



## Spontaneous Areas in Egypt and the Concept of Self-Sufficiency

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### ABSTRACT

Egypt has many urban challenges, one of them is the spontaneous growth on agricultural lands. This type of growth causes the inability of the government to fulfilling the needs of the increasing population. Therefore, it is necessary to develop a comprehensive strategy to guide the growth of those spontaneous self-constructed communities (as we redefine them in this paper) correctly to be effective communities. The objective of self-sufficiency in development shall contribute to the effectiveness of those areas through: 1) not completely relying on the state in fulfilling their resident's needs, 2) contributing to a comprehensive renaissance, and 3) facing some of urban challenges by their residents with the help of specialists and those interested. Based upon this, the aim of this paper is applying the idea of self-sufficiency in developing the spontaneous self-constructed communities in Egypt, mostly that they possess many characteristics of self-sufficiency; as being self-constructed by their residents, expanded spontaneously to solve different problems, fulfill different needs, and individuals collaborate together to deal with the everyday life's. This aim can be achieved through clarifying the concept of self-sufficiency and its importance, reviewing state's efforts to deal with the spontaneous areas on agriculture land, and analyzing of local and international experiments that applied self-sufficiency to extract some criterion. Whereby a better informed strategies for the growth of spontaneous communities can be achieved in Egypt.

**KEYWORDS:** Spontaneous growth, self-development, self-construction, self-sufficient communities, self sufficiency

### 1. INTRODUCTION

The spontaneous growth of human settlements is one of the biggest challenges that Egypt witnessed, particularly in agricultural lands, as 83% of that growth in Cairo is on agricultural lands [1]. The informal growth of self-constructed settlements should be redefined to spontaneous growth whereas; the inhabitants create and improve ways to deal with their problems spontaneously.

Shedding light on Egyptian urbanism as spontaneous instead of informal can give as a different approaches to comprehensive development strategies. This concept can build up on its assets rather than fighting it as a devastating cancer.

In this regard, this study reviews the definition of spontaneous areas as an outward spread of built-up areas caused by expansion, and their typologies within the Egyptian urban environment.

It also highlights the potentials that qualify them to be self-sufficient communities able to fulfill one's own needs without help from others.

Moreover, it explains the strategic plan for developing Al Guabin village in Damietta as an example of the state's efforts in developing the Egyptian villages. Then, comparative analyses were performed between the strategic plan of Al Guabin village and two projects that succeeded in achieving self-sufficiency:

- The first project is one of the private sector local projects, which is called Basata eco-lodge in Nuweiba in South Sinai. The comparison between this project and Al Guabin strategic plan will highlight the potentials of Egyptian spontaneous communities that can be used in achieving self-sufficiency.
- The second project is an international project called the Regen village in Almere, Holland. The comparison between this project and Al Guabin strategic plan will help in improving the Egyptian strategies of developing spontaneous areas to achieve self sufficiency.

### 2. SPONTANEOUS AREAS IN EGYPT

#### 2.1. Spontaneous Areas' Definition

Spontaneous areas are referred as an outward spread of built-up areas caused by expansion, with inadequate provision of facilities that evolves thereby moving the low-income earners to the suburbs for easy access to places of opportunity for casual work and not far away from the city at the same time [2].

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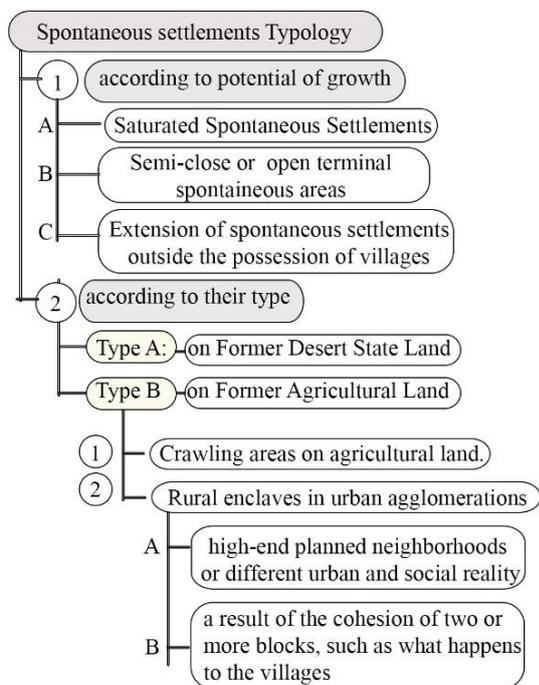
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Spontaneous areas also are defined as the spreading of a city and its suburbs over rural land at the fringe of an urban area. Self-constructed settlements are the product of culturally driven individual and communal initiatives. These settlements evolve without prescribed planning, design, or legal guidelines. They are a dynamic form of urbanization in constant transformation, rich in diverse socio-economic relationships and physical morphology.

**2.2 Typology:** the Spontaneous settlements can be classified according to their potential growth: and according to their type as shown in (figure 1 ) [2] [4].



**Figure 1: The typology of spontaneous areas by authors**

### 3. SELF-SUFFICIENCY

In the past, our forefathers lived sustainably through self-sufficiency in their daily lives, using land for agriculture as a source of food. The traditional village concept was for people to grow their crops together and cultivate their own livestock. The development of their food stocks through simple techniques and practical training on daily activities creates a character and an economic base, a society based on agriculture, natural resources and a clean environment.

