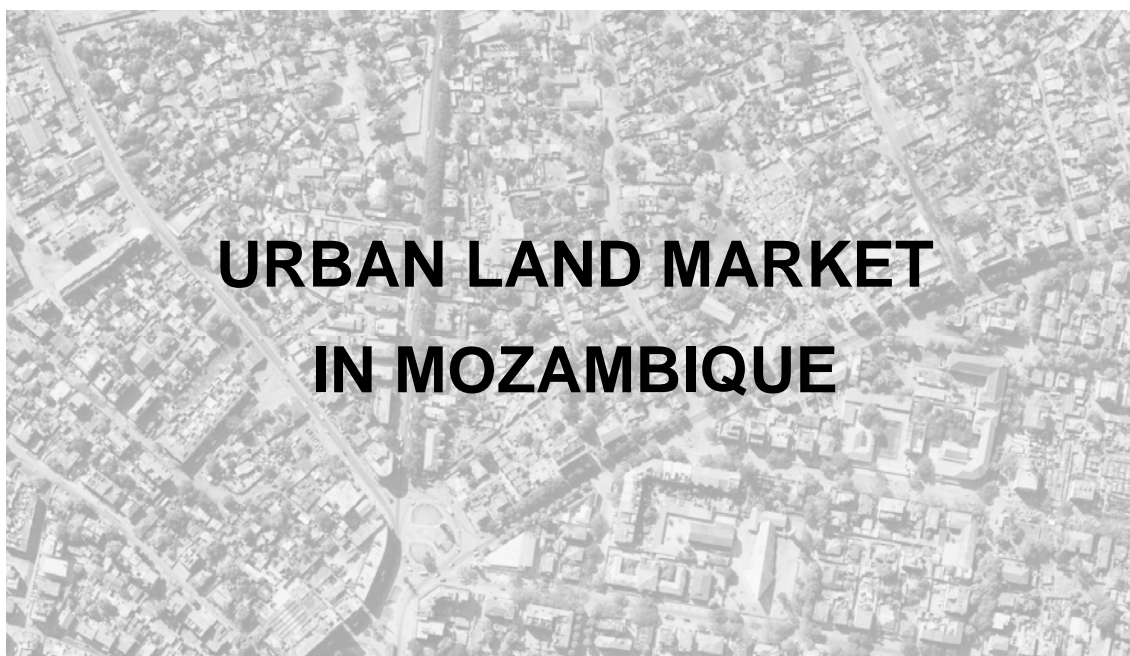


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Maputo, December 2004

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## **1. DEDICATORY**

(in the Memory of Late Prof. José Negrão)  
TO BE PROVIDED BY CRUZEIRO DO SUL

## 2. INTRODUCTION

This study was requested by the Ministry for Coordination of Environmental Affairs (MICOA), through the National Directorate of Territorial Planning (DINAPOT) in conjunction with the United Nations Human Settlements Programme (UN-HABITAT); for this purpose, the team of the *Cruzeiro do Sul* – Research Institute for Development counted with the participation of a group of students of the Master degree course in agricultural development at the Faculty of Agronomy and Forestry Engineering (FAEF) of the Eduardo Mondlane University (UEM).

Study proceedings of the urban land market date back from the year 2003, when the Ministry of Agriculture and Rural Development in coordination with the CTA – Confederation of Economic Associations, requested to the *Cruzeiro do Sul* a study on the rural land market aimed at determining the allocation efficiency of the rural land through the market, identifying the regulation and participation instruments of the various partners in the land allocation as well as modelling the interaction between the demand for land, its purpose and the sustainable use of the natural resources.

It turned out from this study that the land concentration rate to which use rights had been granted by the Government was strong, while in those to which use rights had been acquired through customary systems or occupation in good faith, it was weak to average.

Due to the significant differences between the various forms of allocation of rural land in terms of social justice and to the strong possibility of this to happen for the urban land, the Ministry for Coordination of Environmental Affairs and UN-HABITAT, requested to *Cruzeiro do Sul* to undertake a study of the *urban land market* in Mozambique.

The aim is at identifying the coverage and the dynamics of the urban land markets, surveying the implications of the same and identifying prevention mechanisms of social injustices in the tenure and use of the urban land. Mechanisms that can revert the eventual trend of unsustainable urban growth, as well as improving the economic and social use of the urban land, aimed at upgrading the life quality of the citizens, will be explored.

For this to happen, the identification of the forms of access to the land, the comparison of the land allocation efficiency and the estimation of the market value of the urban land was undertaken. The rural-urban linkage had as background the modelling of the sustainable urban growth of the cities of small and average size. The model constructed – MoCUS, is meant to assist city councils and stakeholders of the civil society in resources management, urban planning, prevention of social conflicts, and in strengthening the economic and social use of the urban space.

We thank all the people who supported the accomplishment of this study, especially the Mayors of the cities of Manica and Nacala, the councillors dealing with urbanisation issues and the respective municipal assemblies. Special thanks go to the contribution given by Professor José Forjaz from the Faculty of Architecture and Physical Planning of the UEM.

### 3. PROBLEM STATEMENT

The study on Urban Land Market intends to identify the allocation efficiency of the urban land through the various institutional mechanisms used and the interaction between urban and rural areas. The aim is at identifying forms that allow a sustainable growth of the cities, that guarantee secure land tenure and housing to the citizens and at concretising the Millennium Development Goal of "Cities Without Slum".

Transactions of goods and of acquired land rights are ongoing processes since a long time in the main urban centres of Mozambique. Therefore, the article 16 of the Land Law and the article 16 of the related Regulation foresee the possibility of transmission of urban buildings together with its automatic transmission of use of the respective land.

It is understood by "land market" the transactions of goods and of acquired land rights carried out through a voluntary agreement between two people or groups of people represented by agents. Thus, the land market emerges whenever there are potential "buyers" who contact potential "sellers" and have a common equivalent, and the said equivalent must be in money or in kind as identified through negotiation.

If the distribution of land is equal, whereby everybody has what he or she needs, nobody has more land or less land, then there is no land market and it is the Government's responsibility to manage the available funds allocated for land in order to ensure a sustainable use of the natural resources associated with land. Nevertheless, this situation is less common, since the population growth and the gradual integration of the familiar and entrepreneurial economies in the market lead to the increase of land demand from those who own less land or do not have land at all. The same applies to those who, for various reasons, own more land than their capacity to exploit it, thus are willing to lease, temporarily or permanently, their goods and associated rights directly to others, without the intervention of the State as intermediary agent.

Preliminary field surveys and literature review confirm the existence of three types of differentiated markets: the market that concerns the built-up city centre ("*Zona de Cimento*"), the market of the peri-urban areas and the market of the "green belt" areas. It was important to verify if this typology was correct and if eventually sub-typologies with differentiated characteristics existed.

The previous study concluded that the typologies indicate different actors which economic and social impacts and behaviours are, most of the times, opposed to each other. This means that, among the poor people, accessing land through the market leads to a more efficient use and produces positive correlations with the job, insurance and capital markets, while among the rich people, such efficiency is weaker and the correlations tend in average to be negative. On the other hand, it was observed that the social returns within the informal or customary institutional framework are greater than those received in the formal context. It was important therefore, to verify the land situation in the urban areas and to understand up to what point it could or would lead to situations of unsustainable use of the urban land.

The determination of the land market values, as well as of the reservation and offer prices, is essential for regulating the transmissions of land rights either through the market, through Government allocation or through consuetudinary systems. The more accurate is the determination and dissemination of these values, the less will be the transaction costs for the potential "buyer" and the potential "seller", the less will be the possibility of corrupting concerned employees and the higher will be the revenues of the State or the City Councils. The higher is the fiscal revenue, the greater will be the benefit through the improvement of living standards in the urban areas.

The State does not have, nor will have at a short or medium term, the possibility to urbanise new land, build infrastructure and install social equipments at the same speed as the demand growth. For this reason, the access to urban land through the market will tend to increase. The unplanned urban growth will increase at rhythms difficult to be controlled and urban poverty will increase.

It is therefore urgent to develop instruments that allow City Councils and surrounding Administration Districts to foresee what will happen in the coming years in order to take preventive measures and, thus, reverting the trend of increased urban poverty.

#### 4. LITERATURE REVIEW

Until mid 1980's land management theories were bipolarized between the collectivisation theory and the evolutionary theory of property rights. The first one, followed by socialist-oriented countries, argued that the Government's responsibility was to allocate the land, build infrastructure, social equipment and housing, while the responsibility of the citizen was to pay the utilisation fee destined to cover the maintenance costs and at replacing the real estate agency of the State. The land was seen as a common good and, as such, had to be managed by the State, being the latter's responsibility to provide service to the citizen by building houses, as stated by Engels in his work on housing market.

The second theory considered land and related services as merchandise which allocation depended on the offer and the demand, in other words, on the market. The lesser the Government's interference in land allocation and more free is the determination of the selling and purchase prices of land and housing, the more perfect would be the market performance and, consequently, the benefits of the citizen. The responsibility of the State was then to elaborate an urban plan and to monitor rigorously the fulfilment of the rules during its implementation [Balchin and Kieve, 1977].

In both cases, practice demonstrated that neither the State nor the market alone had an allocation efficiency that corresponded to the dimension of the growing demand for urban land and the interaction with the surrounding rural areas. In the first case, it was common to have three or more families to reside in the physical space granted for only one family, and in the second case an unplanned growth of slum or informal neighbourhoods emerged where health and sanitation levels were below the minimum standards accepted as compatible with the citizens' rights.

It is in this context that the so-called new economy of land tenure [Stevens and Jabara, 1988] was developed. The main argument is that the legal framework should not focus on who is responsible for land allocation, urban land management and housing construction, instead, it should concentrate on how to take advantage of the economic opportunities resulting from the technological changes and the variation of relative prices in the market. According to the new economy on land tenure, the allocation efficiency does not depend on the entity which executes it but rather on the institutional framework where it operates. The simpler, transparent and participative this framework is, the greater will be the allocation efficiency of all the actors, independently if it is the State or real-estate agents, a simple citizen or a group of citizens.

In other words, the values of land use or land market are not determined by the Laws approved in parliaments, but by the perception of the citizen, as individual or group, concerning the relative value of the land according to the demand growth. The perception of the citizen, according to Ding [2001], is of particular importance since the urban growth is determined by decision-making *inter-temporal* processes, i.e. the citizen takes a decision only after having duly pondered the subsequent decisions to be taken.

However, it should be noted that the land is the only production factor which has a fixed total offer; therefore, it cannot be compared to the capital and the work, which flexibility is almost perfect. Consequently, the land substitutability with capital and work is not perfect [Negrão, 1995].

In addition, when there is an investment in a certain land plot, its relative value increases and there is less possibility for the immigrants to have access to it, which slows down the immigration process and, at the same time, excludes the poor [Bruecknere and Kim, 2001]. That is why David Ricardo used to say that the value of rural land is determined by what it offers (soil quality, water availability, etc.), while the price of urban land depends on the demand (localisation and available area) and on what had been constructed or invested in it.

Since the capacity and investment availability of the city councils in urbanising additional land is slower than the speed of the demand growth, there is a time discrepancy between the two, even when the adjudication is by definition done exclusively by the State, as it happens in socialist-oriented countries, hence a space for the occurrence of market activities is created, as explained by Li for the Chinese case [Li, 2003].

This market is complex and multifaceted, as stated by Gough and Yankson while referring to Ghana. The transaction of land rights may be processed through real estate agencies, where the



rights are automatically transferred together with the sale of the associated goods, or through subdivision or rent, subject or not to registration. This can happen between families through the allowance of occupation rights, or through a local leader or corresponding entity which serves as an intermediate to a potential seller [Gough and Yankson, 2000].

The complexity of the urban land market led to the development of three markets, which in theory are distinct but, in practice, are quite intertwined: (i) the market of purchase and sale of land, (ii) the housing market and (iii) the renting market. Such urban land market as a whole is actually not an organised market where there is a buying and selling place, as it would be for mobile merchandise, but an aggregate of uncountable businesses, big and small, which involve plots or constructions totally heterogeneous. Perhaps due to complexity of the concerned transactions, to the number of stakeholders and to the permanent unbalance between demand and offer in each type of market, the specialised literature shows a series of imperfections of the urban land market. For some researchers these imperfections are endogenous, which, to their opinion, justifies the intervention of the State [Toulmin and Quan, 2000], while for others these are temporary imperfections which are essentially due to the persistent intervention of the State in the market activities [Binswanger and Deininger, 1993; Antwi and Adams, 2003; Teklu, 2004].

Among the various endogenous imperfections of the market that were identified, the following should be highlighted:

- i. The allocation efficiency is inherently imperfect, either concerning the transactions among individuals or concerning its different use (housing, commercial, industrial, agriculture, etc.), since it is uncommon or even impossible in situation of demographic or economic growth to have a balance between offer and demand;
- ii. Since the assessment criteria of land use and land value are determined by the price mechanism, they disregard the need of having less lucrative or non-lucrative land use, even when it is for socially desirable purposes, such as for building schools, hospitals or for public and recreational use;
- iii. In the urbanised areas, when emphasizing the private profit, the financial nature of the urban property market, preserves and enhances the social inequalities, many times based not in the enterprise performance of the owner, but in the monopolistic nature of the buyer;
- iv. In the non-urbanised areas, the market tends to allocate land through subdivision or renting in areas prone to erosion and without natural drainage, among other aspects, degrading the environment and making it impossible to build infrastructure and social buildings [Balchin and Kieve, 1977; Bruce, 1993; Jenkins, 2001; Royston, 2004].

Taking these aspects into consideration, Paul Jenkins advocates an institutional approach that supports the organic articulation between several actors as a way to minimise the market imperfections and increase the allocation efficiency of the offer.

In the case of the urban property market in Mozambique, Jenkins identified three actors to be taken into consideration: the State, which makes the formal allocation of the land; the Private Sector, where the land allocations are made according to the market rules, followed by a formalisation process; and the Civil Society, which deals with the informal land market. Independently from agreeing or not with the selected designations, what Jenkins highlights is the need for having an urban land market typology, and he suggests as typology categories: the stakeholders, the formal registration system and the recognition of the informal transactions [Jenkins, 2001].

Lasserve and Royston in 2002 had already mentioned the need for building a typology which facilitates the analysis and the elaboration of feasible and concrete policies. They also suggested as categories of such typology the stakeholders, the formal and informal registration systems, and added another one, which is the way transactions are carried out. For example, in the case of informal land markets, they presented three approaches: subdivision; renting and sub-renting; and simple occupation, i.e. the one which has not been previously authorised [Royston, 2004].

In brief, literature identifies the definition of a typology, the characterisation of demand and offer, and the description of forms of access as indispensable elements for a study of this nature.

Another frequent indicator used for controlling the imperfections of the offer allocation is the Concentration Rate or “*Gini Coefficient*” and the respective “*Lorenz Curve*”. The Concentration Rate is a tool which allows identifying the distribution of a good, i.e. the land in this case, among various users. If all available land is equitably distributed among all the citizens, the Concentration Rate is 0 (zero), if it is in the hands of only one person, then it is 1 (one). The Concentration Levels Classification usually presents six levels, being the smallest from 0.000 to 0.100, nihil concentration, and the highest from 0.900 to 1.000, very strong to absolute concentration [Caparroz, 1997].

Literature also identifies as indicator of the allocating efficiency the value of the land market analysed jointly with the factors determining the relative values. The demand increase is seen as the main variable to be taken into consideration together with the consequent land scarcity, which determines the user's perception of the demand concerning the value of the land and its associated goods.

In general, literature indicates that when the land is abundant, its value is provided by its symbolic meaning and management is carried out by local institutions according to norms and customs commonly accepted. However, whenever the demand grows, the perception of the land value changes, and this is then seen as a “resource” which needs to be preserved and used according to norms and rules, most of the time of legal nature, under the State's responsibility. When the demand further increases, the tendency is to see the land as merchandise which can be bought and sold, either by transferring property rights or its associated goods [Norton, 2003]. Nevertheless, according to Lauren Royston, when the land passes to the category of merchandise, a perceptive tendency arises in parallel which acts in the opposite direction and considers the housing space not only as merchandise but also as a social space where emotional and affective relations develop [Royston, 2004].

According to the neoclassic evolutionary theory of the property rights, the change of land status to the category of merchandise is an unavoidable fact of History that will occur worldwide, as part of the modernisation process. Neo-Marxist theories advocate that the transformation of land into merchandise is part of a globalisation process where relations of the capitalist production are imposed on the customary rights where the land is, above all, a social property [Platteau, 1996; Deininger, 2004]. Independently from the adopted theoretical position, the empirical evidence produced to-date in Mozambique clearly shows that the demand growth leads to an increasing monetary value of the urban land, either the latter is located in the urbanised area (CBD), in the peri-urban area or in the “green belt” [CMCM, 1999; Chiziane, 1999; Bay, 2002; Adamo, 2003; Malauene, 2004].

