

# **Preparing Khartoum for Tomorrow**

**An INTA Panel Report**

presented to

**The Wali of Khartoum State**

**The Minister of Physical Planning & Public Utilities of Khartoum State**

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## **STATEMENTS BY THE INTA PANEL FOR KHARTOUM**

### **Doug Coolman**

*Khartoum is truly on the doorstep of becoming a great city; it has all the resources; but must choose wisely.*

### **Reg Ward**

*Restatement of the vision of Khartoum should aim at an internationally significant Capital City*

### **Steef Buijs**

*What a relaxed and friendly city!*

### **Henry Chabert**

*Embarking on an ambitious restructuring programme will help Khartoum to better play its role of National Capital City and underline its readiness to join the network of the World cities*

### **Pedro Ortiz**

*Developing Central Khartoum functions will vertebrate the whole metropolitan area thus transforming it into a vibrant city*

### **Yousef Hiasat**

*Khartoum, the city of 3 Niles, is a city of great potentials. It ready, and will, prosper and move to the status it rightly deserves. Let us hope that peace and national solidarity prevail.*

### **Adam Kowalewski**

*Khartoum, for its distinctive features and challenges needs its own, innovative and original urban concepts and solutuions; it should not replicate others on its own way to the future*

### **Michel Sudarskis**

*Khartoum will rapidly secure for itself a specific niche in the regional economy with impact far beyond its regional settng.*

## FOREWORD

We came to Sudan with our experience of urban regeneration and planning in several countries. Some of us were already familiar with the Region and its neighbouring countries. But Khartoum was new to all of us. Our aim is to give our hosts a frank reflection of the issues and the options raised by the development and restructuring of the metropolitan area of Khartoum.

Our report will need to be followed up by much more detailed studies and analysis. But we have brought to this report our collective experience of other towns and cities. And we have had a unique opportunity over the last few days to hear the views and evidence of a wide range of people. Some of them are already intimately involved in the overall development, others have focussed on specific areas and issues. All of them have come with a positive interest in the urban development of the Greater Khartoum. We hope that this report will give a route map for the next few years. We have aimed to pick out what seem to us the absolutely critical considerations at both the strategic and local levels, and to map out the process that we believe will be needed to make things happen. We have very much appreciated the opportunity to work with Sudanese colleagues and have learned a great deal ourselves which we will take back to our own towns and cities. We have enjoyed the hard work, have met and talked to many interesting and committed people, and have been impressed by all that has already been achieved to improve the quality of life in Khartoum.

Our thanks are due particularly to the Wali of Khartoum State, Dr Abdulhaleem Esmail El Motaafi, and to the Minister of Physical Planning & Public Utilities of Khartoum State, M. Abdulwahab M. Osman, for their support and for hosting the Panel during its assignment. Their directors, in particular the Director for Planning, Altaieb Haj Ali, the Director for Housing, Mohammed Elsoffi El Racheed and their respective staff, co-ordinated by Dr Mustafa Abbass El Harbi, Executive Manager of Minister's Office, have brought to the panel all of their talent and warm personal qualities which make the Sudanese hospitality.

We are also grateful to Eng. Salah H. Abukashawa and Mohamed H. Abdulraheem, Director for Public Relations of the Ministry, for providing us with the working environment and the help we needed to carry out our study.

Finally our thanks go to H.E. Abdul Haleem Babu Fatih, Ambassador of Sudan in The Netherlands for his personal support and whom we kept busy for many weeks with logistic arrangements.

We also acknowledge with thanks the many senior personalities who took time away from their busy schedules to meet with the Panel and freely share their knowledge and ideas. Their numbers and community prominence warrant their being listed in this report. It will assure the readers that wide ranging ideas and information were sought and received as part of the investigative study process. Apologies are given in advance if we have inadvertently left anyone off this list.

## THE PANEL'S MISSION

### The Challenges

The challenges the Panel was asked to address were:

- 1. How to handle the great influx of population into Khartoum**
- 2. How to create a transportation system to move residents and visitors throughout Khartoum**
- 3. How to manage to accommodate these new influences and still provide a quality of life and image representative of the capital of Sudan**

The series of plans designed over the years, either locally or with the assistance of foreign experts, and the comprehensive presentations gave us useful background on the factors relevant to the future development of Khartoum as well as the identification of lines of action.

We knew that, in the course of a few days, we could not match the detailed local knowledge of our hosts. Nor could we hope to master all the relevant social, economic, commercial and political issues. We were also not able to commission new studies or surveys. We therefore concentrated on using the interviews to get as many different perspectives on the key questions as we could, and we tested the evidence and data we were given against each panel member's practical experience of urban regeneration and development.

We started by looking at the overall strategic framework. We have picked out what seems to us the key issues for potential of the Khartoum conurbation over the next decade. We then related this to the local area and opportunities that we had been asked to address. Finally, we have tried to set out an approach, identifying the range of decisions and actions that will be necessary to make positive changes.

## NATIONAL AND INTERNATIONAL SETTING

### Khartoum in search of a role in the World Cities competition

The notion of "world cities" has become prominent in recent years. However, the notion remains focused on rich countries cities. Large cities in less advanced countries could legitimately pretend to have also a "world" role. Obviously, these cities differ from the richer cities in a number of ways: they are more subject to the economic, political, and cultural impact of major foreign actors - governments, corporations, international organisations, universities, media industries. The resources they can draw on are much more limited as they too have to make more investments in infrastructure to meet the standards expected by foreign investors; and their population is younger and growing rapidly.

The pressure to transform the existing city reflects the fact that the standard of living of a significant proportion of the population has - or will - dramatically improved. It also conveys the fact that the inequalities are no longer bearable. At the same time, increased integration in the global economy exposes the populations to sudden reversals of fortune that are not cushioned by public systems of support which might exist in richer cities.



Along with the forces of globalisation, the strength of the national State and the power of popular movements have to be recognised as engine for change. States may be weak, popular movements may be dormant, but the public authorities, or popular movement, still constitutes a major driving force for changes.

The vagaries of history crossed with geographical advantages to establish the strategic position of Khartoum. Spatial

patterns and architecture bear witness to history. The form, the physical expansion of Khartoum, may vary from district to district, but each one connects with the other; thus expanding the urban areas, making boundary definitions ever more problematic. The most recent census (1993) puts the population of Khartoum at 3 million, but over 6 million people live today in the metropolitan area.

Given the cost of investments in infrastructure, housing, manufacturing plants, and office space, changes are coming slowly, but the pace of change tends to accelerate due to positive political circumstances.



Past history and present opportunities of cities are shaped by the region in which they are situated, and by the competition of other cities in the region. This is obvious in the case of Khartoum. For example, Cairo's opportunities have been severely limited by political conflicts in the Middle East - but the opportunities of its regional competitors, Beirut, Damascus, Baghdad, were even more diminished. The prospect of peace in the Southern States of Sudan, the instability of its neighbouring countries, the exploitation of oil reserves, all give Khartoum a new role in the Region and beyond. Khartoum could secure for itself a specific niche in the regional economy and not only by selling its agricultural production to countries far beyond its regional setting.

## DEVELOPING A VISION FOR KHARTOUM

### The Magic of Khartoum - Creating the Garden City

Khartoum is already immersed in a process of organic incremental change around a totally remarkable range of opportunities generated by massive un-planned demands and pressures. The scale of the pressure has prompted what is evolving as a unique development thought process. This process is organic, incremental and multi dimensional. The process has to become dynamic around a totally open-ended vision. This vision will, should, constantly change reflecting both new totally unexpected opportunities and the impact of the initial successful concepts.

Four factors appear to have the opportunity of shaping this "open-ended" vision.

- The environment provided by the three rivers,
- The scale of the extended land areas that are served with water, have fertile soils, provide a sheer choice of individual locations and development patterns to the benefit of both individual families in need and the Khartoum State,
- The natural but unique open village dimension and pattern,
- The quality that can be achieved in the core city.

The combination of exceptional locations and the levels of prime property demand are encouraging previously undreamt of development parameters. The initial need is not for conventional long-range plan but the ability to manage organically, incrementally, with a constant readiness to grasp new opportunities as they appear, to change direction.

#### Creating the Garden City

Handling the changes the Panel was to address three initial issues:

Fashioning the dream around the opportunities that are open

Creating the increase in land values of the publicly owned land that is needed to grasp the opportunities

Balancing the public and private sector criteria and mutual benefit over the long term.

The power of the dream and its achievement will fire the generation of land values needed to drive it into an ever-expanding cycle. The starting points are

Realising the impact of the "three" rivers on the total environment around them,

The thrust of the extended village developments around the internal city,

Releasing the development opportunities within the "core" city

The management of the enhancement of publicly owned land between the public sector, the financial sector and private development sector.

#### Fashioning the Dream

Here again there are three initial elements

- The linear extension of the riverside impact
- The extended village environment
- The enhancement of the present core city.

### **The Riverside impact: a new dimension**

The immediate programme is five folds:

- The context of Tuti Island
- The harnessing of the whole White Nile experience
- The nodal point at the island of Treat El Bija on the White Nile
- Re-acting to the Nile between Khartoum North and Omdurman
- The nodal point development of the river Nile at Abu Halim

#### **Extended Tuti Island Circle**

The "circle" embraces the riverside edge of the entry into Omdurman; the junction with the White Nile, the total edge of the Khartoum CBD; the junction with the Blue Nile; the wide green edge of Khartoum North and the Tuti island itself. However, the visual experience is best from the air. At ground level, the island is seemingly "lost" to view except for the slightly raised level of the residential site in the centre. There are no dominant features in the overall context except for the invitation by the White Nile, bridges alongside the line of public buildings sheltering the CBD centre, or the Presidential Palace and the Catholic Church. Roads dominate the interface, deterring both people activity and movement. The "circle" should be the central physical experience, the statement of Khartoum. It is relatively easy to achieve, and should present the "Garden of Eden" experience.

#### **The White Nile**

The width of the river itself, and its entry islands, beckons the viewer to absorb the experience, to walk the environmental banks, to explore the conjunction of flood plains and agriculture land, to decide to live with views down to the water's edge...all en route to the magnificent new locational development of Treat El Bija.

#### **Treat El Bija Island**

The configuration of the island, its narrow featured eastern edges, the adjacent presence of the Jabal Aulia Road and the railway southwards, the existing traditional villages provide the ability to create a distinguished small town drawing on its agriculture, fishing character within a new statement.

#### **The New Nile River**

The river immediately embraces the edge of the characterfull Omdurman to its east side with its traditional boat-building yard, access to the market place. Both edges are open to be environmentally up-graded. The river could be invited in to the larger open spaces. New community facilities could be constructed on timber piles with planked areas over the waterside.

#### **The Nile Island : Abu Halim**

This provides the classic counter-point to the small White Nile township, the definition of the new linear experience at the centre of Khartoum life.

The impact of these responses to the existing open invitations provided by the rivers brings a new quality dimension to the centre of Khartoum, a wonderful range of riverside development, a new invitation to live, work and play. Major areas of the land involved are publicly owned; the competition for the new locations should generate the funds needed to secure development. The impact would register on the adjoining agricultural land and small

agricultural villages. Many families residing within the Core City would be attracted to move up the new property ladder releasing sites and residential units for –redistribution.

### **The Extended Village Community**

The mixture of very detached and separate village communities using large areas of previously un-used and un-serviced land to provide the immediate accommodation of the uncontrollable migration of families from the rest of Sudan, comes to a totally remarkable experience and "answers". The States echoing of the development pattern but in a more regulated construction mode registers a unique answer. This accommodation of the otherwise impossible pressure was related, straight forwardly, to the land being flat, apparently never ending, yet potentially fertile with water, accessible at moderate depths by wells. Yet in this random apparently open-ended development pattern, the State has "found", apparently totally accidentally, an outstanding "building-block" for a future model of development detached initially from dependence on the city and, potentially, providing a wonderful complement to it.

