

Towards a Sustainable System to Activate the Policies of Urban Intensification in Egypt

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Abstract: Urban intensification has emerged as an approach in the strategic planning to solve housing problem in the current urban communities in Egypt. Theoretical studies have shown how far this approach is appropriate in solving housing problem in the current urban societies at the urban, environmental, social, and developmental level. However, the problems of the deactivation of these policies in the executive reality are still existent due to several reasons. The most significant of which are the incomprehensibility of housing studies in the strategic planning, besides the lack of connection between housing studies with the social, economic, and service aspects. In addition to lack of a sustainable aspect of urban intensification policies which made urban intensification studies lose their significance and their real effectiveness, and resulted in an inability of implementation from the concerned bodies.

Thus this paper aims to reach a sustainable system to activate the policies of urban intensification in the executive reality in Egypt, starting with the theoretical studies of sustainable development and the most important requirements for each dimension of urban intensification, in addition the policies that achieve the requirements of sustainable housing development. And the parties used to produce sustainable urban intensification mechanisms, then formulate the system in its final form.

The Paper Methodology:

The Theoretical Approach: This approach includes the concepts, the theoretical studies of sustainable development, sustainable housing development and urban intensification, and finally finding out the requirements of continuous housing development and the policies of sustainable urban intensification

The Analytical Approach: This approach includes the application of the theoretical studies on the selected successful world experiments. then the formulation of the sustainable system to activate the policies of urban intensification.

Keywords: Urban intensification, sustainable development; sustainable housing Development; sustainable system.

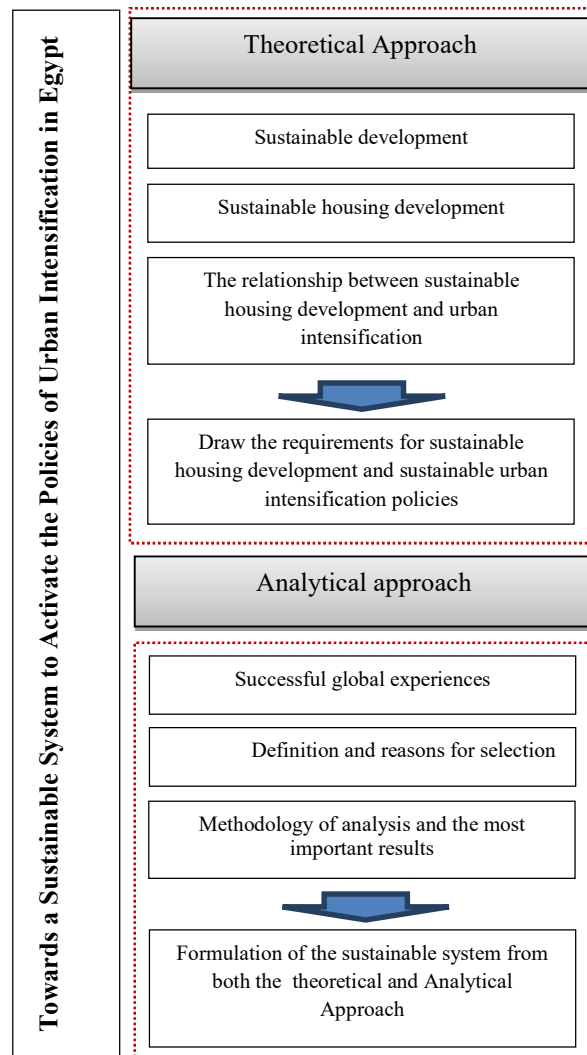


Fig. 1- The Paper Methodology

Source: The author

I. SUSTAINABLE DEVELOPMENT

Sustainable development, in its general sense, is the development that cares about the environment of man, since sustainability cannot be achieved without developmental

plans and strategies that enable it achieve its basic principles. There are several definitions of sustainable development, some of them are inclusive while others define sustainable development from a certain perspective.

- From a materialistic perspective, sustainable development is defined in the dictionary as [1] the development in which the natural sources are used without being partially drained or damaged.
- From a social perspective, sustainable development is the development that seeks to change the present situation in a society to more developed situation in order to achieve certain goals that mainly aim at raising the society's standard of living in every aspect, economic, social, urban, in the framework of the available sources.
- From an economic perspective, sustainable development is the process of achieving the maximum level of economic development in one condition: maintaining the natural sources and their quality. [2] There are other economic definitions that focused on the principle that using the sources today should not reduce the real income in the future. This principle is based on the idea that current decisions must not cause harm to the possibilities of maintaining the living standard in the future or to the protected environment. [3] This definition was proposed by William Ruchelshaus who defined sustainable development as the process that assert the necessity of achieving economic development that suits with the environmental capabilities, based on the fact that economic development and protecting the environment are complementary and not contradicting processes.
- From the environmental perspective, sustainable development is defined from both an environmental and the economic definition set by William Ruchelshaus. It is also defined as the optimal investment of the environment and making use of the available sources and potentialities whether human, material, or natural effectively and in an economic, environmental, urban, social balanced way to achieve justice to housing without wasting the gains of future generation[4]
- Reviewing these various definitions of sustainable development enables us to define the axes towards which sustainable development should be directed; namely the environmental, social, and economic axes. Thus it is evident that man is the basic axis of sustainable development as it includes human development that improves health level and guarantee generalization, welfare, and better economic level. Thus for the development to be sustainable, it should be based on the principle of balance between the sustainable environmental, social, and economic axes.



Fig. 2- dimensions of sustainable development

Source: <https://www.slideshare.net/Maybellyne/from-mdgs-to-sdgs-implementation-challenges-and-opportunities-in-nigeria>

II. THE RELATIONSHIP BETWEEN HOUSING AND THE CONCEPT OF SUSTAINABLE DEVELOPMENT

Sustainable development is, related, in its comprehensive sense, with improving the quality of life to be meaningful in our present time to all the society strata without affecting the capacity of the coming generation to get their needs in the future. Accordingly, with the issuing of the UN reports the governments focused in setting its policies on human development in all its social, environmental, and economic dimensions, in order to achieve sustainable human development in its comprehensive meaning. This requires integration in planning and the implementation of activities at all economic, social, and environmental levels, as a unified work system based on the principles of sound decision. Sound judgment springs from considering cities integrated systems through which decision has been taken in a participatory way at all levels within strategic vision that comprises all partners and define the development needs, for the issues of the cities turned to include the technical, social, economic, environmental, and legislative issues. These issues work together within an institutional framework that suits the circumstances of the local society. From here the relation between sound judgment and sustainable development has emerged to guarantee the conversion of economic growth into sustainable development in all fields. Thus sustainable housing asserts on the following[7]:

- Forming integrated housing blocs through emphasizing the concept of housing group and not individualized building to provide spaces that assert social relations.
- Emphasizing the miniature climate and adaptation with the natural environment

- Developing the existent societies and Rehabilitating them
- Establishing the housing cities as a nucleus of urban attraction that contribute in directing the urban extension while emphasizing the urban identity of the city
- Fields of sustainable development are exemplified in three main fields: economic,, environmental, social, and institutional fields. They are measured by 134 indicators and the housing sector is closely integrated with all fields of sustainable development that seeks to improve the quality of the individuals` life as a first step to improve their life which provides them with stability and healthy safe environment supplied with the basic services. In addition the attention paid to housing issues is not restricted to the local level but the UN sought to strengthen the attention paid to housing and development policies by adopting the World Strategy for Shelter in 1988.

III. THE CONCEPT OF SUSTAINABLE HOUSING DEVELOPMENT

Sustainable Housing Development is one of the modern contemporary topics; however the methods and means of its achievement remain complex, since housing crisis in the Arab countries is a problem. Not all the society strata are able to get houses especially middle and limited income classes. Arab countries still face several challenges, resulting from lack of housing provided by banking sectors ,weakness of organization that provide non – profit social housing, shortage of construction companies that improve building and construction, lack of trained workers, as well as the legislations related to construction and its development and developing the role of private sector in housing development. Thus housing and construction sector should be paid more attention and should occupy a distinguished status in the policies and sustainable development programs in an attempt to solve this crisis.

Sustainable development is defined as achieving sustainable development in its comprehensive concept via housing and through the principle of integration in the urban policies, so that it includes elements of sustainable economic, social, and environmental development and be implemented in accordance with work strategies under an integrated and wise management which raises the capacity of the city to compete with other cities.

Sustainable development is one of the approaches that have emerged to meet the increasing demand on houses in the light of the absence of clear housing strategies of many countries and strategies that aim at achieving balance between the demand on houses and providing land appropriate for housing, according to predetermined time limits. Thus the right to get the appropriate house in a short period of time will not be

negatively affected and it will also limit the excessive use of land for housing at the expense of other urban or rural uses alike. In other words, sustainable housing development seeks mainly to achieve environmental balance and provide a high value of urban habitable environment.

IV. DIMENSIONS OF SUSTAINABLE HOUSING DEVELOPMENT

Sustainable housing development is integration between all the environmental, social, economic, and urban dimensions [8]

The following is an overview of the dimensions of sustainable housing development:

a. *Housing development and the social dimension:*

This means that the population is part of the decision process and there must be a common language between the population and the designers. Therefore, it is preferable that the population is trained to help them understand the designs, schemas, and the models that define the final decisions.

They include the following [9]

The social values, the group, the society, the neighborhood

Neighborhoods should be designed in a way that encourage living together and social relations that would in turn be reflected in useful open spaces or building to provide the opportunity to the user for:

Safety: The housing environment should provide the feeling of safety, group, and neighborhood which refers to the term of participation or social enabling to users. This shows the social tendency that dominates various social contexts, besides the defense style and interaction in the public spaces through increasing the activity of pedestrians in the urban areas.