The procedures on how to do a survey of such market price are widely argued in the specialised literature [Correia, 1993; Roth, 1994; Dale and McLaughlin, 1999; Pinheiro and Carvalho, 2003].

One of the adopted methodologies is the systematic data collection of the real estate agencies, its price conversion per m<sup>2</sup>, followed by the identification of eventual factors that determine this value, such as the localisation, the investment carried out, its purpose, etc. Nevertheless, this approach has its limitations; the first is that most of the transactions do not happen through real estate agencies. The second is that the real estate agencies tend to over-rate the factors that influence the price positively and eventually concealing those that may depreciate the selling price. The third is that through the real estate agencies one can hardly know the characteristics, for example, the quality of the benefits or the pollution level.

Another approach is collecting data through the banks which accept property as guarantee of granted loans. The bank expertise together with its knowledge of the housing market can be a good source of information. However, the main limit of this method is that, for situations like the one in Mozambique, the number of credits granted that were secured by real estate assets is relatively small, and that there are areas where the market of credits still does not exist or is at an incipient stage.

A third methodology is by sampling based on the price of reservation and the offering price. Michael Rotten applied it in 1994 while studying the urban land market of Maputo. Through a survey directed to a random sample with statistical validity, the selling or buying price was inquired (how much would you ask if someone was interested in buying the land?) as well as the price of purchase or offer (how much would be willing to pay for a piece of land with similar

characteristics?). In a balanced market, both prices should be equal, however, since the land market is rarely balanced, there is a difference between the two. According to the economic rationale, in an unbalanced situation, the price of reservation should be higher than the offering price; if the opposite turns out, it is either the case of a very strong affective relationship, which is not common, or there are distortions caused by the monopoly and consequent speculation.

The percentage between both prices and the price of reservation is considered an indicator of the dimension of the transaction costs, which are those related to the lack of information, bureaucracy and other obstacles to the free market performance. The higher the percentage, the higher the transaction costs.

The arithmetic average of both prices gives the market value, which is normally higher than its value of use (the difference between the market value and the value of use is called floating value or "development" value).

Lastly, there is the question of interaction between urban or city limits and the surrounding areas. The secret for a sustainable urban growth is the capacity to sustain the influx of immigrants at a rate which exceeds the urbanisation capacity of the city councils and to strengthen the economic and social use of the urban land.

The Brazilian Institute for Municipal Administration (IBAM) considers that **an urban area** should fulfil at least some of the following conditions:

- i. There is -or it is in process of being developed- a plot demarcation according to urban standards;
- ii. It includes human settlements which, considering the type of land use, the form of spatial occupation and the daily linkage with a nearby urban centre, need a plot demarcation process according to urban standards;
- iii. It includes some sort of urban infrastructure networks such as, for example, water supply and electricity networks; and
- iv. It includes some social equipment where the population tend to concentrate, such as market, school, hospital, etc.

In summary, there are five main research hypotheses:

1. As the demand grows, access to land through the market becomes the predominant -but not exclusive- form of urban land allocation through transactions which can or cannot be registered;
2. The market value is greater than the value of use, and the difference in percentage between the price of reservation and the offering price shows high transaction costs;
3. Access through the market has a positive correlation with private investment in the acquired land and housing, which means an increased value of the assets;
4. The weak allocating efficiency appears in the form of social injustice and unsustainable use of natural resources; and
5. It is possible to create a tool that allows future simulations aimed at identifying preventive measures to be implemented by the different stakeholders.

## 5. OBJECTIVES

According to the Terms of Reference, the objectives of the urban land market study are:

### **General Objectives**

- a) To measure the reach and dynamics of the urban land market, deduce future implications and identify mechanisms that can prevent the spread of social injustices;
- b) To revert the tendency of unsustainable urban growth; and
- c) To reinforce the economic and social use of the urban land, with aim at increasingly improving the life quality of the citizens.

### **Specific Objectives**

- 1. To identify the concentration index of the urban land;
- 2. To establish a typology of the urban land market;
- 3. To describe the market characteristics from the demand perspective and the offer perspective;
- 4. To discriminate the factors determining the relative values of the market price;
- 5. To estimate the relative market values, the price of reservation and the offer price;
- 6. To identify the type of current transactions which may lead to social injustice, unsustainable urban growth and other situations threatening the constitutional rights of the citizen;
- 7. To identify mechanisms which may increase the economic and social use of the urban land; and,
- 8. To model the sustainable management of urban land transactions.

## 6. METHODOLOGY AND SAMPLE CHARACTERISATION

The study adopted as methodological approach the following cycle of sequential steps:

- ❑ Literature review and hypothesis formulation
- ❑ Investigation consortium
- ❑ Selection of the urban areas
- ❑ Applied methods and data collection
- ❑ Data processing, analysis and interpretation
- ❑ Modelling
- ❑ Results presentation and dissemination

### ***Literature Review and Hypothesis Formulation***

This stage allowed revisiting the literature concerning the theoretical framework. Various study cases on land market were consulted, particularly in Africa and in Mozambique.

In addition, specialised literature on urban land management, formation and behaviour of the urban building markets and geo-referenced spatial modelling was also consulted.

Analytical hypotheses were formulated based on the literature review, which were considered crucial for the research.

### ***Investigation Consortium***

Since this represents an interdisciplinary study, it was felt necessary to involve and form a multidisciplinary team that could deal with the different components constituting the objectives of the study. Therefore, the *Cruzeiro do Sul* signed an agreement with the Faculty of Agronomy and Forestry Engineering (FAEF) of Eduardo Mondlane University (UEM) concerning the participation of a group of students attending the Master Degree course on Agricultural Development.

In the field, the terms of reference were presented to the provincial governments and discussed with the municipal councils of the cities of Manica and Nacala. Once the data collection phase has been concluded, a presentation of the findings made at the respective municipal assemblies.

The responsibility of the *Cruzeiro do Sul* was to perform the overall coordination of the study; the Institute was accountable for the final elaboration of the theoretical framework, followed methodologies and overall report, as well as for establishing synergies between the various actors involved. The students of the Master Degree course were tasked with the formulation of the research tools in the field and to identify the variables for building the sustainable urban growth model.

### ***Selection of the Urban Areas***

The cities of Manica and Nacala were selected after crossing some variables related to the standards and levels of urbanisation.

The basic criterion was to be urbanised or being in process of urbanization according to the criteria of the Brazilian Institute for Municipal Administration, IBAM, mentioned above.

The second criterion was to identify cities with dimensions which allowed studying them within the available time frame, and where it would have been possible to identify the main endogenous variables without being under pressure from a series of other exogenous factors, as it would happen, for example, in the capital city.

The third criterion was to identify two cities with such difference in dimensions that it could represent a valid indicator of the growth trend. The identification of the growth trends was crucial considering the high urban growth rate of the African cities.

Three conventional areas were defined within both cities: the urbanised area (Central Business District - CBD), the peri-urban area and the “green belt”. In each one of these areas, basic data were collected on the neighbourhoods, population, areas, infrastructure, services, as well as other information considered useful for carrying out the field work activities.

### **Applied Methods and Data Collection**

For each specific objective the most appropriated data collection method (or methods) was identified. Four methods were used: quantitative survey; semi-structured interview; focal-group; direct observation; and network analysis for modelling purposes. For each of them, a specific form or guidelines were elaborated (see in annex the survey form, semi-structured interview guidelines, focal-groups guidelines and observation guidelines).

For the quantitative survey, a pilot inquiry was carried out involving 30 people with aim at testing the questionnaire and determining the sample size. As a result, some of the questions were reformulated and the level of variability of the answers was assessed using as the main variable the form of accessing land. Based on the recorded answers, the standard deviation was calculated to determine the sample size. The results were then compared to the findings obtained while asking the same type of question during the data collection undertaken for the Agricultural Survey Work (*Trabalho do Inquérito Agrícola - TIA*) carried out in 2003, just for double-checking, since the TIA is applied in the rural areas and all over the country while the current one only in two cities.

When applying tests using the remaining answers which are not directly related with the forms of access, an irrelevant level of significance was recorded. Due to this result, it was preferred working with the classic method of  $n = (pq.Z^2)/(E^2)$ , where Z is the level of confidence at 99%, and E is the interval of confidence,  $\pm 4$ . After checking the answers of the remaining variables, the level of significance was judged acceptable for considering the obtained results statistically valid. By referring to the number of households, i.e. 6,139 in Manica and 22,855 in Nacala, the sample size was established as 789 for Manica and 994 for Nacala. Due to various reasons, only 765 inquiries out of 789 carried out for Manica were validated, thus, to prevent the occurrence of the same type of mistake, the sample size for Nacala was increased for which 997 inquiries were validated. In total, 1,759 out of 1,783 were validated, meaning a deficit of 24 inquiries, corresponding to 1.35% less than the total expected.

Once the sample size was defined, the next phase was to distribute it by areas (urbanised, peri-urban and “green belt”) and then, within each area, by neighbourhood. For this purpose satellite imagery was overlaid to existing digital mapping and cartography, with aim at identifying areas with elevated housing and population density, and at observing the spatial distribution and the territorial settings of resources and urban services, as well as the expansion trends of the municipalities for each area.

The selection of the households to be interviewed in each area was done through random sampling. The total number of families was divided by the sample size, combining it with systematic sampling methods in order to cover the different settlements and ensure proportionality, relying on official data supplied by the 1997 national population census, as well as data available in the administration of each municipality.

The sample is distributed by 17 neighborhoods, 8 in Manica (25 de Setembro, Josina Machel, Vumba, 4º Congresso, 7 de Abril, Manhate, Cacarué e Macorreia) and 9 in Nacala (Bloco 1, Ribaué, Mathapwé, Mawaia, Mocorre, Triângulo, Muzuane, Muxilipo and Quissimanjulo). In the urbanised areas 16% of the inquiries were carried out, 63% in the peri-urban areas and 20% in the “green belt” areas, corresponding to the average distribution of small and medium cities in Mozambique.

The semi-structured interviews were undertaken with key stakeholders such as community leaders, neighbourhood’s administrators, heads of blocks, municipal authorities, religious leaders, employers, influential elders of the neighbourhood. This instrument allowed collecting data related to the typology of the urban land market according to the demand and offer of land, as well as to the dynamics of conflicts and social justice.

On the other hand, semi-structured interviews were also carried out in citizens' focal groups such as women, men and elderly, which allowed identifying the different mechanisms of access and secure tenure, type of conflicts and ways of conflict resolution, citizen's participation in decision-making, participative or pro-active management, factors determining the preference of living location by socio-cultural groups (based on language and place of origin) and by average market value of the plot in the area.

Direct observation enabled the identification of factors determining the relative values of the market price from the side of the offer as well as aspects related to the sustainable use of resources. Therefore, the existence and conditions of urban infrastructure and services, social equipments and living standards were examined in order to complement the information collected through the other approaches.

The data collected for the modelling had for major objective to obtain information on the origin of the main agricultural products, household fuel, land, work and institutional set-up, with aim at assessing the level of dependency of the city from the surrounding areas concerning the above mentioned aspects. For this purpose, it was necessary to track such aspects through methods used for network analysis, in order to identify what goes in and out of the city, the interaction between urban and rural as well as the technological standards reached by the city.

### **Data Processing, Analysis and Interpretation**

A statistical database was built using the SPSS software after introducing and editing the information collected through the codification, digitalisation, cleaning and verification of the questionnaires.

Tests considered applicable case by case were carried out for analysing and interpreting the statistical data, mainly *t test*, *qui-square* and standard deviation analysis. The analytical method consisted in verifying the hypotheses by comparing the data resulting from the statistical survey with the various information collected through the semi-structured interviews, focal groups and observation guidelines.

The data interpretation was undertaken according to three main categories: (i) the forms of accessing land, (ii) the allocating efficiency of urban land versus performance, social justice and sustainable use of resources, and (iii) the land market value.

### **Modelling**

The model was built based on an interactive process that congregates three components: (i) the selection of variables, (ii) the definition of assumptions on which the model stands, and (iii) a theoretical elaboration explaining the correlation and interaction between the variables. All this process was done based on the study conclusions concerning the analysis and interpretation of the collected data. The model was built with aim at carrying out projections and simulations of the sustainable growth of cities.

### **Results Presentation and Dissemination**

Preliminary findings of the data collected in the two cities were presented to the Municipal Council and Assembly of the City of Manica and to the Municipal Council of the City of Nacala. The teams were accompanied by municipal staff during the whole fieldwork period, and all the steps and empirical conclusions were analysed jointly with the staff responsible for urbanisation.

The National Directorate of Territorial Planning (DINAPOT), within the Ministry for Coordination of Environmental Affairs (MICOA) and the United Nations Human Settlements Programme (UN-HABITAT) followed the study development and contributed to the analysis of the preliminary findings.

This research report will be disseminated to various partners and the interested public through the internet site of *Cruzeiro do Sul* [www.iid.org.mz](http://www.iid.org.mz).

## 7. ACCESS TO URBAN LAND

A land use system is a set of norms, rules and legal dispositions, written or not, which determines the forms of accessing and using the land, the control of existing or derived land products, and the transmission of rights of determined areas. Normally this set of dispositions is subject to a specific legislation, which is emitted whenever the legislator feels that there is a need for it. The land tenure issue as well as the norms related to the sustainable use of resources are generally defined at the level of the Constitution of the Republic, and serve as guidance for publishing concerned legislation and for executing of various customary rights systems.

For a matter of simplifying, normally, the expression “access to land” will be used, meaning the set of rules and regulations that constitute the land use system.

### a. Forms of Accessing the Land

Although land in the Republic of Mozambique is owned by the State, the latter does not have the exclusive role of allocating land. The Land Law [Law n. 14/97] foresees that the transmission of land use rights, and consequently access to land, may be done in four different ways: (i) through direct State allocation as consequence of an explicit request and approval of the respective land use plan; (ii) by allocation in the context of customary rights systems; (iii) by simple occupation, individually or collectively, provided that it is in good faith; (IV) and, indirectly, through the transmission of goods located in the plot, normally involving earning mechanisms; i.e. through the market which, for urban areas, implies the automatic transmission of the use rights of the entire plot.

In the studied urban areas it was observed that plots allocated directly through the State are less than 13% (226 cases out of 1,759) of the sample size, that customary systems are responsible for 19% (335) of land allocations, that simple occupation represents a bit more than 6% (112) and that access to the remaining 62% (1,086) of the plots occurred through the market. It was also verified that demand for land is higher in peri-urban areas, with 63% (1,109) of the identified cases against 17% (290) for urbanised areas and 20% (360) in the green belt areas. It is also in the peri-urban areas where access to land is done mainly by rights transaction through the market.

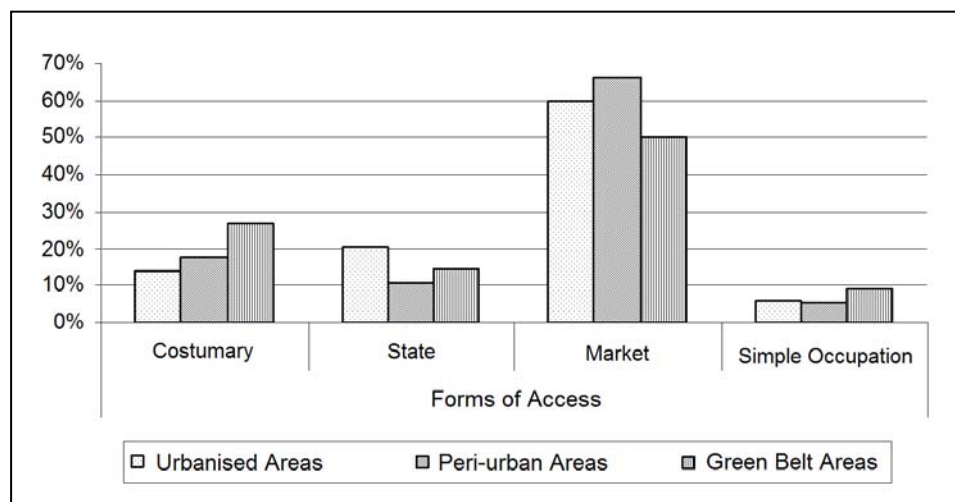
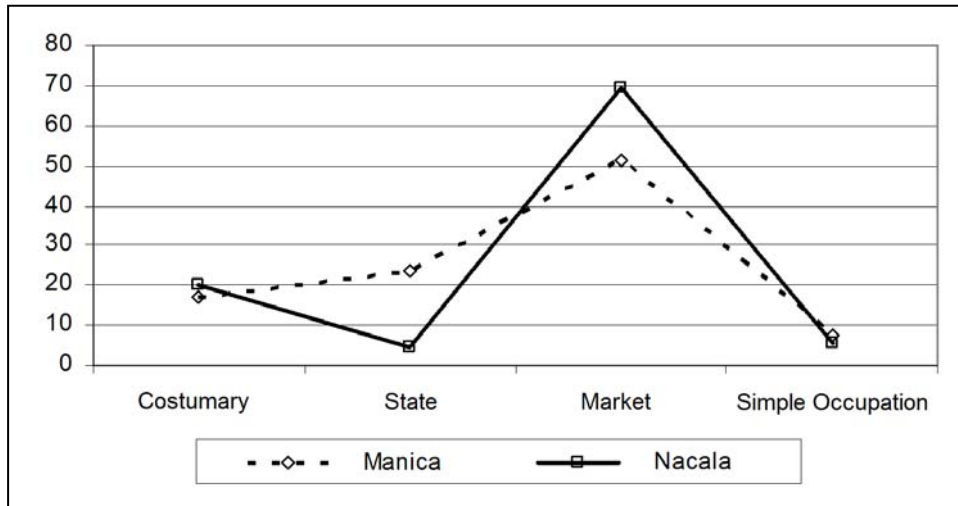


Figure 1: Forms of Accessing Land



By selecting the urban centres of Manica and Nacala, the aim was at identifying the evolution trend between the forms of accessing land and the urban growth. While establishing a comparison between both cities, the assumption is that Nacala City, being older and bigger, constitutes an image of what will probably happen with the current small urban centres.