Recently, with the trend toward the use of technology and its use in life, such use should be combined with awareness of the concept of self-sufficiency for the following reasons:

- Current climate change.
- Human encroachment on natural resources.
- Increase in population density
- Increasing food prices
- This leads us to live more self-sufficient and can be done through group living.

### 3.1. Definition

The definition of being self - sufficient: is being able to fulfill one's own needs without any help from others, while the term community means people living in one place, like city or district, and considered as a whole.

Being totally self-sufficient is not easy to achieve, especially in the urban areas, as compared to the rural areas because of the constraints of space for farming and rearing live stocks. However, it is a step in the right direction if like-minded people, who are concerned with environment and wish to share their skills and know-how, through networking to initiate self-sufficient living collectively. [3, 4].

### 3.2. Self-Sufficiency Features in Spontaneous Areas in Egypt:

The following are a few highlights of people's daily life.[5][١٠٠٩] .

#### • Services, markets and shops

To provide the needs of their inhabitants. Residents also appreciate the fact that goods in these shops and markets are reasonably priced and realize that they are a source of income for the residents of the area. They usually located in commercial carriers and pedestrian streets. They rarely cross narrower residential streets, and thus remain protected from strangers allow them to operate as an extension of the house.

#### • Near work places from home (walkability)

Another feature is found in self-constructed communities: work from home is another feature found in spontaneous areas. A measure of comfort has been achieved in such areas, where more than 60% of the population goes to work on foot. There are many advantages of walking to work. The environment also benefits from reducing energy consumption and pollution from transportation.

- Walking to work provides individual cash and opportunities to meet other needs and tasks on the road.
- This is a model of activity that saves time, effort, and money.

- The main characteristics of the urban pattern of self - constructed areas bearing this measure of comfort include the distribution of non-residential uses as well as the overall diversity of those uses.
- The ability to walk saves money, energy and use.

#### Transportation:

The assembly of buildings commercial streets are connected to residential streets on a large scale, the vehicle traffic routes are major factors residential streets allow cars to pass at low speed and remind us of the pedestrian areas of Europe. The mini-buses is the second most important transport link there.

#### • Community services or participatory services

Such as garbage collection, street lighting, street cleanliness, and landscape coordination in public areas. They represent relative success in residential streets that control the entrance of strangers due to their narrow and traffic conditions allowing these narrow streets to be allocated and controlled by the population. People clean up these places and keep feeling that this place owned to them.

This extended to which the population is involved in what government responsibilities should be in the main streets. These streets are very general and used by many people. They are opening on the neighboring suburbs and difficult for the inhabitants to control two home streets in one. The residential streets mentioned above allow streets to be an extension of homes (figure2), privacy and protection for children to praise street play and women that sitting in the evening to exchange news and information.



Figure 2: Streets in self -constructed areas source[5]

-This provision for proximity to the home environment serves several functions at the same time. It compensates for limited private space within the apartments, for example:

- reduce dependence on local authorities and thus provide state funds by building social ties. When neighbors learn about each other, social solidarity increases, collective initiatives become easier to understand, and natural observation and self-censorship occur.

- **Feeling safe:**

When people feel social safety, the level of crime is reduced, because the presence of people on the streets leads to more eyes. Neighborhood relationships, adherence and solidarity enjoyed within the neighborhood. These people often describe slums in popular neighborhoods in their positive sense of “live, friendly and alive around the clock. Some reasons were given for people to stick to slums. Professionals and policymakers must first admit that new cities in the way that they were planned and designed today are not viable for many people, such as these areas (fig 2). The role of government and self-help cannot be filled in problems such as lack of garbage collection. Similarly, the area of infrastructure networks is an area in which people cannot do much to help themselves [6]

- **Collective living**

Individuals collaborate together to deal with the everyday life’s challenges and to resolve common problems such as the need for shelter and the production of food. With close relation to nature and the integration of agriculture systems [7]. The main features of productive settlements are ‘proximity’, ‘collectivity’ and ‘integrated production [9,10].

We can conclude that: Self-sufficiency features also can increase the “resilience capacity” of the urban areas as it increases the knowhow about local food production of the

societies and make them capable of producing their own food in case of emergency.

Self - constructed settlements are built to meet survival needs of people. They are set on self-sufficiency principles as they arise as a series of responses of human beings to the natural conditions by altering them and using available resources in a rational way in order to survive.

Authors see these features mentioned make spontaneous areas qualified to the development using the concept of self-sufficiency, especially the spontaneous areas which have agricultural background because they have real potential for self-sufficiency.

## 4. THE EGYPTIAN'S EFFORTS IN DEVELOPING URBAN VILLAGES

We review the state’s efforts to develop the spontaneous areas on agriculture land. One of self -sufficient communities in Egypt will be shown as an experiment explaining the elements used in achieving self-sufficiency.

### 4.1. Governmental (public sector) Efforts in Developing Urban Villages

The state's strategies for dealing with spontaneous areas are : [11].

