

## **The Story of the Stunning Success**

### **Kenana Sugar Company (KSC)**

#### **1/ Introduction**

##### **1/1 The Sudan; -**

The largest country in Africa, and the fourth worldwide, The Sudan extends over an area of two and half million square Kilometers in the continents North East side, with a population of 25 million inhabitants (25% urban and 75% rural) <sup>(1)</sup> It lies between Latitudes 3° – 22° North and longitudes 23° – 38° East, it share boundaries with eight other countries, with only outlet beginning through the red sea.

The Sudan is a county of immense size, its 1900 kilometers North- south extent results in a variety of climates which includes desert, tropical and equatorial regions and where rain fall varies from less than 50 mm. per year in the North to over 1000 mm. per year in the South. The River Nile and its main tributaries penetrate the country where most of the important settlement centers, especially in the drier North, leis either by or near the various tributaries of the Nile. The socio- cultural mosaic of the Sudan from the points of view of ethnicity, languages, religious beliefs, traditions, life modality, endemic diseases, environment and settlements patter is changing every 50-100 km. <sup>(2)</sup>

The Sudan has considerable potentials for cultivation, forestry and animal stocks together with possibilities for mineral resources, such as oil and gold.

##### **1/2 Kenana Sugar Company (KSC): -**

###### **1/2/1 Background**

For a long time Sudan was exporting its sugar needs from other countries, till in the early 1970s a proposal for a sugar factory project was predicated on combining the rich natural resource of the Sudan, surplus Arab oil revenues and the western technologies. A feasibility study was prepared for the establishment of a 300,000 MT per annum sugar complex, and in February 1975 the founder's agreement was signed for the implementation of the sugar project, and later on Kenana Sugar Company Limited (KSC) was incorporated in Khartoum as a private Limited Company.

The Kenana dream became a reality by the first bag of sugar produced in February 1980 and the Sudan enjoyed for the first time self-sufficiency in the sugar commodity. Moreover, since 1991, and in accordance with the sugar sales agreement signed between the two parties (Kenana and the Government of Sudan) in 1975, half of the production of Kenana is sold to the government of Sudan, while the remaining 50% is either sold to the public locally, or to the Sudanese Free Markets and Zones Company payment for which is made in foreign currency or is exported. Kenana started exporting sugar to the nearby Middle East [and African countries benefiting from Sudan's proximity to one of the most important demand] area in the world. The major foreign sugar markets for Kenana are Yemen, Chad, Aruba Island, Ethiopia and Kenya. The basic marketing policy for the forthcoming seasons is to concentrate on the COMESA markets, West African markets and the markets of the European Union. The local market is also of especial interest to the company, since Kenana has a strong hold in these Markets. Exporting of sugar from 1991 onwards, has not only enable Kenana to increase its cane and sugar production, but also enable shareholders to receive a dividend on their shareholdings fom1991/92.

**1/2/2 The Project Location: -**

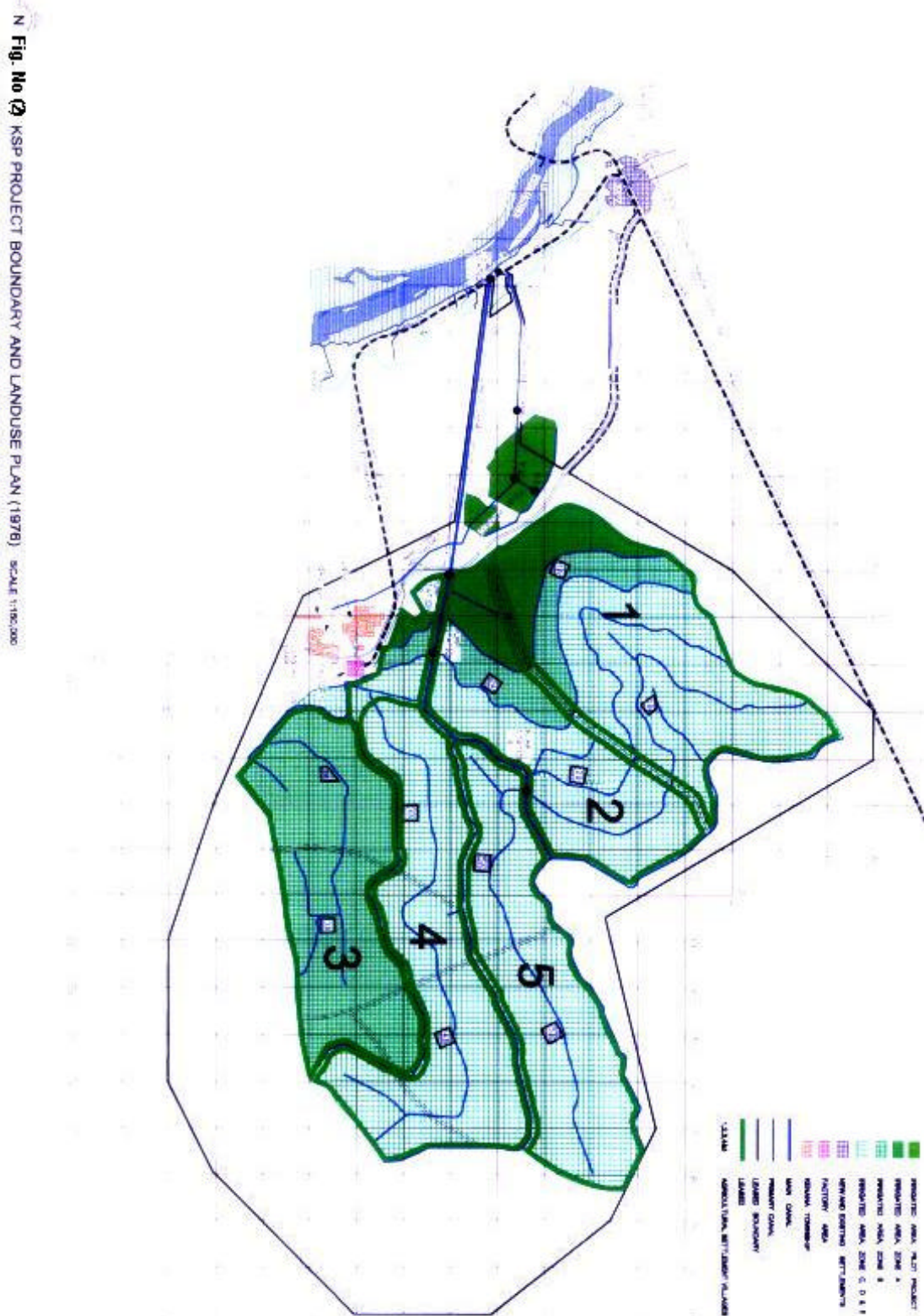
The project location in the Sudan is shown in Fig. No. (1). It lies with Latitudes 12° -15" and 13° -12" North, and longitude 32° - 4" and 32° - 32" East nearby Rabak Town on the East bank of the White Nile River, some 320 km South of Khartoum (the Capital City) and 1200 km from Port Sudan (the main sea port of the country).