The comparison between the forms of accessing land in these two cities is represented in Figure 2.



*Figure 2: Comparison between the forms of accessing land in Manica and Nacala*

The analysis of the data represented in the chart allows us to conclude that either the access through customary system or through simple occupation tend to remain the same in time as the city grows. However, there is a clear trend showing that the State is gradually replaced by the Market in terms of allocating forms of the urban land. It is also observed that access to land through the market tends to grow significantly in the peri-urban areas, with less intensity in the urbanised areas and remains steady in the green belt areas. In other words, there is a distinction between two types of market, one for the rich in the urbanised areas through formal rules, and one for the poor, usually informal, in the peri-urban areas.

It is natural to observe this gradual replacement of the State by the market. As it can be seen, the market is more active in the peri-urban areas, i.e. where there is a high demand for land due to the immigration coming from the rural areas. It is also observed that peri-urban areas grow in a radial manner, often occupying land with neither plot demarcation nor basic infrastructure. Ideally, the spatial growth of urban areas should take place only on demarcated land with minimum infrastructure to ensure adequate living conditions of the citizens. However, the State lacks of resources and means to create the minimum conditions in these areas before they are occupied; consequently, land is first occupied and only afterwards plot demarcation and infrastructure development is observed, as it is occurring in the two cities being studied. Literature shows and the study cases confirm that a balance between demand and offer for urbanised land is reached only exceptionally and for short periods, since normally demand is always higher than offer.

#### **b. Characteristics of the Demand**

While analysing the collected data, it can be observed that there are significant differences between the forms of accessing land and the characteristics of the families<sup>1</sup>. As these differences are related with the urban spatial distribution, and in the absence of master plans pre-establishing occupation rules, they determine the growth trends of each type of urban areas.

Families whose access to land was through simple occupation are those whose family size is the biggest, in average 7.31 people in the same plot, and whose ratio between number of people working and number of family members is the lowest of the four analysed groups, i.e. 0.3277. They are also those families whose percentage of young people is lower while the percentage of older people is higher; they occupy the second position concerning the heads of family who are illiterate, and they have the lowest percentage of the heads of families with primary education. These are, mainly, rural emigrants looking for jobs who are joining others from the same area of origin.

A totally different case is the one concerning the families whose access to land was through customary systems. These are the smallest families, i.e. 5.51 people per plot, and with the

<sup>1</sup> The adopted definition of "family" indicates people living in the same space, i.e. sharing "the same roof and the same pot" – independently of having or not direct family relationship.

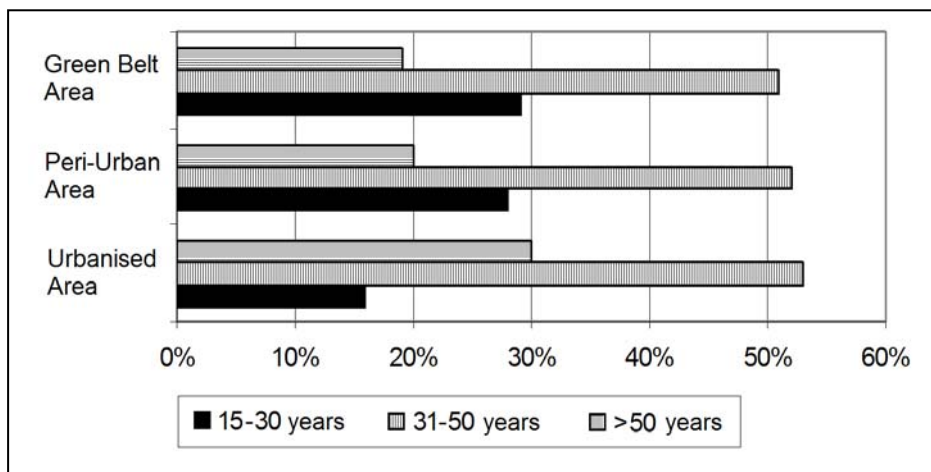
highest ratio between those who work and the number of family members, i.e. 0.4188. They show the highest percentage of children, the highest rate of illiterate head of families, but also the highest percentage of those with primary education. Although the family size is the smallest of the different types of urban areas, it is bigger than the average family size of the districts and provinces where the study took place. During the interviews, it was explained that these families do not allow one or two relatives coming from rural areas to live in their house. These are poor families which invest in their children's education, and which limit the access of rural emigrants according to their actual capacity of hosting them.

Those who had access to land through State allocation are characterised by having the second largest number of family members, with 6.85 members per plot, and with the second highest workers' ratio compared to the number of family members. They have more adults in working age and the highest percentage, together with those who have access to land through the market, of family heads with secondary school education and lowest of illiterate. This is a typical middle class which benefited from the housing sale of the State's real estate reserve. It is among these families that the greatest number of people available for transacting their rights through the market is found, either temporarily by renting, or definitively by selling their property.

Lastly, there is the group which had access to land through purchase. It is the second smallest in family size, i.e. 6.19 people, and has the second lowest ratio of workers per number of family members, i.e. 0.3453. This difference is due to the fact that, although this group has the lowest number of old people as heads of families, it is second in terms of number of children and adults, and has the greatest percentage of heads of families with secondary and higher education. These are families which, unlike the previous group, do not intend to sell or rent their house or plot unless a better house comes up in a more advantageous location.

As it can be observed in figures 3 and 4, the heads of families in the urbanised areas are older and have a higher level of education when compared to the other two types of areas. Concerning the age of the family head, there are no significant differences between "green belt" areas and peri-urban areas; however, the same is not occurring in terms of level of education, with the percentage of those having a primary education higher in the former areas and those with a secondary education higher in the latter areas.

When comparing the cities of Manica and Nacala in order to identify a trend and from the interviews, it can be concluded that the attraction to the urbanised area increases when the family head has secondary or higher education level, and tends to stabilize as shown by the higher average age of the family heads who live there. Since the education level is directly related to the family income (IAF 2003), the urbanised area is subject to more investment and land is more valued.



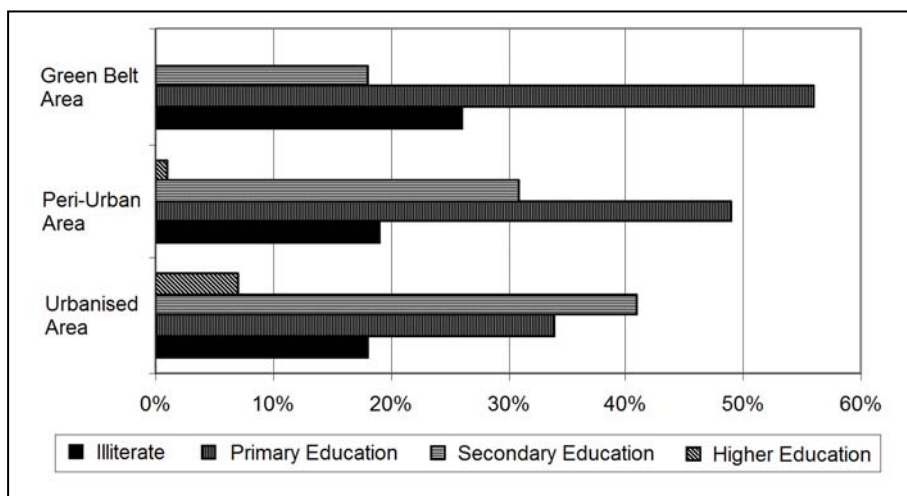
*Figure 3: Age of the family heads vs. type of urban area*

Peri-urban areas also show the same type of attraction phenomenon concerning heads of families and their level of education. Although there are very few cases of heads of families with higher education living there, the percentage of those with secondary education is in the second highest. These are families who have decided to invest in the construction of improved houses in

peri-urban areas, either because there is no available land in the urbanised areas or because they have access to a larger plot. This group of citizens either occupies peri-urban zones already demarcated or is putting high pressure on the municipalities for that purpose and for the construction of roads and sanitation infrastructure.

However, the same does not occur in most cases in the peri-urban areas which are not demarcated, where land occupation is seen as temporary and, often, is only possible by renting to someone who invests little or nothing in it. It is in such context that almost all reported land conflicts were observed.

In the “green belt” areas there is the highest number of illiterate head of families; meanwhile it is also there where the biggest percentage of people with primary education lives. This means that, when the study perspectives and possibilities of heads of families cannot go beyond the primary level, there is a tendency to remain in the “green belt” areas where a gradual investment for improving the land plot conditions is made. Since the average area per family is significantly higher compared to the other two types of urban areas, it is common and viewed as a natural fact to subdivide the plot for sale in order to obtain additional income.



*Figure 4: Education level of the heads of families vs. type of urban area*

### **c. Market Typology**

It is here where the market in which rights acquisition is not subjected to registration (NSR) is found, the so-called "informal" market or market among the poor. Three types of land markets among the poor were identified: (i) through incorporation of new land within the urban perimeter; (ii) through subdivision; (iii) through land allocation in inappropriate locations.

Concerning the first type, according to the data collected through semi-structured interviews and from the focal groups, people who own rural land through simple occupation or by purchasing land close to the urban centres usually perform a provisional plot demarcation in order to sell it later. All people interviewed are unanimous in stating that there is nothing illegal in such activity; on the contrary, it is well known by the politico-administrative structure of the neighbourhood and often it involves elements of the city councils. Those who demand this type of land are either rural immigrants or recently married couples on a tight budget.

The second kind of the market not subjected to registration (NSR) operates mainly in the peri-urban areas where plot demarcation and construction of infrastructure took place after the land occupation process, i.e. these are areas where such process occurred long ago with dwellers living there for several decades. As demand increases, there is a tendency to subdivide the plot with a family member or a friend; the occupier can pay a rent not only in cash but also through services or by helping in the house and, later on, buy the land where he/she lives. The subdivision can also be done by initiative of some elements of the local structures or city council who, arbitrarily, decide that there must be a subdivision, by selling the access rights to the sub-

plot. While the first manner is consensual among the parties, the second is often causing conflict and is seen as a form of corruption.

The third kind is the most censured by the people interviewed. It concerns allocation of areas which are planned to become roads, are too close to drainage channels or located in public spaces. Almost always it involves neighbourhood authorities or municipal council employees from the side of the offer, while on the side of the demand it is represented by the poorest of the poor, divorced women and single mothers, including sometimes of criminals.

As mentioned earlier, the market tends also to grow in the urbanised areas, though not as quickly as in the peri-urban areas. It is a market in which rights acquisition is always subjected to registration (SR), also known as "formal" market or market for the rich people. In this type of market as well, three different categories were found: (i) through sale of infrastructure; (ii) as consequence of corruption; (iii) through horizontal co-properties.

The first category regards the transfer of land rights through sale of infrastructure built on the plot. This type of rights transaction is explicitly permitted by Law, and occurs between middle and high class citizens, normally nationals.

As for the second category, which derives from corruption of influential people, some refers to the practice of "*speculative prices*" for impeding the access to less wealthy people. The quantitative survey did not collect enough elements to allow quantifying such practice, since it concerns a reduced number of actors, and would require a specific study. However, it was possible to determine the existence of such phenomenon through the interviews and participatory observation, in particular in Nacala City. Technically, the term *speculative* is not appropriate because this is not about someone who bought a plot in the market and is waiting for its eventual appreciation for reselling it for profit. Strictly speaking, what occurs is a "*hunt for easy profit*", which originates from the rights acquisition on a large number of urban high buildings at zero cost for selling them at very high prices when the opportunity arises. These are people who belong to or are linked with the political elite and who received houses and plots through godfathers, favouritism and nepotism, without making any initial investment and, obviously, with nothing to lose while waiting. The demand in this case is represented by national citizens from the high class.

The third category of market subject to registration (SR) between the rich is developed through horizontal co-properties in high buildings. These are the private investments starting from scratch on a given plot followed by rent or sale of the houses together with the land where they are located. This type of business is common in Maputo, while it is less frequent in other urban centres; however there is already at least one case in Nacala. Private investment, including roads, drainage and other type of infrastructure represent a manner of complementing the weakness of public investments in this domain; however, it is obviously an intramural investment which does not replace but complements public investment. The demand for housing and its respective plot in these co-properties is represented by high class citizens, often foreigners.

Market Type	Urban Area	Offer	Demand
<u>NSR - Not Subject to Registration</u>			
New land	Green belt	Owners through simple occupation or purchase	Rural immigrants and recently married couples
Subdivision	Peri-urban with no plot demarcation	Owners through inheritance Neighbourhood leaders and municipal employees	Relatives and friends Recently married couples
Inappropriate locations	Peri-urban with plot demarcation	Neighbourhood leaders and municipal employees	The poorest
<u>SR – Subject to Registration</u>			
With infrastructure	Urbanised and peri-urban with plot	Owners by purchasing	Middle and high class

Through corruption	demarcation	through the State	
Through horizontal co-properties	Urbanised	Urban elites	High class
	Urbanised	Investors	High class

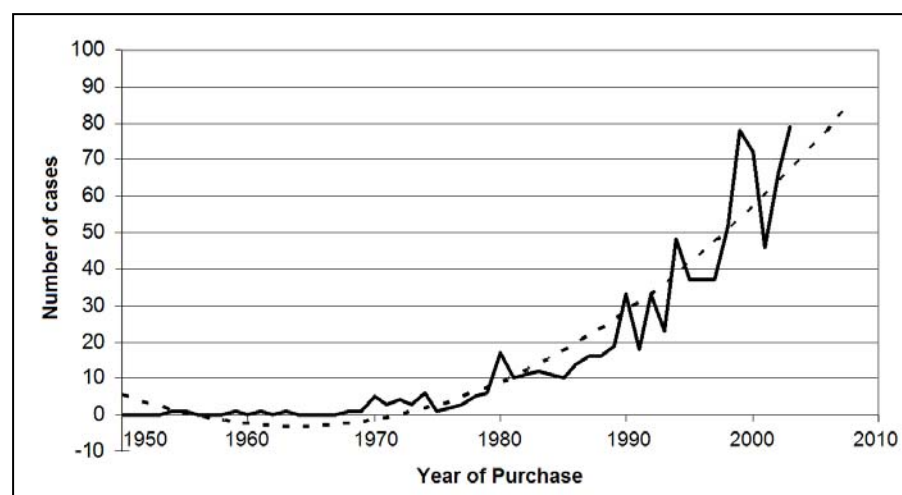
*Table 1: Urban land market typology*

The table above presents an urban land market typology designed during this study. For each type or subtype the urban area where transactions through the market occurs more frequently was identified, as well as the people who offer and who demand the land were characterised. These are obviously the most frequent types and cases, but there are other particular cases with different characteristics.

#### **d. Market Dynamics**

As observed, the market plays a relevant role in urban land allocation. Although with different characteristics, it is present in all the areas of the urban centres. But what is the market trend?

The graphic below was prepared based on the date of purchase of a land plot and its associated existing goods as reported by the 880 people interviewed. The number of collected cases was enough to draw the market growth trend line starting from 1950's, i.e. since urban concentration started in both selected cities. Based on such information, it was possible to estimate the growth trend until the end of this decade.



