

Inadequacies of Master Planning in the Physical Development of Universities in Saudi Arabia

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Abstract. Over the last thirty years, sites of seven major universities have been developed in the Kingdom of Saudi Arabia. Their existing physical development was achieved through implementation of the "Master Plans". These physical master plans, formulated by various consultant firms, have shown several shortcomings since they presented a rigid concept of the University as seen by someone from beyond its borders. Besides these plans (each plan based on a colored land-use map of the future) failed to take into account how this map and detailed design could be achieved within the resources available. In essence, various master plans mainly portrayed physical improvement and addition to existing situations which the local technical and engineering department already intended to carry out. However, the printed form of these master plans was so expensive and inflexible to the extent that they could not be modified fast enough to take into account the unexpected developments.

Therefore, master plans of the Universities for this period and their updates, drawn by the outside "consultants", were not of much use, and thus stored on shelves of libraries as an evidence of substantial amount of money spent or as items of historical or academic interest. A new approach to the university planning, and a different kind of plan is needed to replace the master plan end-state concept, since it allows for little or no modification as the on-going comprehensive planning process evolves. To a much greater extent that the "Master Planning", or "Comprehensive Planning" incorporates up to date data, analysis and information concerning a wide variety of conditions and relevant events is needed. If these are to be long range plans, they must be limited to a time period feasible for realizations, that is from about five to ten years. They also need to represent the outcome of a succession of action and anticipations rooted in the present administration of universities, and directed to the future. Therefore, in this process, certain elements are projected into the future, others, into the middle range, and some into the near future, and still others may demand immediate action. To function in this way, a well established process of planning need to be established into a permanent responsible department. Such a department would produce different range plans supported by a "continuous process" of planning.

Arising from this understanding, the paper records a historical background in illustrating the achievements in the development of universities in the Kingdom of Saudi Arabia. The paper gives a detailed dis-

cussion of inadequacies of the existing planning procedure followed in the development of the university sites, illustrated with the help of several examples. The concept of "Comprehensive Planning" as applied to the planning of universities is simplified and several recommendation are outlined.

Definitions

Master Plans

These are essentially forecasts of existing trends to establish policies and detailed procedures and designs for expected demands.

Structure Plans

These are to describe the planning framework by combination of annotated diagrams analyzing each aspect of the development plan together with composites showing how these come together into a total plan.

Comprehensive continuous planning

These operations denote a general program of action and implied deployment of emphasis and resources to attain comprehensive objectives. It is a statement or understanding which guides or channelizes thinking and action in the decision-making.

A Historical Background to Physical Development of Universities in the Saudi Arabia: Case Study

King Saud University at Riyadh

In 1954, the late King Saud was proclaimed the Ruler of the Kingdom. He decided to shift the administrative departments and ministries from Makkah and Jeddah to Riyadh in the Central Province. This decision to build and re-vitalize the town of Riyadh at the time, witnessed the first attempt to establish a modern higher educational institution. Although the university opened in 1957, its charter was not confirmed until three years later by the Royal Decree No. 112 of 26/11/A.H. 1380 (1960).

The university began functioning in the academic year (1957-58) with the Faculty of Arts and with an enrollment of twenty-one students. Initially, it occupied an existing school building. In anticipation of future university expansion, the Ministry of Education* decided to build a new university campus. A competition limited to

* The Ministry of Higher Education was not in existence at the time and was established in 1975.

four Egyptian architectural firms was conducted in Cairo, Egypt. This marked the first organized attempt to provide planned higher educational facilities in the country. Ironically, the project was suspended for financial reasons**. However, the university continued a modest expansion of its physical facilities in scattered locations in Riyadh by either acquiring existing buildings or by erecting new ones.[1]

Finally, a new site was located approximately 12 kilometers north-west of Riyadh allocated by the government for a new campus of King Saud University. It was in 1968 when a British Architectural firm specialized in the design of medical facilities was engaged to deal with the medical school and teaching hospital to be built on the new site, as the pilot project.

Meanwhile, another British engineering firm was assigned to deal with the infrastructure feasibility studies of the entire site. later on, in 1972, a final agreement was signed by the university authorities and the Austrian consulting firm to deal with the preparation to the Master Plan of the entire university. This Master Plan was completed in 1974 and submitted for consideration as the second step dealing with the architectural design of the building for the entire university. Instead of continuing with the same consultant, a consortium of American group was chosen by the newly appointed Rector of the University.

The Master Plan proposed by the Austrian planning consultant had anticipated to accommodate 15,000 students.

In Saudi Arabia, many ministerial changes took place during the seventies where these administrative developments were associated with the increase of government revenue due to the oil booming business which occurred in the same decade.

The architectural orientation revealed in the proposed university campus master plan was evidently taken care of, giving rise to the extent a campus master plan should be committed to a specific architectural solution. The complexity of campus planning for a large university suggests that a differentiation should be made between the strategic and tactical decisions, following the precept that no decisions

** The winning entry and design documents were submitted to the Ministry of Education in 1960. These technical documents were finally destroyed after being shelved for several years, when the university authorities engaged an Austrian firm in early 1970 to prepare another Master Plan on another site. The plan emphasized the importance of standardization and modular building systems for all academic buildings and the central university facilities. This architectural expression was overdeveloped, thereby imposing an undue rigidity. In fact, the American consortium for the design contract could not but follow the same line of thinking. The approach taken by the consultant architects in dealing with the academic buildings is confined to a single architectural concept to control the design of the whole campus. (Fig. 1).