**1/2/3 Basic Information About The Project <sup>(3)</sup> :-**

Design Criteria	An integrated Cane Sugar Estate, with a factory rated at 26,000 MT of Cane per day.
Estate area;	168,000 Feddans (70,000 Hectares) <sup>(4)</sup> .
Plantation Area;	100,000 Feddans (41,800 Hectares).
Irrigation Works;	Six pump stations with capacity of 42 cubic meters a second and a total lift of between 40 to 46 meters above the level of the White Nile, sending the water along 40 Km. of the main Canals to the Plantation area on to which the water is fed by gravity along some 400 Km of secondary canals following the contours of the estate.
Irrigation Requirements:	400 million gallons per day.
Estate Roads:	328 Km. of major roads supplemented by a 1,500 Km. of in-field roads.
Electrical Generation:	During crop harvesting: 35 Megawatts.
Workforce:	12,000 employees, with 4,000 seasonal workers for the duration of harvesting the crop (Nov.-May).
Share Capital Funding:	The authorized share capital amounts to SD 59 million <sup>(5)</sup> and the paid capital amounts to SD 56 million which is held in the following percentage as at 30 Sep.2001.

1/ The Government of the Republic of the Sudan.	35.17%
2/ Kuwait Investment Authority.	30.50 %
3/Government of Kingdom of Saudi Arabia.	10.92 %
4/The Arab Investment Company.S.A.A.	6.96 %
5/Sudan Development Corporation (SDC)	5.66 %
6/The Arab Authority for Agricultural Investment Development	5.56 %
7/ Consortium of Sudanese Commercial Banks.	4.45 %
8/Lonrho PLC.	0,45%
9/ Nissho Iwai Corporation (Japan)	0.16 %
10/ Gulf Fisheries Company. W.L.L.	0.16 %
Total	100 %





**Source: KSC Review of Existing Situation – Nov. 1999**

### 1/2/4 The Project Social Impact.

The development of the area by the project, has transformed near-virgin scrubland which was previously populated by nomads and peasant into one of the world's largest integrated sugar estates, providing employment and secure stable living conditions for a large workforce from many different parts of the country, and business opportunities for various services to the nearby towns investors. Since inception, KSC is considered not to be a merely commercial project, but a pillar of socio- economic development in the area. It was accepted that Kenana would have to shoulder the responsibility and cost of providing social services to the region where the project was located and where the people were living a traditional nomadic life.

The drastic socio-economic changes that followed the Kenana's wake, transformed the life style of the local people in to a modern civilized existence. The major benefits made available to the employees are summarized as follows:-

- Education to children of all ages from kindergarten to higher school graduation.
- Medical and clinical health, where a modern 80 beds hospital, five health centres, seven dispensaries and a special accident clinic in the factory.
- Environmental health services are also provided for the villages surrounding the project area.

All facilities for the town council, labor office, post office, banks and magistrates court.

- Residences of Kenana Township enjoy the products of the horticulture farm and dairy products with subsidized prices.

- Kenana has many clubs for different ranks of the employees and sport facilities.

Providing all these privileges led to the creation of a large modern society from what was previously rain fed scrubland capable of supporting only a sparse and largely nomadic population.

### 1/2/5 The Project Area land Use: -

As per the 1976 spatial organization of the leased project area, illustrated in Fig. No. (2), the main land use within the project area obviously, consist of the cane sugar plantation area (86.3 feddans), the area occupied by the township, the factory and the air field (4760 feddans) and then the area occupied by the rural settlements (2345 feddans). The designations of the functions on land were based mainly on the physical qualities of the project area. The coming table shows the land uses within the leased area of Kenana project: -

**Table No (1)**

**Land Use Within the Project Leased Area (1976)**

Land use	Feddans	Net %	Gross %
1/ Cane Plantation	86,300	92.5	62
2/ Township, Factory & the Airstrip	4760	5	3.5
3/Rural Settlements	2345	2.5	1.5
Total	92,405	100	67.5

Source: - Report on, Review of the existing situation Nov.1999

### 1/2/6 The Project Population

The estimation of the present population number (1999) for the project area and the township was based on two factors: - the first is the present employment records of Kenana Sugar Company, while the other is the National population census of 1993 and the annual population growth rate. The consultant who was assigned to prepare the new development



plan for the township did an exercise, and the outcome of this exercise is illustrated in the table below: -

**Table No. (2)**

**The Present (1999) Population Number for the Project Area and the Township\***

Area	Total Pop.	Annual rate of Growth	Household Size	Household Number
The Project Area	72,500	4 %	7.89	9,336
The Township	15,500	5.44 %	8.13	1,641

**Source: - The report on, Review of the Existing Situation (Nov. 1999).**

\* This table is extracted from the consultant's report and obviously based on the consultant's assumption and estimates.

**2/ KSC Achievements and Challenges: -**

Since the inception of the production by the year 1980 to date KSC is gaining success after success. As yet KSC management was ambitious and determined to achieve the highest possible levels of productivity. In his speech to the directors meeting of 2001, the Chairman [said "The prevailing situation on the international market reflects the substantial dimension of the challenges facing the sugar industry and dictated the pressing need to introduce new ways and means of achieving sustainable growth for sugar producing companies.

The 1999/2000-production season may justifiably be regarded as the occasion of Kenana [Company age, with sugar production of 387,000 MT, the highest production in Kenana's history. The average yield per feddan of sugar has recorded an outstanding record, both for Kenana as well as by international standards, scaling an average of 45.1 tones of cane per feddan. This significant achievement reflecting the effort exerted in the refinement in agricultural practice to upgrade the quality and to increase the quantity of sugar cane produced. Following the production and productivity figures recorded later, Kenana is acknowledged as a considerable technical and managerial success and one of the most [efficient sugar factories in the World." He added "An existing challenge for Kenana is to face] effectively the globalization and free trade era and resultant fierce international competition".<sup>(6)</sup> Here below is a table summarizing the operation and financial status of the company based on three years span. Table No (3).

**Table No (3) Summary of Operation and Financial Status**

Season		87/88	89/90	91/92	93/94	95/96	97/98	99/00
Area Harvested	Feddans	77,100	75,100	77,300	77,616	76,834	79,160	78,594
Sugar Production	MT	265,000	232,000	253,000	249,000	280,000	333,000	387,704
Production Target	MT	280,000	245,000	266,000	265,000	265,000	340,000	365,000
Profit for the year	SD/000	22,575	50,977	224,460	167,067	5,088,728	15,292,454	9,396,113
Dividends	US \$	--	--	1,500,000	3,000,000	15,852,776	15,859,916	19,600,000

**Source: - 1) Annual Report and Account 1997 (KSC).  
2) Annual Report and Account 2000 (KSC).**

### **3/ The Initiation for the Development Plan: -**

The above mentioned KSC outstanding economic achievements and sound financial position, inspired the management to work for creating a more balanced economic, social and health conducive physical environment, where improved levels of living lead to higher levels of productivity and, in turn, to higher levels of living. Thus the goal is to present the [project as a " Model Sugar Estate" world wise during the first decade of the] 21<sup>st</sup> Century.