The following table shows the terms related to sustainable housing development:

TABLE 1 : TERMS RELATED TO SUSTAINABLE HOUSING DEVELOPMENT ,SOURCE : [10]

Accessibility	Easy to access
Clarity	Knowing the places and find them easily
diversity	The user has many options
vitality	Positive relations between buildings and empty spaces
privacy	The quantity of information released by the individual to others or to keep them
The efficiency of energy	Reducing the use of energy, cars, and stressing the significance of the movement of pedestrians.

b. *Housing Development and the Environmental Dimension:*

This dimension depends on the formation of a more comprehensive view about building and free spaces from the

perspective of the energy derived from the surrounding environment. This can be done via generating energy from renewable sources [3] solar energy, wind, wastes. The methods to achieve this vary including grouping the housing units and neighborhood units to achieve the greatest degree of negative thermal gain or making the optimal use of solar energy for the success of the environmental dimension of the sustainable housing development. There are several ways of raising the efficiency of using power and sources in the environmental dimension [11].

c. Housing Development and the Economic Dimension:

This refers to facilitation which is estimated by the consumption of 30% only of the family income [12]. This sustainable economic housing is offered to families with low income, and is defined as the house that meets the family requirements not more or less. The concept of facilitation extends to include every aspect starting from the piece of land up to the components of the house and the building materials, as well as the diverse preparations for building.

d. Housing Development and the urban Dimension:

The urban dimension emphasizes the importance of providing a number of basic factors, the most prominent of which are [13]:

Reducing the consumption of sources:

Reducing the consumption of sources refers to the land, building material, and increasing the local materials, recycled products, as well as water [13].

- Raising the value of the urban environment: which means getting a new environment through good design and providing the chance for the personal print of the inhabitants to appear.
- The social inclusion: This term means that neighborhoods contain a diversity of income and social levels and achieving a wide range of housing patterns and a variety of options.
- Public transportation: The general trends of sustainable developments call for reducing the use of private means of transport and the use of public transport, bikes, and pedestrian movement, also connecting the pedestrian movement with the local destinations ,i.e. access to a daily hierarchy.
- Densities:

The housing development calls for high density, for low densities means wide extension and not making the optimal use of land, as well as separating people from their work places which means an increase in the use of cars and an increase in crowding. On the other hand, high density saves land and provides services at low cost effectively, besides developing road systems, effective

energy, and provide opportunities for social contact and access.

The trade activity: This means a wide range of public services and business facilities [16].

The following table shows the dimensions of sustainable housing development, its requirements and the possible vocabulary through which the dimensions of sustainable housing development can be applied[16].

Dimensions of sustainable housing development	Requirements for sustainable housing development	Vocabulary possible to achieve
Social dimension	Achieving social cohesion and reducing social separation is the	common language between the inhabitant and the designer
		Training to understand designs and schemes
		Participation in the decision-making process
		Values of society
		Community, community and neighborhood
		Safety
		Choice of choice
		Clarity
		Privacy
		Direct supervision
		Diversity in patterns
		Diversity in architectural solutions
		Vital
Adaptability and flexibility		
Environmental dimension	Resource conservation and environmental protection	Correct orientation
		Energy efficiency
		Optimal shape of the building
		Direct the holes
		Harmonic form
		Exploitation of solar energy
		Exploitation of wind energy
		Photovoltaic cell exploitation
		Save water
Biomass		
Economic dimension	Achieving justice between needs and possibilities	Reduce cost
		Quality and durability
	Activation of economic systems to save the total cost	Exploitation of existing resources
Urban dimension	Optimal utilization of land and the balance between functional relations of land use and distribution of services	Exploitation of land
		Reduce energy used in construction
	The variety of	Increased use of local resources and reclaimed assets
		preserving the open spaces

Traffic Management	uses in the urban space	Construction in previously developed land
		The appearance of the personal footprint
		Provide a wide range of entry levels
	Improving transport conditions and services	services Road planning
		Planning bus routes and locations
	Designing a street network Connected	Connected to accessibility
		Achieving a safe movement
Network tracks pedestrian	Mesh Trails Linking hubs and mopeds with public transport and local destinations	

TABLE 2: THE DIMENSIONS OF SUSTAINABLE HOUSING DEVELOPMENT, ITS REQUIREMENTS AND THE POSSIBLE VOCABULARY THROUGH WHICH THE DIMENSIONS OF SUSTAINABLE HOUSING DEVELOPMENT CAN BE APPLIED [16].

V. GOALS OF SUSTAINABLE HOUSING DEVELOPMENT

Ensuring the right of man in an appropriate house throughout the Arab countries through:

- 1- Providing the appropriate house for the greatest number of families.
- 2- Improving and developing the availability of basic services.
- 3- Raising the efficiency of building houses at low cost.
- 4- Offering equal opportunities to get land for housing.
- 5- Reducing the disparity in housing satisfaction among the various Arab cities, on one hand, and between the urban and rural areas in the Arab city, on the other hand.
- 6- Enabling house owners to improve and widen their current houses.
- 7- Improving the availability of equal opportunities to get loans for building houses.
- 8- Reducing the degree of crowdedness in housing and the rates of populating to the accepted limit.
- 9- Increasing the ability of the government to meet the needs of special categories and social strata to get the suitable house.
- 10- Improving the quality of houses including the efficiency of using energy and the environmental effects.

VI. URBAN INTENSIFICATION AND SUSTAINABLE HOUSING DEVELOPMENT

Several studies asserted the relation between sustainable development and the goals of urban intensification. Here, the studies about sustainable development and its relationship

with urban intensification can be classified according to the following axes:

1. The Environmental Dimension:

These by Fryers, Gheith, and Salah Al-shara: The study emphasized the fact that exploiting the natural sources and land, in its general sense, is one of the stages of development. The study also discussed the idea of automatic regeneration of the limited sources of land in order to preserve its supply in a time whereas there is no clear vision concerning dealing with these two basic elements of the development process. The study proposed the topic of developing the concepts of protecting nature and sustainable housing development to define points of closeness and disparity between them.

The study also dealt with the concept of urban desertification [17], as well as the environmental desertification. The latter is caused by nature due to man's negligence, whereas the first is caused by man who destroys nature. The study also analyzed the reasons of general failure in determining the nature of the relationship between the concept of nature protection and sustainable development. The study pointed out that one of the explanations that may be defining the concept of "the right development" and the "sustainable development was that" development meets the needs of the society through investing the available natural resources and at the same time keeps the nature".

The study concluded that sustainable development and the protection of nature are two interrelated, inseparable and necessary processes. There is no contradiction between them, on the contrary there is harmony and integration between them.

To return to urban intensification, we find that the previous hypothesis asserts the goal of urban intensification to reduce the urban growth and expand the sides at the expense of the agricultural land and to protect it which is one of the goals of environmental urban intensification as well as the optimal use of the current resources.

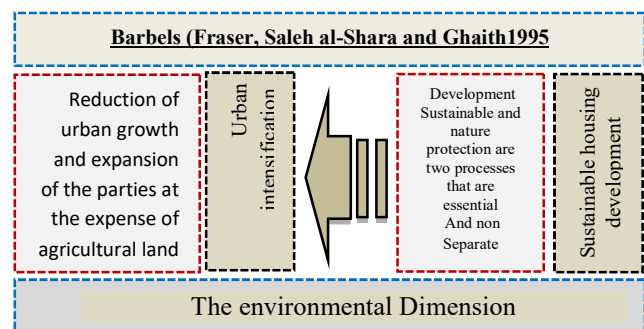


Fig.3- Urban Intensification and Sustainable Housing Development in the environmental dimension

Source[17]: adopted by author

2. *The Urban Dimension:*

Foster’s studies (1999) [19]:the studies explains the concept of sustainability exemplified by working with the (less means) ,the studies focus on the new solutions to construction based on using the best materials and designs that meet the requests of the society and the requirements of the new era. The studies concluded that the building that lasts more is the one that saves energy and thus the world will be better for future generations.

The studies also dealt with the problems that face our world today; namely urban expansion and the horizontal growth of cities, not the vertical growth which decreases the urban land and the individual has to walk for distances in order to reach his work. Therefore, Foster suggests the different and diverse use of land during the development process in the cities, so that new local communities that habit, work, and practice their daily activities in the same site. This what urban intensification emphasizes of the optimal exploitation of the current resources and reducing the daily journeys to work, business, trade, and services. This is one of the means that achieve sustainable development that aims at establishing more sustainable patterns, especially around business centers (trade, work, and employment centers)

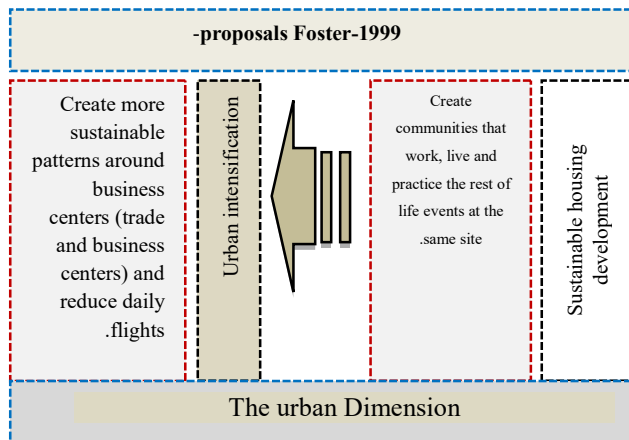


Fig.4- Urban Intensification and Sustainable Housing Development in the urban dimension

Source[19]: adopted by author

3. *The Economic Dimension:*

The studies of El-nagafyand El- galaby, the study examined the relation between the environment and economic development reaching to the concept of development. The study sought to shed light on the nature of sustainable development and explaining its role in achieving economic, and social development while protecting the environment, as well as studying the views and concepts related to sustainable development and their content. The study adopted the theoretical framework of economics and scientific logic the basis for discussing these concepts from an environmental perspective. The study pointed out that that the concepts of

economic globalization , its views, and what it left of effects on the global climate is considered(besides the issue of sustainable development) a necessary matter for the present and future generations alike in the economy of developed and developing economies. Furthermore, the increase in the market patterns that are unable to achieve economic balance from one side and sustainable development from the other will cause structural deforms from both sides. This will have its effects on the economic and social aspects in the world countries.

