

The informal settlements development methodology

(Case study of the investment areas in Kuwait city)

by

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1. Introduction:

Informal zones are considered as a sort of satisfaction of human needs and an expression for carrying out its main demands that the country can't afford. Even though it seems that it's an urban problem yet it's also an economical and social problem for a particular society. It's also a direct expression for the city circumstances. And so the way of solving it as a problem must be done in a comprehensive view that aware the interlocking of this relationship

The process of the development of the informal zones proved that the policies which dealt with such areas with total rejection or even elimination were not the ideal way to solve the problem. In addition of having the policy of developing of these areas by promoting it's urban environment also failed because the authorities neglected the role of the system's components (visual form image – Urban structure – circulation frame)

2. Paper goals:

Finding out a stable methodology to develop the informal zones in the in the frame Integrative system for development of urban form (I.S.D.U.F). This system will be applied later on developing some areas in Kuwait city.

3. Theoretical study:

Informal zones: In order to know the size of the problem that concerns the informal zones, we must find out a suitable definition to these areas as follows: The residential buildings which are been built by the public, whether on there own lands or land been taken unlawfully from the authorities without planning or authorization. These buildings hold the features of low standard of construction materials. In addition to low social and economical characteristics. Besides the form of housing is growing and spreading out in the absence of the law. And being done with self efforts, even without getting building license or without real estate registration. This type of housing is counted as a non-compatible situation to the stipulations of building implementation and the process of general health care.

4. Reasons for the appearance of informal zones:

The increase in the population in some areas as a result for the migration from the rural areas to the city. And the desire of the immigrants to live in the city suburban to be near from the working places. People attempt to depend on themselves and with there own efforts especially with the increase of the critical situation and the lack of offered housing units. So people become obliged to build any where and by any mean without any supervision.

The spread of some industries outside the city's range or extent. In addition to the absence of the suitable housing for the labors. Which lead to the appearance of residential assemblies surrounding these industries without any planning and shortage of services.

Building up and the growing of informal zones in absence of the executive power and legislations that force the people to stop the construction process without getting the approval from the authorities. We can distinguish two main forms of informal zones:

- Illegal random districts which is divided in to two parts:
 - The piece of land is being owned by others and attracted only groups who build temporary buildings (like light structured buildings)

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- The districts were found from the beginning without any planning or legal supervision and that is because it is located in un-favored areas in the city (e.g. Agricultural lands, etc.)
- Legal Informal districts:
Residential districts being funded by the government to provide housing to the people with low standard of income. Then it was exposed to inner and outer influence.

5. Informal zones characteristics:

5-1 characteristics of the urban problem:

The features of informal zones located in the city edges are represented by the building conditions. People by them selves perform all the building process without any planning, which leads to the rarity in the increase in the land value. Besides the houses stick together so their will be a difficulty in the entrance of sunlight to the houses. In addition people build up there houses with there own efforts causing the shortage of the utilities. And despite of the low standard of living in informal zones compared to the downtown and the new cities, however it represents a great solution especially with the unsuitable official solutions.

All the urban features of informal zones can be summarized as follows:

- The bad building status and the use of temporary construction materials without respecting the constructing legislation
- The shortage of a big proportion of these buildings with the main utilities
- The absence of awareness of land ownership concept and hence the absence of the general maintenance on different standards (residential units – the buildings or the real estate as a whole – outer elevations)
- The absence of the accuracy in implementing the water supplying works and water disposal which affect the security of the buildings and its outer elevations.
- The visual pollution caused by the variation in building's forms, Heights and finalizing materials
- The roads are narrow and twisted that lead to the difficulty in the presence of inner transportation means. In addition to the difficulty in serving during emergencies
- The shortage of the green and opened spaces. And the absence of the ventilation due to the high population density.

5-2 features of Economical and social problem:

On studying the social status, which leads to the informal zones formation phenomenon, we find that informal housing is nominated with a continual increase. Facing difficulties on acquiring a residence, as the individuals fulfilled all their needs. And that is according to the urban status especially in big cities where job opportunities are available and the style of housing varies according to the economical standards.