The management has been at the same time, aware of the substantial growth of the project population and its amount pressure on the township housing stock, on its social amenities, on its basic and essential services and on its sanitary disposal methods and consequent environmental hazards, as well as being aware of the rapid peripheral settlements growth and reflected problems.

The awareness of those problems associated with the project economic development achievements and the desire to resolve them within a balanced development framework, couple with intention to diversify the economic activities by investing in related agro-industries,<sup>(7)</sup> have led KSC management to entrust KARPLIN Consultants<sup>(8)</sup> with the task of reviewing the existing situation and formulating a structure plan to guide the development of Kenana Township, the major settlement of the company, during the first decade of the 21<sup>st</sup> Century.

### **3/1 The Present Human Settlements Hierarchy and Spatial Distribution: -**

Prior to the inception of Kenana project, the region was populated by nomads and peasant, the structure of the population in the region began changing rapidly and so the monadic settlements organization when the area was selected as a sugar state. The early (1976) planning concept put for the organization and distribution of the agricultural settlements in the project area, illustrated in Fig. No. (3), was to set up a hierarchy of settlements to give equitable access to a range of organizational and infrastructural facilities in each of the five agricultural management area. Two central farm villages were proposed for each agricultural management area, one of which was to act as the administrative HQ, with workshops. Water treatment plant and housing of the senior staff and the other for housing of the permanent farm workers. Related to these central farm villages were small satellite settlements not more than 3-4 Km distance away, which were dispersed and located in relation to the agricultural Management of cane production areas.

### **3/2 Initial Township Planning Concept<sup>(9)</sup>: -**

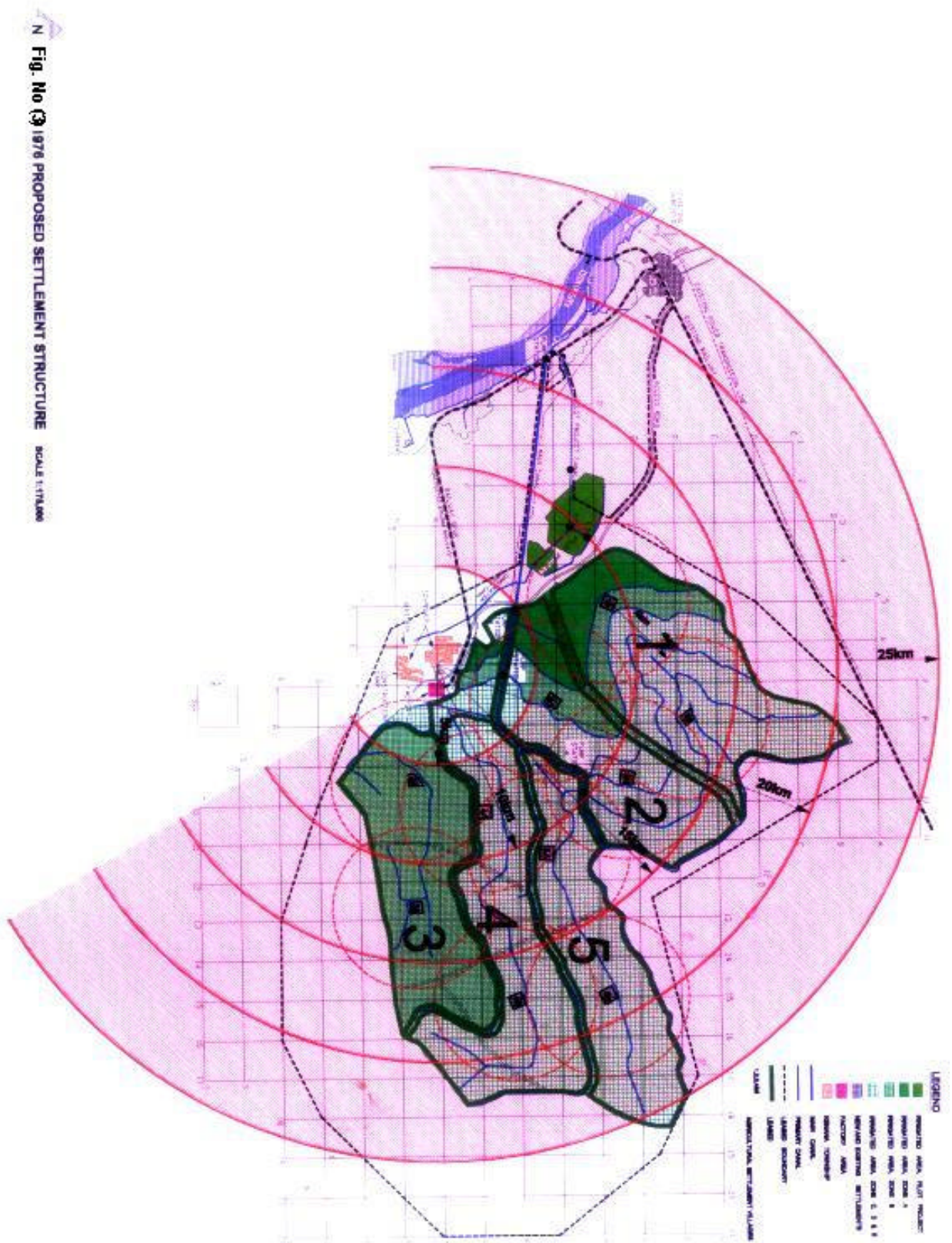
Two layout plans were prepared at an early stage for the Township, the first by Feb. 1976 and the other on Sep.1980.<sup>(10)</sup> The primary function of the Township was to accommodate the management staff including the senior and the junior staff of the project as well as the other factory permanent labor force. The initial planning concept was to group the township functions on the two side of a central spine of internal communications along the NW to SE axis running with the wadi,<sup>(11)</sup> crossing the Township from the factory site in the East down to the South West direction, on an area known as a catchments area for rain water. The Township was to be kept at an optimum distance from the factory and the Township center including all necessary facilities located along this spine, and where the housing communities grouped on both sides of the center. The Township planning concept is illustrated in Fig. No. (4), and the consequent Structure Plan (1976) is illustrated by Fig. No (5)

### **3/3 The Existing Township Land use (1999): -**

A gravel site was designated for the Factory, the Township and the Airstrip. The location of the Factory in a gravel site between the sugar cane production area and the Township, was commendable not only because it observed proximity to both farm and the Township and ensure the construction of the Factory on safe grounds, but also because it allows for Factory smoke movement along the prevailing North-South wind direction, thus avoiding

Township Pollution. The Township and the Factory were linked by both access road and railroad to the nearby Rabak Town. The existing (1999) Land use of the Township is illustrated in Fig. No. (6)