*Figure 5: Date of purchase of the land plot*

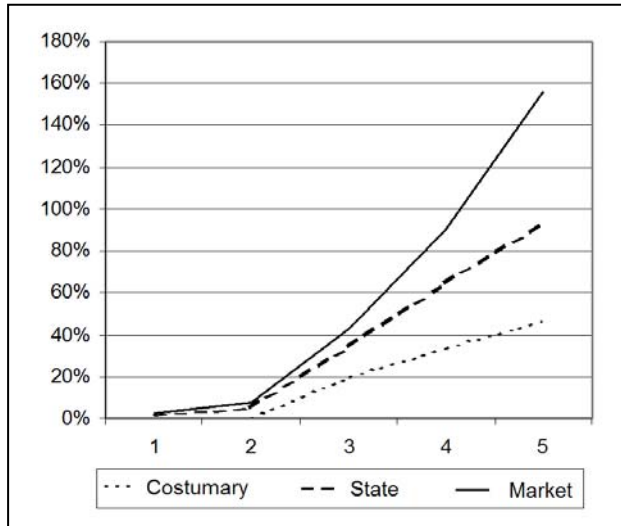
Cases of access to land urban through the market started to be recorded from the late 1960's. After independence was declared (1975), a short fall in the purchase of urban land was registered with the withdrawal of the colonialists and the land and housing nationalisation by the State, but before the end of that decade (1970's) the increase of the rural exodus flow to the cities significantly raised the number of market transactions, despite the on-going nationalisation process. In 1980, there is a sudden fall probably due to the beginning of the civil war, but as soon as its end is envisioned – during the peace talks in Rome - the housing and land plot market grew at an exponential rate. There is a steep decrease in 1991 probably due to the uncertainty of the peace talks in Rome, which was soon recovered for a significant increase up to 1994. Between 1995 and 1997, corresponding to the period in which the formulation of the new Land Law was debated, the market stabilised; soon thereafter a *boom* occurred. Finally, in 2001 the worst crack occurred due to the political and social instability developed as consequence of the presidential and legislative elections held in 2000. Despite so many ups and downs the projection indicates that the market will keep growing in the coming years.

This confirms what reported in the specialised literature, i.e. the housing and land market in the urban centres functions as a barometer of the political situation and economic stability of a

country. In fact, the purchase of land for housing constitutes an investment which is at the same time considerable and on a long-term basis; such investment does not occur whenever the citizen is doubtful concerning his future and of his family.

It would also be important to understand the trend of the different actors or land adjudicators through the market during the above referred five decades. The fact that a plot was bought does not mean that the transaction has occurred only between owners; the plot might have been purchased through the State or from who has acquired the rights through occupation or inheritance.

The following graph was obtained from the percentage of purchase by type of adjudicator, excluding simple occupation, for obvious reasons.



*Fig. 6: Land transactions in the last five decades*

Although it is commonly said that there is no sale of land under "traditional" African systems, findings confirm what had already been determined a number of times by various researchers: as demand increases, access to land through customary system passes successively from a mere authorisation, to loan, followed by rent and ultimately transfer of land rights.

When comparing both cities, the aggregated data re-confirms that as demand increases the number of cases of land sale where access had been obtained through customary rights also grows. No land purchase was recorded until the middle of the second decade; however, starting from that period, the number of sale operations started raise with a tendency to further increase.

For any of the three forms of allocation the percentage of transactions increases starting from the second decade. It is natural that the volume of purchase and sale is greater among those who had access to urban land through the market. Concerning the land allocated through the State, it should be mentioned that during colonial times there used to be public investment for later performing private sale; while after independence the increase indicates the disposal of houses "acquired" during the housing nationalisation process.

What is interesting to observe is the sale of plots by citizen who had access to land through customary rights systems starting from the 1960's.

## 8. ALLOCATION EFFICIENCY

Land allocation efficiency means the form whereby a given area is allocated and leads to its best possible economic, social and environmental use. Such definition seems to be consensual among the various disciplines and the theoretical schools of the same discipline.

First of all, it is not obvious that there is a cause-effect relation between the way land is allocated and the way it is used. For some authors, such as North and Soto, only private allocation through the market assures an individual effort for obtaining the best use. According to others, such as Veblen and Galbraith, the best form of using land depends much more on the institutional framework in which it is developed than on the way land is allocated or the type of property that is established.

Secondly, the interpretation of "best use" is different in terms of meaning and significance among the various theoretical approaches. According to neo-classic economic theories the best possible use is oriented to maximise profits. On the contrary, sociology of development theories hold that in non-western societies the best use should maximise social returns, which includes private economic interest. Moreover, recent environmental theories argue that the best use is meant to ensure that inter-generational returns of natural resources are maintained.

For a matter of practicality, this study opted for analysing up to which point there is a cause-effect relation among three variables seen as fundamental by the different theoretical approaches (economic performance, social justice and sustainable use), and that the best use of land contributes to the increase of wealth and, consequently, to poverty reduction.



### e. **Economic Performance**

Up to which degree does the form of accessing urban land holds or not a positive correlation with investment on a given plot? According to the evolutionary theory of property rights, investment is as much important as the security of tenure of the plot to which the buyer had access, independently from the type of investment carried out.

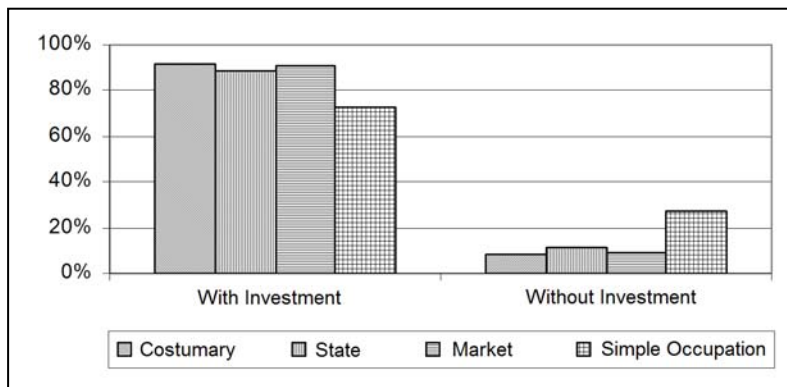
On the other hand, the theory of individual choices in a situation of asymmetrical and imperfect information states that, in front of a condition of risk and uncertainty, there is a strong preference for preserving cash instead of irreversibly investing on property.

Therefore, investment is not only an indicator of the form of accessing land which assures greater security of tenure, but also of the citizen's trust in the institutional framework where it takes place.

#### **Investment and form of access**

The first data indicating performance is that 90% of the families interviewed did some kind of investment on the plot, irrespectively of how they had access to it.

However, after disaggregating collected data, it was verified that those who had access to land through simple occupation invested less, of which about 27% did not make any investment at all. Those who invested more had access to land use rights either through the market or through customary systems, both reaching 91%. Although the percentage of those who had access to land through the State is close to the latter two forms of access, with 88% of the cases, it is significant to observe that, despite belonging to the typical middle class group, the percentage of those who invested is smaller than those who had access through customary systems, as shown in the following graph.



*Figure 7: Investment in the plot versus form of accessing land*

It was also checked if the fact of having a land use leasehold had any correlation with investment done in the plot. The result was a perfect negative correlation (-1), therefore, having a leasehold or not does not influence investment.

Those who did not worry about obtaining a leasehold before doing any type of investment were those who accessed land through customary systems, with 80% of them investing without a leasehold, followed by those whose access was through simple occupation (77%), through the State (63%) and finally by those who accessed land through the market (45%). The data shows the existence of two behaviour trends differentiated in function of investment. While the poor invest first and later claim the registration of their rights on the plot where they have invested, the rich prefer to first secure their formal rights and later carry out the investment.

#### **Type of Investment**

Planting of trees and fencing is generally done by almost all of those who invested, irrespective of how they had access to the plot. About 12% also invested in the improvement of infrastructure such as water supply and electric power.

Why planting trees and fencing? Fencing is compulsory in the areas where plots are demarcated; however planting trees is not yet a rule. This can be partially explained by the insecurity of land tenure. Although the Land Law guarantees secure tenure through occupation in good faith, with or without leasehold, in practice the perception of the citizens is different.

About 18% of the people interviewed are afraid that their plot would be taken away from them. Having or not a leasehold to secure their land rights did not appear to be relevant, since 10% of those who own a Land Use Leasehold or similar document said to be scared that land would be taken from them, while 83% of those who do not have any kind of document declared that they were not scared of losing their land.

The fear of losing their rights arbitrarily is particularly serious among those who had access to land through customary systems and those who live in peri-urban areas and in the “green belt”. When asked who they feared most, 39% replied the land owners, these are cases of rent or loan, and 94% of all remaining interviewed people declared to fear that the Real Property Administration of the State (*Administração do Parque Imobiliário do Estado – APIE*) or the City Council could take away their land.

In such context, it is easy to understand why tree planting and fencing is the first and generalised form of investment. Firstly, it expresses the need of confirming land tenure and showing a concrete indication of the number of years of occupation in case any attempt of land usurpation is made. Secondly, as said during the interviews, planting trees also aims at obtaining shade and fruits.

A second type of investment is aimed at increasing the monetary income and contributing to the domestic consumption; that is the case of small business trade, small industries, animal breeding, farming activity.

The commercial activity is developed by 12% of the sample; it has a clear preference for fixed market stalls (51%), normally with industrial products for consumption. The fixed mobile market stalls follow with (38%); these are unpacked items such as home grown vegetables or home produced food, and alcoholic beverages sold at the entrance of the house, and lastly, formal commercial shops (11%). Those who have access to land through the market can see a slight tendency higher than other groups, to develop commercial activities in their development or plots.

A very small number only develops the small industries, which is 3%. To the majority, the preference is for the small home craft industry, although there is a relatively high percentage (24%) of automobile workshops that involves specialized work force compared to the first. Nobody who accessed through occupation owes an automobile workshop; except for that, small industries exist in all other forms of access, however, those who have access thorough the Government are the ones who practice these activities.

The poultry farming for domestic consumption as well as for sale is the most generalized productive activity, although there is a relatively high number of pig farmers, some 6% of the sample are engaged in some sort of animal breeding. That type of activity is clearly of high choice among those who had access through market and customary system when compared to those who had access through the Government or by simple occupation.

The farming activity was registered by 18% of the interviewed people, with the higher registered percentage among those who have had access through customary way or by simple occupation, using own products (from the previous harvest previous or from the fields of agriculture outside the city) or bought in the market. Although the majority uses the family work force only, about 20% hire workers, either on day-to-day basis (casual who earn as they work) or permanent.

### **Meaning of the Investment**

There are four points to highlight with respect to allocation of the investments. First, it is the planting of trees as a form to guarantee the land ownership, showing the inability of the registration service officials' in fulfilling with the legislation, the necessity to rely on physical landmarks (a verbal commitment admitted in the Law of the Land is not considered enough proof) due to the weakness of the judicial system in the urban areas, and high costs of transaction as a result of insecurity and not fulfillment of what has been written in the legislation.

Te second point is the fact that urban residential plot is not only appreciated by means of improvements, but also as a space to make money through integration either in the market of products or in the associated credit market, for example, the informal commercial activities. These *urban popular economies* [Engelhardt, 1998] is a way of living and survival for some

citizens, they create female work in the area of food production in the mobile stalls and male work in the repairing and manufacturing of goods in the housing industries and fixed market stalls.

The third point is the link with the job market, for the young in particular, the majority of graduate people in the last decade who did not find another type of job other than what has been offered or created in the informal scope that develops in the urban areas.

The fourth point is that usage of the urban space to increase the incomes of the family units, and consequently reduce poverty, is not determined by the form of access to the land but by the performance of the family and the opportunities that are offered to them. For each form of adjudication, there is one kind of preferential investment according to the nature of the space and its relative localization.

## VII.2. SOCIAL INJUSTICE

The issue of social justice in the land adjudication is as old as the History can record and it is a determining factor in the struggle for national independence in the whole African Continent. Today, despite the progressive transformation of the economic structure, where the need of land for agriculture as a form of survival and accumulation of wealth is being replaced by the informal economy, by employment and urban center services, it does not stop being the reason deepen the social convulsions such as those seen in Zimbabwe, Egypt, Kenya or Senegal.

It can be argued that this is typically a rural issue; however, the growing urbanization rate of the Continent already raises awareness of similar situations of urban poverty and the lack of decent dwelling as those seen in Asia and the South America. While in the decade of the 70's the urbanization rate was 10% average per year in the Sub-Sahara Africa, in the year 2000 it was already higher than 35% per year. In the Rwanda, for example, 95% of the citizens live in Kigali and 21% of the Congolese live in Kinshasa.

Recent studies show that contrary to what was supposed to be assumed, the growth of the African cities makes of them an impelling pole for the rural development, since they induce the growth of the commercial, storage and transport networks which assure the permanent link between field and city. The African city is more like a continuity for the "central market" of Von Thünen and less of the point of rupture between the farming sector and industrial sectors as well as services advocated by Harris and Todaro. It is not by chance that it is countries with less urbanization rates that depend more on the importation of food aid and they also apply less value to the rural agricultural product.

On the other hand, African cities have a tendency of being more than a simple place for the sale of products; they tend to be a places that demands quality and better quantity of products from the fields, which leads to adoption of the technological transformation by the local farm producers. All these have spatial implications. It is necessary to assure: (i) the access to physical space, with the minimum living and working conditions for the floating and permanent emigrants; (ii) the effective use of the urban property; (iii) and the conditions for the usage of that physical space.

All this brings the issue of social justice in the distribution of the urban property. Social justice in the land distribution is the one that fulfils three of the assurances mentioned above, that are, effective access to land and usage of the space. It does not mean therefore that all the municipal councils must have the same quantity of land; they must have what they exactly need and use it in a way of contributing for the production of the national wealth and the consequent reduction of the poverty.

To determine the level of social justice of the cities studied, three indicators were used: average area per capita; the ratio between the minimum area and the maximum area; the index or coefficient of Gini. The analysis of these indicators took into consideration the form of access and the area, as well as the future trends based in the comparison between Manica and Nacala.

### ***Average area per capita***

The identified per capita average area was 395.20 m<sup>2</sup>, although with significant differences by urban area and by form of access. It was in the "green zones" where the highest average areas per capita (1132.86 m<sup>2</sup>) registered, and also in the urban areas the smaller (173, 83 m<sup>2</sup>), according to the figure below. The access through customary rights system is what gives the opportunity of having a bigger per capita area (798.04 m<sup>2</sup>), while the access through market is what provides the small average areas (275.16 m<sup>2</sup>).

In a general estimate, it can be said therefore that in the subject of average areas, they are sufficiently enough to allow the possibility of building infrastructure that can guarantee proper life conditions. On the other hand, it can be said that the market way is the one that induces a good exploitation of an intensive physical space, without jeopardizing the average area considered necessary.

**Fig. 8: Per capita average area by form of access and by area**

The situation in terms of social justice is, however, very different when the maximum registered areas are taken into consideration. The smallest per capita area identified was 0.42 m<sup>2</sup>, which is obviously insufficient. It is a house located in the peri-urban area of the City of Manica, which access was through occupation, where the people had to sleep in turns, which clearly means a single case of people “without shelter” also called *squatters*.

The second lower average area registered of (1.50 m<sup>2</sup>), is once again in Manica and it was through the market. Although the market is the one that in average, induces to a more intensive exploitation of the land, that after the occupation can allocate areas which housing conditions are notably insufficient.

The biggest per capita area identified area was 56,677.00 m<sup>2</sup>. It is a piece of land located in the “green zones” of Nacala where access was through customary way. The interviews showed that the tendency is for subdivision of these development or plots as the demand keeps growing. The average area allocated through the market was 9.14 m<sup>2</sup> and through the Government was 11.11 m<sup>2</sup>, which means a minimum average area acceptable.

#### **Maximum Ratio area – minimum area**

This indicator allows us to determine what form of access and which city area where the discrepancies between the minimum and the maximum areas attributed are big. The higher the ratio, the higher the potential for social injustice.

**Fig. 9: Difference between the maximum and minimum per capita area by access and by are**

As it can be seen, the access through occupation is the one that induces the bigger disparities between the minimum and maximum. The ratio indicates that the biggest acquired area by occupation is 30867 times higher than the small adjudicating area through the same way. This is explained by the absence of institutional work frame in the urban areas in which the simple occupation happens. There is no regulating or persuasion mechanism, and the law of the strongest and powerful prevails.

On the other hand, it is the Government that shows the lowest ratio, followed by the customary; the market appears with a ratio slightly superior to the customary, 6838 against 6199 times more the maximum adjudicated. This slight difference shows that the transactions through the market, despite not being supported by a legal specific frame, they are carried out in a auto-regulating frame through price mechanism, it does not allow potential situations of social injustice.

The city area where the ratio is higher is the peri-urban area. The major attributed area is the peri-urban area which is 42390 times bigger that the smallest area. There is no doubt that in matters of distribution, the social injustice is in the peri-urban areas of the city. It is in the urban area where the smallest ratios happen, possibly due to the parceling that it was possibly subjected to.

#### **Coefficient of Gini**

The Coefficient of Gini is a concentration indicator that when applied to the land, it indicates how the land is distributed to the people interviewed. Since the development or plots are occupied by family links. If all families have or occupy an exact same area, Coefficient of Gini is 0 (zero), and if a single family occupy the whole land the Coefficient of Gini is 1 (one).

When the Coefficient of Gini is applied to the land, it is common to follow the table below in order to have an idea of the dimension of the concentration. From 0.701, the potential area of strong

social injustices arises where social instability situations, increase of criminality, deliberate destruction of social infrastructure and others can be seen.

**Classification of the Degrees of Concentration**

Of 0.000 the 0.100 – nihil concentration.