The most important features of social and economical problems are:

- The increase in the population density and the increase of occupancy rates.
- The presence of more than one family in one residential unit which mean the increase of rates of family / units.
- The lack of education
- The bad health and educational standards in these areas
- The presence of a non-attracting environment with the shortage of security which leads to the increase in crime rate.

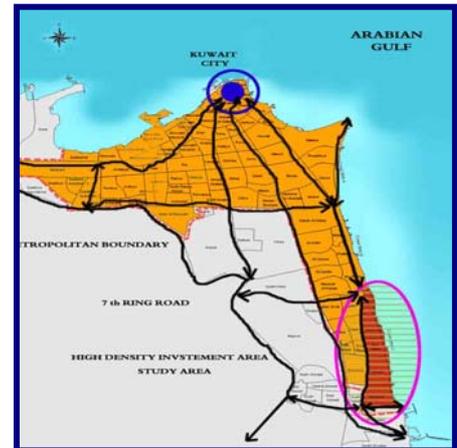
6. Case study:

Generally, Kuwait city was influenced by the natural environment circumstances and so the Kuwaiti cities grew without planning or supervision with a rapid movement. This research aims to study the southern part of the urban zone in Kuwait city which are called the five investment areas. Their names from north to south are Al Fintas, Al Mahboula, Abu Halifa, Al Mangaf and Al Fahiheel.

6-1 Profile of the Study Area

The target of the study is the creation of an integrated urban environment involved with the Kuwait personal nature by all of the social and cultural sides. Throughout the development of the investment of residential areas "Al-Fintas to Al Fahiheel" so that the development plans are connecting strongly with the main capital city. It is essential to achieve the economic and urban rules for five study areas according to the future data view of these areas in compliance with the directions of the national physical strategy plan and the indications of the third master plan which updated to the country in the year 2004. For achieving the study targets, the planning operation must be done within a clear methodology detailed studies about the existing situations for the social, economic and environmental sides and its different problems must be prepared and analyzed in terms of scientific methodology of planning. To achieve these arguments, it is essential to prepare analyzed study about previous regional projects for Kuwait state. This to have benefits from these projects. It is important to apply modern territories of planning in our case study in the five areas in order to put suitable solutions of the required planning. The new plans must be compatible with the urban, social, economical and environmental impacts of the Kuwait State. A *profile of the Study Area can be illustrated as follows:*

1. **Al-Fintas area:** It is located in the north of the investment areas (the study area) and to the south of Mubarak Al Kabeer district. And the 7th ring road. Its area is about "256 hectares), occupied by 37.5 hectares of investment residence. Its existing population is about 24,573 people represented by 25.8 % Kuwaiti people and 74.2 % non-Kuwaitis. This area is connected to the center of Kuwait city, by Fahiheel motorway.
2. **Al Mahboula area:** It is located to the south of "Al-Fintas area" and Al Fahiheel motor way to its west. Its area is about 347 hectares, and the population is about 24,498 people represented by 8.5 % Kuwaiti people and 91.5 % non-Kuwaitis
3. **Abu Halifa area:** It is located to the south of the residential area "Al Mahboula" and Al Fahiheel motor way to its west, In addition to the Fahd Al Ahmad's district. Its area is



The relationship between Study area and Kuwait city
Source: Author



Ariel view of the study area
Source: Author

about 335 hectares occupied by 33.7 hectares of investment residence. The population is about 26696 represented by 16.14 % Kuwaiti people and 83.69 % non-Kuwaitis.

4. **Al Mangaf area:** It is located to the south of "Abu Halifa" residential area and Al Faheheel motor way to its west, In addition to El Sabahya district. It is separated from the district of Abu Halifa by oil line and its buffer by a distance about 250 meters. Its area is about 565 hectares and the area of the investment residence is 86.4 hectares. The population is about 49232 people represented by 20.6 % Kuwaiti people and 79.4 % non- Kuwaitis.