The study reached to the conclusion that economic growth will inevitably go on in the context of objective circumstances and the economists have to change this growth from a growth that consume the environment into a growth that maintains it to meet the needs of the coming generations in the light of economic development that guarantee the future to these generations

Intensification has been economically used to overcome the scarcity of building land in the Egyptian populated land, besides supplying the demand for housing especially for middle class and limited income families due to the rise in the price of land and housing units that does not suit the economic status of a large sector of the Egyptian society.

Intensification was also used as an economic approach to deal with the low material resources of the country to provide the basic infrastructure and services in the new housing units especially for limited income families.

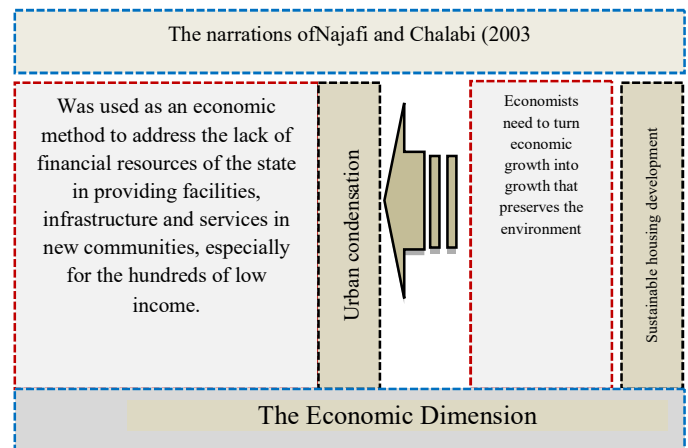


Fig.5- Urban Intensification and Sustainable Housing Development in The Economic dimension

Source[22]: adopted by author

4. *The Social Dimension:*

The study of Brian & wiley (2001) ,the studies sought to define sustainability through "the interrelation and the link between technology and the sociocultural goals". The majority of construction movements played a role in solving this equation. High technical urbanization was an urbanization that shows technology more than the urbanization of society. The

social urbanization neglected the technical aspect and the power of technology to solve human issues that aim at paying attention to the social connection between populations and avoid isolation, since sustainability includes both of them as it does not only renew construction but also grant it a new and a successful modern pattern, free of local problems to create constructions that have the quality of this place and combines between bot technology and the social status through which we can understand the materials and the details as well as their impact on the urban environment. Sustainable construction challenges the basics of the local construction and the style of the streets and buildings to find the basics of the ecological construction related to the sustained cities and buildings, the same as the relation between the city and the country to achieve ecological balance.

The study asserted that we must not separate between " the goals of sustainable development and the achievement of the social goals", in a way that "the house be socially and desirably appropriate to the inhabitants". This is what the urban intensification aims at. It is used as a tool for achieving social integration as it integrates the different housing categories to limit the social and spatial separation while supporting and strengthening the facilities, services , and the infrastructure that improve the standard of living and support the society and the social life via merging small villages with the current urbanization to achieve the maximum use while supporting the housing opportunity to the urban population coming to the marginal villages.

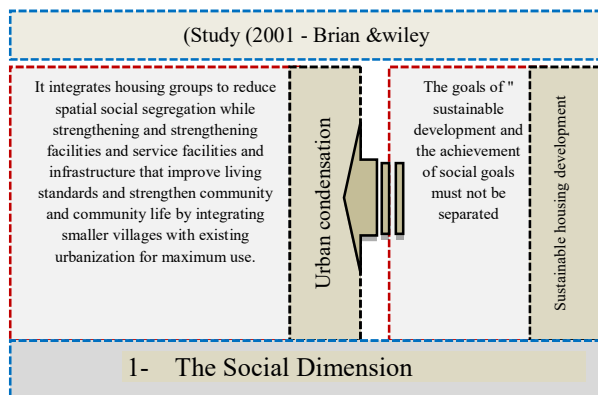


Fig.6- Urban Intensification and Sustainable Housing Development in The social dimension

Source[23]: adopted by author

VII. POLICIES OF ACHIEVING SUSTAINABLE HOUSING DEVELOPMENT THROUGH URBAN INTENSIFICATION

The following is an overview of the policies that achieve sustainable housing development through the approach of urban intensification according to the following methodology:

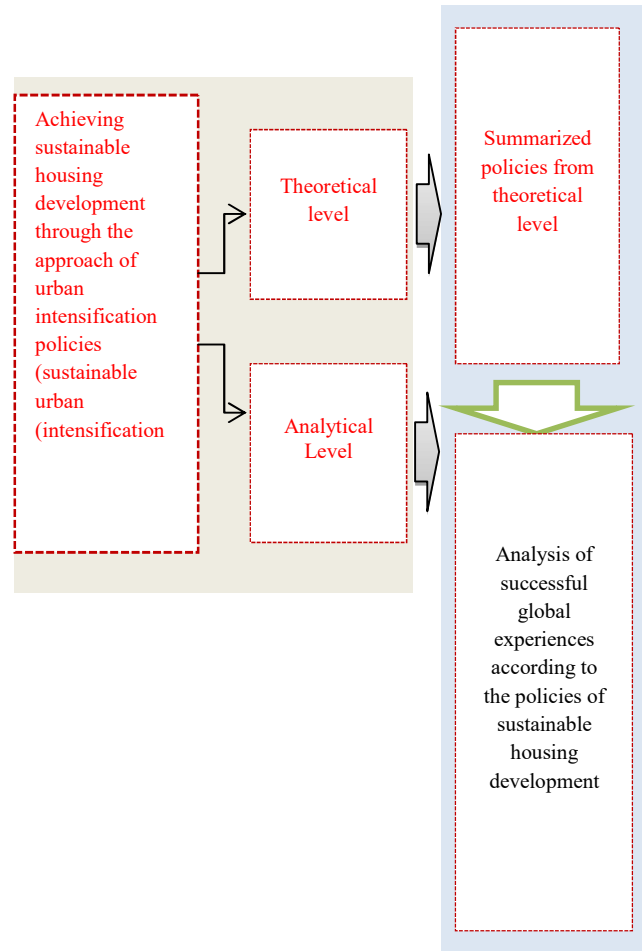


Fig.7: methodology of achieving sustainable

Housing development : the author

A. Theoretical level:

The basics of achieving sustainable development in its full sense through the urban intensification approach depends on the achievement of the principle of integration in the urban policies, so that each policy includes the economic, social, environmental, and urban, elements of sustainable development in a way to be implemented according to work strategies of a wise integrated management. In this way the competency of the city that competes with other cities will be raised. For the housing cities to achieve sustainable development, the basics and principles of the competency of sustainable housing development should be provided. Policies of achieving sustainable housing development for each dimension of urban intensification can be drawn according to the following table:

TABLE 4: DIMENSIONS AND URBAN INTENSIFICATION POLICIES

The dimensions of urban intensification	Sustainable urban intensification policies
The environmental dimension	Reduction of urban growth and expansion of the parties on the expense of agricultural land
	The best use of existing environmental resources
	Minimize emissions from daily transportation by reducing daily trips
	Provision of green spaces
	Recycling and use of materials
The Economic Diminution	Provide job opportunities for residents working to promote the urban economy
	Reduce the total cost of the optimal exploitation of available resources
	Provide special demand for housing for population groups, middle and low-income
	To take advantage of high economic returns such as night interfaces and exploitation of land located on the water destinations on the banks of rivers where it is limited with high economic value areas
The social dimension	Reducing social inequalities and social isolation and segregation of the poor
	Work on the settlement of the population in their places
The Urban Dimension	Easy access to residential and business centers
	Mixed land uses and activities in focus
	Increase the intensity of uses
	Linking areas of transport paths
	Reduce daily trips to work
	Control urban sprawl
	Provide favorable conditions for trips and encouragement to walk

SOURCE: ADOPTED BY AUTHOR

B. Analytical level:

This is done by analyzing the successful world experiments according to the policies of sustainable housing development drawn from the theoretical part.

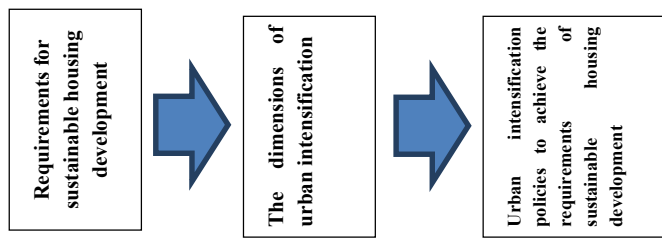


Fig.8: successful international case studies

Source: the author

To analyze the successful international case studies, a methodology should be formulated from the theoretical part of the research paper (requirements of sustainable housing development – dimension of sustainable urban intensification - policies of sustainable urban intensification) as shown in the following figure:

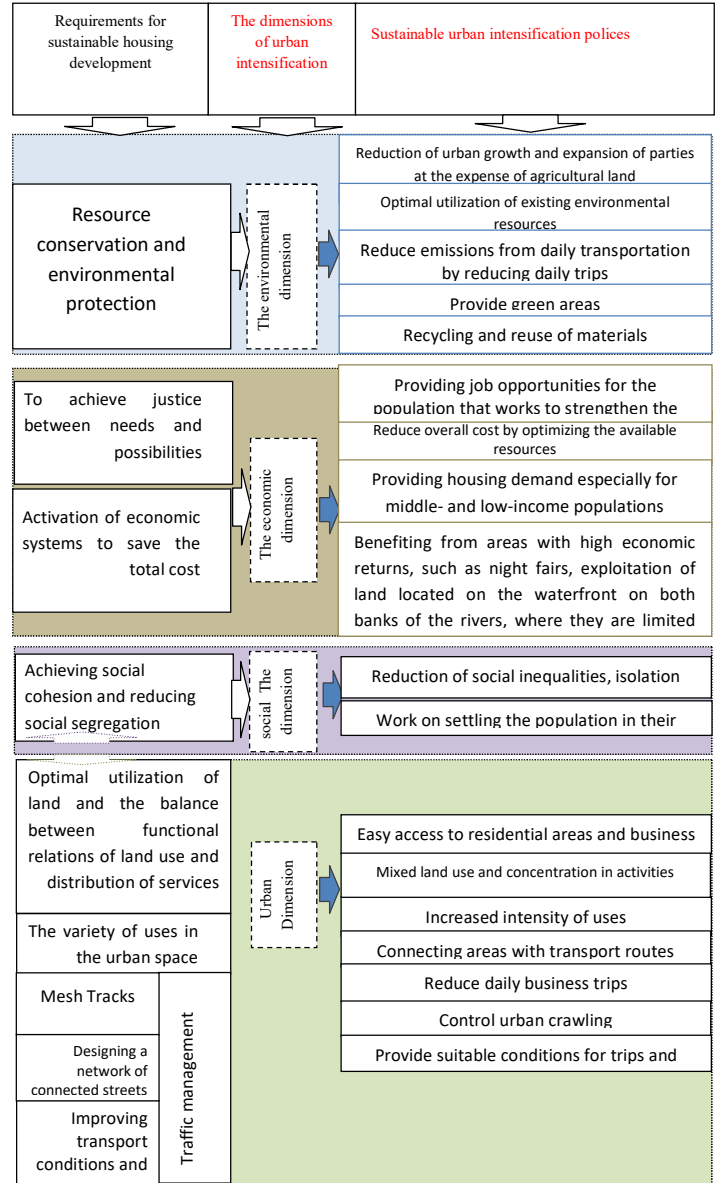
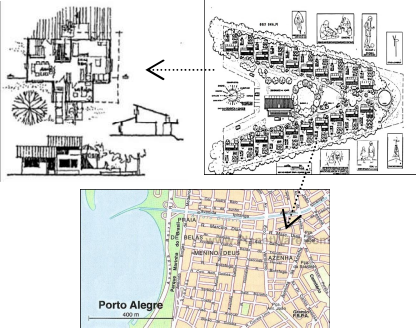
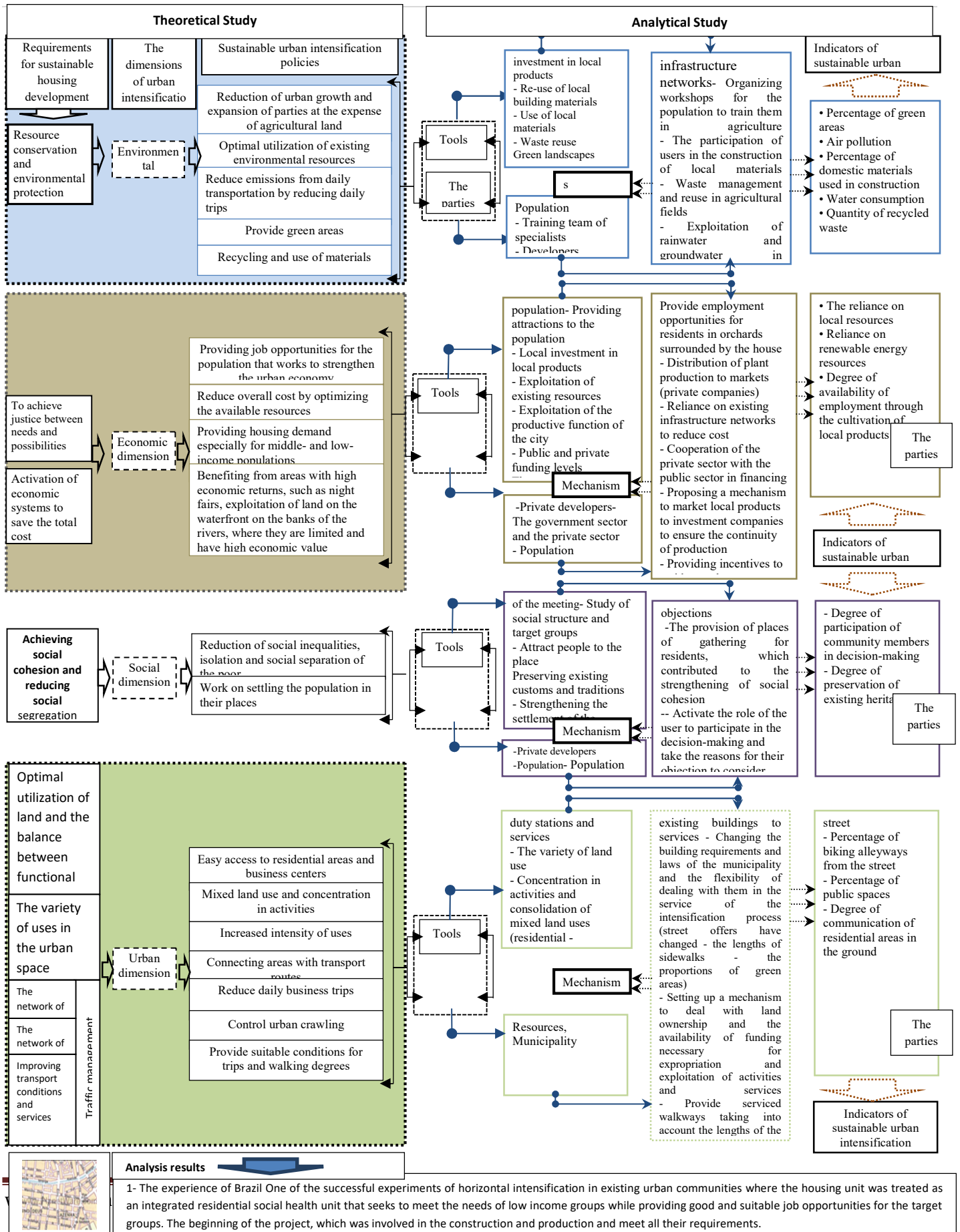


Fig.9: The methodology analyzing the successful international case studies , Source : the author

The previous methodology was followed by successful international case studies. The analysis dealt with how the tools were used by the parties to achieve the requirements of sustainable housing development and then draw the most important mechanisms and indicators for each case study to be added in the proposed system as a result of the analytical part. These countries lagged behind in the development levels, especially in education, rise in poverty rates, decrease in the value of local currency in front of the American dollar, economic inflation, rise in the local public debt whether internal or external, low growth rates, in addition to extreme shortage in power and electricity in great areas in the country.