Of 0.101 the 0.250 – nihil to weak concentration.

Of 0.251 the 0.500 – weak to average concentration.

Of 0.501 the 0.700 – average to strong concentration.

Of 0.701 the 0.900 – strong to very strong concentration.

Of 0.901 the 1.000 – very strong to absolute concentration.

**Table 2: Classification of degrees of concentration**

The aggregated Coefficient of Gini estimated was 0.700, which is higher than the one in the rural areas (between 0.400 and 0.500) as expected. The access through customary way and in the “green zones” is where high level of coefficient can be seen 0.760 and 0.690, respectively. The access through Government and urban properties is where less levels of coefficient can be seen 0.570 and 0.470 respectively.

	<b>TOTAL</b>	<b>Customary</b>	<b>Government</b>	<b>Market</b>	<b>Occupation</b>	<b>Urban</b>	<b>Peri-urban</b>	<b>Green</b>
<b>TOTAL</b>	<b>0.700</b>	<b>0.760</b>	<b>0.570</b>	0.670	0.630	<b>0.470</b>	0.630	<b>0.690</b>
<b>Manica</b>	<b>0.600</b>	0.760	<b>0.580</b>	0.540	0.590	0.470	0.560	0.630
<b>Nacala</b>	<b>0.750</b>	0.790	<b>0.370</b>	0.720	0.660	0.470	0.660	0.670

**Table 3: Coefficient of Gini by access, area and city**

With exception of the customary way, all other forms of access show average to strong level of concentration, and the urban area is the only one that shows average to weak level of concentration.

By comparing both cities, with the exception of the access through the Government, the tendency is clearly increasing the Coefficient of Gini as the cities grow, or in short, the lack of specific regulation and distribution of land tends to concentrate more in the hands of few families, independently whether the access is through market or through customary way or by simple occupation.

The fact that it is the Government which was registered as the one that distributes the urban property more fairly is clearly because of the nationalization effects of the housing after independence and to the explicit limitations to the concentration (each citizen can buy one house from the Government) that is in the legislation of the disposal of the Government's assets at the end of the decade of the 80's.

In short, the Government is the best entity to assure access to the physical space, with the minimum housing conditions, be it directly through the development or plots that it adjudicates, or by what it legislated in terms of alienation. However, as mentioned above as the time goes, the quantity of development or plots is smaller compared to those owned by the Government that can use to adjudicate, where the market can occupy its position. The produced data, demonstrates

that nothing shows that the adjudication through the market has caused social injustice, but the tendency shows that it can go into that direction if there is no regulating frame.

The simple occupation is what drives to an effective usage of the urban property, creating situations of social injustices as shown by the high level of ratio of the difference between minimum and maximum area per capita. The non-observance of the formal legal system or the customary rights system does not mean that the persuasion mechanisms that brick the appearance of situations of social injustices are not acting.

The customary way is the one that less induces to the usage advantage of the physical space, the high level of the Coefficient of Gini and the average areas per capita are indicators of a great sub-utilization of land by some and an intensive usage by the great majority. Knowing that most of these lands are in the "green zones" and the weak financial capacity of these families, this is already a worrying situation of social injustice.

### **VII.3. SUSTAINABLE USE**

The "urban environment" establishes relations with the resources in two ways, the natural resources that consumes, and the processes that uses for the elimination of the urban waste. Land, water, air, fuels and building materials, are between the consumed resources mostly consumed by the urban centers, and the urban waste volume tends to reach quickly a geometric progression with the urban development. Since the African cities are among those with fastest growth in the entire world, they are clearly leaving "environment footprints", some of which will become irreversible character if preventive measures are not taken.

The sustainable use of urban property is more complex than that of rural land. While sustainable use in the rural property is mainly related to the behavior of the user, it is possible to develop a physical management system based on preservation of the natural resources, sustainability of urban property usage depends a lot in the financial capacity for the investment in the land and this obviously from the incomes of the citizens. In the scope of this study, the question that is asked is, until what point the forms of access to land has a relation with the usage sustainability of the urban property?

The private or public investment, particularly in infrastructure and in the services network (water supply, sanitation services, electricity services, hygiene services, transports services, security services, etc.) depend on the level of income of the citizens in matters of collection of income taxes and taxes, as well as the added value that the city produces, or, from the level of technologic specialization and the work of each city, and in the African case, in the interaction that develops with the rural products. On the other hand, the citizen income is a determinant in terms of type of household fuel used, the average area per capita of the family unit and in the investment in sanitation infrastructure.

However high the investment capacity and the citizens' levels of income, if the regulating institutional frame of the urban behaviors in terms of environment is fragile, non-sustainable use of the resources will tend to increase.

For the cities studied, the following were identified as variable dependents: household fuels, the building materials, the organic waste and material; and as independent variables we have: The income level of the citizens, consolidated in the investment, and the institutional frame where the private and public environment behavior develops.

#### ***Household Fuels***



The use of firewood as household fuels not only contributes for an accelerated deforestation of the rural areas, with direct implications in the soil erosion, but also for the pollution of the air, with the greenhouse effect associated to it.

The firewood and the coal are, without doubts, the worst environmental problem in the African cities. The most difficult, however, is that any policy tending to reverse the usage of these type of fuels have significant economic and social implications; on a macro level, it requires the existence of alternative network supply of sources of energy (for example, gas butane and electricity) and, on a household level, a standard of income that can cover the costs of acquisition.

According to FAO, in year 2000, about 3 billion people in the whole world had no access to the quantity of firewood and charcoal needed and they did not have the possibility to consume any other type of household energy. That shows the existence of a direct correlation between the absolute poverty level and the unsustainable use of resources in the urban property.

About 95% of the families of the two cities studied use firewood and charcoal as household fuels, of which 40% is firewood, 32% is charcoal and 23% firewood and charcoal. In the urban area, the consumption preference is charcoal (44%), followed by the association between firewood and charcoal (23%), electricity (9%) electricity and charcoal (9%). This last combination, electricity and charcoal, is an indication that the charcoal is not perfectly replaceable by the electricity and charcoal has been kept for cooking and starching while power is an alternative to the oil lamp for illumination.

In the peri-urban areas, consumption preference is distributed among charcoal (38%), firewood (33%) and

a combination of the two (26%). The electricity is only consumed by 2% of the interviewed families. In the "green zones" almost all the families normally consumes firewood (83%) at times combined with charcoal (12%). Charcoal or electricity as choices for main sources of household energy are practically exceptional (5% and 1%, respectively).

Up to what point is the form of access to land related with the type of household fuel used? The preference of those that have access to land through customary or simple occupation is the use of firewood, while those who had access through the Government or through the market prefer charcoal and firewood. Those who had access through the Government usually use the electricity

#### **Fig. 10: Household fuel by form of access**

All indicates that it is not the form of access *per se* that determines the type of household fuel; it is the financing capacity, the type of housing and location of the plot. A positive correlation between poverty and the usage of firewood is obvious, the poorer the family, the higher it the tendency to use firewood.

The reason of this correlation is obvious in small cities, as it is the case of Manica, where the firewood is closer and where most of the times it is not necessary to buy because direct collection of the wood is still possible. However, the explanation of this correlation is not easy when the cities grow and the cost of the firewood is equivalent to or higher than that of charcoal but poor people still prefer the firewood.

A study done by the World Bank in Mozambique around year 2000, found out that even with cheaper electricity, the poor city people still prefer firewood, and this explains the lack of "economic rationality" of poor city people to their cultural habits. There is no doubt that the cultural habits have influence on the type of household fuel used –bread baked in an oven that uses firewood tastes far better than the one baked in an electricity oven; chicken that has been charcoal grilled obviously tastes better than chicken grilled in an oven gas or else, a shirt ironed by an iron that uses charcoal leaves an aroma that cannot be replaced by an electricity iron – however, it cannot be explained why do the less poor prefer firewood.

The interviews indicated that the reasons that the poor still prefer firewood, even when this is more expensive that the charcoal or electricity is because of the financial availability to buy charcoal or pay electricity (even though the installation cost of electricity has been covered in



total). Buying charcoal implies first of all the availability of accumulated amounts of money compared to the acquisition of firewood, which does not always happens among the poor. It is not therefore an issue of cultural habits *per se* that explains the preference but the simple fact of having or not enough money at the right moment for the right purpose.

### **Fig. 11: Comparison between cities in the use of household fuels**

By comparing both cities, it can be seen that the replacement of household fuels happens proportionately with the growth of the urban centers. The graphic above shows the tendency of the replacement of household fuels with the growth of the cities. The use of the charcoal tends to increase and the firewood tends to decrease. The use of electricity energy tends to decrease, not because of lack of interest, but because the growing capacity of the distribution of electricity networks by the people responsible is slower than the growing pace of the demand. However, whenever electricity energy is accessed, there is a clear tendency to make the consolidation between the electricity energy and the charcoal.

We therefore see that the use of less damaging household fuel sources, as in the case of electricity, does not depend only on the preference of the user, but also, to a large extent, on whether or not there is electricity in the housing area. In the cases at hand, , the private initiative of energy supply only appears if the Government has assumed the initial construction costs of the distribution networks, as the municipal councils.

### ***Building materials***

When the building materials are traditional, the pressure on the resources surrounding the cities is bigger. When the city is small, the demand for stakes, reed and grass, or palm leaves to use as roofs is huge. However, as the urban centers grow, these building materials are being replaced by iron sheet, and the material for walls are being replaced by tin plates and cinderblocks

But that does not reduce the pressure on the resources. When the bricks are made of clay, of the type of rough cooked brick, collection of the material leads to huge craters on slopes, or depletion of the ground if clay is collected on plane surfaces. Cinderblocks pose great pressure on water and river sand consumption also increases for its production and also for the housing construction as well as for the annex buildings. The cement demands more liters of water, river sand and other resources than the traditional construction.

The tin sheets are not environmental friendly either. The average temperature and humidity in the houses increase with that type of roof and this also increases the risk of contracting malaria. On the other hand, the iron sheet allows that one can bring fire to heat the house in form of firewood and oil lamps when it is very cold. Fire inside the house is responsible for innumerable fire incidents, serious burns in children and for a number of pulmonary illnesses, due to poor air circulation inside the house.

Only when the housing construction standards change completely from traditional to conventional will it be possible to reach construction economies of industrial scale that drive to a more sustainable usage of the resources needed, and the architecture acquires characteristics that do not hold risks to the health of its people. However, the demand for products of this type of

industry is confined to a social class whose incomes are well above of the average incomes of the African citizens.

### **Investment**

Of those who invested in infrastructure with positive impacts on sustainable usage of the urban soil, 70% have had access to the land through the market, 17% through customary way, and the remaining ones through the Government (7%) and through simple occupation (6%). There is no doubt that those who have access to land through the market have a higher tendency to invest in the access of the treated water system and to the electricity network.

The access to treated water system allows for a less polluting treatment of sewerage, apart from substantially improving the aspects related with the environment sanitation. On the other hand, the electricity system creates conditions for reduction of the dependency on wood fuels used as household fuel, which reduces the pollution of the air and deforestation of the Country. Obviously these measurements alone are not enough but they are indeed a significant step towards the objective of a sustainable use of the urban property.

The “green zones” have the lowest percentage of investments of such type; among those who have invested to have access to treated water system and electricity only 2% are from the “green zones”. The bulk of such investment is seen in the peri-urban areas, with 78% of the cases, and the remaining 20% in the urban areas

**Fig. 12: Investment on infrastructure on the plot by access and area**

The illustration shows that those who have had access to land through the market and through simple occupation were those who less invested in this type of infrastructure. For those who have had access through simple occupation, one can understand why it happens since, as mentioned above, ownership insecurity is huge, and therefore, the tendency to do investments that require huge amounts of capital is small. In the case of those who had access through the Government, the situation is different, since the Government allows disposal of its property giving then the ownership security necessary to justify the investment.

So, why do they not invest? They do not invest because they do not have money and because they did not contributed to the costs of building and maintaining the house; therefore, they have nothing to lose with the depreciation of the building due to the increased degradation. However, the law clearly explains that a misuse of the Government property, is the reason for eviction and termination of the contract without right the indemnity. It could be expected that with the introduction of a possibility of buying a house, the situation would tend to revert, however this is not the case: only rarely does someone who buys a plot invest on his or her property; most of the times he or she ultimately sells it to a third party and that will actually invest on the property. This is an Government's imperfection with respect to adjudication of the urban property.

A quiet investment that increases as the cities grow still exists; it is the acquisition of cinderblocks. In fact, it is a savings form done by the city poor as insurance against all risks rather than a proper investment. While the poor people in the rural areas accumulate the savings in cattle and trees, the urban poor do it through acquisition of long lasting building materials. Bricks are a symbol of it, iron follows, and then frames, toilet appliances and the like. All this suggests that all housing credit issues, aiming at a less harmful construction for the environment and the health, should be prioritized. For that to happen, it is necessary to review the conventional criteria of granting of credit so that the process is faster and comprehensive. The collateral land, due to its market value, is enough to cover the credit in terms of building materials and the orientation costs technique of the construction of the poor people <sup>2</sup> but the interest taxes are raised due to

<sup>2</sup> the average value of market of the land for m<sup>2</sup> was esteem in \$7.4 and the area measured per capita in 395.2 m<sup>2</sup>. Knowing that the average size of the family is of 6.22 members and that the minimum area for the habitation declared for the inquired ones is of 10 m<sup>2</sup>, the maximum that the land can cover as collateral for cost for m<sup>2</sup> of construction is \$292. The cost of construction in the peri-urban areas patrol the \$100 the \$150 for m<sup>2</sup> and the deep one of the \$300 housing promotion varies enters \$250 m<sup>2</sup>. The land can constitute guarantee for the housing credit of low cost, however the applied taxes of interest are raised.

the insecurity and other factors of national macroeconomic nature. The accumulated weekly saving could more be an extra guarantee so that the interest taxes can be lower and the return periods expanded.

### ***Institucional frame***

The foregoing leads to the issue of the institutional frame within which the public and private environment behavior develops with respect to urban property.

The two selected cities are a clear illustration of two typical situations in terms of the environment. In the City of Manica, for various reasons, the institutional frame in the last years tended to worsen and the relative norms, for example to the use of resources from the slopes of the mountain (classified as protection area), stopped from being fulfilled, today, the scenario is the uncontrolled falling of trees and shrubs for the production of charcoal and firewood, harvesting of clay to make bricks and as well as to use in their own production locally. The result is enormous erosion on the slopes, which can endanger some of the residential areas at the foot of the mountain.

The situation in the city of Nacala is the opposite. Followed the serious problems of erosion in the decade of 1990, the Municipal Council started a participative recovery program of the affected areas, delimitation of the endangered urban spaces and planning the usage of the physical space, to prevent the erosion and guarantee the minimum necessary housing conditions. Today, the achieved results in the City of Nacala are visible.

The institutional frame developed by the Municipal council of Nacala, which relies on the participation of the "local" communities and the citizen in general, has proved to be effective for a sustainable use of the natural resources, on which the city depends. In Manica for example, in the absence of such institutional frame, control of usage of the slopes was left to inspection", which usually is not efficient.

The case of the urban waste is also significant in relation to the institutional frame in which it develops. Waste management in the urban areas is the sole responsibility of the municipal councils while that in the green zones, the regular the citizens have proactive participation in the process. As a result, garbage collection in the cities depends on the cycle of the national holidays and on coming elections while in the "green zones" this is a routine activity through the construction of sanitary land-filling and garbage incineration among others.

We are faced with a set of findings that indicate that neither the Government nor the market alone is efficient in the management of the urban physical space area, and that involvement of the citizen with its local organizational forms is proved indispensable to attain sustainable use of the natural resources needed by the city.

However, the situation is more complex when we look into simple occupation. As mentioned above, there are two types of simple occupation, the one that happens in good faith under the Land of the Law and the one that takes places without discretion, most of the time with the support or tolerance of local authorities and the municipal councils employees in exchange of money or other type of benefits. As a rule, the indiscriminate occupation happens in places with minimum housing conditions are not secure and with no conditions to be and where there is strong pressure on the usage of resources, be it from the falling of trees and destruction of all wood products to be used for consumption and as firewood, to the deplorable waste management and the consumption of contaminated water. These environments are the first ones to be hit by cholera outbreaks and where sexually transmitted diseases rates are high: that is where poor people live.

None of the institutional frames, Government, market or local institutions has proved effective to address indiscriminate occupation. We could even say that we are facing a situation of lack of institutions, formal, customary local or otherwise, where the law of the strongest and most powerful prevails.

One could ponder that, as cities keep growing, the market will tend to be the regulator of the behavior of the citizen due to the environmental questions. Since the market induces into a major

investment in infrastructure on one hand, and services that lead to a more sustainable use of the resources and, on the other hand, leads to the use of less harmful sources of energy to the environment. However, the conclusion is not as linear as it may appear in the first reading.