- Planning for Upgrading spontaneous Areas
- Preventing the Formation of new spontaneous areas
- Containment of spontaneous areas.
- Developing Egyptian villages

The state's strategies aim to the following: 1) develop these settlements, 2) improve the quality of life of the residents, 3) efficient use of resources, particularly agricultural land and environmental conservation and regeneration, 4) prevent the formation of new spontaneous areas which leads to the limitation of the encroachment of these areas on agricultural land, 5) containment of spontaneous areas` projects and developing Egyptian villages` projects.

In the following part we illustrate an example of state`s strategies for dealing with spontaneous area specially on agricultural land

#### 4.1.1. The National Project for Developing Egyptian Villages

Villages should absorb their increasing population which are estimated to reach five million. That is the driver for preparing general strategic plans and new boundaries for Egyptian villages and General Strategic Plans for Villages. The General Organization for Physical Planning GOPP has finished preparing General Strategic Plans for 4740 villages and adopted their final urban boundaries from year 2018 - to year 2022 (fig 4).

The project is the development of Egyptian villages urban ,socially and economically, that represent 57% of the population of the Arab Republic of Egypt through programs, including these following activities [8].

- Improving electricity and sanitation services
- Improve the quality of education and social services.

- Improving the environmental situation and dealing with solid waste.
- Upgrading youth and sports services.
- Strengthen road networks to connect villages to each other.
- Literacy for the age group 15 to 35 years
- Raising the efficiency of veterinary units and the economic level of villages's citizens .

The project is to be implemented in multiple stages. The first phase includes the implementation of the project with 78 villages in 26 governorates with 3 villages in each governorate. The priorities for implementing the infrastructure projects are drinking water, sanitation, electricity and paving roads. The project aims to raise the economic, social, urban and health level of the citizens of the most favored villages. It also aims to facilitate the provision the basic services to them.[8, 9]

#### 4.1.2. The State's Strategic Plan for Developing Al Guabin Village in Damietta

Al Guabin is a village characterized by the reeds (alghab) industry, (see Figure 3). Almost all of its residents know how to work with reeds to produce reeds sheets. Unfortunately, these sheets are usually sold at low prices to farm owners who use it in livestock pens. In 2014, the state has adopted its Containment as shown in Figure (4) and developed a strategic plan for the village development.[10]



Figure 3: AL Guabin village in Damietta by the authors (site visit )



Figure 4 : The approved boundariesAL Guabin village in Damietta 2 014 and the encroachment over it in 2020

#### Socially:

The plan includes a population study of the village and its parts until 2032. The population of the village was 4,500 until 2006 and is expected to reach about 7,156 for 2032 to examine the needs of the population and the services that can be developed or added.

#### Economically:

The plan includes a study of the economic base of the region, identifying the distinctive character associated with agriculture and the reeds (alghab) based industries that must be developed and prevented from being invulted.

#### Environmentally:

Conservation of agricultural land by Containment of the village which conserves resources, as proposed by the plan, is to cover the drain.

#### Spatially:

The plan includes an analysis of the current land use, building height ,state of building and construction systems figure (5) as shown in the following table.

Table 1: The current situation at 2014 source:[10]

Current land use		Building heights	
residential	15.21%	One story	23.8%
Agriculture	81.83%	2 stories	31.7%
		3-4 stories	44.49%
State of buildings		Construction systems	
good	23.13%	Load bearing	60.14%
Bad	8.03%	Mud bricks	.68%
medium	68.84%	Structural	39.18%

-The plan outlines the urban space boundary to limit the encroachment on agricultural land Figure (4 -5).

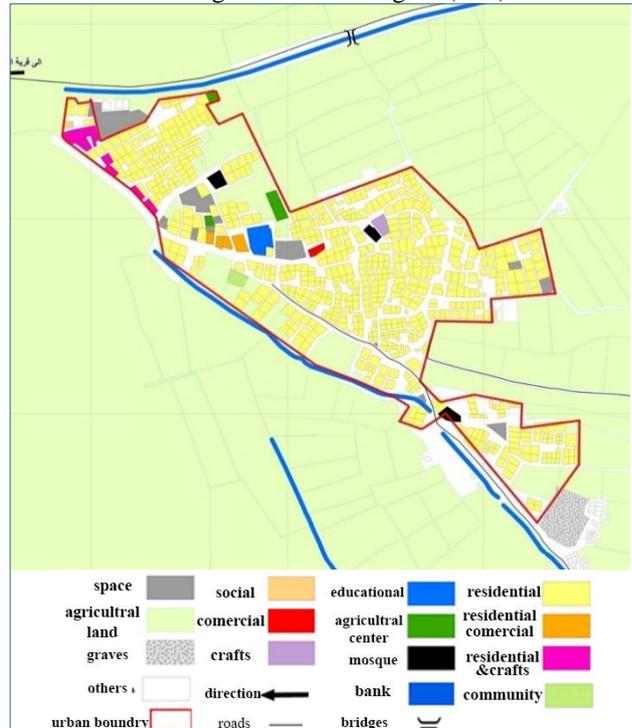
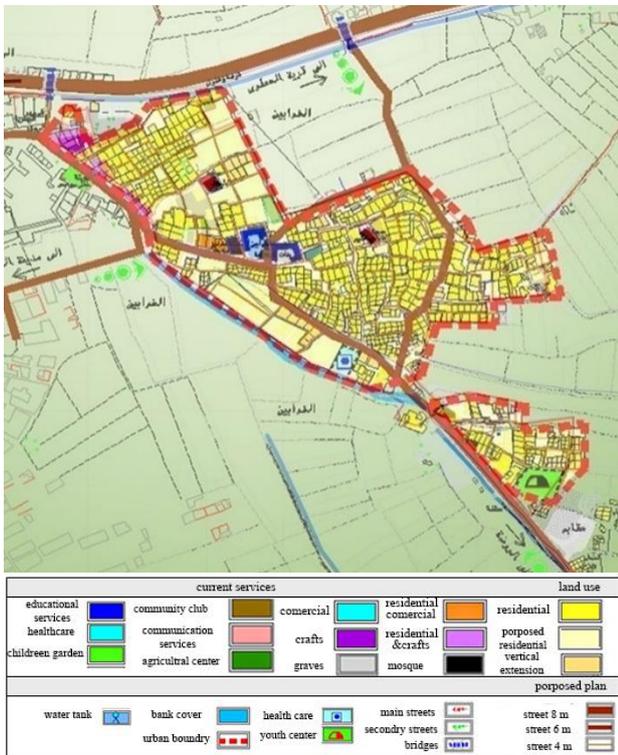