Source: KSC Development Action Programmes - Sep. 2001

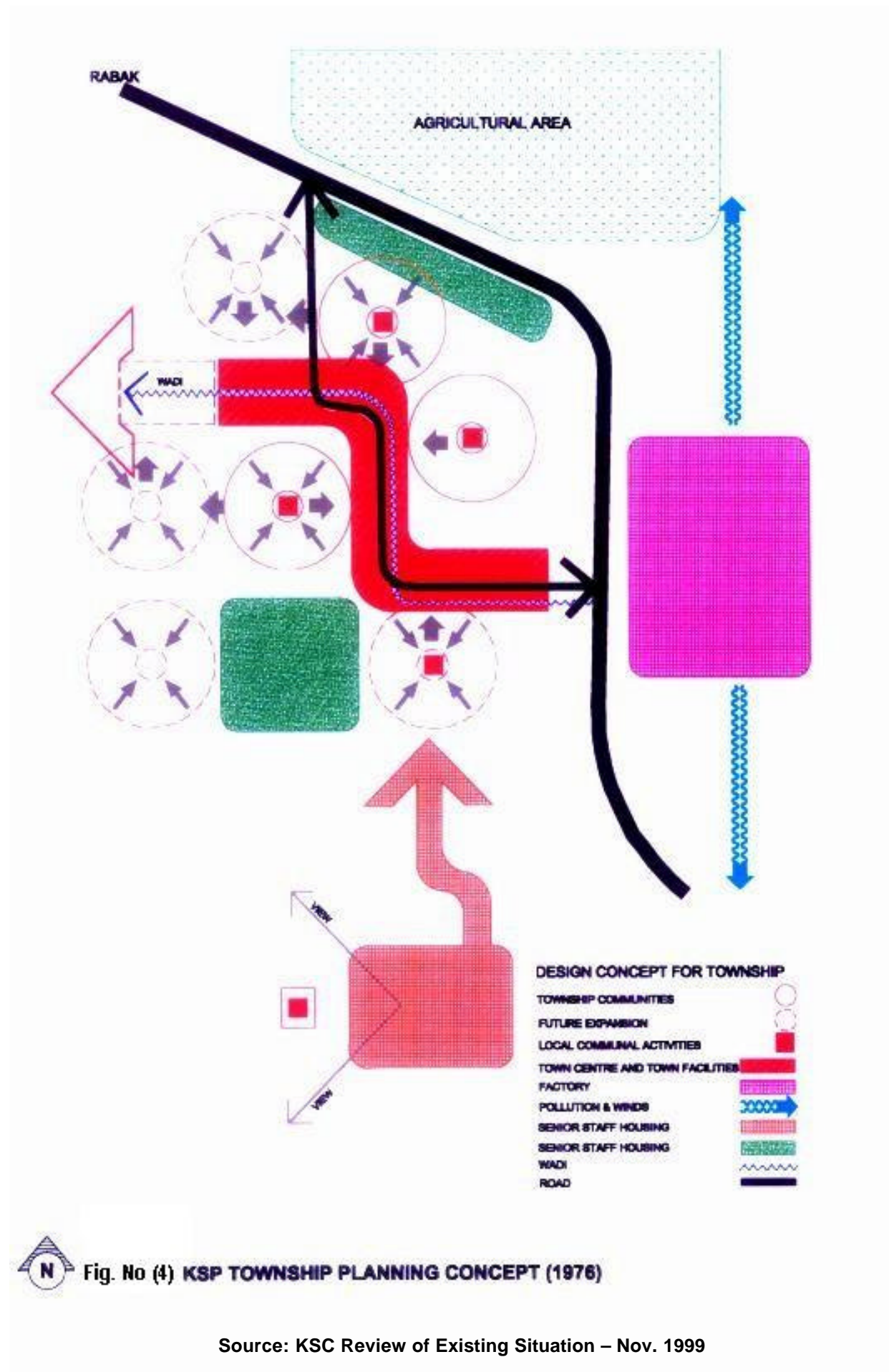
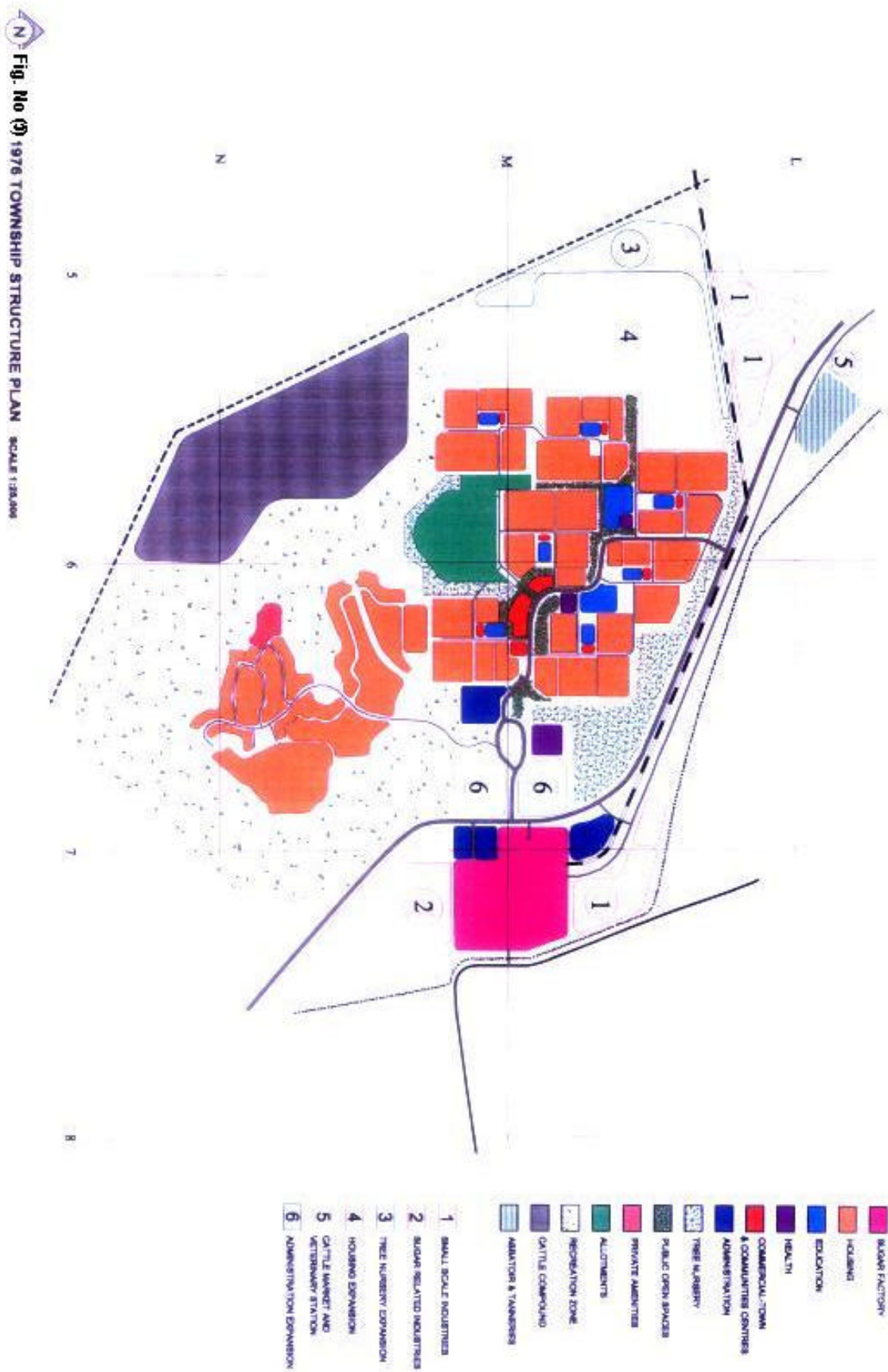