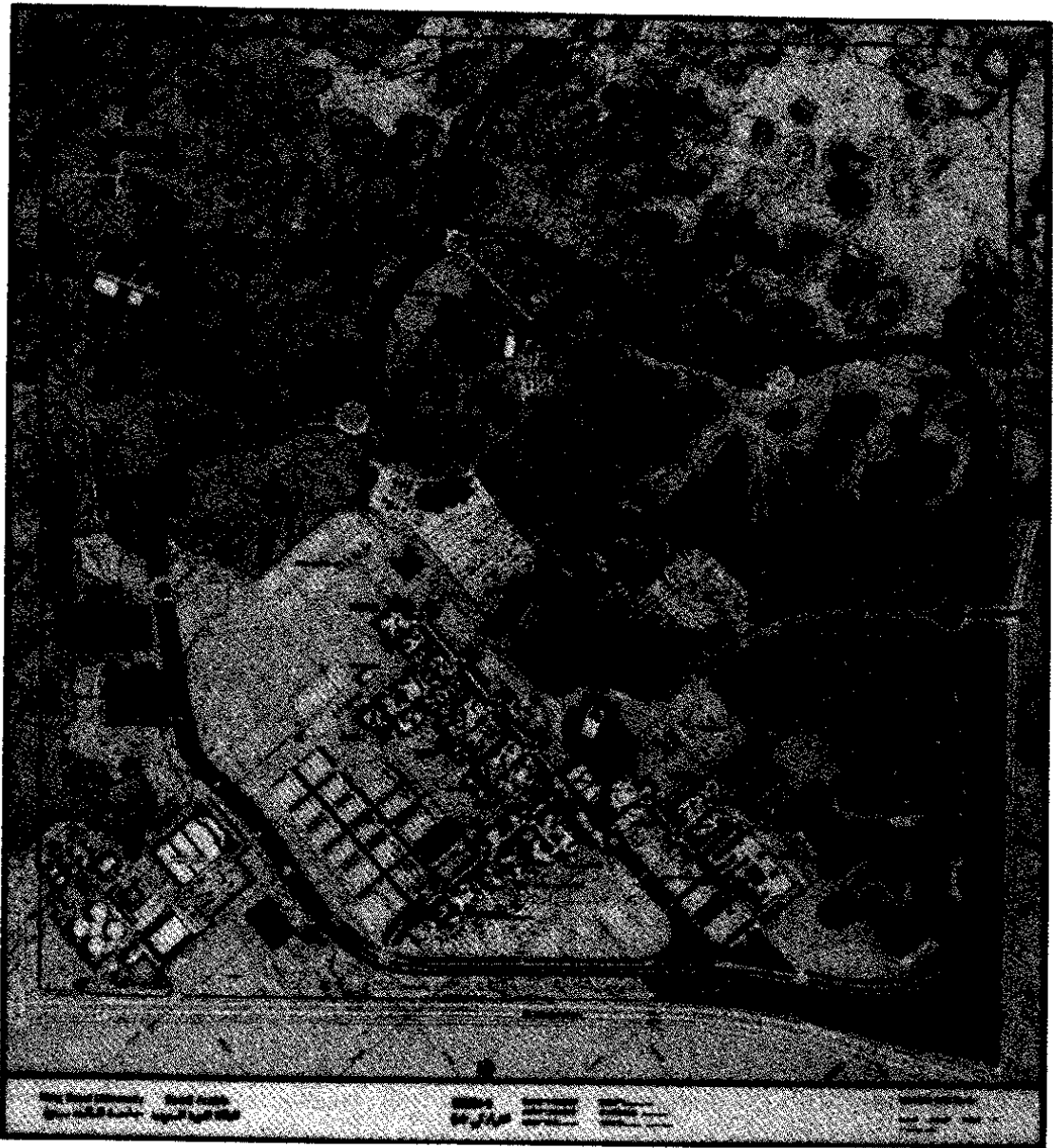


Fig. 1. King Saud University Master Plan 1770.
Source: University Facilities Design Documents, 5-a

should be taken before they are necessary, and leaving individual decision options open as long as possible in the planning process. One of the prime purposes of a master plan is to achieve this differentiation and identify a program of critical decision points.

King Abdulaziz University at Jeddah

King Abdulaziz University was founded in Jeddah city in the western region in A.H. 1384 (1964 A.D.), and was the first private higher educational institution in

Saudi Arabia. A local group of farsighted men were responsible for initiating this private university as a means of helping the community at large to acquire knowledge in various fields of study speedily and to enter into the fast-changing age of technology. To this end, the university was founded with local enthusiasm and civic pride with the help of wealthy businessmen. It aimed to cater chiefly for home-based students from the entire western region.

The present university site was handed over to the institution by one of the founding patrons when it started initially as a private university in 1964. In 1971, the university changed its status of a private foundation to the position of the first government sponsored institution of higher learning in the western region. In 1972, a Canadian planning firm was commissioned for preparation of a master plan of the university campus. [2]

The university administration in conducting and administering the affairs of its planning activities have faced many difficulties and shortcomings. As a private institution dependent on private limited donations, it was faced with the financial constraints affecting the number and capabilities of the technical staff. More often than not, ad-hoc committees were the vehicle for moving the slow and limited development activities. This became an established pattern which characterized its activities when the university became a government sponsored institution. What even more interrupted and slowed down the university planning activities was the succession of the principal administrators of the university. Three vice-rectors and rectors succeeded one another in a period of less than five years in the early 1970s.

However, and as of early 1990, the master planning lay-out was approved, but the design of the university buildings and various other activities still had not yet been completed (Fig. 2).

In conceiving the university as a town of a sizeable population of 16,000, it is to provide for all essential facilities for use by all members of the university community. "This central core area", represented by the consultant, which included these facilities was the first development area to be constructed in its entirety.

Umm Al-Qura University at Makkah

A faculty of Sharia was established in Makkah in A.H. 1369 (1949) which marked a new foundation and start of the first modern higher education institution in Saudi Arabia



Fig. 2. King Abdulaziz University Master Plan

Source: The Master Plan Report, Volume One,

The main objectives of this faculty were to graduate judges and to recruit teachers for religious subjects in the secondary schools. Eventually, another faculty, namely "The Faculty of Education", was established in 1962 to recruit teachers in other fields of specialization.

Initially, these two facilities occupied existing buildings near Al-Haram Mosque. But, due to the expansion of laboratories and the increase in student enrolment, a site at the outskirts of east of Makkah in Al-Azizia district was chosen. On this site, new humble building facilities were erected where the design was handled by local technical staff. At the time new buildings were designed and facilities were constructed by local staff. These facilities continue to serve the institution to the present day.

In 1971, King Abdulaziz University at Jeddah became a state-supported and financed institution. The two faculties at Makkah were annexed to the institution in Jeddah to become a branch of King Abdulaziz University. Furthermore, the establishment of the Ministry of Higher Education in 1975 coupled with the oil economic boom at the time, accelerated the planning and development of higher learning institutions. As a result, a new site was allocated by the government for establishment of the campus for the Makkah branch of King Abdulaziz University. It lies about 7.5 kilometers west of the Holy city. In 1976, a firm of American consultants, Skidmore, Owings and Merrill (SOM), was commissioned to prepare the Master Plan and design the new facilities to be developed on the new site. [3]

The consultants were appointed after some lengthy negotiations deriving from the Administration's earlier experience with the Jeddah campus, where millions of Saudi Riyals were spent on consultancy without tangible effective planning and design outcome. An experienced and technically trained chief administrator was appointed to overtake responsibility for running the affairs of Makkah campus of the university. He soon decided on the formation of an advisory group to assist the University administration in evaluating the consultants' work during the planning and design stages. Eventually, three eminent experts were involved to guide the campus planning activities.

The University at Makkah has been conceived as a comprehensive higher education institution responding directly to the country's need for educated manpower in religion, education, science and technology. Full enrolment of 15,000 students is expected to reach in A.H. 1415 (1995 A.D.).

In the Makkah University project, it has been recognized that the task of planning and design of the physical facilities involves intellectual and professional works which would be taxing to any foreign western consultants. The procedures followed during the master planning stage have made valuable contribution to the development of an appropriate plan suited to the cultural milieu and climatic conditions of the user's environment.

Towards the end of 1978, Master Plan (Fig. 3) was approved by the authorities and it was highly publicized worldwide. At this stage, the educational authorities recognized Makkah campus as an independent institution and named it Um-Al-Qura University. Besides, a new chief administrator was appointed.

But, unfortunately, various problems were encountered, specially in land acquisition, and site selection. The site of the new campus required to be changed, with the result that the master plan document of the university would be shelved again. With the establishment of a new administration, another consultant would be engaged to deal with the new site for design of the university.

King Fahad University of Petroleum and Minerals at Dhahran

The institution was established by The Royal Decree No. 397 of 5 Jumada 1, 1383 A.H. (23rd September 1963 A.D.). The enrolment in the first year was of 67 students, in addition to an international academic faculty. The first degrees were conferred by the University in 1971.

The university is a semi-autonomous government institution in support of the petroleum and minerals industries located in Dhahran in the Eastern Province, the region of oil fields and petro-industries activities. Unlike most other Saudi universities, the institution had to operate through the Ministry of Petroleum and Minerals Resources of the Kingdom. This unique situation probably was initiated in order to speed up the process of development of the institution, which is of vital importance to the country and has long been awaited.