If it is true that the market contributes to the effects above mentioned, this does not mean that the market tends to exclude the less poor. The market only functions when the income level of the citizens accompanies them, otherwise, we see the opposite. When these do not exist, the poor people, those excluded from the market, end up having a bad behavior towards the environment, such as indiscriminate falling of trees, of the collection of clay in order to earn some money to produce bricks, use of urban spaces that do not have the minimum living conditions among others mentioned above. It is an imperfection of the market in its allocating capacity of the urban property and its sustainable use.

As mentioned before, the Government too has its imperfections especially concerning the institutional frame in which operates and the adoption of the non-economic criteria for allocation of the urban property. In turn, the reach of the customary institutional frame tends to be shorter and less just as the cities keep growing, creating thus a vacuum that can be occupied or not by a new type of institution. In the studied cases, this new type of institution counts with the active participation of the citizen in the management (which does not have to be a must to mean in the execution) of the urban soil. Due to the results achieved to-date, all shows that it is to this institutional frame that the environmental management of the urban physical space has to be built.

## VIII. MARKET VALUE OF THE LAND

According to Pinheiro and Carvalho [2003], in order to determine the value of the land, the analytical method or the market method can be used. In the first method, value is determined by the capitalization of the net income, which is expected to be obtained from it taking into consideration the costs and improvements. In the second one, the market method takes into consideration the replacement cost of the existing improvements in relation to the demand and offer. According to these authors *"the market value is the price for which a potential seller would sell and the potential buyer where both are not under pressure of any nature"* [Pinheiro and Carvalho. 2003; p.147].

The market method was selected for the determination of the value of the land or of real-estate market value for two reasons; the first is that the application of the analytical method is practically impossible in the current market conditions of building materials and the construction of the infrastructure in Mozambique. The prices are so different in the course of time, from one place to the other and even on a same place what would force that the size of the sample would be so big that it would not be possible to work in a study of such nature. The second reason is that in a pioneering study on this issue done in 1995 in the peri-urban areas of Maputo, the analytical method was followed and through this, it will be possible to establish a comparison between this and other studies that can be done in this domain.

However, the use of the market method is not exempt of problems in its application, the main one, is to comply with the clause that there must not be pressure of any nature on the potential buyer and potential seller. This is not the situation in Mozambique since there is a lot of pressure, going from the insecurity, uncertainty, as mentioned before, until the lack of knowledge about the legality of selling or not the urban property rights. However, it was taken into consideration that such "pressures" were identical for all the respondents, which validates the achieved results. It is important to bear in mind that the average values identified are not necessarily the values for which the urban properties are being sold, but only how much the "potential seller would sell" (the so-called price of reservation) and how much the "potential buyer would pay" (the so-called offer price). The average between price of reservation and price of offer gives the real-estate market value.

The difference between the price of reservation and the price of offer is a trusting indicator of the transaction costs, especially the lack of information regarding the prices of an incipient market. If all had equal access to the information regarding the real-estate market values, the price of reservation would be equal to the price of offer (for example, in the vegetable market, the price of a hen for a salesman is equal to the price for the potential buyer, meaning, the price seen on the price tag in front of the product). However, at times of great uncertainty, the land transaction costs are normally higher than the income values; that is explained by the fact that the land is practically, indestructible e, therefore, to be able to serve as a reservation of the value.

The data was collected in three main issues: (i) who, where and how many people give mercantile value to the land; (ii) how does the land value varies; (iii) what is the difference between the prices of reservation and the prices of offer of the urban property.

### VIII.1. URBAN PROPERTY VALUE

About 43% of the citizens indicated a mercantile value to the land, however, the estimates show 77%, as explained below. For some, about 10% only show offer value, or rather, how much they would be willing to pay for a plot with the same characteristics as the one they occupy, but for all the others it has market value.

When analyzing the findings by form of access to land, it can be seen that the biggest percentages (44%) of those that value the land are those that had access through market, which is perfectly normal, and those that had access through customary way, which is confirmed above

that the land acquired through customary way, are more and more a great repository for sale in the market. Those that value the land are those who had access through simple occupation (31%), obviously they do not give land value to the market since they obtained through occupation or through the Government (38%), which is related to the fact that most of them had access during the housing nationalization.

Out of those who attributed the mercantile land value, 49% are from the urban areas and 46% from the peri-urban areas. The “green zones” have a smaller percentage, 28% of citizens who give market value to the land that they occupy.

When establishing the comparison between the two cities, the city of Nacala is the one that shows a larger number of people for whom the land has market value, 47% against 37% in Manica. Whichever the form of access, the percentages of Nacala are always higher than those of Manica, with particular distinction for the access through occupation with 10 percent points of difference and for the access through the Government where there is a difference of 16 points. It can be concluded that the larger the city, the larger the number of people to whom the land has a value of market.

A issue that can be raised is, why is it that not all those who had access to land through the market was attributed a market value? In fact, Manica only 40% and Nacala 47% of those who had access to land through the market expressed their prices of offer and demand. The only reasonable explanation, which was later confirmed in the interviews, is that they do not want that their neighbors know how much they paid for the plot to avoid jealousy or requests for loans. This kind of situations is normal, on one hand the integration in the neighborhood develops in the frame of social network that contributes for the reduction of risks, but on the other hand the same social network can be an obstruction to the good economic performance of a family, forced by the reciprocity and redistribution.

If we consider that all those who had access to the plot through the market are attributed a market value, as it could be expected, the percentage of those that attribute the mercantile value to the land rises from 43% mentioned above to 77%. This percentage value is identical to the one that was observed in the rural urban property market study done last year [CS. 2003]<sup>3</sup>

## VIII.2. VALUE OF THE LAND

The average market value in US\$ per m<sup>2</sup> is \$7.4<sup>4</sup>. In the study carried out in Maputo in 1995 as mentioned above, the average value of the market was \$1.8 per m<sup>2</sup>. Could the increased demand in the last ten years made the real-estate market value to increase to about 4 times more?

There are two key questions that are asked in terms of what varies, the urban property market value, and if the market value is attributed to all the land.

Since the classic times, David Ricardo affirmed that the rural property is valued by what it has to offer while the urban property is valued by the demand. If this is the case then the land which access was through market must be more valued compared to that which access was through the Government, since the demand increased from the time of housing nationalization. On the other hand, the land acquired through simple occupation, must be more valued than the land acquired through customary way, knowing that, by definition, the demand for land through customary way is minimum, and it is only possible to get it through marriage or inheritance.

The data collected, confirm with the theory of David Ricardo. The graphic below shows the average value. As it can be seen, the average market value varies according to the theory of

<sup>3</sup> About 88% of total of the sample in the study shows that the rural land market attributed a land market value.

<sup>4</sup> It was preferred to use the American dollar in order to compare with other studies. The applied exchange rate was 1 USD: 20.000,0 MZM.

Ricardo except in the case of the adjudicated Government land. The average land adjudicated by the Government is \$10.4, followed by that of the market with \$7.5 and the simple occupation with \$7.4 and finally the one acquired through customary way \$4.6.

**Fig. 13: Average real-estate market value per m<sup>2</sup> by form of access**

Why is it that the land adjudicated by the Government has more value than in the one from the market? A possible explanation is because were before a situation of speculation or over-evaluation of the plot in relation to the potential demand, without having any relation with the dimension of the offer. This way, a Government imperfection can be seen when intervening on the market of the government property <sup>5</sup>

The demand by itself does not explain the fact to have development or plots whose demand is identical but they have different market values. In the XIX century, Von Thünen said that the real-estate market

value varies with the relative market distance, assuming that the market was at a central point where the land value was reducing with the distance from the point. In the case being studied, the land of the urban area, where the bigger real-estate market volume of transaction through market, should be more valued, followed by the land in the peri-urban areas and lastly the “green zones”.

In fact, the average value per m<sup>2</sup> of the urban property is \$20.0, in the peri-urban area is \$5.1 and in “green zones” with \$1.7. The localization is a determining factor in the determination of the urban property market value in Mozambique. However, the localization does not explain the variations within the same area, for example, in the urban area the average value per m<sup>2</sup> it was estimated at \$0.1 and the maximum of \$416.2.

The analytical tradition that originates from the theory of value by Marx, assures that the real-estate market value little or does not originate from the demand or the localization, but mainly, from the incorporated market that it has to offer in the sales market. In this case, the land where there was more investment must cost more than that which there was no investment.

**Fig. 14: Relation between investment and market value per m<sup>2</sup>**

The illustration above is clear. First of all, the average value per m<sup>2</sup> of those who did not invest is identical, independently of the area, except in the “green zones”, which is explained in terms of localization and the demand. Secondly, either the investment to guarantee security of ownership like in the building of infrastructure of access to water and electricity does not modify the value per m<sup>2</sup>, since it is related to low investments. Third, however the investment in the construction increases significantly the real-estate market value per m<sup>2</sup>, with the exception of the “green zones” where, by rule, the construction is made of traditional materials.

The neo-institutional theories, still asseverate that the security of consubstantiate land ownership in the title deed or similar document, increases the real-estate market value of market. Also, in the ongoing case study, the neo-institutional theories can be confirmed, the m<sup>2</sup> titleholder costs 1.8 times more than the non-titleholder, and the difference between Nacala (2.7 Xs+) and Manica (1.3 Xs+) is relevant, which is justified because the demand in Nacala is bigger than the demand in Manica.

Four groups of independent variables can be found: (i) The demand reflected in the form of access; (ii) the location of the plot in relation to the central point of the market; (iii) the incorporated value in the plot reflected in the investment carried out; (IV) the existence of a title

<sup>5</sup> An Identical imperfection can be seen in Zimbabwe and South Africa. When forced by the agreement of Lancaster House, in the case of Zimbabwe, and by strong recommendation from the World Bank, in the case of South Africa, the Government offered to buy land from the white farmers in order to redistribute it for the black population, the selling prices from the white farmers were (are) so high that it made the land reforms programme followed by both countries impracticable. It was an attempt by the Government to legitimise the market which is primarily, distorted, as it can be seen, produces bigger distortions and facilitates corruption.



deed or similar document. None of these sets explains the variation of the real-estate market value, but the all four together explain largely and can be used as prospecting and simulation instrument of the evolution tendency of the real-estate market value in the urban centers <sup>6</sup>

When establishing a comparison between the two cities, it can be seen that market value per m<sup>2</sup> in Manica is 1.7 times higher than in Nacala (\$9,7/m<sup>2</sup> and \$5,9/m<sup>2</sup>). Since there are no significant differences in relation to the location (both cities are located in strategic points), neither investments carried out (the housing standard is identical), nor in terms of title holding (the average value of the titled development or plots is identical, \$10 / m<sup>2</sup> and \$9 / m<sup>2</sup>), the only explanation hypothesis that remained was the dimension of the demand.

When analyzing the data, it was found that the per capita average area in Manica is 1.5 times smaller than in Nacala (310.8 / m<sup>2</sup> and 456.6 / m<sup>2</sup>), which indicates that there are bigger demand in Manica than in Nacala. Although the absolute demand in Nacala is bigger than in Manica, the same does not happens in relation to the land available in the latter city. Manica is surrounded by mountains (in the South) and by private agriculture fields (North and East), while the expansion possibility of Nacala can take place in place. Established the correlation between the average areas per capita and the real-estate market value per m<sup>2</sup>, a perfect negative correlation was found (-1). In short, the absolute demand criteria must be combined with land related demand to better understand the variation of the value from city to city.

The second key issue is if the market value is attributed to all the land. According to Negrão, in his model on the economic behavior of the rural families in Africa, below the food security line, there is an imperfect substitutability between the land and the capital, meaning, the familiar farmer does not put on the market the land that he depends on to live and produce his food [Negrão, 1995]. It is important to know if the same happens in relation to the urban.

In Nacala, the families who have less than 18 m<sup>2</sup> per capita do not attribute neither the price of reservation nor the price of offer to the land, meaning, below this area the land is not sold, or rather, the rights on the land are transferred by onerous form among the living people. In Manica, the limit is 24 m<sup>2</sup>. In this same city, the percentage of families below this limit is 3% and in Nacala is 9.5%. All the registered cases of sale of land, which the original per capita area is below the limits, can be considered as motivators of precarious housing conditions and, therefore, they are imperfections of the market.

Obviously, the implications in terms of regulation regarding the functioning of the real-estate market of the urban soil vary a lot, they highlight the need of taking into consideration the limits placed by the market and on the other hand, guarantee that the inter-familiar relations and gender in the family cannot impose agrarian transactions that oppose to this rule. The regulation must prevent eventual imperfections of the market that lead to adjudication of the per capita area that can be smaller than those considered *Inter pairs* as minimum to be able to live.

### VIII.3. TRANSACTION COSTS

The average percentage difference between the reservation price and the offering price is 41%, which can be considered very high when compared with the markets of the developed countries where the difference varies between 6% and 10%. This high index is an indication of two simultaneous realities; the first is that the market is still in its incipient formation phase, and the second it that the lack of transparency and information in the mercantile transactions of the

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<sup>6</sup> A simple regression was done as an experiment having  $V_m = f(P1...n)(L1...n)(I1...n)(T1...n)$ . The group with more clarifying explanation was the group of the investment (I), followed of the title holding (T), then the location (L) and, lastly the demand reflected in the form of access (P). It is believed that the reason for the demand is the one that has less clarifying explanation because of its distortion due to the Government intervention. In the end, the residual value was very small and could be accepted as a starting point for a specific work aimed at the construction of a more detailed econometrical model.



development or plots is big. It is a fact that the market is an incipient, but what provokes this lack of?

Analyzing the data by form of access, it can be verified that the high index rate happens among those who had access through customary way (59%), followed by the market (38%), then the simple occupation (31%) and finally between those who had access to the plot through Government (29%). The land transactions which access was through the Government or occupation that have a smaller index is by rule, the first are subjected to registration with more information and the second lead by an informal system where information circulates at a higher speed and certain rigor. The high percentage related to the access through the market, which theoretically should be the lowest, explains itself by the distortions originated by the imperfections of the market and Government above mentioned.

**Fig. 15: Percentile difference between reservation price and offering price**

The analysis per area show that the differences are minimum, the index is slightly higher in the peri-urban areas (44%) and smaller in the urban area (39%), possibly because in the urban area there is a bit more information on the real-estate market values.

When establishing a comparison between the two cities, it can be seen that the index in any variable, is always higher in Nacala than in Manica. The average index of Nacala is 50% while the one of Manica is 29%. This difference of 21 percentile points is basically thanks to fact that the market is more incipient in Nacala than in Manica due to relative demand.

In short, the lack of information is explained by four factors: (i) due to corruption in the sale of lands; (ii) by influence of the social networks reciprocity where there is a conjure of prices (iii) caused by the distortions originated from the low costs of alienation of the Government; (IV) due to the transactions of development or plots with areas below of the minimum limits by imperfection of the market.

## IX. CONCLUSIONS

It is the general objective of this property market study, to identify the reach and dynamics of the urban property market, and its specific objectives are to establish a urban property market typology and describe the offering and searching characteristics. It was presumed that the allocating efficiency of the land was bound to the form of access to land.

Four forms of access to land were identified: (i) through the customary rights systems that establish the norms of inheritance and marriage, responsible for 14% of the distributed development or plots; (ii) through direct Government adjudication, with 13%; (iii) through simple occupation, with or without good-faith, in 6% of the development or plots; e (IV) by transactions of rights through the market, found in 62% of the cases.

A conclusion that is worth of highlighting is that, in a general estimate, the articulation of these four forms has been sufficiently efficient in the urban property adjudication, since one way or another, except rarely all those who have access to the land and consequently shelter. To date, in the Mozambican cities, the *shelter-less* phenomenon does not exist as it does in many other African cities. All interventions that intended to hinder performance of any of the four forms like for example the market prohibition or land privatization would be counter-productive in the current circumstances.

The African cities - and Mozambique - are not exceptions to this rule, the last decades have seen with a growth rate that is higher than the population growth rate of the countries. The Government is unable and is not expected to be able to offer urban spaces with minimum housing conditions that accompany the growth rhythm of the demand. It is in this space that the other forms of adjudication of the physical urban space gain a new dimension, resulting particularly from the transfer of rights of use and exploitation of the land through the market.

The market plays a relevant role in the adjudication of the urban property, and the tendency, keeping all conditions the equal; it is that this role is bigger ending by replacing the Government in the adjudication of the urban property. The market is particularly active in peri-urban areas, to where the immigrants of the rural areas converge, be it definitively, through the sale of development or plots, or by the so called floating (those that go to the city regularly to sell their products or to do temporary work) through the leasing market.

The urban space is each time, the largest central market (of products, work and capital), where all the informal economy develops, ranging from people who do odd-jobs to transport business and from the street peddler to the street mechanic. Accordingly, there is a growing consumption of vegetables, poultry meat and other goods that can be produced in an intensive circular form around the city that was later called the "green belt" green waste/belt. Agriculture is thus part of the city and with it came the land which access is made according to common systems. There is tension between two potential users regarding these lands, the agrarian production to supply the big market and the demand of space to live. This tension is far away from being solved, and the balance between the permanent returns originated from the agrarian product and other immediate returns acquired through the subdivision of the plot and sale of development or plots, is yet to be found. It is concluded by this form of land adjudication will continue along the years.