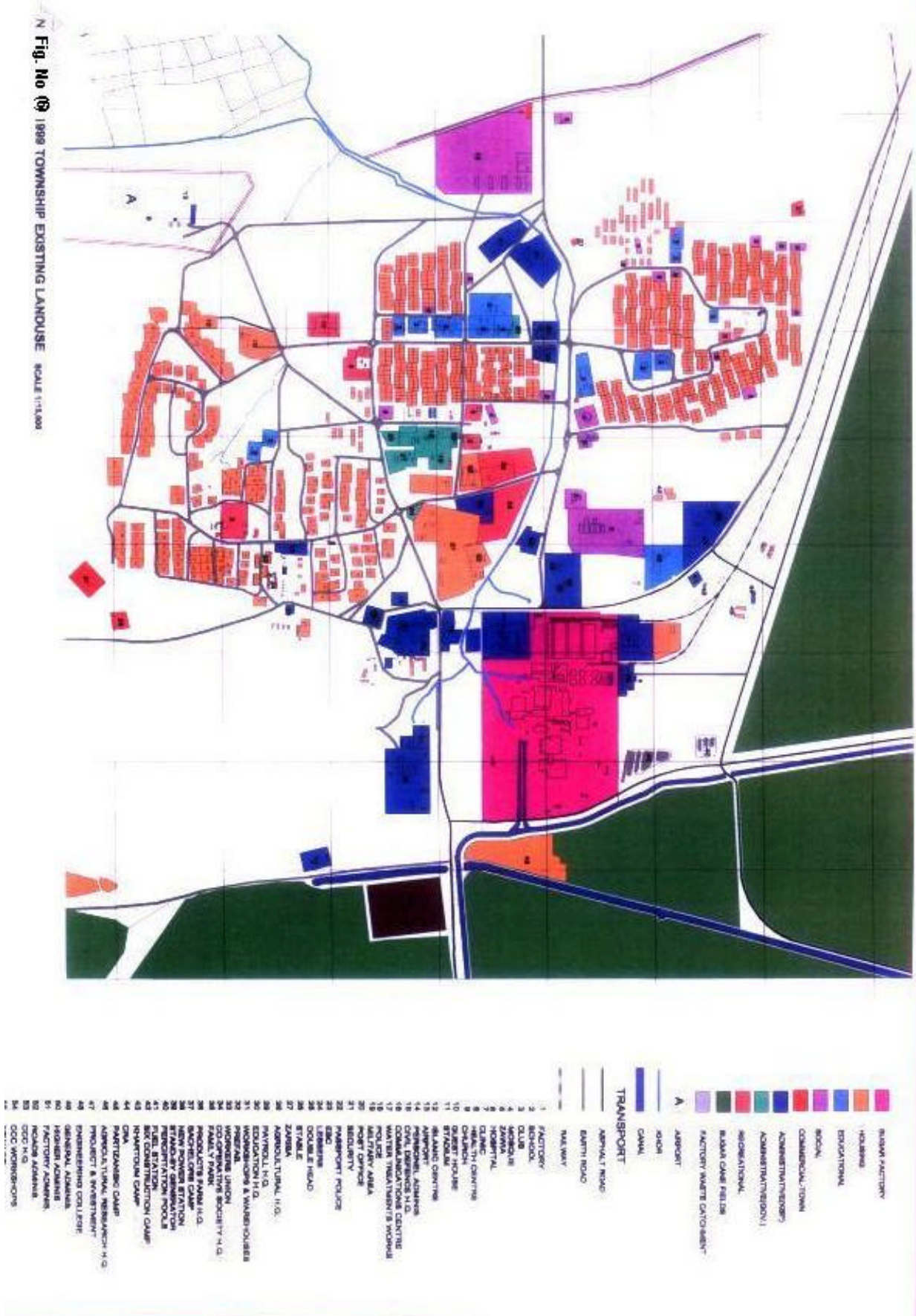
Fig. No (4) KSP TOWNSHIP PLANNING CONCEPT (1976)

Source: KSC Review of Existing Situation – Nov. 1999





Source: KSC Review of Existing Situation – Nov. 1999



Source: KSC Review of Existing Situation – Nov. 1999

#### **4/ Kenana Township Structure Plan (2000-2010).<sup>(12)</sup>**

##### **4/1 The Methodology: -**

To tackle out this assignment, the consultant proposed a five stages method of approach, which consists of the following stages:- The first stage is the task definition followed by the study of the existing situation and Plan Review on bases of which the Township Structure Plan (2000–2010) stage is conceived, which is, then, followed by the stage of plan promotion and interpretation and finally the production of approved final Document. This method of approach is depicted by Fig. No. (7)

##### **4/2 Goals and Objectives**

The main Goals and Objectives to be achieved in formulating the structure Plan (2000 - 2010) are as follows: -

- To secure a flexible structure plan, which provides a framework to cope with the KSC 21<sup>st</sup> century vision and strategies including the anticipated diversification of Kenana economic activities as well as changes in population, employment, income, housing and other human needs.

- To ensure and maintain a properly planned healthy township which allows for the efficient functioning of all activities, with the least friction, cater for the dimension of time and change and gives a sense of community and an atmosphere that is conducive for work within economic limits.

- To ensure that the plan allows for growth in population and locates sufficient land to meet all housing and associated community needs to standards of space density and environmental needs, appropriate to the economic development of Kenana state and put forward adequate housing policies and programmes.

- To plan the township center as a meeting or “getting together” place incorporating shopping, business and banks, and other related functions.

- To secure high quality landscaping within and on the periphery including parks and parkways, playing fields and playing grounds and gardens and squares that not only make the township pleasant for its citizens, but also a center of attraction for tourism.