Visiting the smaller squatter villages is totally persuasive. The visual impact of the grouping of huts in compounds deliberately "separate" from one another by a combination of spaces provided with a hint of future formal connections – roads – is dramatic. When there happens to be scattered trees in the space, often complimented by individual trees nurtured within the compounds.... A new environmental context is being created. If, occasionally a water well is founded, even an apparent canal, a format suddenly appears. Everything then looks deliberate. The mind runs easily to an "extended" village format with public meeting and service support nodal points strategically located and highlighted by created canal links. It is not too difficult to see an extended format of the expanded small town with detached groupings of houses independent but mutually supportive. The free-standing public service support points could be added to by the occasional shop even a transport point. Why not the positioning of a collective educational facility. The basis is being, has been, laid for a physically coherent "extended village" format that builds on their agricultural "village" experience.

It is not too difficult to perceive the coalescence of this collection of independent communities into a small town structure within the Khartoum State, "independent" of the main city. What is exciting is the total open-endlessness of the final statement. It provides the basis for continuing to respond to additional migration patterns, it adapts readily to communities returning to their original roots elsewhere in the Sudan. It provides a new dimension of thought, an exceptionally creative answer that avoids the otherwise threat of total distortion of Khartoum as a city.

### **The Evolution of a New Core City**

The existing city appears locked to its past, its origins, the historic legal, property and financial structures. To free it up, to reflect the change in opportunities - and to the dramatic economic changes occurring both internally and externally - requires the reduction of the pressures that are dictating the form of present city life; to "free-up" the ability to re-shape, up-grade the city by a re-statement of its historic pattern and achieve total enhancement.

We have highlighted the contextual changes; the re-discovery of the rivers and the way they originally shaped and conditioned the city form. The discovery of a new extended village form of life to accommodate the pressure of exceptional migrating population movement that otherwise would threaten to immerse the city, to totally distort its form and operation....Whether or not these major contextual changes are happening, the city needs to

find its future form make the complimentary statement of itself and achieve the quality of life within it. It is a more difficult process because of the level of investment involved. It is the most difficult issue regulating Khartoum, ... a constant three-dimensional exploration and implementation. Space within the city is exceptionally framed but been badly used. How can one restore the historic pattern of use? How are the distorting pressures be used creatively? The pressures could be met by providing compelling new locations with distinctive locational and environmental advantages, by lessening the adverse pressure and encouraging a new statement to be made about selected areas of the core city that are currently currently at a disadvantage.

There are four initial components outside the key contextual changes - the linear river extension of the riverside development; the adoption of an extended village format outside of the city:

- Radical change in the transportation corridors
- Total environmental upgrading
- Pin-pointing the role of an "edge city"
- Re-positioning of key economic activities

#### **New Transport Corridors**

Three opportunities are open

- The completing of a major new ring road around the core city
- The re-use of the railway corridors for passenger movement
- The use of the rivers to provide new services and movement patterns

#### **Major Ring Road**

The positioning of the road and its internal land points are shown on the various plan produced. The management of movement on it will reduce the impact of crossing and through traffic and optimise the re-positioning of key major activity points.

#### **New Concept of Railway use and its future extension**

Khartoum is exceptionally lucky in having a totally underused railway system servicing three of the core areas of the metropolitan territory

- The central part
- Khartoum North
- The external approaches from the north and the south

Its potential impact on day to day people movement is immense, depending on the concept of the approach to station location. The future development is open-ended, the ability to extend the network, add new capacities, .

In itself, the treatment of the railway can be used as a major persuader in the re-positioning of development and in the density of development. The emphasis is transferred to people movement and activity. It encourages transfer points from the railway to other forms of movement – buses, boats, car, air...it can readily service major new facilities for community and visitors use. There is an interesting further dimension. With the development of the "extended village" pattern, new townships could appear that need to be serviced providing both independence and linkage to the core city.

#### **The Role of the Rivers**

This is the most sensitive opportunities, given the immediate environmental context of the rivers themselves and their banks. Restraint needs to be built in alongside encouragement to their use. The initial pattern points towards short within city movements to key feature and

station points alongside to distance travel of goods...quite apart from tailored tourist pattern usage.

#### **Total Environmental Upgrading**

A more explicit environmental framework seems very straight forward to achieve, a new balance between free-form planting and set pieces around key city features and people congregating points.

#### **The role of the Edge City**

This is almost as significant as the re-discovery of the riverside. But it is much more subjective and different. It provides the city entry and leaving points; the meeting point between the built form of the core city, the diverse different forms of the neighbouring towns; the agricultural communities, agricultural land and the new organic " extended village" concept. The "edge city" is absolutely critical in the balance of providing support services and activity to the out-lying non-city areas; in re-positioning key uses and people activity within the city belt in establishing environmentally significant areas, in reducing pressures within the city. Above all it conditions the ability of the external communities to identify with the city without needing to become part of it. The "edge city" notion provides the key element in defining and balancing the distinctive city with the separate and different identities of the areas external to it. It defines the potential extension points of the city.

#### **Repositioning of the activities**

The actual decision to re-position key activities needs to be handled as a totally creative act in its own right rather than as a convenience. The advantages should naturally flow or imaginatively be created.

### **Overall end vision**

The main thrust of our response is the hope that the State Authorities can live with, and continue to grasp, an organic, open-ended, incremental process that is calculated to achieve a dynamic, multi-dimensional end answer. In World terms the present answers to accommodating the immense levels of migration to Khartoum appears to have very few parallels. The challenge is in letting the present experiences shape their own end solution, evolution not re-direction. Alongside, in the conventional but enlarged city, the encouragement, promotion, the driving of the physical enhancement of the city alongside heightening of the lives of its permanent population; finally the economic and international status of Khartoum and of the Republic of Sudan. A remarkable balance is to be achieved.

The INTA Panel has recognised that Khartoum Metropolitan has a vast number of assets with minimal of constraints which create opportunities. In order to meet the challenges three critical but achievable areas must to be addressed:

- Rational land use policy
- New funding structures to create land values
- New planning framework

## RATIONAL LAND USE POLICY

### Planning Approach: from ‘comprehensive’ to ‘incremental’

The situation of Khartoum, as in many other fast growing cities, is asking for a planning methodology that is rather different from the usual structure planning approach. In this usual approach a year is set at which the plan is directed, say 2010 or 2020, and then predictions are made of population growth, economic development, housing need, number of cars, of public transportation passengers, etcetera. These are ‘translated’ in land and infrastructure requirements using internationally recognised density levels and service standards; then a map will be drawn meeting these requirements and taking into account the present urban structure, the suitability of open land for urban expansion, the need to protect nature and agriculture, and so on.

There is one well understood problem to this ‘comprehensive’ approach: the uncertainty of the kind of predictions that form the basis of the plan. There is often a lack of reliable data that may be analysed and extrapolated, and even if there is good data it is still difficult to know all the external factors that might steer the development into quite unexpected directions. One might easily see this when consulting the 1992 Khartoum Structure Plan where an average yearly population growth of 200,000 is calculated for the 1990-2006 period, while at least for the second half of the nineties the real figure has been more or less double. One knows that drought and civil war in outlying areas were responsible for an increased movement of people towards the city, and might assume that for the future, once peace has been established, this movement will cease. But on the other hand, one cannot be certain that periods of serious drought will not occur again. And it is difficult to ascertain to what degree the attractiveness of the city is becoming a factor in its own right, apart from the ‘push’ factors in the periphery. And another question is: what will oil revenues add to the migration picture? Or what will be the influence of the recent transformation of Sudan into a federal (as opposite to a centralised) state?

Usually the uncertainty problem is solved either by introducing margins that are translated next into slower or faster phasing of the development, or by working with different scenarios and identifying common elements among these that may be designated as ‘robust’ and hence get priority in the implementation process. A second problem, however, of the usual structure planning approach is not so well understood nor so readily solved. This is the problem of how to get the implementation going. In order to do this the plan is broken down in yearly or five-yearly steps, to discover next that for the first steps to be made neither the budget nor other powers needed by the government are available. And the private sector will not offer much help either, as mostly its investment capacity is limited as well while they do not understand (or believe in) the government’s picture of the far future as laid down in the plan. Often these frustrating conditions paralyse the government’s ability to act at all and so a lot of spontaneous development completely contrary to the plan goes on unchecked, making the plan a dead letter right from the beginning.

*The combination of problems, uncertainty and the lack of power and budget to get the development on the right track from the beginning, makes for a strong case against the usual structure planning method. It is far better to concentrate on knowing and understanding the present dynamics, assess these in terms of overall development goals, decide next on what should be supported or counteracted most, and then use one's limited power as effectively as possible, not wasting effort on unobtainable results. And it is important to know which parties in the social and business community might be coalition partners because they have parallel interests and can easily be made to understand that co-operating will benefit them as well as the government.*

Of course in this so-called 'incremental' or 'organic' approach one should still deal with the far future. But this is not by making complicated calculations and detailed maps that only mask the basic uncertainty. In stead the future is addressed by creating a vision, formulating a mission, choosing a 'motto'. One needs to make a statement about the city's or region's future character and position. What will it mean and what can it do for the country or even the world on the one hand, and for its inhabitants on the other? How can one use its strong points and repair its weaknesses? How can one seize its present opportunities and escape or counteract actual threats?

Those are the questions to be answered in order to effectively intervene in the city's or region's dynamics, however modest these interventions might be given the limitations of power and budget. While doing this, one will see, and other relevant parties will see as well, that gradually the situation is improving. This in itself will strengthen the government's position and will generate a less restricted budget. So for the next step the effectiveness of guiding the development will increase, resulting in better results again, strengthening the government's capacity further, and so on. Also private parties will get a better return on their investments, enabling them to invest more in the next period and become stronger allies in the general quest for better urban conditions.

*To summarise: an effective, modern structure plan will no longer spend much effort on complicated calculations of long term developments and translate these in detailed planning maps. For a government, as long as it doesn't have complete control, this approach is to deceive oneself and one's citizens. Instead one should create a vision and formulate a mission and should analyse present dynamics to assess which strengths and weaknesses, which opportunities and threats are at work.*

*Then one should go along as much as possible with social and economic forces that work in the urban community, entering into coalitions with all parties that share the vision and have parallel interests and counteracting only those developments that form a really serious threat to the future.*

## **Immigration and the Urban Village**

A good example of how this incremental approach might work is the housing of immigrants. In the first place, as already stated, the number of immigrants is impossible to predict. In the second place, even if the number were exactly known, it isn't the government that has the resources to provide housing to such a large group. So immigrants have to build for themselves, sometimes on land that has been parcelled and serviced by the government, often not even on that. Especially in the latter case the government hasn't much grip on where people will settle but also on serviced land the pattern of settlement tends to be quite



irregular, leaving a lot of open space between lots that are occupied. As a result the settlement pattern is rather irregular and densities remain low.

From the point of view of traditional structure planning such a development should not be tolerated. The answer would be to restrict the delivery of land for settling and place strict development controls on all other lands. In this way migrants would be forced to completely occupy the sites and do so in high densities. The modern approach, however, recognises that such an attempt at complete control might easily fail as it goes against deeply rooted preferences and customs of the people involved. The advantage of this irregular low density pattern is that settlements of newly arrived migrants retain a 'village look' that offers them an intermediate stage between their village of origin and their new urban environment. For this alone the spontaneous pattern should not be rejected but rather cherished. And then there is the additional advantage of low-density solutions posing less health hazards in case the government cannot provide the necessary infrastructure for collective waste water discharge and treatment.

This is not to say that the traditional belief in high densities and regular patterns as a means to make infrastructure provision as efficient and cost-effective as possible doesn't hold anymore. But it means taking another point of departure. The best infrastructure solution does no longer dictate the settlement pattern, but it is the settlement pattern that is a given and that requires innovative infrastructure solutions that find a different way to be efficient. In this particular case photo-voltaic electricity production as may already be seen in newly settled areas of Khartoum is an innovation that meets this requirement. One might also easily think of small-scale decentralised solutions for handling wastewater and solid waste that meet the situation equally well. And even for the provision of drinking water such solutions might be feasible, for example by digging canals bringing raw water directly from the Nile to purification plants in the various settlements. These may at the same time offer the opportunity for wide-spread greening that will further stress the character of friendly villages.