In late 1964, Candil Rolet and Scott (CRS), an American firm, was retained as the planning consultant to the institution. The same consultant continued for architectural design of the entire campus facilities as well as for supervision and implementation of building and development at various stages. The consultants continued their planning and design of the new campus facilities on the basis of an ultimate male student enrolment of 3,000 by the year 1982. Ultimately, a master plan (Fig. 4) was prepared and published, catering for academic facilities as well as for



Fig. 3. Umm Al-Qura University Master Plan -

Source: The University Comprehensive Plan

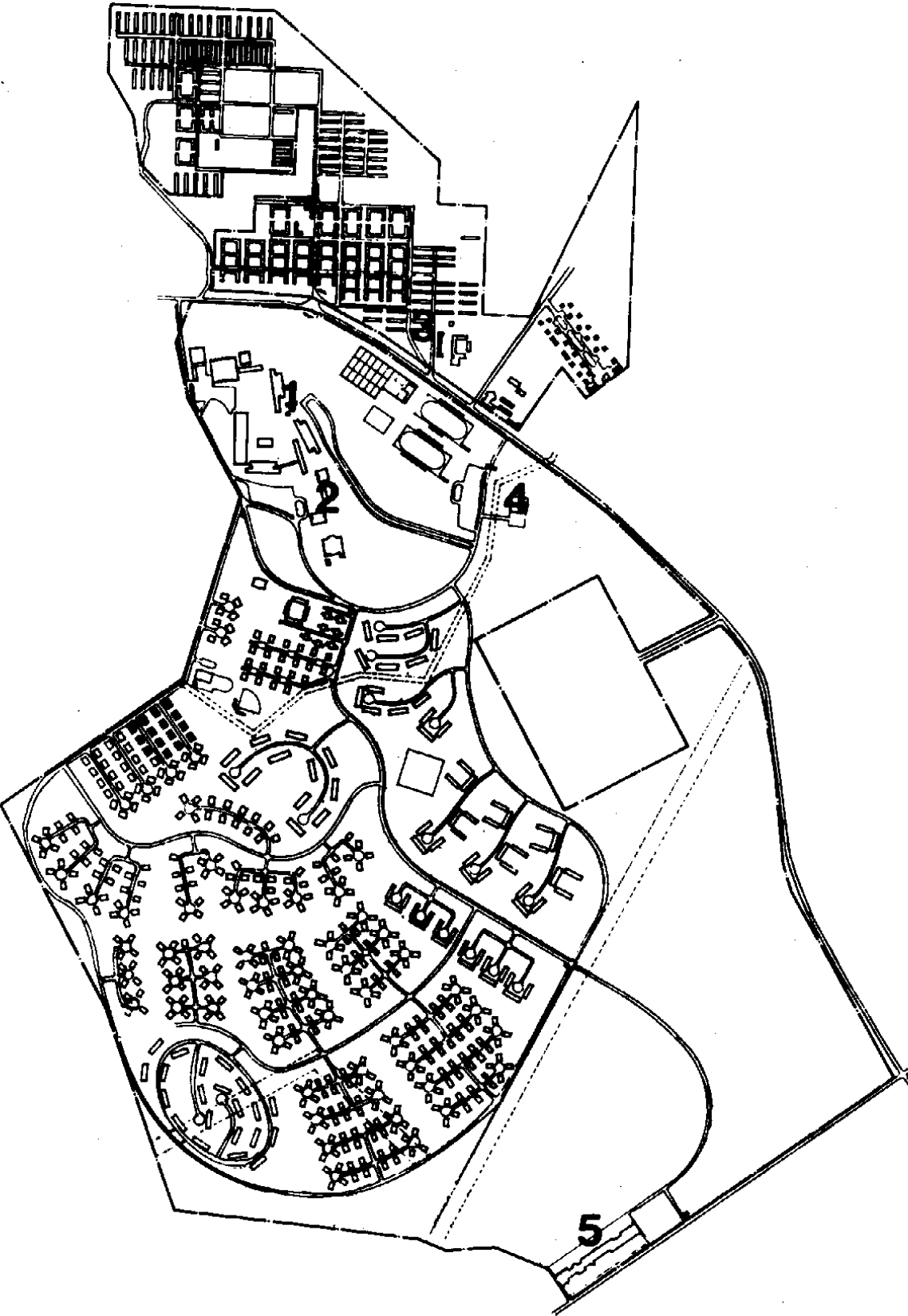


Fig. 4. King Fahad University of Petroleum & Minerals Master Plan

Source: The University Physical Development Plan

housing facilities to accommodate all students, besides academic and administrative staff members. [4]

King Faisal University at Dammam

The King Faisal University was founded in accordance with the Royal Decree No. 67/m dated 28/7/A.H. 1395 (1975), and is regarded as the newest among the Kingdom's Universities. From the educational point of view, "the goal of the institution is to produce balanced personalities proud of their Islamic religion, and cultural roots". Nevertheless, the university was conceived specifically to serve the needs of the Eastern Province and the Kingdom in general. The teaching started immediately when the university was established in 1975 with an enrolment of 170 students.

Two separate locations, one at Al-Hasa Oasis area on the outskirts of Hofuf town and the other one at Dammam town, are allocated for this institution. On Dammam site, temporary building facilities were constructed to accommodate the School of Architecture and the College of Medicine, whereas on Al-Hasa site, Colleges of Agricultural Sciences and Food, and Veterinary Medicine and Animal Wealth were located. With students enrolment growing rapidly, additional "temporary" buildings are being built until the realization of a permanent campus later [5].

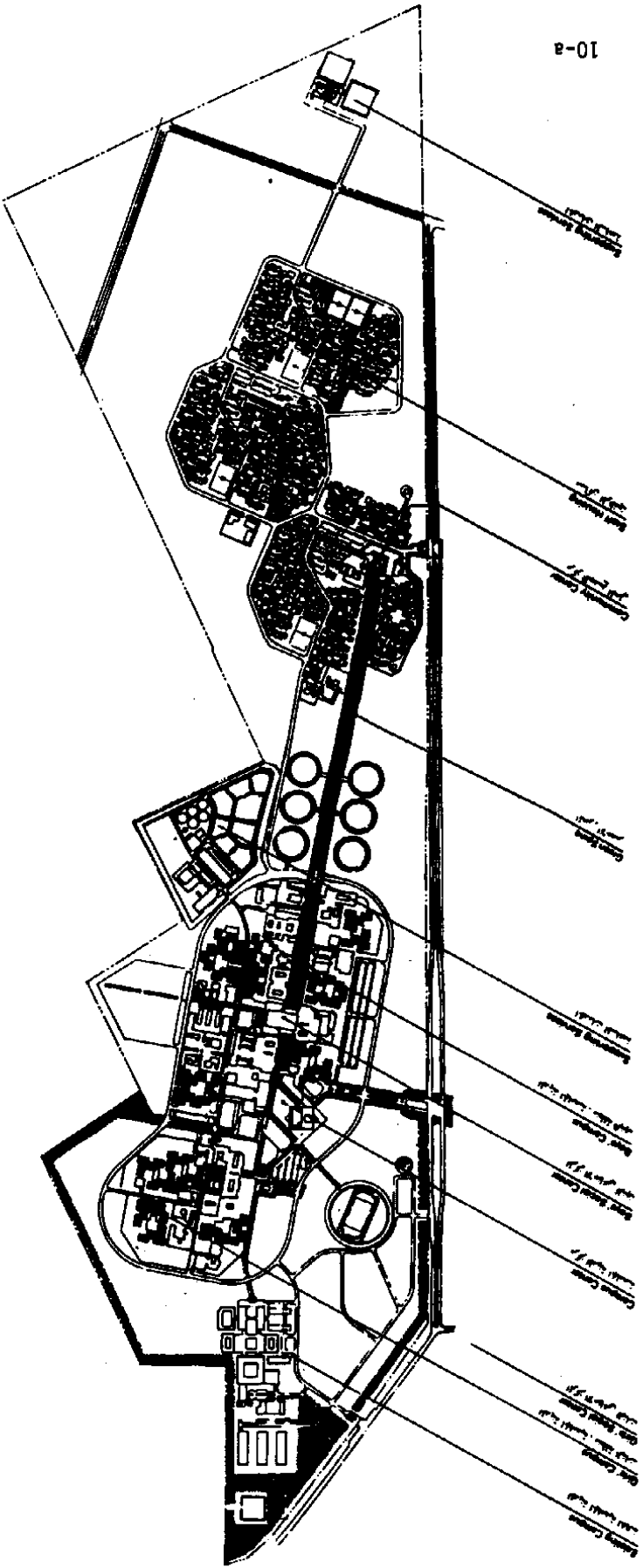
The university engaged an American consultant to deal with the campus planning and design of Al-Hasa branch. A French firm was also assigned the Master planning project for Dammam campus. Although the twocampus Master Plans have been submitted to the authorities and approved by them, building activity on the campus has yet to start [Figs. 5.a and 5.b].