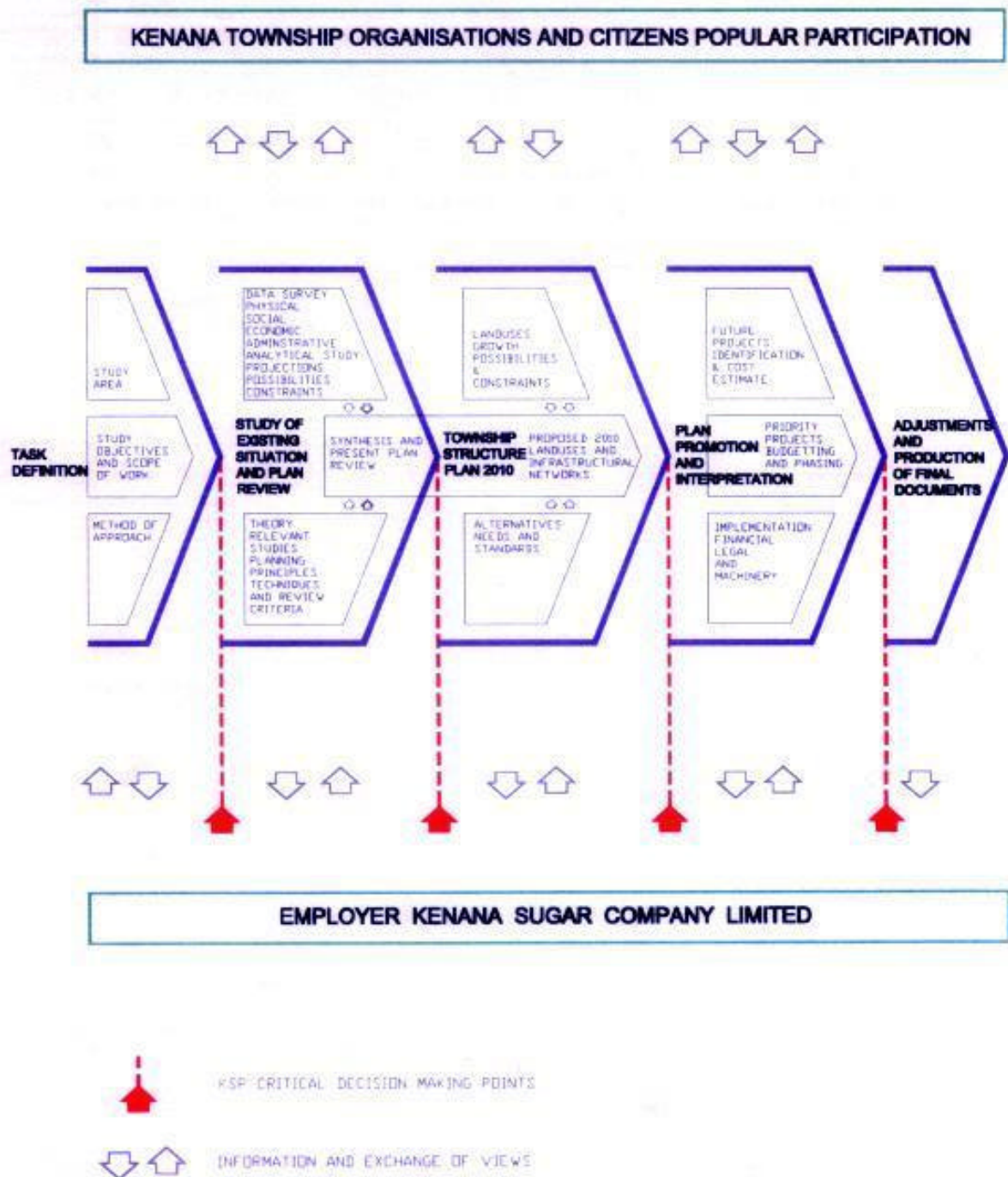
- To make the most economic use of existing infrastructure and that planned for the immediate future and to provide for efficient additional capacity to meet forecasted demands.

- To secure safe and easy access to all of the people and goods and easy access to all parts of the township.

- To maintain the international standards of a healthy atmosphere with the least pollution of air, water and land and to protect environmental sensitive areas.

- To ensure proper implementation of the plan by devising an efficient system of coordination and development control.





**Fig. No (7) KENANA TOWNSHIP PLANNING METHOD OF APPROACH**

Source: KSC Review of Existing Situation – Nov. 1999

#### **4/3 The New Township Structure Plan Concept: -**

In formulating the Structure Plan to guide the Township development during the first decade of the 21<sup>st</sup> century, the general concept should satisfy: the Function, efficiency, flexibility and provision of necessary need, services and facilities in a healthy, green, relaxing and beautiful environment.

The Township spatial development main concept is to create a "Green Environment" which is not only conducive to work and living, but also assimilating an architecture and Landscaping that match its natural beauty.

This beautification concept can be achieved through:

- (i) Encircling the Township with green belts,
- (ii) Tying up the spaces flowing in between the residential communities and between the Residential communities and the Factory (which accommodate central function, and major roads) within continuous green areas,
- (iii) Sensitively controlling building densities, heights, forms and appearance that match the character of the Township, and
- (vi) Through adequate utilization and landscaping of the site topography.

#### **4/4 Possible Improvements on KSC Settlements Structure: -**

In the early stages of the preparations of the structure Plan it was seen that the planning of the Township can't be taken in isolation from its subregional context, which is here the surrounding agricultural villages, as most of the permanent workforce, which is entitled for housing in the Township, for one reason or another is residing in the neighbouring villages and camps. Adding to this, it has been found that a considerable number of the project agricultural workforce, who are supposed to be housed in KSC agricultural villages are now residing in the Township, which will mean in turn more pressure on the limited Township housing stock and services.

For this reason and many others, the study of the structure plan for the Township was widened to include the whole settlement structure in of the project area, to identify the shortcomings in the villages, which led to this pressure on the Township, and how to overcome these problems.

As said before in para.4/3, the early (1976) distributional concept of the agricultural settlements in the project area, proposed a two central farm villages for each of the five Agricultural Management areas. This proposal was dropped and replaced by only one settlement for each of the five Agricultural Management areas during the implementation stage of the project. An additional settlement was created later to serve as the central workshop located at the pump station No (4). This modification in the settlement number and spatial distribution seems to be due to some economical and Physical reason.

The new plan proposes that, while the Township is to remain on top of the hierarchy of KSC service centers, the new settlement (central workshop) at the location of pump station No (4), shall be of the second order in the hierarchy of providing higher level of social services, including secondary schools, hospital, shopping.... etc, for the surrounding villages, which, then, be of the third order.



#### **4/5 The Township Structure Plan Proposals (2000-2010).**

In line with the concept expressed later, the new proposed plan for the Township, is still satisfies the objective of proximity and ease of access from all parts of the Township to work place and central functions as well as the adequacy of relationships of various Township land uses and activities. In addition to that the proposal places special emphasis on landscaping through designating and developing substantial areas within and around the Township to realize the "Green Environment" dream.

The new Structure Plan is illustrated by Fig. (8)

The constituent components of the new structure plan are as follows: -

##### **A / The factory and the other industrial area**

As said before the siting of the factory has been successfully chosen, because of its easy accessibility by road and rail, its proximity to the Township, sugar cane plantation and the, main canal (from which the raw water requirement is taken), in addition to that its suitable soil condition and characteristics. The factory occupies an area of 130 hectares, sufficient to accommodate its present and future requirements. The area North and South of the factory is proposed to accommodate the related industrial projects, as KSC is intending to diversify the industrial activities in related industrial projects, such as, charcoal, animal feed, industrial alcohol and yeast.