After starting with this approach, in a later stage the reserves of vacant land might be filled in step by step and as people get gradually more used to living in an urban environment they may even start to add second and third storeys to their homes. Also the reserves of empty land may be used to gradually (and without too much cost for land acquisition) introduce more services such as schools, health centres, mosques, markets, informal offices and workshops, and so on. This may later expand into functions that do not serve just one settlement but a whole urban district of, say, a hundred thousand inhabitants. These should of course be co-ordinated with gradual improvement of the transportation infrastructure, with a preference for the immediate vicinity of bus or (light) railway stations for their location. So finally the situation may not differ much from the old 'blue print' type of structure plan, but the way to get there is quite different and definitely much more efficient and at the same time much more acceptable socially.

### **Macro-scale consequences: linking infill and expansion**

On a macro-scale the majority of the urban functions is concentrated in an area of roughly 800 km<sup>2</sup>. Half of this is occupied, mostly by mixed-use areas where the residential function dominates (330 km<sup>2</sup>). The remaining occupied land has special functions such as industrial areas, railway yards and an airport. The other half is open land, of which the various Nile branches cover 40 km<sup>2</sup> and the remainder is mostly unused (with some exceptions for agriculture and forest). The high proportion of open, unused land clearly reflects the uneven

process of occupation as described above for the micro-level. When one would transfer to the macro-level the micro-level process of first accepting the high amount of vacant land dispersed between the occupation, and then starting to fill in, then a simple rule of thumb might be that for each phase of the development roughly half the demand is met by in-filling and half by new urban expansion. Doing this, one should be aware that new expansion again will show an uneven pattern, creating new vacant land in between the occupied areas. This of course comes available for continued in-filling during the next phase.

To get a more clear idea of how this might work, one could look at the land requirements of a doubling of the urban population (to be reached somewhere between 2015 and 2025). These would be about 400 km<sup>2</sup> net. When we divide this process in four phases of three to five years each, then for each phase the net demand for urban land would be 100 km<sup>2</sup>. If half of that needs to be met by in-filling, then in the first phase the amount of vacant land (not including the river branches) will be reduced from 350 to 300 km<sup>2</sup>. On the other hand, if the other half has to be met by new expansion in which new vacant land will be included, then to produce net 50 km<sup>2</sup> requires a gross amount of 100 km<sup>2</sup>, half of which is added to the total amount of vacant land, bringing this at 350 km<sup>2</sup> again. So at the end of the first phase the total amount of built up land (including special functions) will be 500 km<sup>2</sup> and the amount of unbuilt land still 400 km<sup>2</sup> (including the river branches).

In each of the next phases the built up area will grow by 100 km<sup>2</sup>, while the unbuilt area will remain at 400 km<sup>2</sup>. So after the fourth phase the built up area will stand at 800 km<sup>2</sup> and the open land within the overall urban territory still at 400 km<sup>2</sup>. Of these 400 km<sup>2</sup> gradually a part (say 100 km<sup>2</sup> over the whole period) should get a definite designation as open land for recreational or natural purposes, in order to step by step improve the general urban environment.

## KHARTOUM URBAN REALITY AND FUTURE

### The role of Khartoum

For Khartoum to play its unique role in the national spatial development policy, as the Capital city, and as the centre of national and international economic dimension, as well as the centre of the country urban system, it calls for properly :

- defining the city functions and programs, including future roles of Khartoum as international city and its potential for growth;
- defining its role in regional settlement system of Sudan;
- rational and progressive urban concept of its development – model of growth, spatial concept and directions of development. These decisions are very important for the future of Khartoum's conurbation;
- general spatial and functional structure of Khartoum's conurbation. They determine its future quality, its functioning and economic effectiveness, living conditions of its inhabitants, its cultural and aesthetical values.

Actual proposals of general urban structure are based on system of corridor-extensions combine with **satellite cities model**. The Khartoum authorities and planners expect, that satellite model of urban development will reduce urban pressure on the city and allows for proper accommodation of expected new migrants.

To achieve these goals, some preconditions should be fulfilled. First, the satellite cities should be generally independent with regard to services, jobs and technical infrastructure. It means that the British new towns model is in a case of Khartoum more adequate than system of suburban urban developments of Stockholm. The latter, created excellent residential locations for population, which generally works in Stockholm city, but the model of transport system employed in Stockholm agglomeration will not be, for many years, available in Khartoum. Secondly, the quality of life in satellite cities should not be much lower than offered by the City of Khartoum.

### Land urban policy

Present land urban policy needs to be carefully evaluated and is desirable to reconsider some of its aspects. Main problems of reconsideration may include the following topics:

- the urban structure and land-use densities;
- land reserves and unwanted vacancies;
- residential urban pattern.

Residential urban pattern should guard and promote traditional urban value, accept style of family and social life, protect the local heritage and cultural qualities. It calls for studying the model of low-cost housing, offered actually to families migrating to Khartoum, especially regarding the considered scale of this program.

### **The urban structure and land-use densities**

Intensity of urban structure and land-use densities for different functions and programs in Khartoum is generally low. It can be seen as an asset and as the value of traditional land use pattern. However, it also creates many urban disadvantages.

**Starting from positive aspects of low-density urban model** we may accept value of low density as respecting the traditional pattern of Arabic and African residential areas. It can also create very attractive, extensive and greening housing districts. This model of urban structure can gain advantages of the green city concept, promoting small-scale activities and renewable energy production, supporting new sustainable technologies and solutions, possible in low urban densities.

**Negative aspects of low-density land use** and urban extensive development are also well known. This type of urban pattern demands more land, generate more traffic, increases energy consumption and pollution. The squatter settlements are located at the periphery of the cities, resulting in further urban sprawl and they seldom can be properly served by public transport. It degrades greenfields and causes destruction of biodiversity. Ultimately, low density and urban sprawl can increase global, urban costs.

**The benefits of urban intensification** have been in last twenty years widely advocated. They are in many aspects more sustainable, however much depends on urban context, scale, location, economic position and status, function and urban patterns. But many features of intensive urban pattern encourage ecological or social sustainability. It offers better functioning city and a better chance for sustainable model of the urban growth, higher density may also offer economic benefits – lower water consumption, lower transportation costs, better energy economy. It gives positive economic effects of concentration, size and scale - especially in services and delivery of water, energy and technical infrastructure efficiency.

**Disadvantages of high urban density are also evident.** It certainly offers less attractive residential environment, and urban intensification often raises a range of social, economic and environmental issues. The concentrations of vital function, services and employment creates traffic congestion, limits accessibility to city programs, and often corrupts real estate market. We are watching these problems in our cities. Higher densities often lead to more crime, noise and pollution, loss of privacy and social disintegration. There is also little evidence that higher intensity of urban pattern would provide a better basis for social sustainability and that a compact urban form can reverse the social segregation.

*To summarize, we may say that urban intensification is not a threat, neither a challenge to the Khartoum city; it most likely will be its future reality. Economic growth, the rising of living standards and new demands of people will accelerates urban expansion and decentralization of city programs. The real issue is how to better guide urban transformations*

*and growth, how to control urban sprawl, how to stop unnecessary urban expansion. Through parallel intensification and enhancement of the city core and careful guiding of the typical village type of urbanisation, for the outskirts, balance may be found and the "best of two worlds" may be gained.*

### **Reserves for future functions and unwanted vacancies of the land**

The Khartoum's conurbation keeps vast reserves of designated land for future urban use but still free. In the scale of all urban lands, built-up already and designated for future urban use (planned) it can be estimated as 60-70% of total metropolitan area. In the scale of built-up area it could be estimated as 30-50% of the urbanized land.

The reserves of land have many advantages. They allow for high flexibility of development patterns and local spontaneous developments. They offer a freedom in allocation of future functions, they offer also better climatic condition. However, the enormous vacancies of the land disintegrate the city structure, its spatial harmony and character. They create spatial gaps, destructive for the city functioning and no-man land destroys the urban image of Khartoum. They have also many other disadvantages of extremely low urban density.

Vacant lands should be a rational part of the city concept - its spatial structure, its functional organization and services, its concept of integrated transport system and technical infrastructure etc. It should not be a result of lack of planning vision and legal gaps in planning control. In its present scale and form, the system of land vacancies is for the city of Khartoum destructive and the city authorities on the priority basis should evaluate the problem.

The list of tools, which can be employed for creation of a rational urban land development policy, are well known among them:

- The planning instruments – as structure and land use plans, which can define the reserve for future developments or for flexible land use arrangements, eliminating unwanted vacancies and urban gaps.
- The financial tools including property tax (preferential for existing resident, properly utilizing their plots and higher for owners of the vacant land, keeping plots for capital gains), vacancy tax applied in a flexible way, depending of land locations and its importance, tax reductions, promoting preferential urban developments.

Introduction of new urban policy may take several years, regarding economic potential of Khartoum citizens, local traditions, political thresholds and other important factors. But is recommended, to take this issue into consideration, despite all difficulties and thresholds.

## NEW FUNDING STRUCTURE TO CREATE LAND VALUES

### Housing Finance

The high rate of immigration Khartoum is experiencing causes a tremendous pressure on public utilities and agricultural land. Between 250,000 and 500,000 people are moving to and through Khartoum every year. The State ministry for planning and public utilities is dealing with the problem in the following manner:

- 1- Legalizing the squatter settlements originating from migrants squatting on government land by allocating defined parcels of land on which they squatted, giving the squatter land rights and supplying it with water mains and road definition.
- 2- Building core houses of around 25 sq m area on a parcel of land with an area of 200 sq m and supply it with water, electric power and sewage disposal to community septic tanks. The unit is then sold to the eligible household for the cost of construction with the land being given free. The beneficiary is asked to pay a down payment of one third of that cost and the rest is collected on monthly installments over 12 years at an effective interest rate of 11% .

The ministry has in the past planned residential land, divided it into 200 sq m plots and allocated it to eligible households with the water mains and other services left to be constructed later. The services were not constructed and in many cases the land was not built on by beneficiaries due to different reasons one of which being the lack of services. This land is still vacant. The ministry could not force them to build their houses on it ,neither did it find a way to encourage them to do so .The Ministry could not take the vacant land either due to the fact that a title was given to the beneficiaries from the very beginning and before they build their houses. Therefore, Khartoum ended up with still having acute housing problem while the residential land is there waiting for the needy to make use of.

Questions that come up while addressing the land management issue in Khartoum:

- **Can** the Ministry prepare a development plan that could be implemented and when implemented could control the human settlements in Khartoum and provide for the migrants housing needs together with the housing needs coming from natural growth ?
- **Would** that plan be based on planning new areas or should it utilize the already planned areas after solving the legal problem hindering the development of the vacant land ?
- **What** are the resources that are needed ? and what could be made available out of them ?
- **Would** it be attainable to promote investment in other States, especially those where migrants come from?

Looking into the accessibility of the public to housing finance we have found the following:

- 1- Banks are only allowed by the Bank of Sudan to offer limited amounts of individual housing loans. Therefore most of the medium and low income families are not able to own their residences due to the fact that they can not provide the residence price from their savings.

2- There is no mortgage market to facilitate long term loans. Therefore banks can not offer affordable housing loans for these income groups even within the ceiling that they are allowed to work under. Short repayment period , a max of 5 years ,does not facilitate these families access to the housing loans .

3- The Ministry has established a Housing Fund and gave it the mandate of building housing units (core houses of 20 sq m ) and allocating it to eligible residents subsidizing the unit through giving the land free .

4- Although the housing need is so high and owning the house is not possible for many income groups apart from the slim opportunities offered to them as mentioned above, there is no supply offered in the market to meet that high demand even for rental houses. Rental environment would have to be studied in more detail to confirm what are the issues that are prohibiting investors from entering this market.