Two types of markets found in any form of land adjudication were identified, the formal market or subjected to registration (SR) and the informal market or not subjected to registration (NSR). Both have their own characteristics, their own rules and regulations, and both too with their own imperfections. In the market subjected to registration SR, it can be mentioned the *hunt for easy profit* the lack of transparency that induces to corruption and to the dubious performance of the city council police. In market not subjected to registration NSR, the arbitrariness, fraud and discrimination based on gender and social group is highlighted. The conclusion is that the institutional frame where the transactions happens it is diffused and weak.

In matters regarding the expansion of the physical space, the expansion of the cities is done through a spontaneous form, without obeying either the specific criteria or the projections on the economic, social and environmental implications of the life of the citizen. The Government argues

that it does not have means and the private sector affirm that it is not their business unless it has profits on the eventual invested capital, as it happens in the horizontal properties jointly owned.

Regarding investment, a clear distinction between investment to reduce costs of transaction and investment to increase the profits was found. In the first case, it was concluded that due to lack of land ownership security, there are two distinct behaviors, while the "poor person" invests to claim effective ownership; the "rich person" invests only when there is guarantee of ownership. In the second case, the low percentage of investments seen and the diversity of the same in relation to the cause-effect relation between the land adjudication form, and the type of investment carried out. It is therefore concluded that it is not the form of adjudication that determines the economic behavior but the individual initiative (the *entrepreneur* initiative spirit of Schumpeter) that, due to land adjudication form achieved, selects the type of economic activity that is best for him.

In terms of social justice in the land allocation, it was found that it is the Government which assures the best and just distribution of land, by imposing its own legislation, and the customary way is the less fair in the land adjudication and has already provoked alarming situations of social injustice. On the other hand, it can be seen that the auto-regulating mechanisms through occupation and market are not enough to control the tendency for a social injustice. It can therefore be concluded that the Government plays an indispensable role on conditions of strict fulfillment of its own legislation.

It was found that the way the simple occupation happens, where the law of the strongest prevails and the use of natural resources is unsustainable, particularly in the peri-urban areas, denotes the absence of an institutional frame that respects the interests of the majority of the citizens and coming generations. It was also found that the institutional customary frame tends to have a smaller and unjust encompass. In this context, it can be seen that neither the institutional Government frame, nor the customary systems and the auto-regulating market mechanisms, are able to have persuasion mechanisms aiming at fulfilling what the basic law and regulations for a sustainable use of the resources have already established. Thus, it was important to develop a new institutional frame that in the light of the positive achieved results obtained in Nacala, counts with the active participation of the citizen in the management of resources and in the planning of the urban space.

In a general estimation, in order for the city to fulfill its rural development dynamic function, instead of deposit, as Arthur Lewis said, of those whose margin job productivity is equal to zero, it is important that the regulation induces to the work specialization and the demand of the rural product and foresees that the existence of the physical space and infrastructure in the peri-urban areas (for example, spaces for small industries and electric power) that can host this dynamic which has direct implications in the poverty reduction.

The household fuels constitute one of the main concerns in the area of the sustainable use of natural resources in the urban soil. It can be concluded that it is not the form of access that determines the type of fuel used, but the financial availability, the type of housing, the location of the plot and the size of the city. A positive correlation between the poverty and the usage of wood as household fuel was also identified even when this results in being more expensive than the electricity which does not originate from the cultural habits but, basically, from the immediate finance availability and saving options.

The person who has access to the urban property through the is the one who invests more to have and do maintenance of the treated water system and electric power of the house, the biggest absences of this type of market investment are those whose land was adjudicated by the Government. Two conclusions arise; the Government imperfections in the adjudication of the development or plots with low costs compared to the costs of repossession, and consequently, the incapacity of the lessees to cover maintenance costs and the imperfections of the market in the exclusions of the poor. The reversion of these trends has to go through revision of the conditions and attribution of credits for housing, contemplating among others, to the propensity for the saving in terms of building materials as additional guarantees to the land and technical advice about the housing sanitation and health conditions.

The attribution of a market value to the urban property, is common to the majority of the citizens, however, it can be seen that high transaction costs related to the lack of information for various

reasons that go from the influence of the social reciprocity networks, to the Government imperfections originated from low costs of alienation and corruption, through the market imperfections that allow transactions of the areas below the minimum acceptable *Inter pairs*. All this suggest that it is urgent that the Government stops intervening directly in the market, dissolving quickly from the Government estates and begin to play the role of legislator and defender of the interests of the voters through the market, the customary systems and simple occupation.

It was also found out that the urban property market value varies according to the absolute demand and relative demand, the location, the investment done and registration. It is obvious that the set of variables so extensive is in permanent change making it impossible to foresee its evolution and behavior, confirming what Paul Benkin said that this is the most imperfect market of all. However, it is possible to have a systematic surveillance of its evolution and be able to simulate situations such as crossed grants in terms of prevision of public and private instruments. For this, sustainable management development models of the urban property must be developed in order to be used by the citizens and be able to contribute to find operational forms that may lead to the reduction of the urban and rural poverty.

## **X. MODEL FOR THE SUSTAINABLE URBAN GROWTH (MoSUG)**

A model is nothing more than an attempt of simplifying the real world through a selection of variables that are seen as basic for explanation of a phenomenon and projection what will happen, in case all the conditions remain the same, and simulation of what will happen, in case one or more variables are modified. It is estimated that there is the relation between variables; and these relations can be positive correlations (whenever one increases another one also increases) or negative (whenever one increases the other one reduces) or interactions (whenever the alteration of one or more variables interacts with the others).

The construction of a model implies (i) a careful selection of variables, (ii) a clear definition of the underlying assumptions (iii) a previous theoretical elaboration that establishes the correlations and interactions. The model resulting therefrom will then be applied to the analysis of the actual situations based on real data through simulation and projection exercises. A model is only valid after it has been tested, at which time the selected variables are approved or disapproved, the estimates are verified and the theory is elaborated.

However, in the real world, not always do the results of a variable have identical effects on the others; a same kind of change may have a given effect once and a totally different one in a second instance. Such unpredictable results that appear in the course of time are often due to the set of other aspects of a situation, which, for simplification reasons, were not taken into account. It is said that models are neither perfect nor imperfect, they are neither good nor bad, they are only appreciated to the extent of their ability to project and simulate during a period of time.

The Model for a Sustainable Urban Growth – MoSUG, is nothing more than an attempt to create an instrument that can be useful in management of the urban space and that can be understood and used by the common citizen when applying it. This double characteristic, utility and simplicity (not simplism), is not always easy to obtain and it is a challenge for the team that worked in the study of the urban land market.

The construction of the MoSUG counted on the participation of numerous specialists who worked together in the selection of variables, in the definition of the estimates and in the identification of the relations between variables. The MoSUG has only been tested at environmental laboratory and has not been used in the real world. We are aware that it has its limitations and probably errors that might be corrected, but we are also certain that the MoSUG constitutes a pioneer starting point that will stimulate the interest for the creation of useful instruments for management and planning of the urban space in Mozambique.

## **X.1. OBJECTIVES OF THE MoSUG**

The purposes of the MoSUG are:

1. To revert the tendency of unsustainable urban growth;
2. To turn negotiation of rights into a form of optimizing the economic and social use of the urban space;
3. To prevent situations of social injustices;
4. To contribute for participative management of the resources and the territorial planning.

## **X.2. THEORETICAL BODY UNDERLYING THE MOSUG**

One of the three conditions for the construction of a model is existence of a previous theoretical body where the correlations and the interactions between the variables are explained.

The localization theories, developed by Von Thünen at the beginning of XIX Century, argue that there is a relation between the distance up to the city center and the costs for transportation of merchandise and people. According to such theory, the variables “distance” and “costs of transportation” are essential for establishing the connection between the urban center and the surrounding rural areas.

In turn, the urban structure theories suggest that what determines the connection between the urban and rural areas are not the costs but the time of transportation and the occupational density. That would explain why posh areas tend to move from the city-centre to the periphery, therefore raising the value of peripheral rural areas. The variable “time of transportation” appears as well as determinant in the relationship between the city and the fields.

From the many theories on urban growth the theory of the central place and the theory of the urban base stand out. The theory of the central place, devised by Christaller and later developed by Berry and Garrison, suggests that the cities grow because they have something to offer and they have a product to distribute. The range of such product depends on the distance that the person is willing to travel to get it, and the threshold of this distance corresponds to the minimum purchase power needed to justify the supply of a product or a service from the central place. The variables to note in that theory are “range” and “threshold”.

The theory of the urban base suggests that what determines growth of a city is not the distance that the offer for rural products is willing to cover, but rather the increased dependency of the city towards the field and how much it is willing to spend or is capable of spending on its sustainability. This theory also suggests that the more a city grows the less self-sufficient; therefore sustainability becomes increasingly dependent on the level of income originated from the services and goods that it has to offer and from its capacity look for those products that it does not produce on its space. The variables to hold from this theory are the “dependence of the surrounding urban space” and the “income originated from the specialization of the city activities [Balchin and Kieve, 1977].

More recently, the theory of participation was developed, which advocates that growth and management are not separated and that the letter originates from the articulation of the several social, cultural, political and economic, public or private agents existing in the city and in its region. The participative management as a determinant variable started to be considered in the 60's when the concept of blueprint planning was replaced with that of process planning. However, when the participation is understood such that each and every decision must be submitted to a referendum, it can constitute an obstacle to investment [Staley, 2002]. “Participation” and the “institutional frame” within which it happens, are then the important variables from such theory.

In terms of modeling there are four theoretical schools documented in literature, that is, the neoclassical, the neo-Marxist theory, the theory of endogenous growth and the theory of structuring. The neo-classical theories are based on economic income, the distance to the center and on individual decisions, as suggested by Von Thünen. According to Mbiba and Huchzermeyer [2002], these theories assume that local economy has to be modernized including the institutions that support them, the formal legal system of the Modern Government must replace the customary systems of access to the land and the methods of production, consumption and traditional distribution must be modernized in accordance with the economic rationality of capitalism.

In this context, the modeling must aim at the perfect functioning of the land market and the full substitutability between factors, that is, of work, **capital** and land. The individual economic behavior must be guided toward maximization of the income and the social logics are subordinated to this rationality and, as such, are exogenous; the same is true with respect to the urban work specialization, which is seen as the product of a perfectly operational real-estate markets, **capitals**, products and work<sup>7</sup>

The neo-Marxists theories resort to the dependence-oriented economic theories of the years 1960 and 1970, arguing that the spatial distribution structure and conflicts are inevitable products of the capitalist organization of the society in the globalization frame. The globalization induces capitalist-production relations that inexorably destroys the forms of life and the local institutions, towards proletariat and the maintenance of *lumpen* proletariat.

In such event, the modeling privileges the social organization of poor peoples, their alliances with the working class and the activism against the globalization on a worldwide scale. The Economy is practically determined beforehand and there is no need to model it, the same happening in relation to the physical space that becomes solely a battle field for the simple occupation and for the legislative battle on the land reform.

The theories of endogenous growth are today popular among the Bretton Woods institutions; they advocate that the specialization or technological transformation becomes endogenous as they are assimilated on economic scales, which are only possible through agglomeration. Then there is a perfect replacement of factors and economic and social behavioral logics of the citizens are fully integrated in the market, thus, for example, children education is required not because of the rights of access to knowledge, but because it is an investment that the parents do and they depend on the family returns that will come within some years [McCann, 1995].

Modeling is basically a technical zoning exercise of the urban space that can be done with either small or large levels of participation, according to a more or less democratic tendency of the people responsible for the planning and physical development of the urban space together with the costs that such exercise may involve.

The structure theories are based on the development sociology, which reject the economic determinism of the modernization and the structural of the globalization, to argue in favor of the existence of an autonomous dynamics where the human values are structured according to the challenges and the opportunities originated from the power relations existing at a certain place and moment [Mbiba and Huchzermeyer, 2002].

In such sequence, the modeling means nothing *per se*; it can only be justified when there is a given specific conjuncture; Therefore, there can not be models with "universal" ambitions but only with "universal" practices.

The study produced enough evidence to be able to affirm that the African city constitutes a rupture [SIC] with the neighboring rural territory, the so-called hinterland; on the contrary, the floating immigrants and the increasing function of the impelling pole of the rural development,

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<sup>7</sup> Have a series of conceptual and empirical neo-classic models that is not related to the question of modernization; however they assume full existence of a real-estate market and possibility of perfect replacement of the factors; in such events, cases such as those of Moçambique do not apply [ Bell and Irwin, 2002 ]



show that there is a continuum between the field and the city, where this is no longer a place from which to drain the agricultural surplus, as it was in the colonial times, but, as [Hugon 2003] said, a space of creation of wealth for work division and by the action of the market in the constitution of an exigent demand of a greater quantity and quality.

It is in this niche that the informal economy installs itself and develops new relations of power between the young e elders, men and women, field and city, market and Government as well as the peripheries and centers. Upon settling, the informal economy induces the work specialization that becomes an independent variable. However, this does not always benefits from the institucional frame that prioritizes or even gives consideration to the interests of the majority, appreciation of resources and the preservation of the ecosystems. This alone already justifies existence of models supported on management to contribute for the territorial planning. Four variables result from there – the sustainable growth, the economic performance, social justice and sustainable use.

The local dynamics are strong and autonomous enough to suggest that they depend, exclusively, on the globalization, that are not embedded with a specific endemic power as suggested the by the neo-Marxist theories, and therefore should submit and await a global revolution, for the creation of a new international economic order [sic].

The evidence produced also showed that the cities are not self-sufficient but can be self-sustainable provided that they produce enough to cover the "costs of importation" of what they need. The case study highlighted, as variables, that the urban space depends from a buffer zone, food, timber-derived fuels and work. Such costs of importation could be reduced, for example, by electrification and increase in productivity in the green zones, which makes these variables to be independent from the model.

To obtain the resources that are needed, there is a permanent interaction between the spatial range of the offering and demand, the threshold that is not worth stepping through and the high growth rate. They are therefore mobile variables (the ones that are always changing), which depend a lot on the roads network, while independent variables [sic]. The constant mobility of such interaction is not compatible with the argument in favor of the zoning highly supported by the technocracy of the new endogenous growth theories.

The study also demonstrated that economic income is connected with the localization, as argued by the original localization theory, but it refutes the neoclassic theoretical approach of economic determinism and of the logics of submitting all and everything to the principle of maximizing the profits. There is no doubt that for the majority of those interviewed that the land has a market value and, as such, it is an economic asset that is an independent variable, although the fact that it is an economic asset does not automatically turn it into a merchandise.

Social relations of reciprocity were determined in the fact that one third did not declare the market value of the land, although they have had access to the land through purchase; there are also an imperfect substitutability between the land and **capital**, to which the poor people hold on assure access at least to a plot of land and a roof over their heads. These social relations and the non replacement of the land by **capital** show that the land, although highly economic, may not be a merchandise and, as such, it has a fundamental role to play in the poverty reduction.

Nothing can be commented, with respect to the structuring theories, on existence or nonexistence of "universal models" since the MoSUG is still in its construction phase and it has not been tested in Mozambique. However, rejection of the theorization and, therefore, of the principle of reproduction of normative and analytical models, even if in identical conditions, means denial of the theory itself and calls for empiricism (apart from the high implicit costs of the practice on a case by case basis) which ultimately means denials of the very theory of structuring.

We believe that the theory has a role to play in the decision-making process, as far as politics are concerned. There is a series of political variables which are determinant for performance of all others. Among them, the study identified access to land, institutional frame, participation of the citizen, as crucial for specialization of work in the city, together with development and consequent reduction of poverty.

### **X.3. ASSUMPTIONS OF THE MoSUG**

The MoSUG assumptions derive directly from the conclusions of the study.

1. The cities of Moçambique have a growth rate that is higher than national population growth, and such tendency is expected to continue in years to come.
2. The Government has not managed – and it is not expected to manage - to offer urban spaces with minimum living standards in pace with growth of the demand. Accordingly, expansion of the cities is made in a spontaneous manner without following any specific criteria or projections on the economic, social and environmental implications in the life of the citizen.
3. Articulation of the four forms of access to the land, traditional right systems, direct adjudication by the Government, simple occupation and real-estate market has been enough efficient in the adjudication of the urban land.
4. The Government is that one that better assures a far distribution of the land as required under the legislation that it developed, but it has imperfections that reflect in the adjudication of plots at costs below replacement cost and in the corruption. The traditional manner is the least far in adjudicating land and the self-regulating mechanisms of occupation and market are not enough to control the tendency toward social injustice. Therefore, the Government's regulatory role is indispensable.
5. The market plays a relevant role in the adjudication of the urban land, and the tendency is that- if the current conditions remain –such role will be increasingly important until it ultimately replaces the Government. The market is particularly active in the peri-urban areas; however it has imperfections that show in exclusion of the poor people, and in its failure to recognize existence of the imperfect substitutability of the factors.
6. The urban space is the large central market where informal economy is developed to add value to the products, contribute for development of the markets and the specialization of the work, in particular of the women's work. Accordingly, there is an increasing consumption of goods produced in a area around the city. The thrust function of agricultural development demands specific regulation and infrastructure in the appropriate peri-urban areas to structure such dynamics.
7. Informal economy not always takes advantage of an institutional scenario where the interests of the majority are contemplated, the valuation of the resources is had in consideration and the preservation of ecosystems is had in account line, as it is denoted clearly in the use of timber-derived household fuels.