##### **B / The Township Central Functions,**

The central functions of the Township center consist mainly of:

- KSC and government administration.
- Shopping and other commercial facilities.
- Social, recreational and religious facilities.

All these functions are taking place in present within the area between the township residential communities in addition to the areas between the township and the factory. This same area is kept by the new plan to accommodate the new requirements of the same nature.

##### **C / Residential land use**

The three residential communities of the Township at present occupies an area of about 3 km<sup>2</sup> (kenana South, Central and North). For the future expansions of the areas, the consultant designated two potential residential expansion areas, the first lying West of kenana North residential area while the other lying South of kenana south residential area.

##### **D/ Other land uses on the Western periphery of the Township: -**

Other land uses on the Western part of the Township are: -

##### **(i)The Camps,**

Camp 4,5 which lies within the project leased area, are to be separated from the Township by a buffer green zone and to be retained as residential land use to accommodate part of KSC permanent workers and thus to relieve the pressure on the Township.

(ii) The airstrip: -

The township Airstrip is well located on its South West corner, with a total area of about 500,000 sq.m. This location is considered by the new plan as adequate to accommodate the function in terms of location, area and standards.

(iii) Waste treatment ponds: -

A ditch crossing the Township and draining towards the Southwest into the evaporation ponds carries the factory liquid waste. These ponds cover a total area of 750,000sq.m. Due to the mixing of the surface water with the factory liquid waste during the rainy seasons, these ponds become muddy and filthy for most of the year, thus causing health hazards.

The present ponds being unsuitable for use by the sewage system, the piece of land, immediately South West of the present ponds, is proposed as the combined sewage waste treatment area.

(VI) The Major Road Network.

The Land uses and the other activities within the Township are linked with a major and secondary road network system, this road network consist of the main access road linking Rabak town to the factory and the Township and other roads linking the factory with the town center, the airport with the town center, the township with the other settlements and the plantation area and the agricultural settlements.

The new plan proposes a new roads and an extension of existing ones, such as the extension of the main access road of the Township to link the proposed Southern industrial area development zone and the southern residential development zone. Other two new major roads running South- North, East and West of the camps are proposed as alternative links to kenana Rabak access road.

(v) Landscaping: -

As already mentioned in the Township structure plan objectives and the planning concept, the creation of a 'Green Environment' is highly emphasized, to match the] natural beauty of the Township which is not only conducive but also attractive to visitors and with functional advantages including:

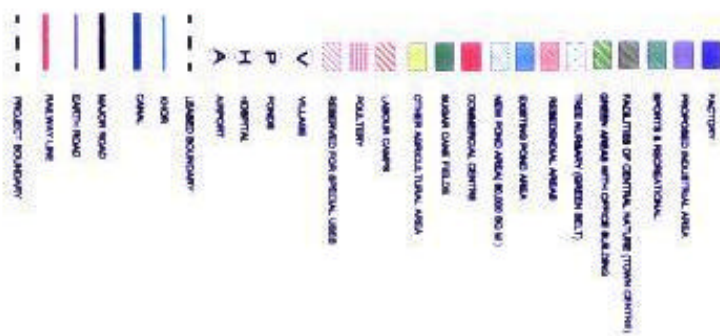
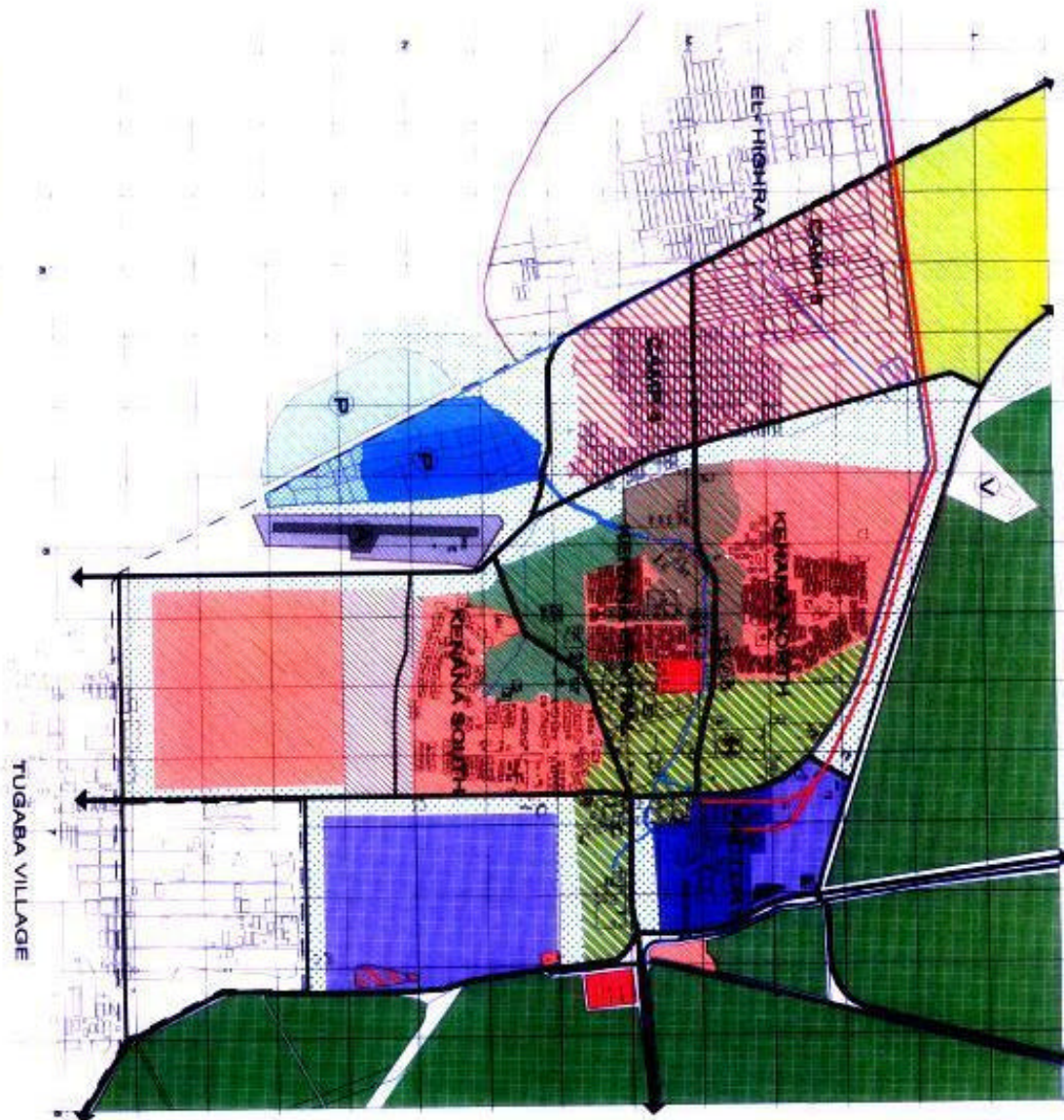
- Reducing pollution
- Increasing humidity and reducing dust.
- Minimizing noise
- Reducing Temperature
- Providing shade for pedestrians
- Beautifying and reducing stresses

The proposed Township structure plan (2000-210) caters to achieve these landscaping objectives through establishing the following:

- Shelter belts, these shelter belts shall act as 1) wind breakers 2) minimizing carbon hazards from burning the sugar cane after harvesting 3) act as buffer zones.