Figure 5: The urban situation in 2014 [10]

The proposed strategic plan as shown in figure (6) :

- Suggest new roads and entrances for the village

- Also it suggested added services such as health care services ,educational services ,craft area
- Suggested residential units and futuristic vertical extension.
- Development of the agricultural center to help farmers.



**Figure 6: The strategic plan of Alguabin village development**

## 4.2. Private Sector Efforts in Providing Self-Sufficient Communities in Egypt

After reviewing the state's efforts to deal with the spontaneous areas on agriculture land, one of self - sufficient communities in Egypt will be shown in this part as an experiment. It explains the elements used in achieving self-sufficiency. It is worth mentioning that, due to the lack of self - sufficient communities in Egypt, the scale of the selected experiment is much less than the scale of spontaneous areas subject of study. Thus, it will be used only in extracting the potentials of Egyptian spontaneous communities

### 4.2.1. Basata Eco-Lodge in Nuweiba in South Sinai [11, 12]

Basata is an eco-lodge for tourists' activities. It is a special self-sufficient eco-community around the main activity of tourists' units as shown in fig. (7).



**Figure 7: Basata eco-lodge in Nuweiba in South Sinai[13]**

#### Spatially:

**Mobility:** Walking and biking are the main mobility means. It is car-free community, the car parking spaces are only on the entrances of the project

**Socially :** The eco-lodge for tourists' activities supports the Bedouin local community

- The education centre provide after-school education for the local Bedouin children.

- The applied indigenous construction methods reflected the local vernacular architecture and the identity of the region.

**Economically:** There is sustainable income for the local community through their work the eco-lodges they are educated and trained to work.

- local Bedouin women are also provided the opportunity to showcase and sell their handmade accessory products to tourists, all surplus funds come from the beach are directed towards local projects

- workshops of learning centers, sharing knowledge of sustainable building desert community.

#### Environmentally:

**Emissions:** several passive strategies were applied for cooling, heating, ventilation and natural daylight. The optimal use of natural wind reduces the need for air-conditioning.

**Waste management:** organic food waste is used to feed animals grazed on site. Animal manure is used as an organic natural fertilizer for the plants and the clay soil mixture in building. All solid recyclable materials are sorted and picked by a local NGO to the solid waste transfer station in Nuweiba,

**Water management:** Grey water is used for irrigating nonedible crops, palm trees and plants.

**Energy resources:** They started gradually to replace the generators with solar panels for electricity and solar heaters for water heating.

**Food:** food production and urban agriculture are, implemented through Habiba community organic farm which help in creating a self-sustained community in terms of food production fig. (8).



Figure 8: Habiba organic farm's production [14]

**Building material:**

Residential units use local materials like reeds (Figure 7), clay, straw and natural stones to reduce the embodied carbon in the construction and also in lifetime energy usage. They had examples of rammed earth construction, buildings with straw and buildings with recycled bottles.

**Reeds construction in Basata:**

Using reeds in construction (figure 7-9) is low-cost, make the building able to be self-assembled, quick to erect and, able to achieve adequate indoor thermal.

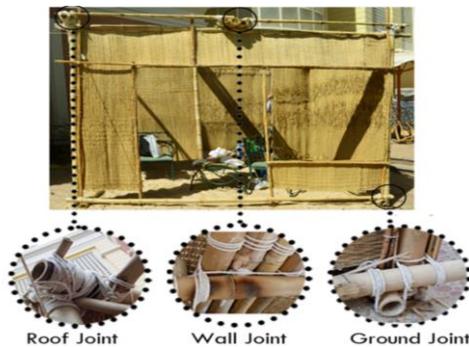


Figure 9: Reeds construction 'prototype in the learning center workshops in basata [12]

**Other solution could be added such as:**

- 1- using reedcob technology that consists on building monolithic walls with successive layers of a mix of earth and reed fibers, and reeds Figure (16) [15].
- 2- using reed- thermal insulated walls [16].
- 3- using reeds in construction with reinforced concrete, brick and stonework, bajareque (interlaced reed and straw/clay mixture ), reed framework and woven palm leaves [15].