Some houses in the study area
 Source: Author

5. **Al Fahaheel area:** It is located to the south of "Al Mangaf" residential area, Al Faheheel motor way to its west, In addition to the south of Al Sabahya and the industrial area to its south. Its area is about 621 hectares occupied 51.8 hectares of investment residence housing. The population is about 63487 people represented by 29.3 % Kuwaiti people and 70.7 % non- Kuwaitis. In general, it is important at the planning of Al Fahaheel area, the necessity of separation buffer between it as residential area and the southern industrial area.



Study area constrains
 Source: Author



Land use plan for all study area
 Source: Author

6-2: The Project Objectives:

- The study will establish a revised local plan for the area to guide future requirements to alleviate the area's problems within the context of the third master plan revision.
- It will address the following points:
 - Survey and analysis
 - Population
 - Land use
 - Building regulations
 - Traffic and parking survey
 - Data collection and review
 - Land use and planning studies
 - Public transport
 - Public Utilities
- Role and status of the district centers within the study areas.
- Traffic management measurement and operation of public transport services.

6-3: The main components for the study procedure:

The study of the local structural plan of the five areas includes the next main components in the in the frame of the proposed Integrative system for development of urban form (I.S.D.U.F). which will be discussed later as follows.

1. Understanding the existing condition of the study area in the national and regional framework in the structural plan .
2. Studying the existing problems and collecting its information in a database in the frame of Integrative system for development of urban form (I.S.D.U.F).
3. Analysis of the information and deduction of the main indicators which help in putting the conceptual framework to the structural local plan for the areas.
4. Preparation of the local structural plans of each study area after preparing group of planning alternatives to every study area and their evaluation by a group of criteria that contribute in the achievement of the targets with the seeking guidance from some regional and local experiences in this affair.
5. The redevelopment of the structural plan for every study area to achieve the local structural plan by its flexible image that includes the distribution of land uses and hierarchy of roads and the primary paths to the required vital networks.
6. Putting the redevelopment regulations by its different levels (regional – local - urban) throughout an integrated redevelopment system with the urban, economic and social sides.
7. Preparing an executive financing plan suitable to each study area and specification of the elements that can carry out for the management of each study area and matches within the executive stages for the execution of each study area.
8. Preparing a clearly flexible plan for a follow-up and the reformation of the plans during the stages of its detailed and executive planning and during the stages of the execution.
9. Preparing a program related to each study area by the suggested projects on the local plan with putting a tentative imagination for the cost of these projects and the financing authority.

7. The proposed model for developing methodology

7-1: Components of urban development system:

The urban development system is formed by the three main structures (visual image structure – urban form structure – circulation structure) and that is as follows:

- **The visual image structure:** It is usually concluded from the integration between urban structure and circulation frame in between

- **The urban form structure:** The distribution of the activities (land use) and the building form.
- **The circulation structure:** And that is formed by circulation channels (vehicles tracks – pedestrian tracks) and the flow through them that includes the movement of goods and pedestrians.

The urban form structure and the circulation structure are linked together through which they aim to have an easy access to the different activities in the cities through the main circulation unit (vehicle) or the secondary unit (pedestrians)

Besides the urban development system is related with the activities distribution in the site and the building's status. In addition to its relationship with the circulations structure through the conditions of routes network and it's grading.