A record of inadequacies of master planning on universities' physical development in the Kingdom

Fifteen determinant elements characterize the preparation of "Master Plans", as it exists in developing the universities in physical terms. These overlapping elements are grouped under five different disciplines, namely: I – economic, II – political, III – management, IV – organizational, and V – other elements that deal with the process of planning.

1. The economic elements

1.1 Master plans are being prepared with the understanding that the University authorities can easily provide for all the funds needed to achieve the end-state, and the desired ultimate stage of development in the distant future. [6, 7, and 8]



Source: The University Master Plan

Fig. 5.a King Faisal University at Al-Hasa Master Plan

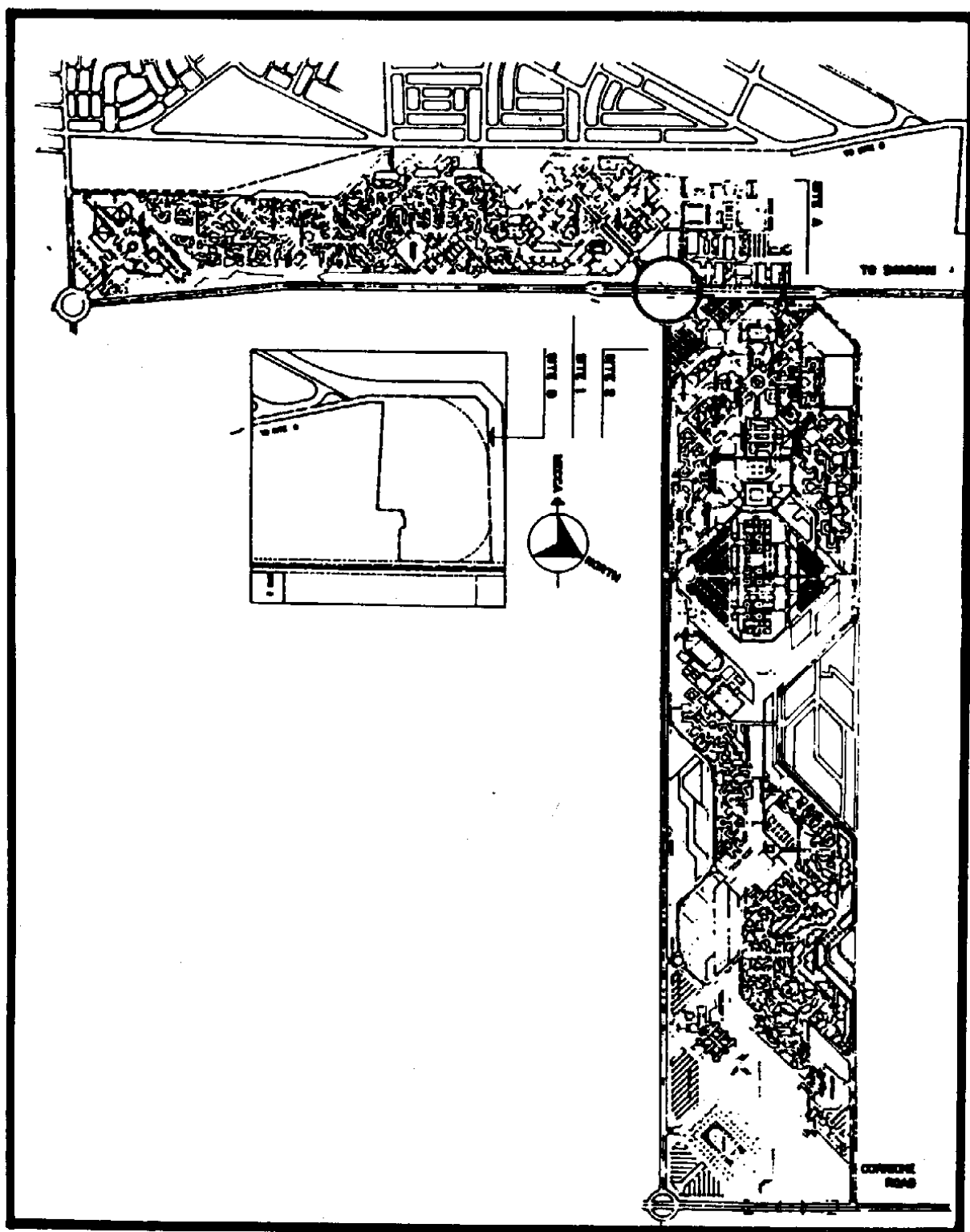


Fig. 5.b King Faisal University at Dammam, Master Plan.

Source: The University Master Plan

The master plan used by the consultants assumes that what would take many years to achieve is desired to be built within a single point of time. Since there is often scarcity of financial resources to meet all needs and desires, the main question is of proper allocation of the resources and the various facilities.

Example No. 1

A classic example is the situation revealed through the assignment of King Faisal University project. A master plan for the campus was prepared in the late seventies. The consultants were not limited with a specific cost or a total value of the project. When implementation was to begin in early eighties, the university administrators came to know that the implementation of the master plan was almost impossible due to shortage of funds. Besides, since 1975 when the university started until the present day, the institution is still functioning in an unsuitable yet costly "temporary" buildings and awaiting for the implementation of the campus master plan and the construction of "permanent" buildings.

2. The political element

The political elements which could be considered are:

2.1 The government's ambition to develop modern universities in a short period of time encourages administrators to rush into their building tasks without even considering the laws and regulations, and standards to achieve the end-state Master Plans [9].

Example No. 2

The so called "Master Plan" is a total package starting from inception of the idea to the completion of a "master plan map", according to the planning by-laws, building regulations and standards. With the engagement of different international consultants, i.e., Canadian, French, American, Spanish, German, Japanese, ... etc, foreign consultants adopted and reflected their own regulations and standards on "master plans" conceived for Saudi Arabia. Obviously, these are alien to the local culture and climatic conditions. The result is the establishment of seven totally different universities in one country in nearly less than a span of one generation time.

2.2 At the time of preparing or updating the Master Plans, there has not been an effective system of participation of the users [10, 11 and 12].

Example No. 3

The engagement of foreign consultants stationed in different parts of the world, and the nature of the process involved in the preparation of the "master plan" did not

allow for the real users to participate (i.e., students and staff members) fully during the total planning and design preparation stages. This is clearly evident in the case of King Saud University where architecture and planning students and staff alike found it extremely difficult to adjust themselves to the new building facilities provided to them. Naturally these building facilities were very much influenced during the planning and design stages by the thinking and process embeded in the nature of the "Master Plan" preparations.