Figure 10: Reedcob technology [15] Figure 11: Reed panels production [15]

**5. THE POTENTIALS OF EGYPTIAN SPONTANEOUS COMMUNITIES THAT CAN BE USED IN ACHIEVING SELF-SUFFICIENCY**

In this part, comparison between Basata eco-lodge and Al Guabin strategic plan will be performed to highlight the potentials of Egyptian spontaneous communities that can be used in achieving self-sufficiency as shown in the following table (2).

**Table 2: comparison between private sector (Basata) and the state's efforts (Al Guabin) in developing Egyptian villages**

	<b>Basata eco-lodge in Nuweiba in South Sinai</b>	<b>AL Guabin village in Damietta development project</b>	<b>Self- sufficiency Potentials in the development</b>
Spatially	Using bikes and walking as a main method of movement, cars are outside, there is a parking at the entrance.	Strategy suggests developing roads, that could make gradation street width, some inner streets for walking and bikes only.	1- Decrease the dependence on cars inside the village gradually. 2- Cars usage is suggested to be in main streets only, adding parking area is required
Socially	- Touristic activities, education centers workshops, near organic farms are based on local community that helps them to apply their needs. - Using local materials and construction methods reflect the community identity.	The strategy focus on services only to help people. - Residents income need to solutions to be raised through investment of their local reeds industry and agricultural activities.	- There are good social potentials to make projects based on the local industries and agricultural industries relying on local residents which support their social needs.
Economically	1- Sustainable income for the local community through their work the eco-lodges. 2- Marketing of local Bedouin women products to tourists. 3- All surplus funds come from the beach, education services and near organic farms are directed towards local projects.	-The plan aims to identifying the distinctive character associated with agriculture and the reeds (alghab) based industries that should be developed ,it need more economic solutions to raise up the economic situation .	1- There are good economic potentials such as organic farms and learning centers for organic food production 2- Reeds industries and activities investments and adding technologies are good economic potential.

Environmentally	<ul style="list-style-type: none"> <li>- The optimal use of natural wind.</li> <li>- Waste management methods organic food waste and solid recyclable materials.</li> <li>- Using Grey water is used for irrigating nonedible crops, palm trees and plants.</li> <li>- Solar panels for electricity and solar heaters for water heating.</li> <li>- Organic farms for food production</li> <li>- Using local materials like reeds clay, straw and rammed earth construction, buildings with straw and buildings with recycled bottles.</li> </ul>	<ul style="list-style-type: none"> <li>-The development strategy aims to save agricultural lands from encroachment to save food resources, but need more environmental solutions.</li> </ul>	<ul style="list-style-type: none"> <li>- Agricultural land is a good potential for food production.</li> <li>- Waste management methods could be added.</li> <li>-Using water waste for irrigation.</li> <li>-Using solar panels.</li> <li>-There is potential to use reeds and straw and rammed earth and recycling materials in construction.</li> </ul>
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## 6. INTERNATIONAL EFFORTS TO ACHIEVE SELF-EFFICIENCY

One of the globally self-sufficient societies - Eco village in Holland- and the technique used to achieve self-sufficiency will be discussed in this part [16, 17]. The regen village company is building and converting 25 houses in Almere, Netherlands into a self-sufficient community. (fig 12)



Figure 12: Eco village in Holland source [17]

### Experiment Aim:

- To develop a revived, self- sustaining community to produce organic food, clean water and renewable energy.
- To discuss the urgent need for renewable energy in the world because of the growth in population.
- To produce high-yield organic foods.
- To produce and distribute clean energy through networks and small units.
- To manage and preserve fresh water, take advantage of the surplus and turn it into a resource.
- To increase society productivity and provide products at reasonable prices.
- To reduce the burdens on the government in dynamic economic and environmental change.
- To pay attention to and improve the health of population[18]

### Experiment Analysis:

#### • Spatial dimension

#### Formation

The village is designed in a round shape:

- There are residences circularly distributed with slight heights at the outskirts (fig. 13).
- The center has basic services on which the village is based, such as energy, food and parent units (fig. 9).

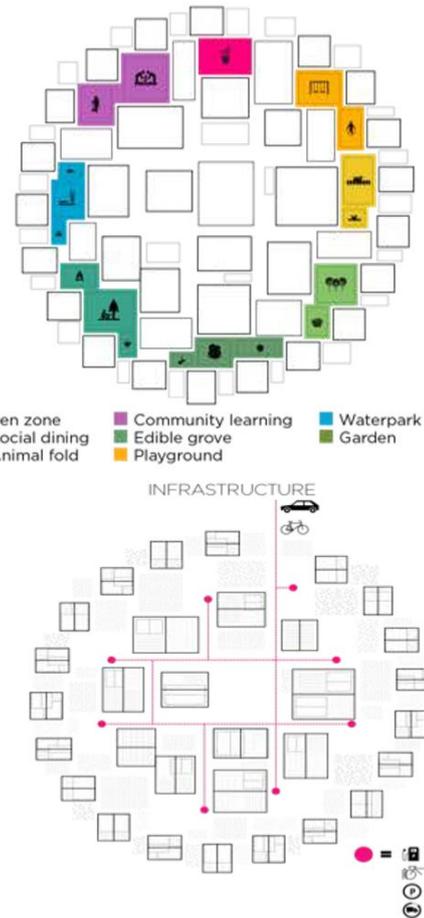


Figure 13: Mobility system source [18]

-There is circular planning of neighborhoods. And the presence of services is distributed among the internal units in the neighborhood, their integration and interconnection with social and recreational spaces.