Having the above background in mind some actions need to be taken to activate the housing sector and create the atmosphere that would promote investment in land and housing provision for both ownership and rental. In order to do that a basic understanding of the housing sector that we want to have should be clearly stated. What is needed is an efficient and well performing housing sector.

An efficient and well performing housing sector is that where the households from all income groups can find the housing product that fulfil its requirements and needs and can pay its price or its rent in a way that is affordable to it whether from its own income and savings or by getting an affordable housing loan from the banking system in the market . Such a sector requires the right **infrastructure** that would facilitate such a performance and efficiency in a smooth and easy-going way. Following is the suggested composition of that infrastructure :

*a-The adequate affordable housing supply that satisfies the different income groups needs that lies within its capability to **own** or **rent**. Efficient land market ..small plots of serviced land developed in the market by developers (public or private) : incentives to encourage private developers ,the proper land regulations to maximize land utilization and allow minimum plot sizes ,the proper plots servicing.*

*Proper rental legislation that allows for rent to be revised at the end of contract as an incentive to encourage private rental housing development*

*b-The adequate affordable housing loan in connection with its down payment and its term (maturity ) that the different income groups can pay its installments within the appropriate percentage of its monthly income in order to own it. Efficient finance market mortgage system to solve mismatching problem.(secondary mortgage market) as in the Jordan experience .*

Accordingly the following actions are suggested:

1-Revise the Khartoum Structure Plan after developing the State vision for the future that would guide and direct the development in Khartoum. Land use would be revised to achieve proper utilization of that precious resource and thus planning the rational use of land within the existing planned city .For that it is highly recommended that a consultative process be followed to guarantee feasible and practical applicable vision and plan accordingly be developed. The consultative process would involve government, private sector, non-governmental organisations (NGOs) and the public.

2-Adopt and issue residential land regulations and set the standards that would allow land division to sizes and building regulations that make it affordable to the target groups. Sizes down to 150 sq m might be considered. Building on up to 60 to 65 % of plot area is also recommended. Zoning the residential land to allow a variety of heights from 2 to 4 floors up to 10 floors in the core area .

3-Create the atmosphere for private developers to invest in the land development for different purposes with a special focus on housing schemes, be it land development schemes or individual houses or apartments . This would include the following:

a)-Allowing for incentives to be directed to the beneficiary when benefiting from a land or a house produced by private developer, addressing the target group needs and affordability. This could be in the form of exempting the beneficiary from land registry tax when the house area is less than ,say, 100 sq m

b)-Address the individual housing finance to facilitate easy marketing of the developers housing products . Recommendations on housing finance will follow below .

c)-Introduce and promote Public-Private partnerships in housing production schemes to encourage private developers involvement in the process . This could involve passing incentives through public sector partner . Partnership would serve as a demonstration to the feasibility of private developers involvement and planning and subsidies procedures and techniques.

d)-Develop the building materials sector and techniques to facilitate owner builder approach whereby the family that gets a developed plot of land may build its house easily and with the minimum possible cost .

e)-Private developers and the owner builders would then become the main player in housing provision process ,and the government agencies would then be the facilitator for the sector and would focus on the subsidized lowest income groups housing provision.

4-Introduce innovative approaches in housing schemes design ,implementation and pricing model. Examples of that, concerning pricing model, would be Cross Subsidy in Serviced Land Schemes whereby the prices of residential land directed to low income are subsidized from the profits that are collected from commercial and other residential land that are sold for market prices through auction.

5-Reform the housing finance system to allow for the long term housing loans to be offered so that families would be able to get the loan that enables it to own the house within its income. This would be done by:

a)-Allowing banking system to extend loans and for a longer period to the public for housing purposes; to buy a residential land and build the family house on , or to buy an apartment or a house.

b)-Introduce the secondary mortgage market to solve the issue of mismatching of funds which is why the banks are normally reluctant to offer long term loans .This could be done by creating an entity (company ) that would refinance loan portfolios submitted to it by banks through collecting long term money (such as that of Social Security funds, Insurance Companies , Pension Funds ...etc ) by issuing long term bonds .

*So allowing (lifting the ban) banks to give housing and real estate loans and giving the opportunity to get refinancing would create a new rewarding market to the banks This will activate housing finance market and result in an active and efficient housing sector . This , as well, will deepen the capital market (bond market) .*



6-Study the rental sector and the legislations affecting it . Reforming that sector , if needed, will extend the low income families who can not afford to own a house the opportunity to rent it . The type of constraints to the rental sector is normally when the law does not allow for the revision of the rent over time .This constraint makes the developers reluctant to invest in houses for rent because that would not be a feasible investment . If that reform proves to be needed, it is highly recommended to introduce together with above actions to encourage investment in houses thus increasing the supply in the market .

7-If a Regional government (Wilayah) involvement in the housing production would still be needed it should be maintained in the following frame :

a- Involvement should be restricted to sites and services schemes only . Developed plots could be allocated to eligible households in a subsidized rate ,and to the higher income households and private developers at the market rate (auction ) so that they could build houses (apartments) to be offered in the market.

b-In such case the title of subsidized housing unit should not be given to the beneficiary before :

certain period of time, say 3 years, has passed after the beneficiary has build his house on the land allocated to him .

certain period of time, say 5 years, has passed since the house (apartment ) was handed over to him .

These arrangements are meant to assure that the household is benefiting from the housing unit, and to prevent it from selling it to earn money (the amount of subsidy) and be left with no house again.

## TRANSPORT BASED METROPOLITAN STRUCTURE

The Khartoum transport structure must reflect the regional structure and to profit and enhance the assets of the territorial layout and existing infrastructures

### Metro-regional Structure

The Nile marks the regional structure of the outer metropolis of Khartoum. The location of village and urban units has been historically produced along the course of the river. The Nile provides not only water and life, it does provide as well a mean of transport. The principal mean of transport and communication in a limited infrastructure provided pre-industrial society. Due to this we find in the Khartoum Regional structure that the three branches of the Nile, from south and east, bound north, determine the lines of expansion of the secondary villages and urban units of the region. We must point however for further analysis and decision making that the location of these urban units is not homogenous.

The North bound Nile has developed an homogenous line of urban settlements at both sides of the river. Separated from each other for an average of ... km they still have kept a distinctive character and a certain sense of place. Communities exist with a certain social entity and rural structure.

The North Khartoum bank (east bank) has profited from the road to the north and the railway line to vertebrate the continuous string of settlements. The Omdurman bank (west bank) has a more unequal location and dimension of those settlements.

The White Nile presents on the contrary a rather more vertebrated pattern on the Omburman side (west bank). The distinctive villages at an homogenous sequential location provides for a regional structure. On the Khartoum bank (east bank) of the White Nile we can find what probably is the peripheral effects of the expanding megalopolis, and the creation of unstructured settlements along the river side as the forefront of the progressive urban invasion.

The Blue Nile benefits again of a sequential regional structure of villages on the Khartoum bank (south bank) and a provision of the railway line as well as a national route. On the Khartoum North bank (north bank) we are confronted to a limited amount of settlements and a comparative lack of transport infrastructures.

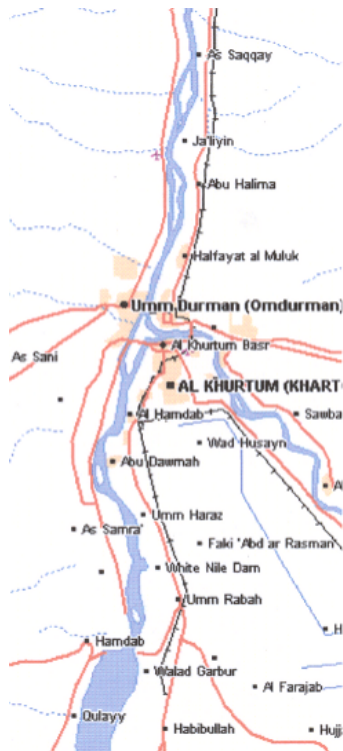
The region's present important assets.

- The regional structure is of a linear form. This is a fundamental asset on terms of public transport servicing. Public transport has a linear development and is a difficulty when it has to serve an homogeneous metropolitan layout. This is not the case of Khartoum where it has regional linear structure, defined by the banks of the Nile.

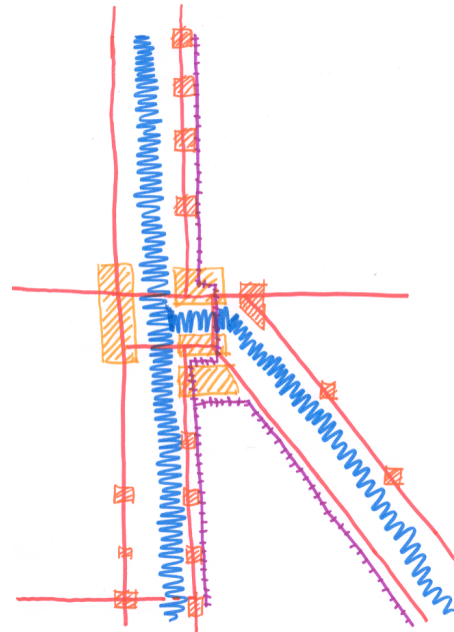
- The region has already a linear transport infrastructure which is the railway line. This infrastructure benefits only the North Khartoum bank of the Nile (east bank) and the Khartoum bank of the Blue Nile (south bank).

- There is already a sequential village and urban settlement structure that can provide the basis for the development of an urban expansion with a sound social pre-existing structure.

### Analogical Regional



### Diagrammatic Regional



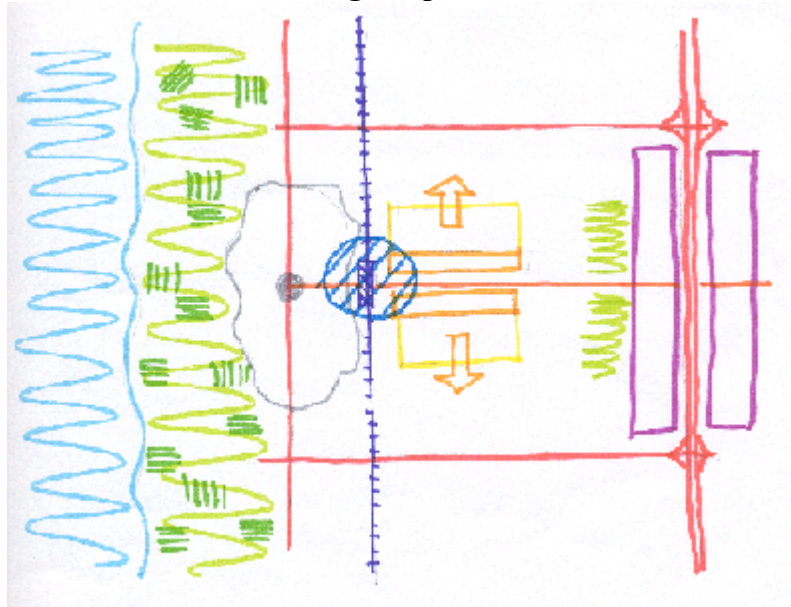
## Settlement criteria for regional locations

There are certain principles of good practice for the location of uses in the metropolitan and regional context that are going to be applied to the proposals made in this report. For the most direct and easy reading of the final proposals we are going to summarise these principles in the following points. The priority locations for suburban activities, in a regional context, are:

- 1- The new residential developments should be an expansion of the existing ones. This is to benefit from existing social structure and existing basic facilities and infrastructure. These new residential development will have to be complemented, reinforced, and improved by future investments.
- 2- Residential nucleus should be served by regional commuting rail services. Stations should be as central as possible to the future pattern of settlement. Railway stations should be the focus point of centrality for the extended urban settlement. Urban activities feed the rail system, and the station provide centrality for those facilities.
- 3- Urban centralities should benefit from the location of central functions synergies. Those are:
  - a) Transport intermodality (Rail, bus, taxi, parking)
  - b) Residential density (Permanent social activity)
  - c) Civic spaces (Gathering places)
  - d) Commercial activity (Benefit and enhance economic and social activity)