2.3 A University Master Plan represents the wishes of the planners rather than being geared to the needs of the officials or the users for that matter [10,13,14 and 15].

Master planning, as it exists, implies that the conditions, needs, and objectives of a living organization as complex as a university can be identified, analyzed, and projected for many years into the future. It assumes that a group of foreign individuals have the vast knowledge and technical capability to:

- a) Select and analyze all significant elements of a university.
- b) Identify and quantify their interaction.
- c) Project these elements and interactions into evident future.
- d) Decide what the University would be like at the identified future time.

Based on these steps, unless all elements are identified and analyzed properly, the Master Plan is not likely to present a comprehensive picture for a university, it provides an incomplete and tentative formulation. This is true even for a building plan or a structural engineering part. These are normally subject to many minor and major changes before the project is completed. It is rather difficult to foresee the requirements and anticipate all contingencies except for simple activities such as number and sizes of lecture halls. But certainly, information does not exist now to analyze and organize in a comprehensive manner, and at one time, as complex as a university.

The Master Plan concept assumes wrongly that unexpected external events or internal developments will not occur to make it imperative or desirable to revise the plan a number of times. It is rather assumed that the university administrators are independent and self-sufficient, and are able to forecast and act freely on their own to its long-rang future, depending upon reliable projection of the future development and behavior of these universities.

The Master Plan concept also assumes that the objectives and priorities of the participating officials are already determined and will remain unchanged to permit drawing of any conclusions today with any certainty concerning what they will desire in another twenty years. It may further assume that the planners are wise enough to anticipate all requirements needed by a university organization.

Example No. 4

King Abdulaziz University has changed its Master Plan three times during the last twenty years resulting in a loss of hundreds of millions of Saudi Riyals on fees only. This could be attributed to the changing circumstances dealing with either financial, planning, design or academic desires of the officials. It has been realized after this hard experience that it would have been much more functional and much less expensive if a mapped master plan was replaced by a continuous process of planning based on strategies and more clear objectives. That is, a continuous process of planning can live with and react to real events in a dynamic way, contrary to the more rigid and static Master Plan.

3. The management elements

Five management elements which could be considered are:

3.1 Physical planning activities of various colleges and institutions are not managed and coordinated for planning purposes [16 and 17].

In the internal environment of a University, requirements for space are usually not identified in an organized way. Also, there does not normally exist a procedure to report these requirements to the planning office of the University. As a result, the actual needs of colleges and institutions are met on an ad-hoc basis, and on day to day needs. Central planning office of the University is in the process of studying and modifying the master plan on its desired lines. Clearly, there is a need for a "continuous planning process".

Example No. 5

At Jeddah University, which was started as a private institution, the firm of Canadian consultant was appointed to prepare the master plan. The University administration had initially faced financial constraints which in turn, affected the number and capacities of technical staff who were responsible to communicate the program and space requirements to the consultant, stationed in Ottawa. More often than not, ad-hoc committees were the vehicles for moving the slow and limited development activities. This became an established pattern which characterized the activities of the University when it became a government sponsored institution. Such

committees with temporary assignment and without much effort can not possibly establish a continuous line of communication needed in order to coordinate between the master plan consultant and the users.

3.2 Master Plans fail to establish economic and physical regulations and standards for guiding the building activity [9,14 and 17].

Economic and physical regulations and standards are necessary to provide the end-product with a personality and character unique to the local community. However, even these do not exist in briefing the consultants. Therefore, the consultants adopt their own measures which they consider are relevant and available for their task. Had these regulations and standards been established, more functional universities could have been built. Besides, a common personality and character could have existed among the very different physical environments of the Kingdom's universities.

Example No. 6

The local, traditional Arab urbanization patterns and the way of assembling buildings have not been effectively utilized by the foreign consultant in developing the planning concepts for almost all universities in the country. In this regard, Riyadh University is no exception. The campus layout is representative of the so called "functionalistic doctrine" ideas which are characterized by overplanning and over-systematization, thereby imposing upon an undue rigidity. What ensues is an architectural style based mainly on quantitative aspects. This architectural industrialized repetitive pattern tends to overlook if not ignore the kind of local traditional patterns and, in addition, architectural quality necessary for a major educational institution.

3.3 Universities' administration basically depends on foreign consultants to prepare physical development plans [18 and 19].

No matter how competent the foreign consultant firms are, they are unlikely to fully understand the needs of day-to-day operations of a university. Furthermore, it is also unlikely that the consultant firms with a greater degree of certainty would be able to predict the future needs of the various colleges and institutions. The university's technical and engineering department needs to be more substantially involved to fully understand the present and future needs through an organized "continuous process of planning".

Example No. 7

Literally, master plans of all the universities developed and still under planning stage in Saudi Arabia are prepared by foreign consultants. Besides, the development being based on a rigid layout plan, consultants overlook the unforeseen future needs and changing circumstances which get encountered. Furthermore, no matter how comprehensive or sophisticated master plans might be, they are of dubious value unless policy objectives can be transferred into action programs and projects can be implemented. Therefore, the consultants should leave behind them a viable system to enable the implementation of their proposals by the local staff, or they should be engaged by the university authorities on a permanent basis.

It is unlikely that Saudi Arabia will have neither sufficient professionals to implement the recommendations of the university master plans nor be able to engage foreign consultants on a permanent basis. However, the engagement and retention of consultants on a permanent basis could prove impractical since the implementation of a master plan is a continuous process and the development of a university is a historical process. Examples such as changing site of the Makkah campus or needs of developments of new facilities of Riyadh bear witness to this.

3.4 Existing Master Plans do not treat political, technological, educational, and other "non-physical" realities which must be incorporated in order to have total and meaningful master plans [11,14 and 17].

Respective roles, rules, and objectives of the government are continually evolving. With regard to build-up and development, this evolving nature does not suit rigid master planning and perhaps it is likely to threaten its success. Also, new technologies introduce improved ways of doing things besides potentials change. Thus, master planning is neither valid nor useful if it does not treat non-physical realities of a university organization.

Example No. 8

Inadequate and rigid planning concepts can result in irreparable damage to the education system and to the quality of the learning environment besides obstructing future changes. To set a fixed physical framework for education is tantamount to freezing tomorrow's potential and change. For example, Riyadh University, where the functionalistic idea was applied, illustrates a case in this regard.

The proposed campus plan and its academic zone is an example of building at a scale and speed which permits the development of a uniform and strong overall order. At a later stage, when the need had arisen for the development a new faculty

of Architecture and Planning, the preliminary design proposal by an internationally reputable Architect represents a classical case where these architectural expressions were over-developed by imposing an undue rigidity. This concept of design is against the idea of a total commitment of the entire academic facilities to a single building type and system.

3.5 Task of preparing and updating master plans do not device activities and programs of staff training in universities planning and development [14].

The universities' local technical and engineering departments normally have no interest to learn from the experience of the consultant firms. The personnel in these departments are assigned the primary task of collecting the information besides attending to and passing on complaints from institutions to administrators, and sending the replies from administrators to institutions. They are rarely involved in the actual task of preparing plans and, therefore, they are losing a great deal in learning from activities around them. The consultants could have provided an opportunity to the local personnel to learn by involving the University local office.