7-2: Proposed Integrative system for development of urban form (I.S.D.U.F)

- The aim of creating the integrative system is to arrange the data to make it easy for the decision makers to recognize the interlocking relationships of the problems, developing tools and main developing axes to help the decision making process. Therefore, a theoretical model was done to give the planners or decision makers a clear image and data of interacting relation between problems and tools to define the required strategy. This process is done through main three axes which are:
Visual image structure - urban form structure - circulation structure
- The main axes of developing system consist of a group of problems related to each axis as was mentioned before. In the same manner development tool's main axes are related to each axis.
- Each problem can be marked with a particular indication (X1, X2, X3...), and then Applied to all survey's model. Also the tools used have there own indications (Y1, Y2, Y3...).
- A reference card is created for every problem showing the relationship between the problem and the other problems in the frame of developing axes plus the positive and the negative effects to know the ideal tools to deal with the problem.
- setting up the main relationships between the problems, the developing tools and the developing axes and putting them in a graphical chart with three axes (X-Y-Z) to show the whole relationship between them as one unit. And then all the problems in every axis are assembled together in one sector chart without repetition. And that's according to its code. This is called the primary system frame.
- All the positive relationships are identified and classified according to its priority, and arranged in a three axes graphical chart. This chart is done to analyze the relation links between the problems and also the problems and the tools.

7-3: Creating the developing system model diagram (I.S.D.U.F):

According to the previous assumptions, the process of creating the developing system needs to classify and gather the problems through every problem's card. Plus gathering the tools according to the selected code to each one of them to form the first X coordinate and the second Y coordinate to show the relation link.

When referring to problem's cards, we will find that every problem has its own positive and negative effects that differentiate it from the rest of the problems. Besides some problems need to be solved with a package of tools, as a result for the interlocking of the positive and negative effects of the problems and the tools used in solving them. To make this relationship clear to the decision maker, a three axes chart was set to illustrate the elements as follows:

- The group of tools that participate in solving a particular problem.
- The relationship between the developing axes and the problems.
- The relationship between the developing axes and the developing tools.

- The relationship between the developing axes and the problems and the tools together.
- To what extent do each tool can solve a group of problems

This diagrammatic system seeks to illustrate all the qualitative elements of the relationships to the designer and the decision maker to allow the correct selection of the tools to deal with the problem in the frame of the desired city development in terms of the social and the economical properties. It also allows them to know the consequences of using the tools in terms of the positive and the negative effects.

7-4: guide lines of the problems related to the proposed developing system.

In the absence of the ability in controlling the urban structures in Kuwait cities that rises with problems in urban formation. In this issue, by having a case study for the areas, we can conclude the main problems of its urban system in the frame of the main three items of developing axes systems as follows :-

7-4-1 Visual image structure:

- The absence of obvious borders that can be easily understood and felt.....(X1)
- The continuation of the informal growth of the urban mass.....(X2)
- The absence of the compatibility between the urban agglomeration and the urban extent..... (X3)
- The absence of functional division of different land uses..... (X4)
- Entrances and exits are not clear on main roads around districts..... (X5)
- The spread of improper uses in many streets(X6)
- The distortion of the land use distribution due to the presence of the activities, in one only side of the street and the absence of it in the other side of the street..... (X7)
- The absence for spaces for entertaining purposes and main yards..... (X8)
- The misuse of the Cornish space which is considered one of the most important factors of visual formation..... (X9)
- The absence of the feel of the spaces and its value and the distortion in the visualization due to the urban legislation..... (X10)
- The absence of the awareness from understanding the concept of the space's beauty value due to the numerous intersections and vehicles circulation.... (X11)
- The absence of the hierarchy of the circulation paths and its bad distribution through out the district..... (X12)
- The misuse of the spaces that leads to the lost of the visual connection and the continuation of the urban mass..... (X13)
- The absence of applying the right concepts in the urban yards.....(X14)
- The absence of the landmark that can be related to the Importance of the area..... (X15)
- The visual abstract due to the absence of blocks arrangement..... (X16)

7-4-2 Urban form structure:

- The unbalanced services distribution..... (X17)
- The miss use of the lands in the Cornish..... (X18)
- The overlap of the residential use with the other uses..... (X19)
- Presence of activities outside the services range..... (X20)
- The absence of future developing plans in the center of the city..... (X21)
- The bad condition of the components of the urban structure.....(X22)
- The bad condition of the commercial areas which influences its function negatively..... (X23)

7-4-3 Circulation structure:

- The absence of a hierarchy of the road network compatible with the hierarchy of urban units..... (X24)
- Crowd in circulation tracks..... (X25)

- The absence of enough pedestrian paths..... (X26)
- The narrow width of the road network that can hold vehicles..... (X27)
- The bad distribution of vehicle's main utilities(X28)
- The weakness of the connection between the commercial center and the residential areas (X29)
- The flow of traffic through a regional road..... (X30)
- The lack of car parking places in the residential areas (X31)

8. The proposed methodology of developing system process:

Redeveloping is a complex process. Each step in the process is linked with the next steps and other terms like laws, feasibility study, funding process, building status and obstructions. Besides all the implementation are been applied in a short period of time, but what is needed is having the implementation process done in a longer period to be able to use various developing tools compatible with the goals.

And generally, The developing systems are based on the economical developing process, improving the environment and providing the main needs for different societies (residence – working places – services – communicating facilities – infra structure) All this is in the range of the location, social and cultural value, In addition to the funding restriction. Without affecting the natural environment or misusing it's resources. Urban planning and urban design represent tools to perform urban development.

And with studying the properties of urban form, we find out that there are strong connections through which it will be difficult to have them separated especially in putting an urban developing system

On putting the urban form in the frame of global structure urban formation, we find that there are main terms that control the process of developing of the urban structure of the city and can be classified in to three main features:

- Improve the visual shaping image
- Improving the urban structure
- Improving the circulation frame

And these three axes form the proposed system method and with using the three features, we can put a theoretical concept for the developing system.

8-3 The main developing system methodology features:

8-1-1 Developing in the frame of visual image structure:

On defining the urban form concepts and to what extent It is linked with the visual form of the city through edges, areas, paths and visual marks. Regarding this issue, the developing process is related to these components therefore the process of developing is done by improving the visual frame image.

8-1-2 developing in the frame of urban form structure:

On using the idea of understanding the urban form structure according to the location distribution for the activities (land use) and the buildings status in the area. We will find that the developing is done by improving the conditions of the building in the area - whether it a historical area by using tools depend on conservation, restoration and protection. Or areas of bad building conditions by using tools aiming to keep the urban properties (rehabilitation, upgrading and improving) or having radical changes (elimination, replacement and reconstruction). Or applying the concept of urban renovation and it is characterized by having all the effects and status that participate in treating the urban environment.

8-1-3 Developing in the frame of circulation structure.

Developing process is done by improving the circulation system to make it easy to move through out the city. In addition to the movement of people inside the city freely and securely and providing the security during the circulation of the people in the commercial areas in the downtown.

The tools where used according to the size of the problem and the urban form property. Aiming to achieve the easy going to each and every part of the city. This was done by making a ring road surrounding the city to serve the traffic.

In order to provide the easy circulation for the pedestrian and the commercial purposes, the pedestrian paths where applied, It's size was chosen according to how much traffic is flowing to and out of the area and knowing the capacity of the roads network, even studying the ability to change the road in to pedestrian tracks.

8-2 : Developing tools related to developing system:-

in the field of theoretical studies and identifying the problems that face the area being studied, a group of tools where set and related to the developing features directly and indirectly by showing the interaction between them. The main developing tools for study area can be identified as the following.

8-2-1 Visual image structure:

- Identifying the urban zone for keeping the general appearance..... (Y1)
- Shifting the regional axes outside the borders of urban zone..... (Y2)
- Surrounding the urban mass with a green belt with a concentrated plantation to prevent the random extensions.....(Y3)
- Creating the urban zone entrances with a nice view related to its urban form (Y4)
- Demarking the district's borders naturally or with a major road..... (Y5)
- Finding organic relationships between the districts..... (Y6)
- Providing suitable environment to the services and showing up the signs of civilized expressions..... (Y7)
- Reusing the spaces by settling new activities..... (Y8)
- Changing the land uses along the Cornish path..... (Y9)
- Rarefaction of the built mass by creating squares and regional roads to connect the districts..... (Y10)
- Connecting the urban space with a linked network instead of having them scattered..... (Y11)
- Paying more attention to the pavements and pedestrian paths especially in the commercial zones..... (Y12)
- Establishing yards, counting them as people's assembly and avoiding the vehicles from getting in to it.....(Y13)
- Treating and exhibiting environmental spaces..... (Y14)
- The Hierarchy of roads network and spaces.....(Y15)
- Using landscape elements to beautify paths and main squares..... (Y16)
- Connecting the main axis with the visual city image..... (Y17)
- Making the landmarks clear to make it easy to be seen from all views.(Y18)
- Reusing the historical building in an ideal way..... (Y19)
- Exhibiting all the urban marks in the city..... (Y20)

8-2-2 Urban form structure:

- Balanced distribution of services to be compatible with the distribution of land uses..... (Y21)
- Shifting the undesired uses and regional services outside the range of the urban agglomeration..... (Y22)

- Assemble all the services in the least possible space, to decrease the time taken to move between them. In addition of reducing the use of vehicles..... (Y23)
- The grading in change of land use, aiming to achieve the best activity distribution..... (Y24)
- Making a good use of the destroyed areas by making it available for the service centers..... (Y25)
- The ideal exploitation of the current activities location..... (Y26)
- Keeping the buildings with a unique character of architecture.... (Y27)
- Restoring the historical buildings..... (Y28)
- Protecting the areas of the fair status buildings..... (Y29)
- Making good use of none used spaces in planning needs..... (Y30)
- Erasing the building of bad conditions plus replacing the population and activities..... (Y31)
- Raising the level of the services and utilities.....(Y32)
- Renewing the residential buildings and other facilities..... (Y33)
- Improving the urban environment..... (Y34)

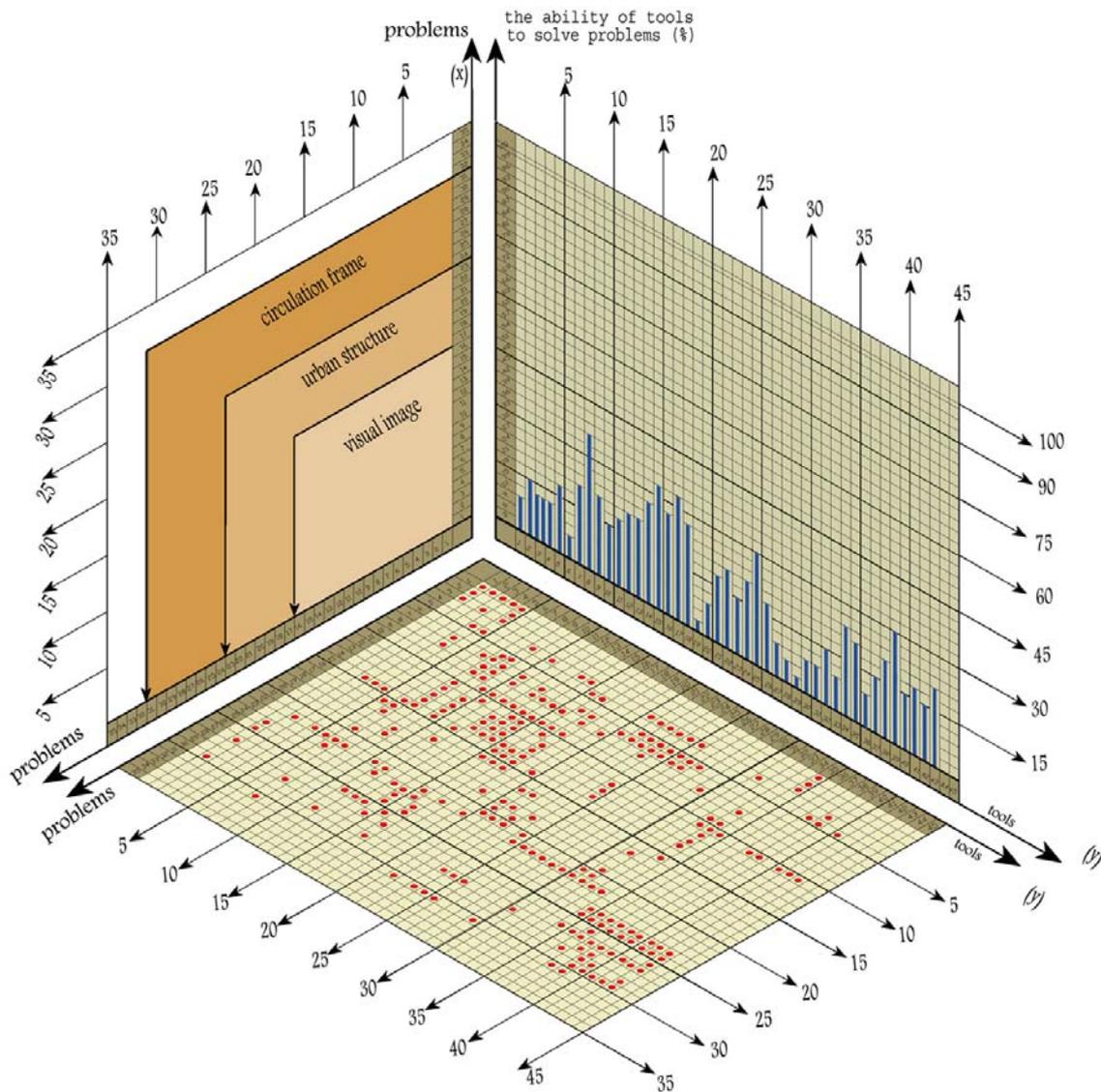
8-2-3 Circulation structure:

- Creating a ring road surrounding the city to prevent the traffic from penetrating the agglomeration area..... (Y35)
- Paying attention to the points of transit between the regional network and local network..... (Y36)
- Providing pedestrian paths in the center of services complex.... (Y37)
- Increasing the width of the roads to increase the capacity..... (Y38)
- Creating axes for the vehicle movement to provide the easy connection between different activities..... (Y39)
- Changing the direction of the roads in some axes to be integrated with the network system to decrease the traffic load..... (Y40)
- Decreasing the number of intersection between different axes by creating bridges passing above the other crossing axes..... (Y41)
- Making a one way axes to avoid traffic jam..... (Y42)
- Turning some axes in the shopping area to a pedestrian path only and avoid the vehicles from passing by it..... (Y43)

8-3 :The relation links between developing tools:

After studying the developing tools that where mentioned before, relation links appears between some tools as the following:

- Developing tools that allow the selection between them to achieve the same aim of their use.
- Developing tools that are linked with the other tools in an integrated frame to achieve the best result form their use.



Integrative system for development of urban form (I.S.D.U.F)

Source: Author

9: Conclusion:

- An integrative system was concluded (I.S.D.U.F.) to deal with the inputs In order to have a perfect plan for the developing process. This system is designed to clarify the ideal way to the designer and the decision maker to prevent the loss of any factors or relationships of the existing problems and tools which can be manage with these problems.
- In order to use this system we have to follow four steps:
Step one: field study to identify the most important existing problems and the priority in solving the problem
Step two: using the developing system (I.S.D.U.F.) to specify the tools.
Step three: Application
Step four: Rechecking outputs for feed back developing process.

- The developing system process arises from the awareness from the continual change in the functional uses and the way of fitting the developing concept with the circulation stages in terms of the duplication between the old and the new. And also between the permanent main uses and the added new uses.
- The success of any developing plan is based on response of the planning philosophy that faces the continual change in order to have the ability to plan the nascent uses and circulation.
- The concluded system (I.S.D.U.F.) will be applied later on developing the area of case study in Kuwait city. The feedback of its application will be discussed in other paper .

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