We think that this solution fulfills properties of self - sufficiency in spontaneous areas as the proximity of services and home.

#### Functions:

- Societal uses and recreational elements, such as: community education areas, community food areas, livestock pens, the center, and edible orchards, Water Zones, Gardens, Game Zones (figs 15-17) are distributed in the area separating from the center.

- Community services and open spaces solutions are suitable for spontaneous area because the residents' life style and needs as we mentioned before.

**Mobility:** Through electric cars and bicycles (fig 13) We find Toktok and bicycles in the spontaneous areas that refer to self- sufficiency concept in these areas.

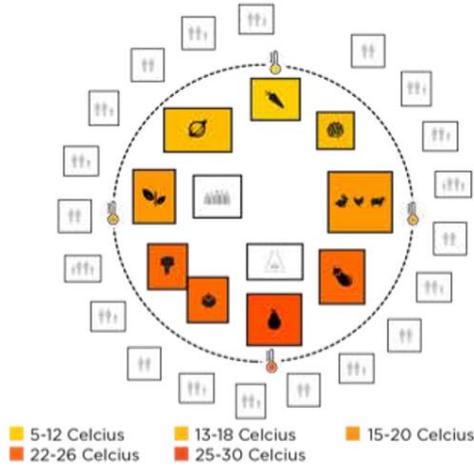


Figure 14: Climatic zones illustrated drawings source [18]



Figure 15: Formation and functions illustrated drawings source [18]

**Climate zones:**

To attain self sufficiency, Elements must be distributed in regard to climatic factors(fig 14)

This point should be considered in the development of the spontaneous areas

• **Environmental dimension**

**Energy:**

-Positive homes:

Home positivity can be measured by efficient resources, energy conservation and generation, at lower cost with less waste[18].

And we can focus on this concept in the spontaneous area development

**House characteristics:**

- Pre-made units can be removed and installed.
- Merging between external and internal spaces.

- Natural ventilation, sunlight utilization and home temperature control between summer and winter.

- Contains solar energy units and rain water collection units.

These solutions could be useful for spontaneous areas.

**Heating system (fig.(16)):**

- Geothermal bore holes.
- Geothermal heat pumps.
- Thermal batteries.
- Poly cistern tanks with heater exchanger.
- Micro grids.

It is not necessary for houses in Egypt because Egypt's climate is moderate.

**Food:**

-Food distribution of food production between units which as shown in (fig.17) include farms, Organic food production (vertical farming) (fig. 19).

-Aquatic ecosystem (fig. 18).

Authors see that it is very important for spontaneous areas to plan for food production, to be productive and self - sufficient community, so we can use this concept in the development.



Figure 16 Heating system source [18]

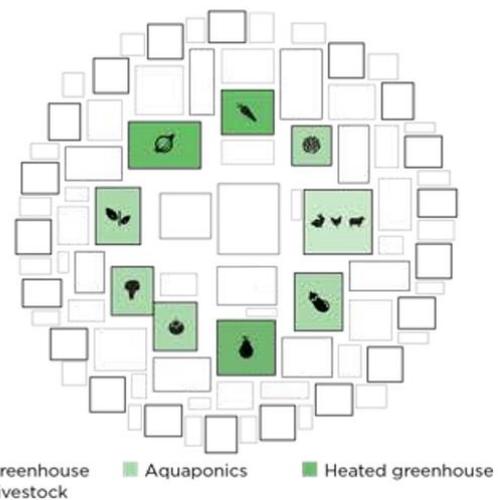


Figure 17: Food production utilities distribution [18]

**Water system:**

- Anaerobic digestion process (fig. 20)
  - Hydroponic living machine water (fig 21)
  - water recycling techniques
- Author see that this may help in agricultural land development by usage of recycled water in irrigation



Figure18: Aquatic ecosystem, source [18]



Figure 19: vertical farming, source [18]



Figure 20: Anaerobic digestion process source [18]

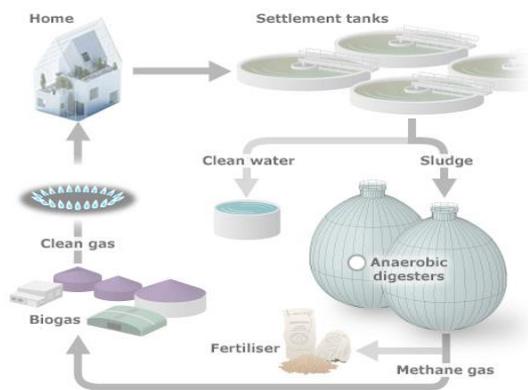


Figure 21 Hydroponic living machine water source [18]

**• Social dimension**

Community participate to provide basic services such as food, social spaces ,gardens and energy figure (22-23).This is in line with the Egyptian society’s perception of its solidarity

**• Economical dimension**

These technologies combine renewable and clean energy, energy storage, organic food production, water management and waste recycling.