- The green areas accommodating central functions.
- Creation of recreational parks.
- Roads lining.
- Home gardens
- Special Treatment Areas.

Fig. No. 10 KENANA TOWNSHIP STRUCTURE PLAN 2000-2001 SCALE 1:50,000



Source: KSC Development Action Programmes – Sep. 2001

#### 4/6 Environmental Hazards and Protections: -

KSC as one of the largest integrated sugar state in the world, is facing a number of environmental hazards related to the different activities in the project, such as: -

- Smoke, heat and burned residuals produced during the pre-harvest burnt cane sugar process.
- Factory emission of gases
- Cake mud and bagasse residuals.
- Dust accumulation produced by the heavy traffic movement in un- paved roads.
- Effluent of wastewater from the factory.
- Wastewater from defective and overloaded sanitary systems.
- Poor drainage of excess irrigation water and ponding of storm water run off.
- Unhealthy practices by dwellers in illegal settlements.

These hazards can be categorized, summarized as, Air, Water and land pollutants.

Some protection Measures were proposed by the Structure Plan of the Township to improve the living environment within KSC estate. The following Tables depicted mitigation measures to minimize and protect the above-mentioned environmental hazards:

**Table No. (4) Air pollution**

	<b>Cause of pollution</b>	<b>Mitigation Measures</b>
1	Smoke from fire setting to sugar cane as per-harvest requirements.	1-1 Planting green belts as per structure plan proposals. 1-2 Introducing type of sugar cane where fire setting is not requirement.
2	Emission of gases from factory's chimneys.	2-1 Planting green belts. 2-2 Installing equipments to entrap gases that are emitting from the chimneys.
3	Baggasses Particles	Green belts and protective equipments.
4	Dust generated by moving trucks on un- paved roads	Paving main roads and direct heavy trucks to use these roads

**Source:- KSC Development Action Programmes Sep. 2001**

**Table No. (5) Water Pollution**

	<b>Cause of Pollution</b>	<b>Mitigation Measures</b>
1	Effluent from Factory	Sewerage system
2	Defective sanitary facilities (domestic)	Waterborne sewerage system
3	Recycling of raw water for cooling process in factory (deterioration of water quality by Baggasse particles)	Monitoring quality of recycling raw water and adequate measures shall be adopted.

**Source: - KSC Development Action Programmes Sep. 2001**

**Table No.(6) Land Pollution**

	<b>Cause of Pollution</b>	<b>Mitigation Measures</b>
1	Huge amount of cakes and mud from filtering process and boilers ash residuals	Utilizing these solids to produce fertilizers or additives for building, materials...etc. Proper landfill disposal of this solid waste of major organic origin.
2	Sludge generated from factory effluent and from evacuated wastes of the cesspools, holding and septic tanks	Erection of a waterborne sewerage system both for the factory and domestic effluents.
3	Flooding of low lands	Hydrological study to propose and implement drainage scheme for natural courses

**Source: - KSC Development Action Programmes Sep. 2001**

### **5/ Summary and Conclusions:-**

The paper tried to highlight and describe the unique situation of Kenana Township in the Sudan's urban settlements context and to give a brief description and discussion on the planning efforts exerted during the preparation of the Structure Plan (2000-2010), and the initial plans as well. The paper concentrated on the spatial development proposal of the Plan, although the Structure plan covered all sectors of development including social, economical, services and infrastructure sectors, and further more the plan covered the implementation set-up for effective plan implementation.

Since the inception of the project, the major settlement of the project was carrying its seeds of successfulness and enflourishing. Being the major settlement of such a multinational project, and having a pre-planning effort, including the careful selection of the Township and the factory location, and coupled with the economic and managerial successes of the company, all these factors together, gave birth to a new town of international standards of living and employment conditions.

As said before, the primary role of the Township was to accommodate the senior and the junior staff of the company and the permanent worker of the factory as well. Along the time the Township attracted more other residence from inside and outside KSC, and which is quite obvious in the high number of dependences living with their relatives in the Township (household size is 8.13 inh.b.) <sup>(13)</sup> One of the most attracting factors is the efficient and sufficient social services and public utilities of the Township, quality and quantity wise, which does not exist in any other town in the country

The Township and its peripheral settlements grew much in their area and population number and the result was mounting pressure on the Township housing stock, service and utilities with their associated problems.

The outstanding managerial achievements and the sound economic and financial position of the company through the time encouraged the management to assign a local consultant to prepare the new Structure Plan for the Township.

The future expected role of the Township is mainly based on its potentiality to be a national and international town as well. This future role will be clearer, if the present police of the company towards the Township (to accommodate only KSC employees) is changed, and the Town is open for other residents, from outside KSC, especially, new local or international investors. This new police is further more enforced by the proposal of the Structure Plan, to designate an area South of the Town (named area for special uses) to accommodate the foreseen activities.

The Township of Kenana with its said potentials can fairly compete in the coming era of globalization a competitive world.

### Endnotes

- 1/ The National Population Census of 1993.
- 2/ Seif S.Hassan "Entity – Identity Modules and the Rationale for Intermediate Settlements in the Sudan" DISP 124.1996.
- 3/ KSC. The Annual Report and Accounts 2001.
- 4/ One Feddan = 4200 m<sup>2</sup> = 2,38 Hectare
- 5/ One US \$ equals 261 SD (as per Aug. 2003).
- 6/ The Chairman's Statement for the Board of Directors 2001.
- 7/ "Corporate Plan for the Next Millennium" KSC 1997.
- 8/ KARPLIN CONSULTANTS. ARCHITECTS, PLANNERS, ENGINEERS.  
Is a local consultancy firm with the address.

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- 9/ Kenana Township and the Agricultural Settlements Planning Consultant during the early 1970s were Architects and Planners, Shankland Cox partnership of London- UK. The Planning and the housing proposals were carried out in close liaison with Howard Humphrey and Sons, who were the consulting Engineers for Kenana Sugar Project.
- 10/ The two plans were prepared by Howard Humphrey and Sons "Township area layout" one on Aug. 1976 and the other on Sep.1980.
- 11/ Wadi: is a local name for a natural watercourse.
- 12/ These sections are mainly based on the two Planning Reports namely:
  - Review of the Existing Situation Nov.1999.
  - Development Action Programmes Sep.2001.

KARPLIN Consultants prepared these two reports, during the different stages of the formulation of the Structure Plan for Kenana Township (2000-2010). Also based on the Planning team discussions, and the several site visits to the Township during the plan preparation.

- (13) See table No (2) on page 3