Example No. 9

Cultural and social differences are many, but perhaps one of the main difficulties a consultant faces in a foreign country is the language barrier. The consultant is expected to work with a local team, train his counterparts; or prepare technical reports. Yet, very often, he is not even familiar with the simplest of words of the local language. In Saudi Arabia, most administrators and local professionals are expected to speak English at a modest level which, to a certain extent, assists the consultants. However, several problems arise when it comes to interpretation of technical or legal terminologies, or when the foreign consultant himself cannot understand English well, as was the case with Riyadh University planning consultants.

Also, in a country like Saudi Arabia, authority is centralized and consequently only the top management have constant contact with the consultant. Moreover, foreign consultants should endeavor to establish closer links with the counter part team, i.e. the technical and engineering department of the university. Such an arrangement seems to have been overlooked by the Saudi authorities. Most consultants for Saudi universities were often carrying their work in almost total isolation from the rest of the architecture and planning personnel. The case of Riyadh University and that of Jeddah bear witness to these aspects. Planning in developing countries must be recognized as a continuing process which will help meet urgent development needs, specially in conditions of rapid change, too rapid urban growth and with limited resources at hand.

The consultants should leave behind them a viable system to enable the implementation of their proposals by the core of the existing staff. Such a continuity can only be achieved through cooperation, shared tasks, and training programs during all the stages of the master plan making process.

4. The organizational elements

Two organizational elements may be considered which are:

4.1 Tasks for university planning are scattered among a large number of different interested groups [6,8, and 20].

At different times and without due consideration given to various groups' staff members, administrators or concerned officials from outside involve themselves in evaluating the plan of the university. This sometimes results in delay in the implementation of plans. However, while preparing the plan, as different groups come to know about it, they have something to say about its development. This again causes hindrance in the way of the process of making the plan. As a result of the practice, the administrator at the top level should not allow groups from their ad-hoc participation for the favor of undertaking the plan, and the realization of its completion in a smooth way.

Example No. 10

The university, as an institution, is a large autonomous system which is comprised of many interacting sub-systems. Procedures and decisions in University Planning are concerned with students, faculty and staff. These must meet various educational objectives, expressed in curricula and course content, in planning and control which are concerned with the academic and physical prediction and projections, and of physical facilities provided to satisfy the educational, social, and religious needs and needs of the university population. At present, the university administrators set up of most Saudi institutions are not properly organized to cope with the varying demands exerted upon its staff. Moreover, normally the committees which are established within the university deal with special topics or tasks which relate to the institutional development. Their function tends to be limited to the framing of recommendations on university planning matters and issues. More often than not, the consultants' work is carried out with little or no coordination. There are other problems engendered by an over reliance on committees. Sometimes the large size of these committees have precluded effective discussions leading to the formulation of over ambitious aims and targets. Again, very often, committees have proliferated and aggravated by the excessive changes from one committee to another with the attendant loss of communication and experience. However to meet various requirements,

those concerned demand a sophistication in the university's administrative organization and the provision of adequately prepared sub-systems.

4.2 University planning has attempted to function while ignoring existing administrative processes of a university. [6,11 and 19].

A conducive external and internal administrative environment of a university is important for the plan preparation and implementation. "Master Plans" do not in the least consider the administrative elements, and also do not include a section on the process of implementation. Therefore, after receiving the map, local administrators struggle to find out ways and means for its implementation. This gives rise to several changes and an up-to-date plan becomes necessary.

Example No. 11

To translate development plans into operational programs is one-of-the most critical and difficult tasks being faced by the administrators in a developing country like Saudi Arabia. No matter how comprehensive and sophisticated master plans might be, these are of dubious value unless policy objectives can be transformed into programs of action and the project can be implemented. Unfortunately, most of the foreign consultants engaged for universities' development planning in Saudi Arabia confined themselves and limited their activities to the physical facilities proposals through the master plans.

The consultants should therefore leave behind them a viable system to enable the implementation of their proposals by the core of the existing staff.

5. The planning process

Four elements could be considered under this discipline, these are:

5.1 The main components of the adopted planning process and its implementation are not sufficiently coordinated to device physical development plans.[6 and 14].

As discussed earlier, three dominant parts contribute to the planning process concerning the university. Those are: University institutions, consultancy firm, and Administrators at the top level of the concerned university. The technical and engineering department does not have any significant role in this process. The responsibilities of some of them are defined to the extent of making the planning process clear in its operation. The information is exchanged depending upon the feeling of one party to inform or consult another. Therefore, decisions during the preparation and implementation stage of a plan are scattered among the different parties,

and no one holds its responsibility for any single task. Such a process needs to be organized by defining the power of each of the party for decision making, delegation of authority, and a well established system for information exchange. This should become the dominant role of the permanent technical and engineering department as this will be recommended in the following section.

Example No. 12

Despite the solid governmental financial backing for higher education institutions and the availability of funds for the university building construction in the late seventies, development of Jeddah University campus was hindered for reasons other than availability of the financial resources. Among several main reasons, some stand out as of inpragmatic importance. First was the difficulty of obtaining experienced managers, and the time needed for the establishment of a well thought out management and administrative procedure within the university to guide and control the process; secondly, inability of international construction companies to maintain necessary speed and amount of construction; and lastly, the need for a phased growth to support a rationally programmed and controlled growth in student enrolment.

5.2 Master plans so far prepared in the future are so idealized that they do not represent the outcome of a feasible sequence of short-range operations and attainment [20].

The main characteristic of the existing plans has been emphasis on the future, with little regard to needs in the specific near-term. The consultants presume that after acceptance of the Master plan by the university authorities, the University on its own could develop the strategies, tactics, funds, mechanisms, program, and schedule required for its implementation. But, in true sense, this practice of implementation of the Master Plan has not been successful because the mode of implementation is the essence of planning, and perhaps the most difficult part of the planning process. Usually, long-range plans need to be reviewed every few years, or when same events call for a review. The operating plans which are not considered these days, normally need change or adjustment quarterly, monthly, weekly or even daily, depending upon the activity in hand.

Example No. 13

The argument put forth concerning the Master Plan based on long term predictions is that it is necessary to keep in mind the difference between this kind of projection and what in fact is required and can be achieved in a short term policy. The long term policy is simply strategic and its development into an overall master plan should be done in the spirit of testing that policy rather than informing a commitment for the future.

The intention, (not the commitment) of the Master Plan *should be* to regard it as an *instrument of planning policy* to guide future developments, rather than *to control rigidly* the individual acts of building.

5.4 Long-term planning has presumed that it can avoid the primary and most urgent problems [20].

Immediate needs, such as the need for teaching space or for staff or students housing, cannot be met by a Master Plan. Because planners have ignored or have been unable to contribute to the gradual resolution of primary problems, these are not taken seriously by universities' decision makers who are forced by events to face these difficulties and do what is possible about them. In fact, this is the real task of planning to be realized through implementation.

Example No. 14

The rigidity of the master plan and the unwieldy phasing proposals made by the consultants for Jeddah University campus have proved to be impracticable. The construction of prefabricated buildings introduced as a "temporary solution" to offset the delay in implementation of the "permanent buildings" is now threatening to overrun the campus. These "temporary buildings" will most likely "become permanent", as these are now in existence for over a decade.

5.4 Master Plans are recognized as inflexible publications, revised and republished after long intervals, regardless of changing conditions [8].

The preparation and production of the master plan documents takes considerable time, sometimes more than a year to just write the manuscript and prepare illustrations. It may take another year for typing, printing and binding. These documents therefore become outdated before being published. The cost precludes because of revised versions made every several years.

Besides, the conceptual invalidity of these plans and any recommendations which they contain are also outdated by the time the plan is published. Their relevance is further reduced as conditions change, and the data used in their formulation becomes outdated. Finally, after few years of publication, the plans are hardly of any significance.