That could be useful to be added to state` strategies.

**Experiment results**

- Development of 25 houses in Almere and the formation of a self-sufficient community (Fig 23). Redefining housing projects into integrated and flexible neighborhoods that provide energy, food, waste management and depend on themselves.

- Dealing with expected population growth and limited resources.

- A model for a self-sufficient society that contains positive houses, renewable energy, a water management system, waste transfer systems to resources, and closing the department, which leads to reducing the burden on the government. Which we see that state’s strategies lacking for.

- Improving resource utilization to achieve community self-sufficiency.

- the population do not need to leave much outside the village to apply their need within it , availability of social activities support the solidarity of the community and their Satisfaction.

-Increase income as a result of participation in production and provision of electricity for their use of tools of self - sufficiency such as renewable energy.



Figure 22: Regen village experiment of on developing 25 houses in Almere source [15]

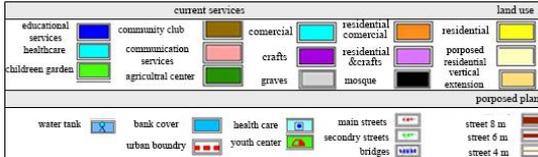


Figure 23: Regen village experiment of on developing 25 houses in Almere source [15]

## 7. COMPARATIVE ANALYSIS OF THE TWO EXPERIMENTS

A comparison between Eco village development as a self-sufficient community and Al Guabin strategic plan will be performed to help in improving the Egyptian strategies of developing spontaneous areas to achieve self sufficiency.(table 3)

**Table 3: Comparison between international experiment (holland) and states efforts (Al Guabin) in developing village**

	The regen village experiment of on developing 25 houses in Almere, Holland	The development of AL Guabin village in Damietta project ,Egypt
	 <p>The figure shows the site of the regen village in Almere, Holland source [18]</p>  <p>The figure shows the regen village experiment of on developing 25 houses in Almere, Holland source [18]</p>	  <p>The figure shows the state's strategic plan of Alguabin village development source : [10]</p>
Selection reasons	<p>1-Participation and interaction of people to improve the quality of life, protect nature, and achieve self -sufficiency.</p> <p>2-Increasing society productivity and providing products at reasonable prices which could be useful for local experiment development.</p> <p>3-Reducing the burdens on the government in dynamic economic and environmental change.</p> <p>4-The experiment produce several methods to achieve self- sufficiency that we can select from them to apply in Egypt.</p> <p>5-The characteristics of daily social life are similar to the local experience.</p>	<p>1- The desire to preserve and invest agricultural land from violation.</p> <p>2-The desire to strengthen the economy of villages based on the distinctive character threatened with extinction.</p> <p>3- Daily life features of village that support applying the concept of self -sufficiency.</p> <p>4- The readiness and the need of the population to accept improvement of their lives.</p>
Experiment results	<p>Development of 25 houses in Almere and the formation of a self-sufficient community as a model for a self-sufficient integrated and flexible society. This society contains positive houses, renewable energy, water management system and waste transfer systems to resources which leads to reducing the burden on the government as shown in the figure above.</p>	<p>1-The strategy propose development of roads of the village and current services according to people`s need.</p> <p>2- The strategy propose added services to develop the village as shown in the figure above.</p> <p>3- Helping people to improve their life through the projects added.</p> <p>4-analysis of current situation land use ,building heights ,state of building and construction systems Which help the development process.</p>
Experiment advantages	<p><b>Socially:</b></p> <p>1- People participation in the development process.</p> <p>2- Community activities support the solidarity of people.</p>	<p><b>Socially:</b></p> <p>-The population feels that they are not neglected by the state and that they want to rise up.</p> <p>-The added community services such as youth center child garden and others, support the solidarity of people.</p>

Continued

	<b>The regen village experiment of on developing 25 houses in Almere, Holland</b>	<b>The development project of AL Guabin village in Damietta, Egypt</b>
Experiment advantages	<b>Environmentally:</b> 1- An integrated, flexible and self-sufficient neighborhood deals with the expected population increase and lack of resources by applying the concept of eco village. 2- Maximizing the benefit from agriculture and producing the necessary food for self-sufficiency in food. 3- Clean energy production and good distribution. 4- Managing water and benefiting from the surplus.	<b>Environmentally:</b> -Preserving agricultural land from encroachment and conserving resources.
	<b>Spatially:</b> 1- Good distribution of services while supporting self-sufficiency. 2- Increasing productivity and reducing the burden on the government.	<b>Spatially:</b> 1- Good analysis of the village, population conditions and needs as a starting point for development. 2- good plan for services distribution.
	<b>Economically:</b> 1- Systems interdependence, integration and introduction of the technological aspect. 2- Intelligent transportation system, use of electric cars and grades. 3- Using modern construction methods and prefabricated buildings. 4- Improving resource utilization to achieve community sustainability and self-sufficiency.	<b>Economically:</b> The development engine for the development of the village is the upgrading of the craft, the jungle industry and agriculture industry, which leads to a qualitative improvement in the economic situation of the population.
	<b>Management:</b> 1-It consists of a mother board through a flexible and renewable infrastructure that adapts to the geographical area and the different climatic conditions around the world. 2- It includes sensors linked to current data collected to translate it to permanent and frequent development of technical decisions.	<b>Management:</b> 1- The developing process is managed by the government.
Experiment Disadvantages	1-The lack of information on the cost of the technologies required achieving self-sufficiency. Traditional means are adequate, but enough financial support is required for them to be implemented. 2- Unlike clusters that are the largest in the number of units, each unit contributes to or part of a product, the small number of units will bring pressure on society in its full self-sufficiency. 3- Future unit extension is not observed. Services centralization will not accommodate future new units, and replacements need to be provided for that.	-It is a respected effort by the relevant authorities but lacks comprehensive development that covers the maximum utilization and investment of resources and good marketing for its production. - The strategy failed to provide environmental solutions to benefit from renewable energies. -The strategy did not provide planning for food production and agricultural land use -The strategy did not offer solutions for investing crafts, attracting people to visit the village or buying products. -The strategy did not provide solutions for its use of water waste, agricultural residues or the waste of buildings.