- e) Social facilities (Accessibility to basic services to the population)
  - f) Emblematic institutions (Sense of place and social belonging)
- 4- The environmental system should be continuous and developed interstitially separating the productive areas and the residential areas, reaching the urban nuclei. This is to integrate the quality environment with the urban fabric, and to avoid the merge of urban structures into a continuous unstructured mass.
  - 5- New social facilities on the border of residential areas and peripheral parks, to combine the accessibility to the served population and the environmental quality. This location serves the population by direct accessibility from the residential areas and benefits from the environmental quality of the park front line.
  - 6- Regional facilities (Regional Hospitals, Large Sports Grounds, Universities) should have the double accessibility on the crossing of the high capacity road system and the railroad system. Higher rank regional facilities need immediate road access and mass public transport access.
  - 7- The high capacity road system, due to the acoustic, visual and air pollution effects, should be at a distance from the residential areas. They should be absolutely protected from settlements and activities on the road sides infringing the traffic flow, to avoid the contamination from local trips and the loss of the speed and range function. Fences and controlled exits, management by toll procedures might help this policy.
  - 8- Large commercial facilities, large shopping malls, should be on the exits to the urban nucleus of the high capacity road system. Access to these commercial facilities is made mostly by car, and traffic pressure can best be solved by the proximity to the high capacity road system
  - 9- Economic industrial activities should be adjacent to the high capacity road transport infrastructures. Truck transport should be limited on the urban centres. To avoid interference with the urban centres they need direct proximity to the exits of the highway system. Pollution of both highways and industry must be kept away from the urban centres.
  - 10- Heavy industries should be on the intersection of the highroad system and the railroad system. The same industry principle applies but these industries require rail service.
  - 11- Service facilities (electrical high voltage lines, heavy water pipes, gas, optical fibre, etc) should be along the "strength lines" of the high capacity road network. They directly serve the industrial areas and their polluting effect is contained to those.
  - 12- A long distance urban-social identity reference element, with a distinct design (i.e.: communications tower, water tower) could be located on the urban fringe, at a gate/entry point, on the contact area of transition between the peripheral and urban interstitial parks.

### Village Expansion



### Khartoum Development Proposals

These overall regional location principles may be applied and adapted to the specific conditions of Khartoum's region is determined by the north-south linear presence of the Nile. This linearity is a strong and sound regional organic structure that should be reinforced by location decisions of activities and infrastructure. It is an asymmetrical linearity:

- a) The Blue Nile introduces a 45 degrees south-east bound cross activity line. The very junction of the rivers determines the very existence of Khartoum.
- b) The asymmetry of the settlements of both riversides. The right riverside, the east one, is much more populated, bears much more infrastructures (road, train) and is where Khartoum lies.

1- Khartoum is a nearly 7 millions inhabitants. Underground and commuting train services have an efficiency threshold of 1,5 million inhabitants. Khartoum is far beyond this threshold and requires this kind of basic and essential service to the population. Service not only to be analysed from the transport effect and the territorial effect but as well from the social effect. A commuting train service is a must and should be set in place:

- a) to provide accessibility to the region,
- b) to provide and spread that accessibility to the non car owner population,
- c) to avoid dependence on road transport for daily journeys,
- d) to save energy and reduce pollution, and
- e) to reduce congestion on the urban centre of Khartoum.

2- A controlled freeway heavy capacity road parallel to the Nile, to the east of the urban settlements and the railroad line. This location has several beneficial effects:

- a) takes pressure out of the borders of the Nile that bear most of it, in conflict with the environmental and agricultural values of that land.
- b) leaves room for the expansion of the actual urban nuclei around the railway stations and
- c) reduces the urban pressure on the sides of the road infrastructure improving the transport capacity and efficiency of the road.

d) by-passes Khartoum by the east, reducing the urban conflict of a heavy traffic capacity highway, decongests the urban centre of Khartoum and crosses the Blue Nile at an upstream point, rather than at the river junction.

3- Residential, housing developments, should be located close to the commuting rail stations, both to feed the rail service and to avoid the dependence of the population of other means of transport.

As the railway line is at the east of the village centres it is further to the east of those stations that there would be room and station proximity for those residential developments. Density should be a feature of those developments to reduce distance to the station to important numbers of potential users. With actual densities for social housing, within the actual policies of Khartoum Government, figures on the range of as much as 25.000 dwellings, that is 125.000 inhabitants, can be housed in 10 Km<sup>2</sup>. This can be the average size of these urban units. As many as 40 potential settlement sites have been detected. This kind of settlement strategy can confront the needs of settlement for 5 million new, or re-housed, inhabitants. This figure of 5 millions is not an objective; it is just a saturation ceiling. Not all of the settlements will be possible. Not all of them would be produced at a similar speed or efficiency. There is though, a second beneficial effect of the policy: the diversification, and multiplicity of places for action, allows for a less fragile policy implementation and for more possibilities of success.

4- Environmental protection for the Nile riverside. (Regional Park)

The qualities of the Nile riverside, both in terms of agricultural value, fauna and flora, landscape and environmental unity require a protection from disruptive uses.

- a) This protective approach is compatible with social facilities, leisure facilities, if those do not disrupt and make the best of the Nile environmental qualities
- b) Some low density housing could be as well exceptionally acceptable, if necessary.

5- Industrial sites should stand by the controlled exits of the high capacity road system. As the future of Khartoum base economy is linked to the export market, and the products will have a very large airborne necessity, highways close or directly linked to the actual and future airports will have a priority

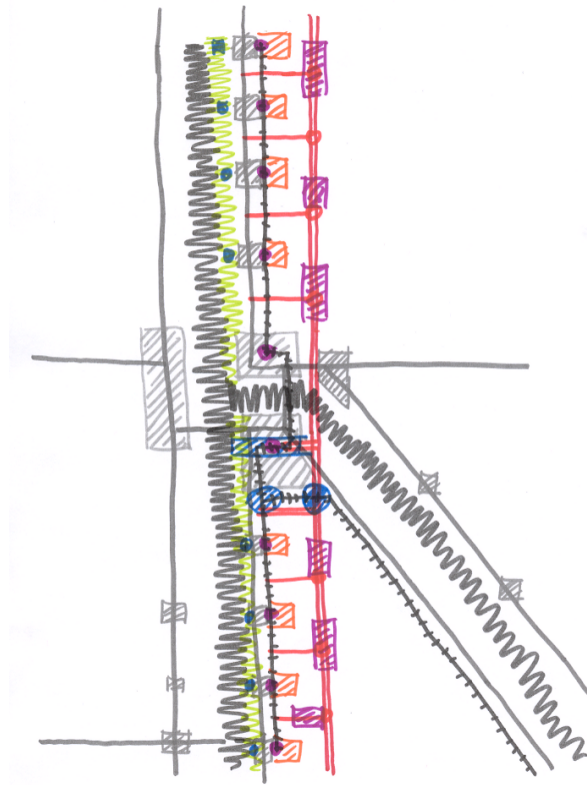
6- Future large commercial facilities will be able to share those location by the main exits of the high capacity road system though they will required a higher proximity to the Khartoum centre and probably close to the junction to the airport.

7- Large Regional Facilities (Universities, Hospitals, Sports Grounds, etc) will have a potential location on the crossings of the major road network and the railway lines.

8- Khartoum Metropolitan Area and urban centres require a specific approach to articulate the regional system to the international centrality.9- Prime site office space will mostly locate at the accessibility node to that centre, from the road to the airport.

*This regional structure can be implemented already based on the existing railway lines. That is both to the north, at the east bank of the Nile, and to the south at the south bank of the Blue Nile. The west bank of the Nile could benefit from a similar model when the pressure for development builds up. In this case, the strategy could be one of building up the demand for the public transport service of the commuting rail, before actually providing the service.*

## Diagrammatic Development Proposal



### Khartoum Metropolitan Center

Khartoum has been growing on an “oil stain” phenomena basis. The growth to up as much as over 6 m. inhabitants in a “extended village” model is a main difficulty for the functioning of Khartoum as a metropolis. The infinite, homogeneous, residential layout lacks those vertebrating elements that constitute an urban structure of a higher organisational degree. This non-structured structure has to be vertebrated. Khartoum presents important assets and challenges for this transport vertebration:

- a) Low density
- b) Large avenues and streets
- c) Low car ownership
- d) Public transport base
- d) Manageable congestion
- d) Existing railway line
- e) Flexible transport facilities

From this analysis the structuring proposals are the response to these characteristics and the combined reinforcement of the assets.

#### Public Transport

- a) The introduction of the Commuting Train Service will connect the Central Station of Khartoum both to Khartoum North and to the new South Social Facilities Centrality.
- b) The future extension of the service to Omburman, with a new metropolitan line, will connect Omburman urban centre at the Suq and the new Institutional Centrality at the river side.

c) With this extension the three main urban centres of Khartoum, Khartoum North and Omburdman, will be directly linked by a mass transport of railway “overground” line. The centrality of central Khartoum is reinforced with the ease of traffic congestion effects. The closing down of the “loop” might be a postponed project until other more important priorities are met.

d) Both centralities at Khartoum North can be extended to the Train Stations. There is a development potential on these extensions. Real state value will be provided by the accessibility of the new train service.

e) A complementary urban transport system might be introduced linking directly the urban centres through the street pattern and the urban fabric. This system has to have a high capacity in the long term and thus it might require a rail basis. The width of Khartoum street allow for the introduction of reserved platform for a medium/high capacity public transport. This could be in the medium run a tramway system but can be in the short run a special line of high capacity articulated buses, with the absolute necessity to run on a reserved and preserved paved line.

- This line can run from the new South Social Facilities Centrality to the Central Station Business District serving the midtown centrality of the Race Track Suq and Bus Station.

- The line will follow north to the United Nations Centrality and to the North-Khartoum South Centrality. The difficult, and expensive, crossing of the Blue Nile can take three forms:

i) using the existing old rail and road bridge. In that case a “wing extension” for the reserved platform should be built. This will serve the railway station and the extended centrality of North-Khartoum South

ii) a new bridge by the tip of Tuti Island in such way that the inhabitants would be served by a stop at this location. Although this bridge should only be a bridge just for this public transport line, this service can foster undesired development.

iii) a new direct lowcost-reserved bridge that will join directly United Nations Square and North-Khartoum South Centrality.

- In North-Khartoum the line will join both Centralities and the railway station.

- The line will finally join North-Khartoum to Omburdman Suq using the existing bridge (reserved platform), producing an alternative transport among those two centres complementary to the rail link.

f) The link of the eight centralities of Khartoum generates a polycentric model of high efficiency.

g) Each of these centralities would take a specific role in the future and play it own function on the overall metropolitan social and economic structure. A specific policy and design will have to be developed for each of these sub centralities

h) The new commuting train stations within the urban fabric will take strategic locations to foster the development of urban sub-centralities around them.

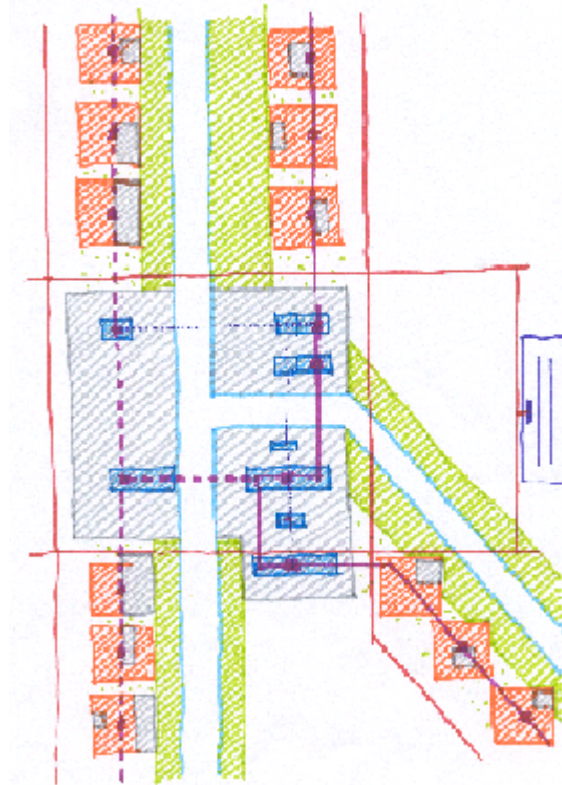
i) Industrial areas, obsolete in their location and their infrastructures and layout, will leave place to new developments. Those industrial buildings have been largely depreciated, and the privileged area they sit upon can have better urban uses

j) The envisaged railway and stations at the south west of Khartoum create the potential to open up the urban fabric to the river and to integrate the quality environmental spaces of the Nile to the urban image. Some emblematic uses, buildings and developments will have to take place along the riverside.