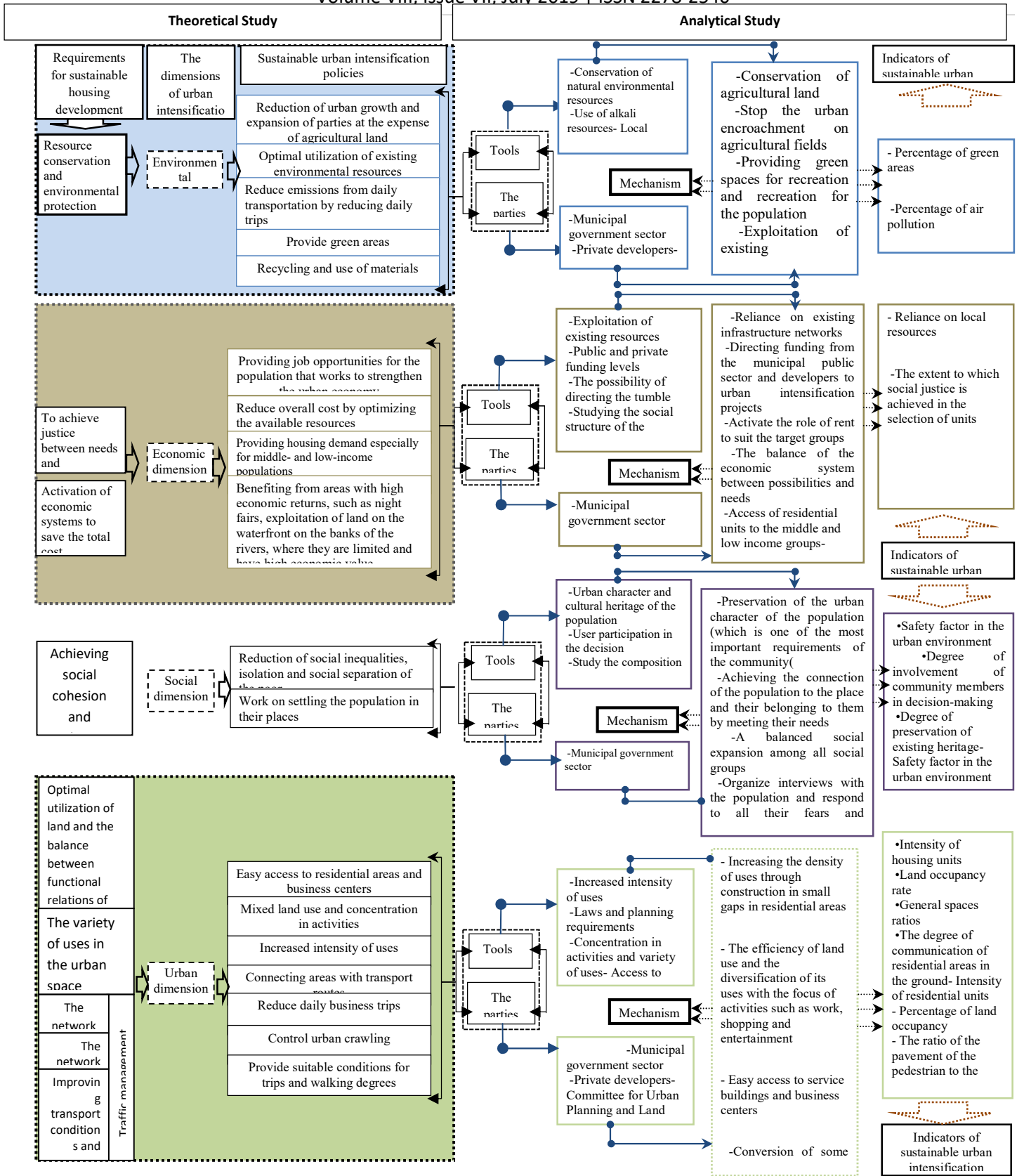
The first successful international case study in Brazil according to the study methodology		
Brazil (Porto Alegre) Definition	<p>Site : Porto Alegre is one of the largest cities in Brazil, the capital of Brazil's state of Rio Grande do Sul and the most important cultural, political and economic centers in southern Brazil, one of the most environmentally conscious areas.</p> <p>Objective of the experiment: Creating affordable, affordable and affordable housing solutions with minimal environmental impact down to producing low cost housing, sustainable integration with the environment, optimal use of available energy and enhanced social interactions.</p> <p>Design and Implementation: The Federal University of the State of Rio Grande do Sul. Under the patronage of the Brazilian Association of Technology for Built Environment and Low and Low Energy Engineering, the main objective was to stimulate the presentation of design alternatives to architecture and urban planning in line with Brazilian reality and the principles of sustainable development within the mechanisms</p>	
Requirements	<p>Urban intensification policies to achieve the requirements of sustainable housing development</p>	<p>How to implement sustainable intensification policies</p>
Conservation of resources and protection of nature	<p>Environmental dimension</p> <p>Reduction of urban growth and expansion of parties at the expense of agricultural land</p> <p>The best use of existing environmental resources</p> <p>resulting from the means of daily Reduce harmful emissions transportation to reduce daily flights</p> <p>Recycling and use of materials</p>	<p>- The participation of the population in the construction of the house using local energy-saving building materials and promoting the principle of civil construction under a specialized team that contributed to the conservation of resources and the protection of nature.</p> <p>- Provide areas to collect rainwater and use groundwater to irrigate agricultural land surrounded by housing, so as to work on the conservation of environmental resources and exploitation of available materials best exploitation.</p> <p>Encourage traffic and reduce the use of transport and communication and thus reduce emissions harmful to the environment</p> <p>Provide an orchard surrounded by each house by 15-20% of the land area to provide food needs and achieve green spaces and the participation of people in agriculture</p> <p>Provide a system for the recycling of waste and household waste and its use in neighboring agricultural fields.</p>
Achieving justice between potentials and needs	<p>The economic dimension</p> <p>Providing job opportunities for the population leads to the strengthening of the urban economy</p> <p>Local production evaluation systems</p> <p>To promote the economy by optimizing the use of available resources and services</p>	<p>- Providing employment opportunities for the residents of agriculture in the gardens surrounded by the home by training them before lodging in their homes from a group of specialists in agriculture and irrigation. The distribution of plant production to the market and control of production from the executing agencies of the project contributed greatly to the strengthening of the local economy</p> <p>Evaluation of agricultural products provided and their consumption in the market, which helps to sustain production and economic stimulation.</p> <p>Utilizing available resources from recycling, rain water and groundwater helped reduce the total cost</p>
Reduce total cost	<p>Providing demand for housing for middle- and low-income populations</p> <p>Benefiting from areas with high economic returns such as night fronts. Vertical intensification is used to exploit the land on the waterfront on both sides of the river, as it is limited and has high economic value.</p>	<p>Provide housing units for a large segment of the low-income groups and ensure the arrival of units to them.</p>
Optimal utilization of land and the balance between functional relations of	<p>Easy access to residential areas and business centers</p>	<p>The provision of integrated services and linking housing units work sources led to the lack of need to use means of transportation almost entirely where to walk from the housing unit distance to the business and service centers account so that the span of 400m .which contributed to the success of easy access to all needs ,m</p>
The variety of uses in the urban space	<p>The Urban dimension</p> <p>Mixed land use and concentration in activities</p> <p>Increased intensity of uses</p>	<p>education for education night youth and adu-day ,ionaleducat /Providing a social center Contributed to the The activities of the entire community And giving other options social - residential)concentration in the activities and strengthening of mixed land uses .(A service - entertaining-Educational</p>
Traffic management	<p>Connecting areas with transport routes</p> <p>Reduce daily business trips</p> <p>Reduce daily business trips</p> <p>Control urban crawling</p> <p>Provide suitable conditions for trips and walking degrees</p>	<p>There is no need to use the means of transportation almost completely where the housing has been linked to the areas of business and services (shopping centers).</p> <p>Provide serviced walkways, taking into account the lengths of the sidewalks of the pedestrian to the roads, thus encouraging the traffic and the use of stairs.</p>
Achieving social cohesion and reducing social	<p>the social</p> <p>Reducing social inequalities, isolation and social separation of the urban poor at the periphery</p>	<p>Socio-economic expansion among all socio-economic groups and non-separation of groups, especially low-income groups.</p> <p>- Integrate the population and settle in their places and provide all the needs of the population and services and workplaces, which in turn lead to increased belonging to the place and the consolidation of social ties and safety.</p>



Analysis results


1- The experience of Brazil One of the successful experiments of horizontal intensification in existing urban communities where the housing unit was treated as an integrated residential social health unit that seeks to meet the needs of low income groups while providing good and suitable job opportunities for the target groups. The beginning of the project, which was involved in the construction and production and meet all their requirements.

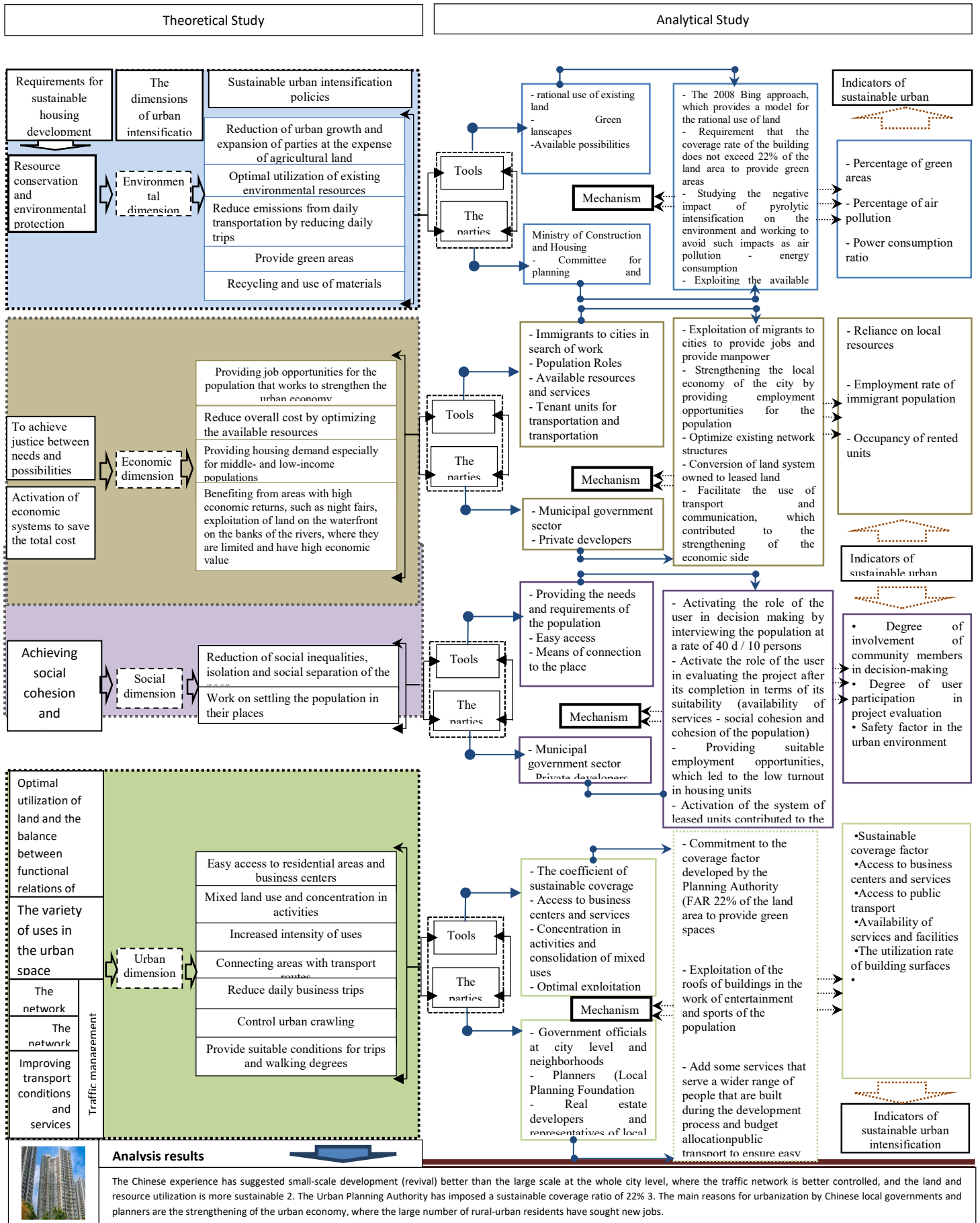
The second successful international case study in Canada according to the study methodology			
Definition (Alberta, Canada)	<p>Location: Alberta is a small village in South Galleria and most of the buildings are on small plots of land around 1850 and are beautiful in nature and permeate the lakes. The majority of the activities in Alberta are centered around the rich nature of its wealth.</p> <p>Objective of the experiment: Urban intensification has emerged to address two major issues in Canada: - Over the past 50 years there has been a development in Canada, where the urbanization of green fields began, which led to the loss of agricultural land and natural areas and high dependence on cars and traffic congestion was resorted to urban intensification to stop the encroachment on agricultural land - Municipalities lack the necessary resources to pay for the necessary infrastructure to support the expansion of green fields; the urbanization of existing residential areas and the exploitation of infrastructure networks and transport services already exist.</p> <p>Design and Implementation Agencies: By developers, residents and municipal officials, where 23 projects (case study) were condensed and requirements were put in place after the challenges were examined by developers as a tool to overcome them</p>		
	Requirements for sustainable housing development	Dimensions of urban intensification	Urban intensification policies to achieve the requirements of sustainable housing development
Conservation of resources and protection of nature	Environmental dimension	Reduction of urban growth and expansion of parties at the expense of agricultural land	- Use urban intensification in Alberta to stop the urban encroachment on green fields, agricultural land and natural areas.
		The best use of existing environmental resources	- Exploitation of the infrastructure networks and transport services already in place and in contrast to maintain the fields of creeping architecture.
		Reduce harmful emissions resulting from the means of daily transportation to reduce daily flights	
		Provision of green spaces	Provide green spaces and landscaping around residential units suitable for hiking and entertainment.
		Recycling and use of materials	
Achieving justice between potentials and needs	The economic dimension	Providing job opportunities for the population leads to the strengthening of the urban economy	
		Local production evaluation systems	- Provide additional funding programs and incentives from the municipality to clean up the pollution and restore the archaeological buildings surrounding the intensification operations
Reduce total cost	The economic dimension	To promote the economy by optimizing the use of available resources and services	
		Providing demand for housing for middle- and low-income populations	Lower infrastructure costs, where existing infrastructure networks have been used for urban intensification, thus reducing total cost
Optimal utilization of land and the balance between functional relations of land	The Urban dimension	Benefiting from areas with high economic returns such as night fronts. Vertical intensification is used to exploit the land on the waterfront on both sides of the river, as it is limited and has high economic value.	Produce a good product with diversification of spaces and activate the role of rent to suit all segments of society
		Providing job opportunities for the population leads to the strengthening of the urban economy	
The variety of uses in the urban space	The Urban dimension	Easy access to residential areas and business centers	Provide additional transportation systems for daily accessibility and business areas
		Mixed land use and concentration in activities Increased intensity of uses	- Increasing the density of the applications through the use of horizontal intensification through construction in small gaps in residential areas, demolition and reconstruction of dilapidated housing buildings, and intensification of existing residential buildings and increase their height.
Traffic management	The Urban dimension	Connecting areas with transport routes	- The efficiency of land use and the diversification of its uses with the focus of activities such as work, shopping and entertainment.
		Reduce daily business trips	Changing the regulations and requirements of the municipalities regarding the division of areas and parking to achieve the maximum suitable for the population and adoption of the ministries concerned.
Achieving social cohesion and reducing social segregation	the social dimension	Reduce daily business trips	Provide transportation systems so that the residential buildings within the distance of the traffic to the stations of transport beyond the limits of the range of 600 m
		Control urban crawling	- Control the urban crawling on neighboring agricultural lands and preserve them from the most important objectives of the experience of Alberta Canada.
Achieving social cohesion and reducing social segregation	the social dimension	social inequalities and social isolation and separation of the urban poor with the parties	The balanced social expansion of all socio-economic groups and the non-separation of groups.
		Work on the settlement of the population in their places	- Preserving the character of the neighborhood is one of the most important requirements of the opposition population and has been met by the competent authorities. - Achieving the people's connection to the place and their affiliation by meeting their needs and taking their opposition into consideration by the responsible authorities. The evaluators appreciated the efforts of the developers to meet their requirements.
		making-User participation in decision	Activating the role of the user and responding to the opposition of the residents of the neighborhood and their fear of the process of urban intensification and study their requirements of blocking the sun, parking and traffic problems by adjusting the requirements for heights and lighting rates from the municipality and was approved by the Ministry of Housing.