Example No. 15

In the late seventies, the planning consultant for Jeddah University submitted what was considered as the final definitive draft physical layout plan. In the mean-

while, the university authorities had already considered the expansion of the Health Services and Teaching Hospital Complex located in the north west site area. The consultant regarded these activities as a major change in the "Master Plan" parameters requiring a re-study of the "plan". This resulted in negotiations for allotment of more time and higher fees for preparation of another "Plan". However, it was in the late eighties, that a second "Master Plan" was finally submitted by yet another consultant. Ironically, its approval by the University authorities was given after nearly twenty years of engagement of the consultant. The design stage has yet to start most likely with a different consultant. It might be in the late nineties which will witness the final submission of the design packages and construction might begin not before the twenty-first century.

Conclusion and Recommendations

University development planning process

The Master Plan

Contemporary attitudes to the achievement of control of the built environment of universities is by the adoption of a so-called "Master Plan". This "Master Plan", as an instrument of planning policies, is oriented mainly towards construction of individual buildings. Recently, in the West, investigation in this respect particularly argues that a "... conventional master plan (based on a map of the future cannot solve the basic problem because it is too rigid to do so, and, because in addition, it creates an entirely new set of other problems more devastating in human terms than the chaos it is meant to govern". If this is the case in the developed countries, and if we are to apply and adopt the same approach in the case of developing countries, one can certainly anticipate problems to be more devastating and compounded.

Current design approaches and planning concepts in the field of higher education facilities, as applied in the industrialized countries, have become a sanctified body of knowledge assumed to be relevant and seldom if ever questioned when adopted for a developing country such as Saudi Arabia. In the case of Saudi universities, the master plans were inadequate to meet local needs because they failed to address problems unique to the country's culture and environment. Instead they were prepared on the basis of preconceived, rigid and generalized notions of the problems.

Recently an attempt has been made which takes an entirely new attitude to architecture and planning by defining a process which can be adopted as a master plan for the university development. The investigators believe that the process of building and planning in a community (a university for that matter) will create an

environment which meets human needs only if it follows six principles of implementation [10]:

1. The principle of organic order;
2. The principle of participation;
3. The principle of piecemeal growth;
4. The principle of patterns;
5. The principle of diagnosis;
6. The principle of coordination.

An analysis of the above principles shows that these cannot be achieved only through land-use planning or by distribution of functions. A coherent relationship is required to be established in both micro and macro elements in the University campus. Such a synthesis may give a new kind of spatial order based on the much needed planning flexibility in University development and "master planning". But certainly it sets its own requirements of a single owner, a centralized budget besides participation and design process. This may prove impracticable in developing countries like Saudi Arabia where the user/public participation in planning process is far from the familiar habits of the central authority and administration, especially when it comes to participation by women. Nevertheless, these principles have a connotation and they imply what we might describe as a "comprehensive continuous process" of building and planning. A modification and refinement of the current method of campus master planning may be more appropriate in case of Saudi Arabia, if we keep in consideration the political, administrative and educational systems and build on practical Saudi experience in planning and developing its higher education facilities.

The development of a university is a historical process. The "Master Plan" method currently used by the consultants is one way of anticipating the ultimate stages of development but, in effect, it assumes that what would take many years to achieve is built within a single point in time. This method has the advantage of being able to provide an identifiable illustration of the quantitative effects of development. Its weakness lies in premature design decisions which can obtrude and obstruct proper planning decisions besides being too particularized to demonstrate freely the other equally important planning aspects.

Another technique which may be referred to as the "Structure Plan" approach is to describe the planning framework by a combination of annotated diagrams analyzing each aspect of the plan together with composites showing how these come together in a total plan. Although this depends on the use of abstract images, each should develop a characteristic shape which determines the guiding dimensions and shape of the general development. For example, the pattern of roads superimposed on the pattern of pedestrian routes would define the shape and dimension of building plots. The limitation of this method rests upon the strain it places on imagination in translating abstract images [21 and 22].

Both methods rely on supporting studies of the basic built form and density of the various types of buildings which constitute the development. We believe that the two methods are not mutually exclusive but complementary to each other, with emphasis heavily placed on the "Structure Plan", because of its comprehensiveness and more flexible qualities. In the following notes we suggest some of the possible contents of a Structure Plan that could be presented in either diagrams, plans or illustrations [15].

Campus Structure Plan

1. Campus location
 - Plans of site in its regional and local setting.
2. Local environment
 - analytical plan of physical characteristics of site and its surroundings.
3. Land use plan
 - quantitative analysis of parcelling of site for proposed and future purposes.
4. Campus layout plan
 - overall diagrammatic location plan to indicate zones for academic faculties, university facilities, student housing etc., and access roads.
5. Housing layout plan
 - overall diagrammatic location plan showing zones for housing communities, shopping, refectories etc., and access roads.
6. Campus pedestrian route system
 - diagram of the university pedestrian route network.
7. Campus vehicular route system
 - private vehicles and parking
 - vehicular supply / service points
 - emergency vehicle access
 - public transport transit points
8. Campus open space and landscaping
 - location and designation
9. Campus central supply distribution system
 - diagrammatic route plan in relation to storage, processing and service points.
10. Campus utilities primary distribution system
 - schematic layout plan showing distribution network of primary utilities in relation to central plan and public mains.
11. Campus drainage system
 - schematic layout of foul and storm water sewers in relation to central plant and disposal points.
12. Campus substructure plan
 - overall diagrammatic plan showing layout of undercroft areas for principal building types and interrelationship of ground and sub-structure levels, floor layering concepts and principal movement levels.

13. Site density analysis

- Schematic sections showing basic number of floor levels for principal building types and interrelationship of ground and substructure levels, floor layering concepts and principal movement levels.

The recommendations presented above are intended to offset some present inadequacies in campus master planning concepts and procedures. As basic notions for planning, these present an awareness of the need for practicality. They are meant to improve the level of planning performance, consistent with theoretical considerations and practical applicability. Furthermore, the primary objective is to establish the planning process at the local level involving the three established parties, i.e., universities' institutions, technical and engineering department which may be named "planning and development department", and the university administration at the highest level. In this planning process, the main department is the "department of planning and development". It would become the local agency for day-to-day information coverage, besides being the local established administration unit where short, middle and long range policies are made.

This planning unit need to be organized for establishing the three interrelated tasks of collecting the information needed to coordinate between various institutions and colleges and, most important, to establish the various policies and plans. To function effectively, this planning unit need to be well-equipped and organized. This process which integrates these three interrelated planning tasks aimed at a proper organization is likely to produce a viable and important outcome. It would also imply the verification of the ability of personnel operating that planning organization and the appointment of competent staff to carry out these activities.

A representative from every college or institution should be represented on the planning unit. His main task would be to exchange information between the planning unit and the various academic institutions, as well as the administration of the university. Daily problems and opportunities, which are both physical as well as academic, are gathered and reported. Such an information will be up-to-date on daily basis, and could be exchanged in a confirmed, and on reliable basis.

Again, since the information would be received by the analyst, his analysis is likely to be factual and useful, which could be communicated to the entire university within a limited period of time. Policies and recommendations could be established regarding all possible interests of a university's institutions. As a result, lively and functional plans would become the result of the planning unit. Such plans could be published in each academic term, and would include policies to solve the most pressing problems and account for opportunities and short-range policies. The middle-range plans could be published every year including strategies and development policies, whereas the long-range plans would not exceed 5 years and will include

“comprehensive planning process” developed locally. These will interact with realities of the universities, and give a realistic picture about the past, the present and the future.