- k) The train station will be the origin and destination of the bus public transport routes, in such a way that both transport systems will complement each other
- l) The train station will have an integrated taxi terminal.
- m) The railway stations will be integrated to the most possible centrality functions described for the regional model
- n) River transport can complement the system, with bus intermodality at the river landings,

### Metropolitan Policentric Proposal



### Private Transport

Car ownership in Khartoum is still very low. 350.000 cars for nearly 7.000.000 people give us a ratio of 0,05 cars per person. Saturation ratios, only suffered by Europe and North America are on the range of 0,7 cars per inhabitant. With economic growth, an obvious outcome for Sudanese economy, the car ownership rate will join the developed countries ratios. The final ratio we have to expect in the long term is the 0,7 ratio. That will mean a car ownership stock of 5 million cars. 14 times the actual number of cars. The previous basic public transport system proposed is absolutely essential. The Metropolis of Khartoum will not be able to present a sustainable pattern without it. But this system is not enough.

- Urban structure: Khartoum has the important asset of large open space, street space and low densities. The adequate control of this space must be introduced. Street design and space allocation among vehicles, pedestrians, moving, standing, and parking must be introduced. There is room enough in the actual urban structure of Khartoum. It needs to be allocated and order has to be implemented and enforced.

- Regional/Metropolitan Structure: A metropolitan structure for traffic movement has to be created. As the urban space is limited, and it is a disrupting urban policy to introduce strong traffic engineering like flyovers and elevated highways in the urban fabric, the new traffic flows infrastructures have to be built at regional level, on the urban extensions and

open land, integrated in the overall strategy of location, and relocation, of metropolitan functions.

Doxiadis Structure Plan offered a good approach to the Metropolitan highway system. The Panel made an accumulative approach and worked upon this system adapting it to the new larger regional context. Integrated in this road system proposal are a series of specific proposed projects that feed and are served by the road system.

## Regional integrated projects and specific projects and Proposals

*The proposals made in this report form a consistent system, where basic structural elements vertebrate the region and sustain specific strategic projects.*

*We are going to sum up the basic lines of procedure, and include some of those projects. The relevance of those make them essential and indissolubly necessary for the success of the overall structure. They have to be developed according to a specific urban design and need, most of them following implementation procedures set by a dedicated Agency.*

### **Development of the Regional Commuting Rail Network:**

Khartoum is a city of 7 million habitants, well beyond the threshold of need of a high capacity transport system.

In a dense city this system normally has to be an underground system. Khartoum has the possibility to make an above ground system less capital intensive.

The development of the rail network for commuting will decongestionate the centre of Khartoum as it will diversify centralities along the rail corridor. The result will be a polycentric metropolitan structure, highly efficient in transport terms.

a) The first phase would be to use the existing tracks for a primary north-south line with stations as close as possible to existing urban centres at the north and to potential centrality locations in the south.

b) The second phase would be to set new lines in search of new centralities and for potential demand

Set up of a Metropolitan Transport Agency

### **Railway Stations Centralities:**

The accessibility of large numbers of population to the high capacity transport system provides an opportunity for the provision of services and goods at that location. This concentration of activities are actually urban centralities that home and foster central urban civic functions of all kind: Transport intermodality, Public spaces, Commercial activity, Social facilities, Residential density, Institutional functions.

### **Housing location on stations centralities**

The high capacity transport system must be “fed” with demand. This demand might be brought on complementary means of transport like local buses and/or personal means. Though, as the shadow price of transport is one of the highest deterrents for its use, it would be more efficient to be able to concentrate the demand, thus the threshold amount of population, as close as possibly to the stations. Threshold efficiency in high capacity transport is on the range of 40.000 inhabitants at accessibility range of the station. New housing areas

around those stations could be on the range of 25.000 dwellings, within the range of a mile and a half. Set up of a Land and Housing Agency might help to meet these conditions.

### Bus stations

Bus supply can be both of metropolitan routes for access to the central city and local routes to feed the commuting train stations. In both cases the urban bus structure will have to be revised. Location of bus stations will have to be redesigned, and probably relocated on terms of the complementarity of both systems and the, more rigid, location of the train stations. New locations will have to be organised in terms of the economic and institutional locations in search of an integrated urban functionality. Stations Management is a potential issue for the financing of the service provision.

### Markets improvement

The market is the outmost symbol of economic activity in the Sudanese city. The actual conflict/overlapping of space occupation, stalls, pedestrians, pavement, traffic congestion, etc, might be part of the “cultural usage of space”, but can be obviously improved for the benefit of all those uses. Proximity and complementarity to public transport provision is essential and the market improvement must be confronted on a integrated basis with the bus stations. A trial and error process might be necessary, thus an experimental approach would suggest a first model project to be developed. Dealing with an economic activity the cost of the operation might be entirely financed by private funds, either from the beginning or by the value of the results of the operation. The Municipality is the obvious institution to carry out this policy though a corporate cooperation from the Regional Government would strengthen the process both financially and institutionally.

### Analogical Urban Plan



### Diagrammatic Urban Plan



### Central Khartoum Capital functions

Central Station in Khartoum will receive important amounts of trips destinations. The area around the Central Station would become the centrality of centralities, Capital Centrality of regional centralities. Prime Capital Functions, a “Central Business District” will naturally take place around the Central Station.

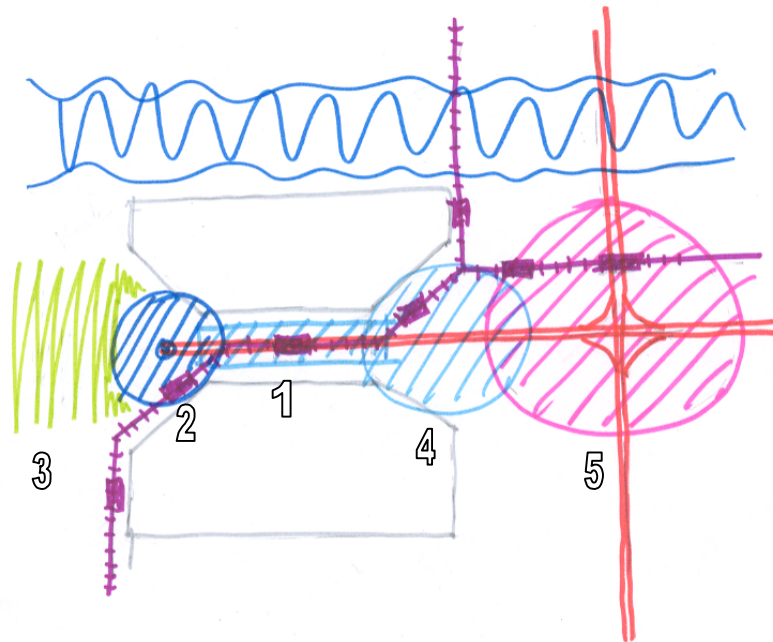
#### 6.a) Khartoum Central Station Business Metropolitan Centrality.

The core of the metropolis has to perform a leadership role, both in economic, social and institutional terms. The urban structure presents a cleavage produced by the rail and obsolete industrial zones, brown fields, and under developed land. These areas, due to the following factors, have an enormous potential:

- a- Centrality to the overall urbanised area
- b- Accessibility by railroad, if an improved regional commuting service is introduced
- c- Environmental potential by the access to the Stunt Forest and to the White Nile bank to the west.
- d- Peripheral and regional road accessibility potential if the adequate infrastructures are provided to the east

This grouping of potential factors sustain the following proposal:

**Diagramatic Development Proposal**



- 1: Central Business District
- 2: Institutional Zone
- 3: Environmental Area
- 4: Khartoum Gate
- 5: Regional Node

a.1- **Central Business District** development around the main railroad station.

This maximizes the location features:

- a) Railroad accessibility:
  - Maximum regional railroad commuting accessibility if the quality of the service is improved
  - National railroad accessibility
  - Future rail-airport accessibility, when needed
- b) Urban centrality:
  - Gravity centre for the urban area of Khartoum
  - Proximity to prime urban functions
  - Road/street/motor accessibility
  - Maximizing existing infrastructure and urban services.
  - Internalising land added value

- c) Recuperation of degraded urban areas
  - brown fields recuperation,
  - urban surgery for an urban injury
  - decontamination, chemical and landscape,
  - obsolete public land,
    - \* no compulsory purchase procedures necessary
    - \* full public benefit for land value increases
    - \* Added Value for financing infrastructure investments

- d) Prime centrality new uses:
  - Offices, Headquarters, Hotels, Banks, Prime retail, cultural functions...
  - Economical benefits for those activities.
  - Multiplier effects on the Khartoum economy
  - Urban beneficial effects, externalities, on Khartoum structure

a.2- **Institutional Zone** development between the Central Business District and the Sunt Forest to the White Nile:

- a) The forest provides environmental quality and prestige background
- b) Close by centrality. Beneficial for both. Proximity beneficial synergies.
- c) Final perspectives, representative functions
- d) Uses: State Buildings, Ministries, Justice, Institutional, Museum, etc...

a.3- **Environmental Area** improvement and requalification of the Sunt Forest and the White Nile bank to the east:

- a) Institutional Facilities of environmental profile. Public institutional grounds, University?
- b) Social Facilities of environmental profile. Public Park, Water leisure
- c) Dynamic protection with urban financial benefits from the Khartoum Centrality Development Corporation (KCDC)

**a.4- Khartoum Gate**

- a) Main entrance to the CBD and the Institutional Zone. Prestige access
- b) Transitional and articulation zone between the exterior and interior of the urban core
- c) Large Corporative location: Paris La Defense Model
- d) Public facilities with less representative functions and larger land requirements. Exhibition grounds, etc...

**a.5- Regional International Node** at the airport area:

- a) Larger demands for extensive land
- b) Commercial Centres and Regional Mall
- d) Arena, Stadium, Hospital, University,
- e) Economic functions, limited housing
- f) Future main exit of the central area
- g) Highway exit to the future airport and the regional highway backbone

A Central Khartoum Corporation could be set up for this development

**River Environmental Protection Plan**

The three Niles and the Tuti island provide a very high quality environmental asset. This areas of flood and rich vegetation have to be protected from development pressure and

misuse of polluting functions. Sensible leisure, social facilities respectful of the environment, protection reserves, are all functions that can be integrated in the Comprehensive Plan for the Protection and Enhancement of the Nile River Banks.

### **North / South Highway**

The development of the rail network for commuting will decongestionate the centre of Khartoum as it will diversify centralities along the rail corridor. The increase of activities along this metropolitan backbone spine will increase the pressure for all types of transport, including road transport and thus congestion on the actual road system.

An alternative “long distance” metropolitan network will need to be set to reduce the long distance and the time burden on “metropolitan trips” that can not use the same infrastructures than “local trips”. This system would have to be parallel to the line of centralities. The north/south linear location of these centralities, parallel to the Nile, requires the location of this highway to the east of the urban/metropolitan structure.

This highway should be prevented from development along the sides as it has to remain a long distance transport infrastructure and not a local development infrastructure. Potential for local development exists, and has to be fostered on the controlled accesses. This highway might be a toll highway. It will help both for the finance and the protection from access of the land along the highway.