Analysis results

Canada's experience of experiments that have succeeded in dealing with the needs of the population and the study of their fears and objections and the user's consideration in the process of urban intensification where the population showed their objection to urban intensification fear of blocking the lighting and landscape - as well as the problems of car parking and reduced that may result from the process of condensation and also The lack of green spaces has been cooperated by all parties from the municipality and developers to address the objections of the population and provide adequate solutions to them

The Third successful international case study in China according to the study methodology				
Definition Shenzhen China	<p>Site : Shenzhen is a city in southern China that has been transformed from a small fishing town of 30,000 people into a flourishing port in which reform and prosperity policies were applied to a population of 11 million.</p> <p>Objective of the experiment: The urban intensification policy was used to control the city's massive population density and the HDSS neighborhoods of Shenzhen were selected. Both are located in Huhai District of Nanshan District, one of the most well-established living quarters in Shenzhen.</p> <p>Design and Implementation: The design was made by the Urban Planning and Land Resources Commission of Shenzhen (Municipal). Two types of buildings were presented</p>			
	Requirements for sustainable housing development	Urban intensification policies to achieve the requirements of sustainable housing development		How to implement sustainable intensification policies
Conservation of resources and protection of nature	Environmental dimension	Reduction of urban growth and expansion of parties at the expense of agricultural land	<ul style="list-style-type: none"> - The Peng (2008) approach, an approved model that promotes urban intensification of cities, has been used as an ideal model for the rational use of urban land and the possibilities available. 	
		The best use of existing environmental resources		
		Reduce harmful emissions resulting from the means of daily transportation to reduce daily flights		
		Provision of green spaces		The coverage ratio (the total area of the floor built to the total area of the site) should not exceed 22%, so that green areas are provided to serve the population of each neighborhood.
		Recycling and use of materials		
Achieving justice between potentials and needs	dimension The economic	Providing job opportunities for the population leads to the strengthening of the urban economy	<ul style="list-style-type: none"> - The strengthening of the urban economy, which led to the large population of rural migrants to the city of Shenzhen in search of new jobs near the center of business and trade. 	
		Local production evaluation systems		
		To promote the economy by optimizing the use of available resources and services		
Reduce total cost		Providing demand for housing for middle- and low-income populations	<ul style="list-style-type: none"> - The conversion of land system owned by leased units by the state, which contributed to the economic enhancement of the access of units to all segments of the society from the Mediterranean and low-income, and is one of the systems recommended by UN-Habitat, Regional Office for the Arab States 12 November 2015. 	
		Benefiting from areas with high economic returns such as night fronts. Vertical intensification is used to exploit the land on the waterfront on both sides of the river, as it is limited and has high economic value.		
		Providing job opportunities for the population leads to the strengthening of the urban economy		
Optimal utilization of land and the balance between functional	The Urban dimension	Providing financing systems from government agencies and developers	Provide additional funding programs and incentives from the municipality to clean up the pollution and restore the archaeological buildings surrounding the urban intensification	
		Easy access to residential areas and business centers	Provide additional transportation systems for daily accessibility and business areas.	
		Mixed land use and concentration in activities Increased intensity of uses	<ul style="list-style-type: none"> - Preparation of the budget for land use and different housing levels to include functional diversity among all urban uses to meet the needs of the population and achieve the principle of sustainable sustainability. 	
		Increased intensity of uses	<ul style="list-style-type: none"> - The efficiency of land use and the diversification of its uses with the focus of activities such as work, shopping and entertainment. - Commitment to the rate of coverage of FAR 22%, which allows the provision of green spaces and places of population and increase the intensity of uses - Exploitation of the roofs of buildings in the provision of population services such as sports services 	
		Connecting areas with transport routes	Establish an effective public transportation system that promotes the mixed use of urban urban areas as well as supports the city's economy.	
		Reduce daily business trips	Reducing daily trips to work stations and relying on transportation. Shenzhen's traffic management system introduced the public transport system and encouraged people to use it to reduce the use of private cars and rely on the transportation network.	
		Control urban crawling		
Provide suitable conditions for trips and walking degrees	<ul style="list-style-type: none"> - Provide a range of bicycling lanes for cars. 			
Traffic management	Easy access to residential areas and business centers			
Achieving social cohesion and reducing social segregation	The social dimension	inequalities and social isolation and separation of the urban poor with the parties	The balanced social expansion of all socio-economic groups and the non-separation of groups.	
		Work on the settlement of the population in their places	<ul style="list-style-type: none"> - To absorb the high population density in the city, which is one of the main goals of the experience of Shenzhen, where the urbanization absorbed the population of the city about 11 million people. - Meeting the city to the needs of the local community to provide jobs and the need to travel distances to seek jobs and facilitate mobility and the use of transportation contributed to the local population and their attachment to the place. 	



VIII. RESULTS OF SUCCESSFUL INTERNATIONAL CASE STUDIES

- Previous studies have shown the variations in the implementation of urban intensification. It has been revealed that there are policies that were not used, whereas experiments have shown that there are new policies that were not found yet on the level of theoretical studies.
- Dimension of urban intensification whether the environmental, social, urban dimensions integrate to achieve sustainable urban intensification . There is a close connection between the dimensions of intensification as they are inseparable and complete one another.
- The basic goal of urban intensification differs from one experiment to another, since urban intensification was used to face the high urban density in China while it was used in Canada to stop urban expansion on agricultural land. On the other hand, urban intensification was used in Brazil to benefit from the productive job of the city.
- All previous experiments showed the extent of the flexibility of the conditions of housing construction of all responsible parties whether the Ministry of Housing, or municipalities, or urban planning bodies to serve the process of urban intensification .
- All responsible parties from the public sector and the private sector cooperate to produce an appropriate integrated product for the user.
- Activating mechanisms to overcome the problems of funding and the division the funding between the public and private sectors contributed in the success of intensification projects.
- The interaction and participation of the user was clearly evident whether in the design or implementation as in the Canadian and Brazilian experiment or in the evaluation phase in the Chinese experiment. Also, paying attention to the fears and objections of the population towards the process of intensification and find real solutions to these objections contributed in the success of urban intensification and achieving social suitability.