The collection of closely comparable statistical information by the planning unit can often be combined with only significant modifications to serve its purposes at much less cost. However, this kind of coordination is never easy to achieve. The various institutions almost always claim that their requirements are unique, and that any modification for any purpose will seriously impair the operation. Despite this expected reaction, the most essential requirement of “comprehensive planning” is the interaction of the different elements of the organization involved. It is important to note that in this process – unlike in the Master Plan – academic and physical elements of a university are projected far into the future, others into the midrange, some into the near future, while some are not projected at all.

The “comprehensive process of planning”, is not the printed document depicting a university so far into the future. The result of the process could be reproduced in the form of documents, but in a much faster and less expensive manner than the Master Plans. And, furthermore, in a much functional way, they would incorporate budgets, operating plans, and long range strategies and objectives. In addition, this process of “comprehensive continuous planning” will incorporate current data, analysis, and information concerning a wide variety of conditions and relevant events. The long-range plans thus produced would represent the outcome of a succession of actions and anticipations rooted in the past, continuing in the present, and directed towards the future. It is invalid – as in Master Plans – to formulate long-range plans without working out how they are derived from present conditions and developed through the near future. The absence of this necessary interconnection between long-range plans and current conditions is the main reason as to why Master Plans have not been successful.

The “comprehensive planning” will be the central mechanism for synthesizing the planning operations, budgets and functional plans of various academic institutions of one university in relation to the university system and its projected future. In this context, the collection of information, analysis and observations are far more important than any attempts at long-range predictions. Rather than focusing on the distant future, “comprehensive planning” starts with day-to-day functions, and works toward the future. This process would project the next budget year in detail, and as thoroughly as practicable.

It should be noted that there is a limit to the amount of core information and analysis which can be processed, maintained and conceptualized for reference and decision making. Many factors are involved, e.g. type of information available, its reliability, the time required to revise analyses, and developments of alternatives,

besides the personnel who are capable of establishing and maintaining the analysis and its cost. The analysis and how it is organized and worked out are crucial, because planning decisions and actions are as sound as information and analysis on which they are based.

A flexibility factor in "comprehensive continuing planning" is the capability of revising the information and analysis in the shortest possible time. An emergency situation, or an unexpected decision of a major concurrence may require immediate revision of policies and plans. The on-going process and emergency reformulation should be considered when determining the process, procedures, and mechanism of the comprehensive approach to planning because the capability to change is important and advantageous over the existing Master Planning.

Finally, personnel required for "comprehensive planning" need not be increased nor be highly paid compared to those now engaged in Master Planning. Probably, they would be fewer in number if the greater knowledge required of them is matched with increased efficiency. However, those engaged in this suggested approach to planning including those who had worked earlier during the preparation of Master Planning need to recognize themselves, not only in their profound differences in approach, but in their quick response to needs and events as well.

The use of the broad term "Campus Master Plan Concept" need not lead to a conceptual straight jacket for University development. There are always such differences between Universities and their function, and requirements and environments sufficient to generate specific solutions. It is worth drawing attention to these differences to emphasize that there is no comprehensive solution to the problem of planning university developments in developing countries. Furthermore, the final answer for each country and for each university is an individual one. The establishment of "Planning Principles" to priorities relevant to the case and its circumstances and the adoption of a "Structure Plan" to provide flexibility at the preliminary planning stage are the prerequisites for adaptable "comprehensive campus master planning development".

Higher education institutions are beset with many difficulties in planning. The campus master plans and alien concepts currently applied for universities' development in Saudi Arabia are creating even further difficulties because of their inherent rigidity and complexity. It is hoped that this study has thrown some light on the problems, and that the recommendations stated could provide guidance for future policies and actions of university building and planning not only for Saudi Arabia but also for other Gulf countries with similar problems.

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القصور في كفاءة «المخططات العامة» لتطوير مواقع الجامعات : دراسة حالة المملكة العربية السعودية

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ملخص البحث. أنشئت في المملكة العربية السعودية على مدى الثلاثين عامًا الماضية، سبع جامعات تعليمية. ولقد شيدت هذه الجامعات طبقاً لأسلوب «المخطط العام».

ولقد صيغت هذه المخططات العامة بواسطة مكاتب استشارية أجنبية - وأظهرت الكثير من الجمود الفكري لأي متتبع لهذه المخططات. فضلاً عن أن هذه المخططات العامة (وكل منها قد اعتمد أساساً على إظهار استعمالات الأراضي المستقبلية في ألوان مختلفة) قد فشلت في المواءمة بين هذه الاستعمالات والتصاميم التفصيلية من ناحية وبين الموارد الوطنية والمحلية من ناحية أخرى.

والواقع إن هذه المخططات قد عملت من جانبها على تحسين الأوضاع البيئية - وهو ما كان ستقوم به الأقسام الفنية والهندسية على المستوى المحلي. وعلى أية حال فإن الكلفة المرتفعة لطباعة هذه الدراسات فضلاً عن عدم مرونتها التصميمية قد حالاً دون إجراء أية تعديلات وفي الوقت المناسب لملاحقة المتغيرات غير المتوقعة.

وعلى هذا فإن المخططات العامة للجامعة التي أجريت في هذه الفترة والتي أجرتها هذه المكاتب الاستشارية الأجنبية لم تكن ذات نفع عظيم، ومن ثم فقد جرى تخزينها في المكتبات كشاهد على نفقات مالية كبيرة قد أهدرت أو كشاهد على تجربة علمية أو حدث تاريخي ذا بال.

ولما كانت هذه المخططات العامة قد أثبتت جمودها الكامل أو سمحت ببعض المرونة، فإنه يلزم أن نتوخى توجهاً جديداً عند وضع المخططات الجامعية ليحل محل فكرة المخطط العام الجامد. وهذا التوجه ربما يكمن في فكرة المخطط الشامل. والحق أن كلا من الفكرتين سواء «المخطط العام» أو «المخطط

الشامل» تحتاج إلى معلومات متجددة وتحليلات تتعلق بمجموعة من الأحوال والأحداث الراهنة أو ذات العلاقة. وإذا كانت هذه الخطط ذات مدى بعيد فلا بد أن توجه إلى فترة زمنية محدودة يمكن على أساسها تنفيذ مقترحات هذه الخطة بشكل عملي.

ومن المقترح أن تتراوح هذه الفترة الزمنية ما بين خمس إلى عشر سنوات. كما تحتاج أيضا هذه المخططات إلى إظهار المتغيرات المتوالية وإلى التعبير عن حسن وإدراك الإدارة الجامعية. وبناء على ذلك فإن ثمة أمور طبقا لهذا المنظور يمكن أن نتنبأ بها للمستقبل البعيد وأخرى يمكن التنبؤ بها في المستقبل القريب، وأخرى للمدى المتوسط. ولا تزال هناك بعض الأمور التي تتطلب إجراءات فورية. وحتى تسير هذه الإجراءات المختلفة التوقيت في تناغم وظيفي مثمر لا بد أن يربطها قسم في دائم الكيان مسؤول عن العملية التخطيطية في مراحلها المختلفة ومدعم بخطة ذات إجراءات مستمرة.

ومن هذا المنظور فإن الورقة تسجل أولا الخلفية التاريخية للفكر التخطيطي الذي صاحب تشييد الجامعات بالمملكة العربية السعودية. ولقد ناقشت الورقة مدى القصور الإجرائي والفني الذي لازم تشييد هذه الجامعات مع التركيز على بعض الأمثلة. وكذلك ناقشت الورقة فكرة «التخطيط الشامل» كحل تطبيقي مع ذكر بعض التوصيات.