### **Toll roads and bridges.**

The provided population figures for Omburdman are on the range of 3 million inhabitants, and 2 millions for Khartoum and Khartoum North, each. The new bridge between Omburdman and Khartoum supports a daily traffic of 65.000 vehicles. The old one might be on the range of 35.000 and is at limit capacity. Traffic between North and central Khartoum might range on the 70.000 figure. Between Omburdman and North Khartoum 60.000. These figures have been made on very basic assumptions and have a very limited credibility beyond the purpose of this proposal analysis. The limited intensity of traffic, among the three cities, proves the actually spoiled economic potential for an integrated urban structure, that would benefit, at most, from the economies of scale. The need for the new Omburdman bridge is obvious, and one could even point that the demand is in some way a captive demand. Thus the possibility for a toll bridge is a matter of thought.

The cost of the bridge (80 million \$) may be substantially reduced to 50 m \$. An International loan for that investment will require a yearly payment of 4m \$. Let’s assume that with toll the traffic would have been reduced to 50.000 per day. That is 15 million vehicles per year. The loan could be paid with a charge of 0,25 \$ per vehicle. There is an argument for introducing road tolls on the metropolitan structure.

### **Airport Redevelopment**

Khartoum is a city far away from potential consumption and production markets. Actual production of Sudan is mostly based on the primary sector, mining and/or agriculture: oil, gold, chrome, sugar, etc. That production is exported by train and ship. The Sudanese economy will evolve in the next few years. Oil revenues are the occasion to built up an industrial and service industry that will be able to integrate advantageously Sudan in the world economy.

The first step might be the substitution of imported manufactured products by nationally manufactured ones. The second one will be to produce products competitive in the international markets. The distance from international markets requires to compete in products which minimize transport costs. (Any transport cost will be a detriment to the benefit margin or the labour force retribution). The products will thus have to be of limited

weight and high added value per unit of weight. This kind of product is competitive for air transport.

Air transport might be an important feature in the future of Khartoum. Air freight and industrial transformation linked to the air transport would be best placed by the airport. The airport is still underused and still has potential extra capacity. If actual passenger traffic is 150.000 per year the one runway structure allows up to 1.5 million passenger capacity, before a new airport might be needed for saturation reasons (apart from noise pollution). In this framework it might be a good solution to be able to offer an important industrial site by the airport for Sudanese, or foreign, investment for export products. This Industrial zone can even have a Tax Free character. A National/Regional Development Corporation might be the best instrument for such a project.

The present location of the airport and the plan for its future relocation deserve special attention. On the one hand it is clear that on its present site the airport cannot develop into fully grown international size. Noise, air pollution, polarisation of traffic, even the risk of planes crashing into densely populated areas are restricting the level of use of the airport as it is. Also there is insufficient space to fully seize the opportunities an airport offers to attract high value added industrial and logistic activities. And it's obvious that the present airport location, once freed from its aviation function, might be redeveloped with high profit from the land and to great general economic advantage, because of its location near the city centre. On the other hand, at present levels of flights and passengers handled, the saturation level is far away. The number of passengers might easily grow tenfold (from present 150,000 a year) before the maximum capacity of the runway is reached and environmental impacts become intolerable. In the meantime, it is a distinct economical asset to have an airport so close to the city centre (compare London City Airport). Investors from abroad will appreciate the ease with which they can do business in the city as a result of this, and visiting tourists will like the short transfer times between airport and hotel.

Transferring of the airport to the North East of Khartoum presents several opportunities:

- to free the space in presently congested centre and to strengthen the area around the central station,
- to improve the relations on east-west axis thus overcoming the obstacle posed by the present location of the airport - thus recomposing and completing the urban fabric ,
- to create a new modern airport not too far from the centre of agglomeration with minimal land difficulties.,
- to reduce noise and air pollution in the densely occupied city centre,
- allow Khartoum to recompose all its urban territory, to better play its role as a national capital and to be recognised both in a more visible and symbolic way as a player in the network of the World Cities,
- to create a modern logistic centre for the whole agglomeration by relocating or net creation of warehouses under customs control, logistic, repairs shops for long haul transport, freight centre, free zone, trading houses, redistribution platforms, etc. ,
- to rationalise the investments to be made for modernising the existing terminal; better to create a brand new airport in a good location than to invest into modernisation which will be insufficient in few years time,
- to cover the cost of the new airport by income generated by selling the land of the current airport.,
- The release of the airport land could have a positive effect by decreasing the value of the land in the town centre (releasing more land could pull down the land market for a while making it more affordable for a variety of mix development).

Balancing these considerations there is no doubt that sooner or later the airport should be moved according to plan; it will then create a new economic ‘magnet’ in the Khartoum conurbation. But the question is: what is the right timing of such a move? Even if one takes into account that between the decision to actually relocate, and the opening of the new airport there will be several years (five or even more years), then there might be more pressing issues in urban development that need to be addressed. These are dealing with other areas in or near the central business district that also are in urgent need of redevelopment (such as underused railway yards at the central station), with the balance between investing in micro and macro scale infrastructure, the balance between physical and institutional interventions (reform of the land market or setting up a mortgage system), etc.

### **Industrial Location**

The highway side is not an acceptable location for residential use due to the noise and air pollution effect. Residential location should be on the railway network stations and there is an obvious incompatibility between the quality urban spaces to be created around the commuting rail station and the negative impact in scale, intrusion, segmentation, etc of highway design. On the contrary, industrial states can confront the environmental impact of the highway and by location at the fringe of it you are improving the road accessibility, reducing the transport costs and avoiding the environmental impact of industrial activity and truck traffic on the urban residential and civic environment. The highway system would be the backbone of location of a system of interlinked industrial states, connected not only among them, but as well with the international airport and the expanded cargo/freight areas.

There is enough urban space to accommodate the existing demand for industrial zones and to allow for the economic development in the centre of the agglomeration. These industrial zones should be protected in any spatial plan. However, they have to be transformed and reshaped according to several criteria.

Relocation may be necessary for strong environmental motives: polluting industries or inadequate location generating unnecessary traffic. In these instances, new industrial zones could be established at the periphery of Khartoum, preferably towards the North East, close to the junctions with the planned highway and the railway.

The establishment of a new airport will certainly be the occasion to relocate close to it most of the warehouse activities dispersed today over the metropolitan area. The need to provide the Customs Houses a more efficient location is another reason that supports the relocation of the airport. The zones of stores spread at present in the Centre. The transfer of the airport could be also the occasion, when the land has been released for development, to plan in the centre a range of activity of superior level such as financial services.

The relocation of industrial activity, today in the vicinity of the University on the east bank of the Blue Nile, could release land for the establishment of R&D related activities - Technology of information and communication (NTIC), incubators for small and medium sized enterprises (SMEs) in cooperation with the nearby faculties.

It seems necessary to clarify what are the priority sectors Khartoum wants to develop over the next years. Considering the present strength of the country in agriculture and food related activities that sector should be encouraged. Textile industry is another strong point. However, the Panel felt, based on data provided, that a lot of export in these basic commodities is currently made without much added-value. The expected increase of oil production will certainly generates an industrial sector of its own kind – maintenance, refinery, plastics, chemistry, transport, etc.



Other sectors should be explored by looking for their best lever effects and optimum use of resources and market opportunities – for example medical research, rural engineering, construction engineering, computer technologies, imaging, etc. Higher education and Universities are powerful levers to promote applied research centres and create market opportunities for locally developed new technologies.

The Panel suggests that, in order to clarify the economic issues, an *Economic Development Plan* be prepared to identify in spatial terms the needs of all economic activities.

### **Khartoum Image**

An effort could be made either by the School of Architecture or the professionals working in Khartoum, to develop a distinctive image of the city. Institutional architecture and Corporative architecture should not try to seek an “international” image with a senseless “locus genii”, but to develop, without losing international standards of efficiency and readability, a local personality. Projects presented in this proposal might be a good occasion to develop this distinctive integrated Khartoum image.

### **Regreening Khartoum**

Khartoum from its very beginning was envisioned and created with avenues and framed with alleys of trees. This is evident by the few massive specimens remaining today. The desire to recreate this image is very strong today and one observes the almost the maniacal efforts the people go to protect and grow vegetation. One common denominator of Great Cities is the vegetation and streetscape and the benefits its provides. This also provides an opportunity for the creation of jobs for the community and the local plant industry. Khartoum with its grid street pattern is well positioned to recapture its majestic urban promenades by systematically replanting the street trees of the capital city.

## RECOMMENDATIONS

### Vision

- The basis for a remarkable development strategy for the Khartoum region has been laid. It consists of two inter-dependent, multi-dimensional programmes: in the first place, the containment of the migration movements to the flat and fertile lands beyond the urban city, and in the second place the total enhancement and re-statement of Khartoum as the Capital City, with results that may astonish the world.
- With the abundance of flat, fertile land served by water resources, a free-form, interconnecting grouping of new communities can be created around agriculture and related activities.
- Restatement of the vision of Khartoum should aim at an internationally significant Capital City.
- For the implementation of the vision there are a number of components. First the re-setting and re-creating the junction of the three rivers as the centre-piece of the historic city. Second a total enhancement of the environment. Third the creation of new choices in housing. Fourth identifying and re-positioning of key developments within the re-stated 'Image of the City'. Fifth and last a new transport infrastructure to free up movement within the city (ring road, railways and the river).

### Planning approach

- To realise the vision, adopt an 'incremental' or 'organic' (as opposed to 'comprehensive' or 'blue-print') planning approach, jumping back and forth continuously between short and long term.
- For the short term: go along with forces at work in society as much as possible and try to 'deflect' developments that really threaten the long term vision; use unexpected developments to your advantage.
- Also for the short term: in general give priority to micro-scale improvements over 'grand schemes'; make major investments in heavy infrastructure later.

### Rational land use

- The roles of Khartoum in national spatial development policy is unique. It is important to define the future city functions and programs, including future roles of Khartoum as international city and the core of the regional settlement system of Sudan
- The general spatial and functional structure of Khartoum conurbation will determine its functioning and economic effectiveness, living conditions of its inhabitants, its cultural role and social quality. They need to be evaluated and defined.
- Present proposals for the general urban structure are based on system of corridor-extensions combined with satellite cities model. The satellite model of urban development can reduce urban pressure only, when the satellite cities are self sufficient with regard to services, jobs and technical infrastructure.
- Present land-use policy needs to be carefully evaluated and some its aspects may be reconsidered. Main problems of reconsideration may include the urban structure and land-use densities, issue of vast land reserves and unwanted vacancies; residential urban pattern.

- The density of urban structure and land-use in Khartoum is generally low. It can be seen as an asset, it also creates urban disadvantages. We may predict that the economic growth of Khartoum, the rising of living standards and new demands of people will accelerates urban expansion and decentralization of city programs. The real issue is how to better guide urban transformations and growth and how to stop unnecessary urban expansion.
- The Khartoum conurbation keeps vast reserves of land which in the present scale and form, are for the city of Khartoum destructive. The state and the city authorities should evaluate this problem on the priority basis, since the empty areas disintegrate the city structure, its spatial harmony and character. They create spatial gaps, destructive for the city functioning and the urban image of Khartoum. Vacant lands and urban reserves should be a rational part of the city concept - its spatial structure, its functional organization and services, its concept of integrated transport system and technical infrastructure.
- Residential urban pattern should guard and promote traditional urban value, accept style of family and social life, protect the local heritage and cultural qualities. It calls for studies on the model of low-cost housing, offered actually to families migrating to Khartoum, especially regarding the form and the scale of this program.
- It is desirable to adopt the innovative approach to the tools and instruments which can be employed for creation of rational urban land development policy
- Introduction of new urban policy may take several years, regarding economic potential of Khartoum citizens, local traditions, political thresholds and other important factors. But is recommended, to take this issue into consideration, despite all difficulties and thresholds.

### **Urban Economics**

- Revise the Khartoum Structure Plan. The consultative process would involve government, private sector, NGOs and the public.
- Adopt and issue residential land regulations and set the standards that would allow land division to sizes and building regulations that make it affordable to the target groups.
- Create the atmosphere for private developers to invest in the land development for different purposes with a special focus on housing schemes
- Introduce innovative approaches in housing schemes design ,implementation and pricing model. Examples of that, concerning pricing model, would be Cross Subsidy in Serviced Land Schemes.
- Reform the housing finance system to allow for the long term housing loans to be offered
- Study the rental sector and the legislations affecting it.