IX. OBSTACLES TO THE IMPLEMENTATION OF URBAN INTENSIFICATION IN EGYPT:

It can display the obstacles to implementation of urban intensification policies in the Executive reality in Egypt briefly . Thus the proposed system aims to find clear mechanisms to solve it.

- The funding crisis and lack of financial resources and their urban implications on the necessity of intensifying development of the existing construction.

- The special urban character of the distinct urban areas is considered a determinant of the process of intensification where it should be placed within studies that precede the implementation process.
- The need to take into account the avoidance of negatives which may be caused by urban intensification of visual pollution in the existing urban areas and the noise that may lead to audio pollution, as well as taking into consideration the rate of overcrowding when setting a strategy for developing the housing sector using urban intensification .
- The non-flexibility of laws and conditions of the existing regions in dealing with urban intensification in terms of Highs, road offers, and others.
- Housing studies on the approaches of solving housing problems in strategic planning to study infrastructure, road and transport networks and their capacity not comprehensive.
- Relationship of service centers and activities with urban intensification regions.

X. FRAMING THE SUSTAINABLE SYSTEM TO ACTIVATE THE POLICY OF SUSTAINABLE URBAN INTENSIFICATION:

The formulation of the system is based on two main parts: the theoretical part, which was derived from the theoretical study from the paper, which includes the requirements of sustainable housing development for each dimension of urban intensification, and then the policy of urban intensification achieved for these requirements for each dimension of urban intensification ,Therefore : the theoretical part summarizes three main axes of the system:

- 1- sustainable housing development requirements,
- 2- The dimensions of urban intensification
- 3- sustainable urban intensification policies

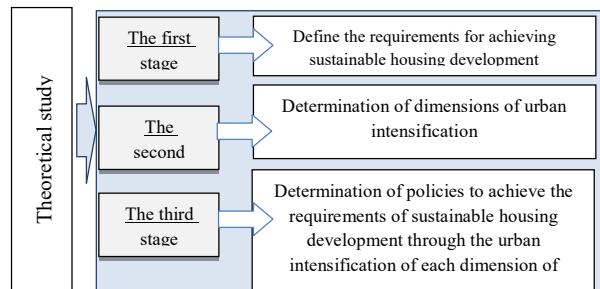


Fig.10: Methodology of formulation System , source (the author)

The analytical part of the outcomes of the successful global experiment and the extraction of a set of inputs for urban intensification policies from the identification of the tools used by a group of parties to achieve sustainable

urbanintensification mechanisms and then to derive indicators for measuring these mechanisms. The analytical part summarizes four main axes:

- 4- Identify responsible parties
- 5- Identify tools
- 6- Formulation of sustainable urban intensification mechanisms
- 7- Identify indicators for measuring sustainable urban intensification mechanisms.

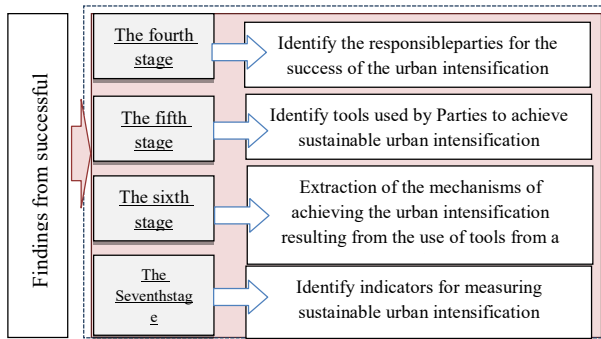


Fig.11: Methodology of formulation System , source (the author)

Thus, the first three stages of the system can be presented as constants of theoretical study in the following:

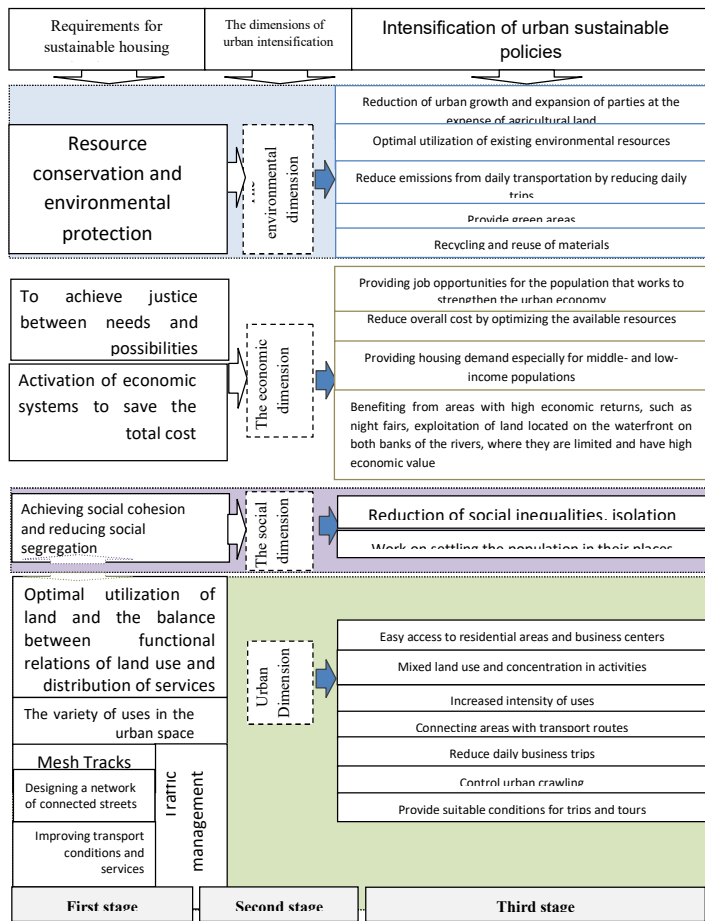


Fig.12: first three stages of sustainable system

Source : the author

Fourth phase: identify the parties:

The identification of parties phase can be divided as follows:

1. Identifying the participating parties:

They are the parties that participate in the urban intensification process (governmental bodies, local community, and non-governmental bodies, funded entities...). The participating parties should have full readiness and desire in effective and constructive cooperation. (willing to participate).

2. Identifying the mediating parties:

For a successful and fruitful cooperation between all parties and participating entities, as set of rules and laws that organize the relation among the parties concerned with urban intensification should be laid down. Setting roles and laying down rules and laws are the most important phases in the urban intensification process. In this stage, the mediating party identifies the role of each party and the type and shape of the participation expected from it especially in the recommendation and decision stage.

3. Identifying roles and coordination between the participating parties:

The mediating party identifies the significant parties in taking decision, as there are other participating parties are not authorized to take decision and its participation is defined by its role in representing a certain entity of civil society or non-governmental and nonprofit institution. While other institutions such as world institutions and governmental bodies has the right of the last decision, which necessitates that the mediating party identify the authority of each participating party and the degree of its authority in the stage of taking decision among the concerned bodies without discriminating one over the other.

The fifth stage: identifying the tools used by the parties:

Tools can be defines as the available means in the city to be used by the parties to achieve mechanisms that can be implemented for each dimension of urban intensification dimensions. The tools may share one or more dimensions and by reviewing the successful world experiments we can draw the following tools:

The environmental Dimension tools:

- National investment in local products
- Returning to the use of local construction materials
- Using local materials
- Recycling wastes
- Green spaces
- Maintaining the natural environmental resources
- Rationalizing the use of the available land
- The consumption of energy

The economic Dimensiontools:

- Attracting residents to the place
- Local investment in local products
- Exploiting the available resources
- Exploiting the productive function of the city
- Levels of public and private funding
- Studying the social structure of the population
- The immigrating population power
- Systems of managing land
- Systems of transportation

The Social Dimension tools:

- Studying the social structure and the targeted categories
- Attracting the residences to the place
- Maintaining the present traditions and customs
- Supporting the residency of the inhabitants
- The urban character and cultural heritage
- The participation of the resident in taking decisions
- Accessibility
- Means of connecting residents with the place

The urban Dimensiontools :

- Accessibility to work centers and services
- Diversity in the use of land
- Focusing in activity and supporting the various uses of land (housing- entertainment- services)
- Land ownership
- Increasing the density of uses
- Rules and Planning requirements
- Sustainable coverage coefficient
- Diversity in the use of lands
- Exploiting the empty spaces and floors

The sixth stage :Mechanisms of achieving sustainable urban intensification:

The following is a display of the mechanisms of achieving sustainable urban intensification to achieve housing development for each dimension of urban intensification after examining successful world experiments as follows:

The Environmental Dimensionmechanisms :

- 1- Better use of rare and non-renewable urban resources (facilities- services- urban facilities- marginal means of transport) and developing them quickly
- 2- Exploiting the natural environmental resources (rain- local resources- underground water)
- 3- Providing systems for recycling wastes and trash to be re-used
- 4- The reduction of power and oil consumption rates
- 5- Reducing gas emission and pollution rates
- 6- Providing green spaces out of the land space

- 7- Organizing workshops for the population to train them on building activities and agriculture to make use of the productive function of the city
- 8- Freezing the marginal growth on the agricultural land to maintain it

The Economic Dimension mechanisms:

- 9- Effective and efficient expenditure to fund the quality improvement and improve services and facilities to accepted levels and planned rates
- 10 - The maximum use of land, urbanization, services, and the current facilities and supporting them to intensify their use and exploit the available potentialities to raise densities.
- 11 Try to transfer public and private funding sources to fund urban intensification projects.
- 12 Intensify and support the productive function and services (especially business services) of the city with several activities and central services and try to maintain and protect historical regions.
- 13 Intensify the central business and services , especially in the midst of the urban
- 14 Increasing job opportunity and employment in the city
- 15 Activating and intensifying means of transport that serve the urban intensification processes to achieve integration between urban intensification and the policy of public transport.
- 16 Activating information network to follow the production and examine the extent of exploiting the productive function of the city.
- 17 Intensifying development, improving absorption power, and raising the current densities
- 18 Compatibility among the various governmental managerial levels on the level of the urban region and the local level to reconcile making decision and improve the coordination of decision process.