### **X.4. SELECTED VARIABLES**

The selection of variables, as well as the definition of the assumptions and the identification of the relations between variables derived from the findings of the study carried out. These activities are not done sequentially: they are done in a process where the three interact with each other, therefore the need to make successive adjustments and permanent confrontation with the empirical evidence collected and produced in the data analysis. Twenty variables were selected as follows:

- v01: Sg – Sustainable Growth
- v02: Ep – Economic Performance
- v03: Sj – Social Justice



v04: Su – Sustainable use  
 v05: F – Food  
 v06: Fw – Timber-derived fuel  
 v07: W – Work  
 v08: B – Buffer zone or zone of influence  
 v09: – Range  
 v10: T – Threshold  
 v11: G – Growth rate  
 v12: R – Roads  
 v13: P – Productivity  
 v14: E – Electrification  
 v15: S – Specialization  
 v16: Lv – Land market value  
 v17: Lt – Form of access  
 v18: P – Participation  
 v19: I – Institutions  
 v20: R – Comparative Weight

### ***variable results***

v01: Sg – Sustainable Growth  
 v02: Ep – Economic Performance  
 v03: Sj – Social Justice  
 v04: Su – Sustainable use

The Sg variable– Sustainable Growth is the ultimate result or dependent variable to be attained. It depends on three other products, of the levels of Ep – Economic Performance of the residential units (municipal, families, companies, etc.), dimension of Sj – Social Justice in the allocation of the urban land and in the Su – Sustainable use of the resources for the city.

Indicators for each of these variables are those that were identified during the empirical evidence survey of the land.

### ***Dependent variables***

v05: F – Food  
 v06: Fw – Timber-derived fuel  
 v07: W – Work  
 v08: B – Buffer zone or zone of influence

During the fieldwork, the basic question for the identification of these variables was – what is it that makes a city not self-sufficient? It was assumed that as it keeps growing it loses its self-sufficiency, meaning that it depends more and more on resources originated from the neighboring territories. As it is obvious, these variables can change from city to city, the selected ones correspond to the places that have been studied.

A city does not only consume food (v05: F) that is produced in the green zones but also food that comes from neighboring countries. Due to lack of formal jobs and the low wages and remunerations (or to the low work productivity margin) gained in the cities, there is a permanent interdependence between the "field" and the "city". On one hand, it is the city that needs the agricultural product that is supplied every day and, on the other hand, is the field that needs the city to which its products will be supplied. The city becomes therefore, a large market where the farmers supply their surplus and purchase the industrial goods that they need, the middle-market adds value to the product (primary transformation, packing, etc.) and the consumer keeps demanding more quality.

On the one hand, the functioning of the market induces the technological transformation before the agriculture producer; on the other hand it creates new labor and opportunities, meaning one

work specialization (v07: W). As a result, as shown in the study, the city appears as a booster agent of the agricultural rural development and as a regional growth pole.

However, the city also appears as a consumer of enormous amounts of timber-derived fuels and logging brings fast deforestation and erosion of the surrounding territories and the use the environmental pollution (v06: Fw). This interaction happens in a surrounding area that vary from product to product and from city to city, meaning that the city has an area of influence or as the buffer zone it is called by the wildlife ecologists (: B).

To facilitate the use of the model and to be an interactive instrument anywhere, without the need to resort to sophisticated computerized programs, the team developed a simple program that can be worked on a normal calculation sheet. In this calculation sheet, this group of variables has the following visualization

Distance in minutes			
F o o d	F i r e w o o d	W o r k	B u f f e r Z o n e / Z o n e o f i n f l u e n c e
0	0	0	0

**Fig. 16: Visualization of the dependent variable**

### Mobile variables

v09: – Range

v10: T – Threshold

v11: G – Growth rate

Each product that the city needs is collected at a certain distance (v09: A). The distance that a person is willing to cover to get this product, which is called the range of the product, depends on the conditions of the access ways and the means of transport used, therefore, it was determined that the best way to measure that would not be kilometers but minutes. Since its values are subject to continued change, they were called mobile variables.

However, the distance that can be traveled to obtain any of these products is not infinite, there is a point where, for example, firewood is already so very far that the time used to fetch it and the costs of transport do not justify its consumption, therefore, it is less costly to use some other kind of household fuel. This is called the threshold (v10: T), the point after which purchase power does not justify the demand and offer of a product. When the threshold is reached, changes are induced in the consumption standards that may or may not occur according to a set of conditions, in particular, the average income of the family.

Each one of the products has its own threshold that is as much valid for demand as it is for offer. Whenever such distance (in minutes) exceeds such threshold, the city is no longer sustainable. The city may not be self-sufficient (as it normally happens) but it maybe sustainable, if it has financial means and resources that allow it to cover the necessary distances without jeopardizing its normal function.

Since African cities are in continued growth, the range for collecting each of the products that consumes and it does not produce, has an annual growth rate (v11: G), for example, the range for collecting firewood in the city of Manica grows 10% annually. Articulation of the growth rates of each range, space localization of some thresholds and the possibility to modify any of the two is therefore the "secret" to achieve urban growth on a sustainable level.

In the calculation sheet these variables are visualized as follows

		F o o d	F i r e w o o d
		0	0
		0 %	0 %
			A n n

**Fig. 17: Visualization of the mobile variable****Independent variables**

v12: R – Roads  
 v13: P – Productivity  
 v14: E – Electrification  
 v15: S – Specialization  
 v16: Lv – Land market value

Five independent variables were identified: those on which one can act and that withdraw the threshold or shorten the distance that demand and offers have to cover. These variables were also selected according to the findings of the study, and it is possible to modify them according to the specific conditions of each city.

The better the road conditions (v12: R) the shorter the time to cover the distances and, therefore, the threshold is moved away and reduces the distance between resources and the market. Improvement of the roads has indirect multiplying effects on all other related variables since moving away the threshold not only reduces the distances but it also incorporates other producers into the relevant market.

The more a city grows the higher the demand for perishable and sensible products transported by long distance, and that induces the increment of the productivity, first in the green zones and later in the neighboring countries, as it was found in the study related to the production of vegetables and poultry breeding. The increase of productivity (v13: P) depends on a series of factors (product input and knowledge) but there is one that is indispensable, which is demand. If the demand is not secured, the producer does not risk investing in product inputs and in the development of the family human capital to increase the production of a product that not sold in the market.

Electrification is one of the forms (v14: E), as if it was seen, to reduce consumption of firewood as household fuel, but there are others such as the network distribution of butane gas, solar energy etc. The selection of the electrification variable is due to the fact that not only does it reduce pressure on the resources not produced by the city, but it also has multiplying effects, among others, on the urban production structure leading to work specialization (v15: S) both in the context of the informal economy (for example, stalls and small home-based industries) also in the formal economy (for example, agro-industries and mechanic workshops).

But what is the influence of the market value of land? It was seen that market value of the land (v16: Lv) varies in accordance to a set of variables (investment carried on the plot of land, existence of a title deed or a similar document, localization and the demand reflected in the access form), and that the investment has greater explanatory power. In this case, when the market value increases there is always an improvement in all other variables that reflects directly in the increase of the buffer zone or the area where there is an interaction process between the field and the city.

The visualization of the independent variables appears in the calculation sheet as follows.

	Distance in minutes			
	<b>Food</b>	<b>Firewood</b>	<b>Work</b>	<b>Buffering Zone/Zone of Influence</b>
	60	40	90	60
	Threshold distance in minutes			
	90	60	120	120
If everything stays the same				
	Annual Growth Rate of the Distances			
	5%	10%	2%	5%
Within these years . . .				0

**Fig. 18: Visualization of the independent variable****Management variables**

v17: Lt – Form of access  
 v18: P – Participation  
 v19: I – Institutions  
 v20: R – Comparative Weight

The management variables are those variables that deal with politics. Not even the best of all model production technique will ever be able to replace political decisions. Models are instruments to assist in the understanding of reality, project the future and simulate the changes, instruments that subordinate to the political decisions politics; the MoSUG is no exception to that rule.

As it was seen in the study that was carried out, the forms of access to land and everything that revolves around it, is a result of a national agrarian policy. Any alteration in such policy will bring different results from those mentioned above, for example, according to the old Land's Law, the right of occupation was

only recognized as a way to obtain a title, absent which the right of occupation was not possible for the citizen and the same can be said in terms of maintenance or not of the current regimen of property. Any policy change involving the form of access (v17: Lt) will bring implications, for example, on the variable of the value of the land market (v16: Lv).

Participation (v18: P) is seen as necessary so assure actual involvement and trust on the part of the citizen and minimize transaction costs; however as we have seen, if not administered in the right dosage and with political sensitivity, may become an obstruction to investments and have effects contrary to the ones expected. To avoid this, it is important that the institutional frame where the transactions rights elapse be known to all and demands transparency. The study demonstrated that such institutional structure (v19: I) is indispensable to correct the market's and the Government's short comes.

The last variable is political although it may not look like one. It is the variable that deals with decisions related to the relative weight and the multiplying effect of the independent variables are taken. The MoSUG, for example, was programmed for each alteration in the variable v12: R – roads, to have an interaction weight of 100% in each one of the other variables and the variable v16: Lv – land market value to have an interaction one weight of 50% on the others. The weight of the variables depends on the economic policy options that are adopted. For example, if the current national strategic option were not market economy but rather a planned centralized economy, then the relative interaction weight of the variable v16: Lv would be nihil.

Evidently, the MoSUG can be reprogrammed simply by changing on the “simulation” sheet, the assessment basis for cells C18, D18, E18, F18 (since it is a specialized technical matter, line 18 is hidden – *hide*, just *unhide* by clicking on the right button of the mouse) and the following formula on which one can work will appear,

$$= (\text{Projeção!C9} * F5) + (\text{Projeção!C9} * F15/2) + \text{Projeção!C9}$$

When doing the *unhide* the following will appear with the required explanations

Food	Firewood	Work	Buffer Zone/Zone of Influence			
60	40	90	60			

**Fig. 19: Visualization of the cells for programming of the MoSUG**

## X.5. VISUALIZATION OF THE MoSUG

On opening the MoSUG first page called projection has the following configuration

Current Situation			
Distance in minutes			
Food	Firewood	Work	Buffer Zone/Zone of Influence
0	0	0	0
Distance threshold in minutes			
1	1	1	1
If all stays the same,			
Annual Growth Rate of the Distances			
0 %	0 %	0 %	0 %
withing these years . . .			0
the situation will be . . .			
Distance in minutes			
Food	Firewood	Work	Buffer Zone/Zone of Influence
0	0	0	0

**Fig. 20: Visualization 1 of the projection page of the MoSUG**

Filling in the required data answers to a series of methodological criteria that are recorded in a specific report called "*Grupo da modelação*" [modeling group]. It important to keep in mind that data collection must include all possible sources from the research and surveys on land, urban statistics, studies, key informers, salespeople, producers, etc. and the wide range of methodologies such as, interviews, quantitative surveys, network and geo-referencing surveys. The stricter the collected figures regarding distances, the thresholds and the growth rates, the lower the margin of errors of the findings of the projection and simulation.

Naturally, since there is no homogenous surface, either on the side of the buffer zone, where there is difference of topography, soils, communication means, etc., or on the consumption side, scattered through the urban zone, peri-urban and green zone, each with different habits. Recording of the characteristics and geo-referencing thereof will be a valuable help for the management of the resources and for planning of the urban space.

The team was not able to develop interactive software that could be applied to different cities, due to technical and financial constrains, but it developed a prototype for the City of Manica that can be used as an example of the MoSUG potential.

The following illustration shows data related to the "current situation" collected in the City of Manica.

Current Situation			
Distance in minutes			
Food	Firewood	Work	Buffer Zone/Zone of Influence
60	40	90	60
Distance threshold in minutes			
90	60	120	120
If all stays the same,			
Annual Growth Rate of the Distances			
5%	10%	2%	5%
within these years . . .			10
the situation will be . . .			
Distâncias em minutos			
Food	Firewood	Work	Buffer Zone/Zone of Influence
Insustentável	Insustentável	110	98

**Fig. 21: Visualization 2 of the projection page**

Upon completion the growth projection, keeping all conditions unaltered for the next 10 years, it is determined that, if the current growth rates remain, the food and firewood situation will become unsustainable

<b>Current Situation</b>			
Distances in minutes			
<b>Food</b>	<b>Firewood</b>	<b>Work</b>	<b>Buffer Zone/Zone of influence</b>
60	40	90	60
Distance threshold in minutes			
90	60	120	120
If all stays the same,			
Annual Growth Rate of the Distances			
5%	10%	2%	5%
within these years . . .			10
the situation will be . . .			
Distance in minutes			
<b>Food</b>	<b>Firewood</b>	<b>Work</b>	<b>Buffer Zone/Zone of influence</b>
Insustentável	Insustentável	110	98

**Fig. 22: Visualization of the projection**

The next step is the simulation about what could be done to reverse such tendency.

**Fig. 23: Visualization of the simulation**

If for example, it is possible to replace firewood with electric power or gas butane for 50% of the families living in the city in next the 10 years, and if the value to the land where the firewood is

	<b>What can be done?</b>			
	<b>Link between Village-City</b>			
	Improve the roads . . .			<b>0%</b>
	<b>In the village</b>			
	Increase the productivity . . .			<b>0%</b>
	<b>In the city</b>			
	Electrification . . .			<b>50%</b>
	Work specialization . . .			<b>0%</b>
	Increase the value of the land . . .			<b>20%</b>

mostly consumed increases by 20%, then it will be possible to revert the tendency. On the spacial representation prototype, the visualization is presented as follows

**Fig. 24: Geo-referencing visualization of the MoSUG.**

## XI RECOMMENDATIONS

1. To maintain the four forms of adjudication of the urban land, although with a progressive registration through for example, systematic granting of ownership title.
2. To allow for coexistence of both types of markets, one subject to registration (SR) and another one not subject to registration (NSR) based on the principle that one supplements rather than replaces the other.
3. To implement, as soon as possible, the regularization of all kinds of real estate-related operations, be it between living people (*inter-vivos*), for consideration or otherwise, such as to allow for transparency, celerity, and effective and efficient economic, social and sustainable use of the plots. Particular attention should be given to social justice issues arising from customary ways of access and the simple occupation of urban land, therefore preventing among others, adjudication of family areas where substitution *inter pares* is not permitted and attribution of areas considered below the minimum living standards.
4. To develop models for management of the resources that lead to a sustainable urban growth. These models must, among other things, take into consideration the peculiarities of the African urban space, the government's financial insufficiencies, the interest of the private investment in public places, and to rely on with the active participation of the citizens in its use for the management and the territorial planning.
5. The Public Attorneys' Office must exercise its duty to oversee enforcement of the laws, and the City council police must bring the appropriate lawsuits in order to assure the security of land ownership and therefore reduce the transaction costs and increase efficiency of the economic, social and sustainable use of the urban land.
6. Directive plans and other instruments provided for in the urban space territorial planning law give consideration to the spaces and the access ways for small business, small home industries, urban agriculture, poultry and others of similar nature, to push ahead rural development of the surrounding areas.
7. Informal economy must be the subject matter of a specific plan of action given its positive role played in the product market, work and **capital**, and the contribution that gives to work specialization, especially the women's work, and to the fostering of the rural development.
8. The household domestic fuel issue must be addressed in terms of alternative sources of power more sustainable on a neighborhood basis rather than limited to individual behavior only. For instance, installation of butane gas and electric power distribution networks must take into consideration the savings that will result to the urban environment.
9. Home financing systems must be reviewed such as to include issues related to housing for the poor, such as, for example, the use of savings accumulated in the form of construction materials as additional guarantee to the land and technical assistance for designing the houses in order to assure family and environmental health.
10. An official system of citizen participation in the management of the natural resources and the territorial planning has to be implemented, as means to develop an institutional work-frame capable of addressing the new challenges of life within the urban space.
11. The Government should dispose of its real-estate stock as soon as possible and begin enforcing its role as legislator and protector of the interest of the voters in face of the market, of traditional systems and simple occupation.
12. The Government should include, as part of its routine statistics survey, a component pertaining to the market value of the land, which should be of public records and, preferably, with access to the space visualization through the use of geo-referencing systems.



13. The notion of “buffer zone”, meaning an space of interaction between the city and the neighboring territory for the supply of the products needed by the former and provision of rural development services that the latter needs should be introduced.

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