### **Urban infrastructure**

- Development of the Regional Commuting Rail Network:
- Railway Stations Centralities:
- Housing location on stations centralities
- Bus stations
- Markets improvement
- Develop Central Khartoum Capital functions
  - a.1- Central Business District development around the main railroad station.
  - a.2- Institutional Zone development between the Central Business District and the Sunt Forest to the White Nile:
  - a.3- Environmental Area improvement and requalification of the Sunt Forest and the White Nile bank to the east:
  - a.4- Khartoum Gate
  - a.5- Regional International node at the airport area:
- Prepare a River Environmental Protection Plan

- Complete the North / South Highway
- Introduce toll roads and bridges.
- Plan the relocation of the Airport together with Industrial Development
- Distribute Industrial location close to transport nodes
- Prepare an Economic Development Plan
- Improve the Khartoum Image
- Commence replanting street trees throughout the city starting with the major avenues followed by secondary streets etc. Secondly initiate a programme within the new settlements for streetscaping even with elementary fixtures such as tree protection cases.

## ANNEX A – THE INTERVIEWS

The Panel has interviewed the following personalities:

Dr Mohammed Ali Abdulhaleem, general manager of Khartoum State Cleaning Project  
 Dr Bushra Eltaib, director of the Urban Studies Institute, University of Khartoum  
 Eng. Altaib Haj Ali, director general of the Town Planning Departemnt, ministry of urban planning and public utilities  
 Eng. Mohammad Al Rasheed, director of the Housing Department, ministry of urban planning and public utilities  
 Dr Salah Alnous, associated professor, University of Khartoum  
 Eng. Ahmad Alhaj, director of the Omdurman Town Engineering Department  
 Eng. Nour Alkareem, director of the Khartoum North Town Engineering Department  
 Eng. Abdulhaleem Ahmed Yasen, director of the Khartoum Town Engineering Department  
 Mr Mohammed A. Abdelraheem, director of the Public Relations Department, ministry of urban planning and public utilities  
 Dr. Mustafa Abbas, executive director of the minister office, ministry of urban planning and public utilities  
 Eng. Salah Hassan Abukashawa, executive director of the minister office, ministry of urban planning and public utilities  
 Eng. Shereen Hussein, general manager office  
 Eng. Zahia Mosa, general manager office  
 Eng. Khalid Kamal, Khartoum Town Planning Office  
 Eng. Abdulgadir Himmat, manager of the City Centre Development Authority  
 Eng. Badr Aldin Ali, director of the Map and Image laboratory, Survey Department, ministry of urban planning and public utilities  
 Eng. Tijani abdulwahab, Khartoum Town road manager  
 Eng. Abdullaa Osman, Khartoum North planning director  
 Eng. Ossama Abdulsami, director general of the Road Department, ministry of urban planning and public utilities  
 Eng. Khalid Abbas, senior town planner  
 Eng. Salaw Altib, City Centre Development Authority  
 Eng. Mamoon Osman, town planner  
 Eng. Ibrahim Atta, town planner  
 Eng. Kamal Mostafa, town planner  
 Eng. Ghada Faredd, town planner  
 Mr. Isam, Khartoum Public Transport Department  
 Eng. Khalid Ali Khalid, general manager of Khartoum Water Corporation  
 Eng. Eltahir Osman, manager

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## THE INTA DEVELOPMENT ADVISORY PANEL

### The INTA Panel Process

INTA is a non-profit, independent international association established for the promotion of improved development and management of existing and new towns. INTA members represent both the public sector, on national, regional and local levels and the private sector: land developers, planning and renewal agencies, investors, financial institutions, builders and contractors, researchers and scholars.

The Association makes available an international advisory services carried out on a voluntary basis, by professionals from the urban development sector who possess sound expertise in all aspects of land-use planning, development, financing and marketing of large-scale urban projects. During a five-day assignment urban problems are thoroughly reviewed, development opportunities detailed and options proposed.

### The panel for Khartoum

The INTA Panel for Khartoum was composed of:

#### Steef **BUIJS**, Rotterdam, The Netherlands

Mr. Buijs is Project Manager for Development Planning with the Province of South-Holland. He was Project Director for the National Spatial Planning Agency of the Ministry of Housing, Spatial Planning and Environment of The Netherlands, responsible for urbanisation, planning and implementation projects. He was also Deputy Director for Urban Planning with the City of Rotterdam, Project Leader for Regional Planning with the Province of South-Holland, Project leader for regional planning with the Province of Overijssel. He served as an advisor on various development projects mainly on South East Asia: establishment of GIS for Jakarta; public-private participation in Indonesia; Regional Development Plan for Greater Surabaya; methodology for Structure Planning and Urban Management in Indonesia; methodology and implementation for Integrated River and Urban Management in Greater Jakarta; manual for the development of Water Front Cities in Indonesia; Urban Redevelopment Plan and detailed Structure Plans for Dhaka, Bangladesh. Other projects include feasibility study for Mombasa Southern Mainland Tunnel, Kenya; Regional Development Plan for St Petersburg and Leningrad Oblast, Russia.

#### Henry **CHABERT**, Lyon, France

Henry Chabert is the Chairman of Heritage Vision, a private firm specialised in cultural projects. He was a member of the French and European Parliament, Deputy Mayor of Lyon in charge of Urban Planning and Development for 12 years, Vice President of the Urban District of Lyon, Managing Director of the Public Development Corporation of Etang de Berre near Marseilles. He graduated from the Ecole supérieure de commerce de Lyon and the Institut des Hautes Finances.

#### Douglas **COOLMAN**, Fort Lauderdale, USA

Doug Coolman is a senior partner of EDSA (Planners and Architects) a private firm that serves clients in the private and public sectors in the design of new communities, resorts, tourism destinations, entertainment venues and urban environments and provides creative solutions that enhance the

environment and contribute to the clients' success. As a Principal at EDSA, Mr. Coolman employs the firm's team approach to master planning, a process which draws on the expertise of the multidisciplinary team and is based on the careful analysis of each site/project. He is also expertly skilled in the consensus building process for both public and private sector projects, and committed to the community in which he lives. Mr. Coolman has managed and been principal designer and facilitators on many of the firm's comprehensive award-winning projects, among them: Tierra del Sol New Planned Community, Aruba; Fort Lauderdale Riverwalk Revitalisation; Fort Lauderdale Beach Redevelopment and Revitalization; Volusia County Tourism Plan Daytona Beach Florida; Downtown Fort Lauderdale Urban Vision; Diana Beach Community Vision Statement; Sustainable Master Plan for North West Point Providenciales Turks and Caicos.

**Yousef HIASAT, Amman, Jordan**

Mr. Hiasat is currently Director General (CEO) of Beit Al-Mal Saving & Investment for Housing, a leading financial and investment firm based in Amman, Jordan. He is also a member of Near East and North Africa Urban Forum, a group set up to assist the management of cities through a more inclusive and consultative process and to stimulate improved living conditions for the poor and economic productivity. He is also a member of the Policy Advisory Board of the Cities Alliance based in Washington, USA. He served for 12 years as Director General of the Housing and Urban Development Corporation (HUDC), the public sector institution responsible for the Housing and Urban Development policies and production in Jordan. During this period he initiated the development and formulation and adoption of a National Housing Strategy in Jordan. In the course of the NHS he managed to introduce reforms to the housing and urban development sector, including Housing Finance, Land Management, Secondary Mortgage Market and Public Private Partnership. A civil engineer by training, Mr Hiasat worked in several fields of consulting engineering before joining HUDC.

He also was a member of the Board of directors of several public and private sector institutions such as Housing Bank, Jordan Mortgage Refinancing Company, Jordan Higher Planning Council, Environment Protection Corporation, Greater Amman Municipality. He also served as a member of the Advisory Committee of the Urban Management Program based within UNDP in New York, USA.

**Adam KOWALEWSKI, Warsaw, Poland**

Dr. Kowalewski is currently the Chairman of the National Secretariat for the Habitat Agenda in Poland, Vice Chairman of the "Foundation in Support of Local Democracy", Poland, Vice President of the National Chamber of City Planners in Poland, Architect-Partner in: 'Badowski, Budzynski & Kowalewski - architects and consultants Ltd.

His previous positions included being Ambassador of Poland in Kenya, Uganda, Rwanda and Burundi, the Permanent Representative of Poland to the United Nations Centre for Human Settlements (UN-Habitat) and United Nations Environment Program (UNEP). He was also the Chairman of the Committee of Permanent Representatives to UNCHS (Habitat); General Rapporteur of Governing Council of UNEP.

Other positions include Under Secretary in the Ministry of Physical Planning and Construction, Poland. Deputy Minister, responsible for problems of environmental planning and architecture; senior researcher at the Institute of Economic Science [Section of Regional Economy], Polish Academy of Sciences. Participation in the international comparative studies with Nijmegen University (the Netherlands), Johns Hopkins University (USA) and other European and US universities. Adam acts as architect-planner in the UNCHS Physical Planning Project in Africa, responsible for preparation of the Baladiyat Physical Planning system (regional and local planning) in Libya; Executive Director of the Warsaw Town Planning Office (BPRW) and Head Planner of the Warsaw Metropolitan Area. Other professional activities include being a member of the Governing Council of African Center for Technology Studies (Nairobi) and expert to the Senate of Poland.

**Pedro ORTIZ CASTANO, Madrid, Spain**

Mr. Pedro Ortiz Castaño is currently Director of the Institute for Urban Renewal, a joint venture between the public and private sector in Madrid. He is as well Director of the Master on Town Planning of the University King Juan Carlos of Madrid, and a Partner of the Planning Consultancy firm of Arop&As. Counselor to the Regional Governments of Navarra and Murcia, as well as to



several engineering and development companies as Intevia, SA, Institute of Transport Engineering and Roads, the Centro Superior de Arquitectura, Camuñas Foundation. Member of the expert committee of the Madrid Nuevo Siglo Foundation, involved in the planning of the Madrid Olympic bid for 2012. Pedro was former Major for Madrid's Central District (Distrito de Salamanca) (1989-1991). Member of the Madrid's City Council (1987-1995). Responsible for Urban Prospective (1993-1995) and for Culture (1991-1993). Director of the Strategic Plan for Madrid (1991-1994). Pedro has been as well Director General for Town and Regional Planning on the Government of Madrid Region, and as such author of the Regional Development Plan of Madrid of 1996 and the Land Planning Law of 1997.

**Michel SUDARSKIS, The Hague, The Netherlands**

Michel Sudarskis is the Secretary General of INTA, the World Urban Development Forum since 1987. He was educated in economics and political sciences. Before joining INTA he taught on international co-operation and foreign affairs as Associate Professor with several Universities (Strasbourg, Paris, Nice and Lille) and served with international organisations in Italy (1971-1974) and Belgium (1974-1984). Michel Sudarskis writes and speaks regularly on urban issues.

**Reg WARD, London, UK**

Reg Ward held four Chief Executive posts in the U.K. Public Sector; (Coatbridge; Hammersmith and Fulham in London; the county of Hereford and Worcester; and, finally, London Docklands Corporation). In 1980 he was appointed Chief Executive Officer to set up the London Docklands Development Corporation. He directed London Docklands remarkable redevelopment over its first 8 years. This period culminated in its initial peak that involved Canary Wharf; the Docklands Light Railway; London City Airport; major new road and tunnel system; some 30M square feet of new Commercial Development; 25,000 new houses; and major schemes of Environmental renewal and leisure developments.

After quitting the Docklands Corporation, he was retained for major development concept work in New Zealand, Australia and the U.K. From 1999 to the end of 2002 he was retained by the Government of St. Kitts in the Caribbean to produce a 'Vision' for the North West part of the Island where he set up a major new eco-environmental and new economic structure to replace the previous dominant sugar industry.

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