The Social Dimension mechanisms:

- 19 Achieving social justice especially overcoming the issue of spatial social isolation
- 20 the policy of intensification should take into consideration the character and privacy by and not to deteriorate the level of urban environment
- 21 Activating the role of the user by taking part in making decisions and taking the reasons of their objection into consideration
- 22 Activating the role of social communication and organizing workshops, and forums about the importance of agricultural production , means of irrigation and others.
- 23 Strengthening the connection between the individual and the place through participating in building

- 24 Balanced urban expansion among all social categories
- 25 Organizing interviews with the residents to write down their fears and objection
- 26 Encouraging the merge of limited income categories with middle and high categories to encourage social integration.

Urban Dimension mechanisms:

- Diversifying the housing offer and increasing the housing choice opportunities of housing units that meet all housing needs to provide a mix of housing units that suits every need.
- Strengthening and improving the urban structure
- Achieving balance and rapprochement among the basic functions (housing- work- services)
- Activating the system for the flexibility of the housing conditions for developing housing regions and service usage and entertainment standards. Also, using special regulations and conditions of each spatial dimension to achieve spatial balance of housing patterns while encouraging requirements for each category that reflect the size and density of the required development
- Improving accessibility to service centers and work centers to all the city residents.
- Reorganizing and intensifying the use of land in the deteriorated regions of the city taking into consideration the social and economic considerations.
- Limit urban expansion and marginal growth and its quick urbanization
- Activating the dealing systems with land owners and turning the land from owned into hired in turn for money or owner partnership in a process of land investment.
- Stopping the marginal growth by following the policy of buying marginal land, especially those adjacent to urban regions to be an insulating area restricting development.
- Balancing the distribution of development programs to achieve justice in job opportunities, the possibilities of employment and services in the city, and land usage standards.
- Reducing the requirements of developing housing areas and reducing the usage rates of service, entertainment especially the green and open spaces.

The seventh stage: Identifying the Measurement Indicators of sustainable Urban Intensification in each Dimension of urban Intensification

The environmental dimension	<ul style="list-style-type: none"> • The proportion of green areas • Air pollution • Percentage of domestic materials used in construction • Water consumption • Quantity of recycled waste
The economic diminution	<ul style="list-style-type: none"> • Reliance on local resources • Reliance on renewable energy resources • Degree of availability of employment through the cultivation of local productsenergy resources
theUrban Dimension	<ul style="list-style-type: none"> • intensity of housing units • Land occupancy rate • Ratio of sidewalk to the street • The proportion of biking alleyways on the street • General spaces ratios • The degree of communication of residential areas in the ground
The social dimension	<ul style="list-style-type: none"> • Safety factor in the urban environment • Degree of involvement of community members in decision-making • Degree of preservation of existing heritage

Table5: Indicators of sustainable Urban Intensification
Source: the author

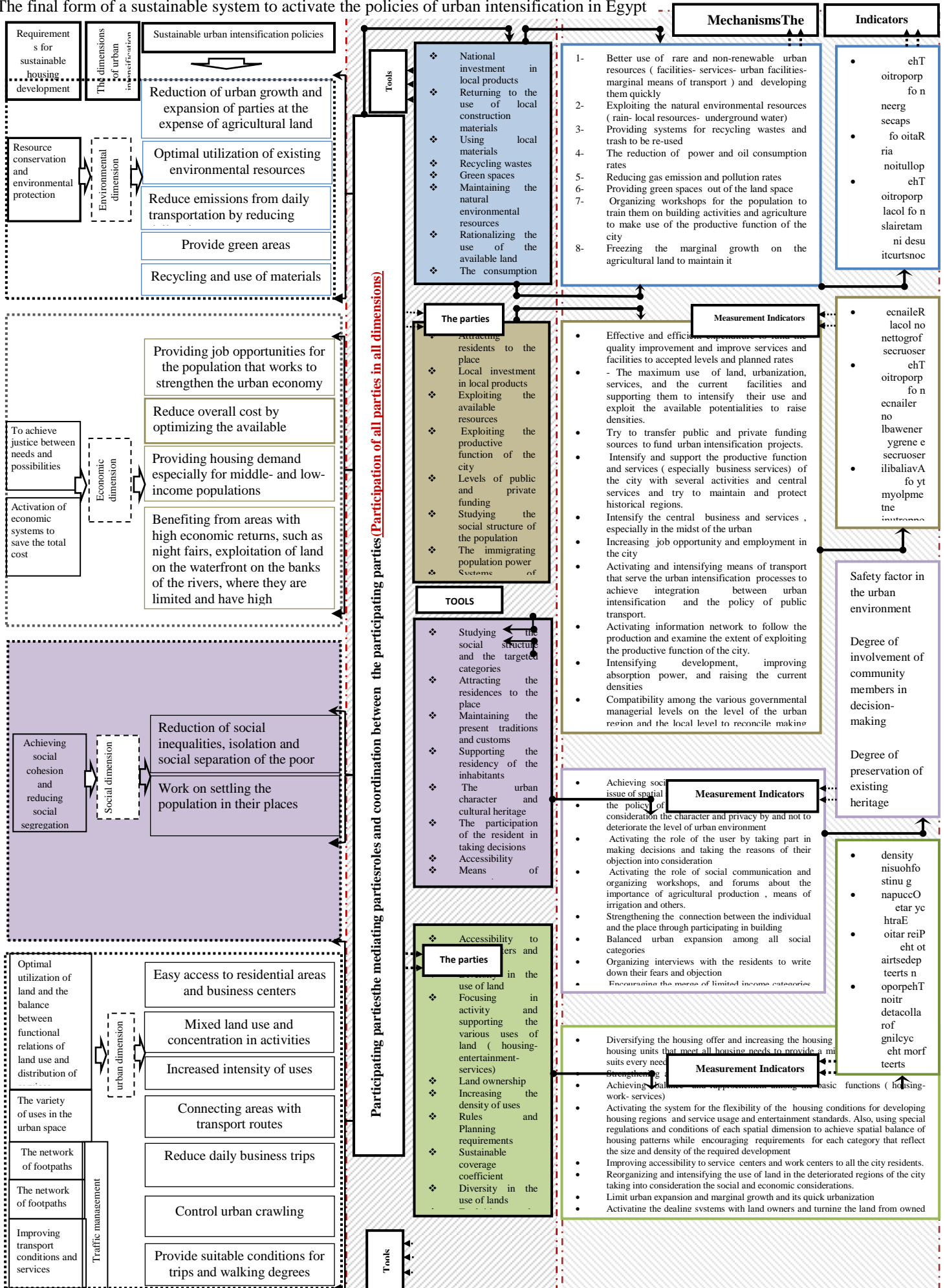
The following can be combined into the final formulation of the system by combining the outputs of the theoretical part and analysis and finding a set of mechanisms that can be followed in the existing urban communities to achieve sustainable urban intensification

Where the theoretical part which contains the requirements of residential development, the dimensions of urban intensification, the policies of achieving residential development for each dimension of urban intensification

And the analytical part, which includes the mechanisms that were derived from the successful global experiments that resulted from the use of urban intensification tools from a group of parties and the extraction of indicators of measurement of these mechanisms, The figure below shows the final shape of the sustainable system



The final form of a sustainable system to activate the policies of urban intensification in Egypt



XI. RESULTS

1. The research paper discussed the concepts of sustainable development and the axes of sustainable development which are the environmental, social, economic and urban axis.
2. The relationship between housing and sustainable development is an integrated relationship in which housing and sustainable development are linked to improving the quality of the scheme to suit all segments of society at present without affecting the ability of future generations to meet their needs.
3. The development of housing four dimensions of the social dimension, economic, environmental, urban, economic and each dimension requirements and showed the paper possible vocabulary to achieve
4. The second part of the theoretical part included urban intensification and sustainable housing development. The paper presented the views of the pioneers for each dimension of urban intensification , This explains the most important policies of sustainable urban intensification for each dimension of urban intensification.
5. The analytical part discussed three global experiments to implement sustainable urban intensification and how to achieve urban intensification policies to meet the requirements of sustainable housing development.
6. All responsible parties from the public and private sectors must cooperate to produce an integrated, user-friendly product.
7. The role of the user is very important both in the design and implementation, as well as attention to the concerns and objections of the population towards the process of intensification and to find real solutions to those objections contributed to the success of the process of urban intensification and social achievement.
8. The residential unit resulting from urban intensification should be treated as a socio-economic, environmental and urban unit with a comprehensive and integrated perspective.
9. The paper then presented the stages of formulating the proposed sustainable system using the theoretical part and the analytical part. It contains seven main stages, three stages extracted from the theoretical part, and four stages of the analytical part.
10. All parties must cooperate with the tools available to produce viable mechanisms.
11. After analyzing the successful global experiences, it became clear that the parties and tools and their unions 13.must be available to produce mechanisms for achieving sustainable urban intensification policies and then to draw indicators to measure the efficiency of these mechanisms.
12. The most important outputs of the sustainable system are to extract the mechanisms for achieving sustainable urban intensification and their measurement indicators for use in existing urban communities.
13. All parties to all dimensions of urban intensification in an integrated manner where the functions of one of the parties can not be separated in the distance from the other, but must be their cooperation to produce a successful product of urban intensification
14. Measurement indicators are indicators that measure the efficiency of urban intensification mechanisms for each dimension of urban intensification

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