The previous comparison shows that in the development of Al Guaben village, the Egyptian strategy provides it with the basic services and roads that are essential that is based on the current situation analysis. To be effective, it is only a step in a comprehensive strategy that should include the economic and environmental dimensions and solutions. The regen village experiment should decrease reliance on the state.

## 8. RESULTS AND RECOMMENDATIONS:

Improving of—ALGuabin village strategy by taking advantage of both the local and the international experiences –indicated that:

The development of environmental and economic solutions with the participation of citizens using the self-sufficiency tools is a must through:

### **Spatial dimension:**

**Function:** To make a good service and activities distribution plan such as:

-community education areas - community food areas - livestock pens - and edible orchards -  
-Water Zones - Gardens - Game Zones and Aesthetic Items by the specialists, youth and the community as needed with urban fabric for the village.

**Mobility:** Study of providing an adequate infrastructure for the bicycles to maximize the access to homes to reduce the reliance on the vehicles which cause low-energy-consuming.

### **Environmental dimension:**

**Energy:** Develop the design of the proposal and adding micro grids that produce safe, reliable, and affordable energy for entire communities, commercial and industrial facilities. Moreover, government invest it in agricultural lands, producing organic food, clean water and renewable energy.

-good orientation of new units and services to raise the natural ventilation and sunlight utilization and reduce energy and emissions.

**Material:** using local materials like reeds, straw, rammed earth and recycling materials in construction.

#### **Food:**

-Using Organic food production methods such as green roofs, eco farms and Vertical farming systems.

-Establishment of food production units which plan for maximizing the benefit from agriculture production and good distribution of crops to raise the productivity.

**Water:** Develop the proposal, a water cycle system, the utilization of rain water, and minimize water consumption.

**Waste:** Develop the proposal and make waste system with collection units and recycling activities to be integrated with food, energy and water systems.

**Management:** Effective resource management, services, production and consumption, and surplus management, using technology to optimize their benefit.

### **Economical dimension:**

1- Using low cost technology necessary to achieve self-sufficiency that can be provided by encouraging private sector investment.

2-. Since product energy and food can be exported to other countries, the amount of investment and benefit can be compensated.

3- Increasing productivity and reducing the burden on the government:

- The community provides the organization of workshops for the development and construction of sustainable construction methods based on local materials.

- Developing (Ghab) reeds products market near to the entrance of the village.

- Establishment of economic unit which help farmers and craft people to raise their income, develop themselves and export village products to other communities.

4- Over the production of a self-constructed community, there is a surplus that can be shared with other communities, and produced for them. In order to generate a material return which provides other services and goods which cannot be manufactured by community itself.

5-learning center is suggested that could organize events and workshops to share knowledge with others and to have economic profits.

6-Providing sustainable employment opportunities through self-sufficiency actions and activities

7-Continuous study to try to reduce the costs of technologies necessary to achieve self-sufficiency, especially in energy.

### **Social dimension:**

- Community and recreational spaces between units such as community education areas and community food areas which Strengthen community cohesion, community halls and community gardens that keep mental and physical health.

- Participation and interaction of people to improve the quality of life, protect nature and achieve productivity and self -sufficiency.

-Ensure the identity of the village by the development of the main craft and using it in construction.

-New added projects and workshops could help the residents to apply their needs.

### **The expected benefits:**

1-The opportunity to repeat this experiment for multiple villages that achieve integration, interconnectedness and achieving self -sufficiency gradually.

2- The maximizing of community resources which leads to reduce the burden on the government.

3- The opportunity of Exporting food products, products of workshops and energy to other compounds which make profits to the communities.

4- The sustainability of development process, that could change residents' life and provide them with jobs.

5- Identifying the distinctive character associated with agriculture and the reeds (ghab) based industries using new projects and investments.

6- The developed experiment that could achieve the self-sufficiency starting with 60% and gradually to be full self-sufficient if applied to more than one compound and integrated between them.

7- We can repeat the developed experiment and apply it to many spontaneous areas in Egypt that could make economic, social, environmental and urban general rise.

## **9. CONCLUSION**

Spontaneous growth makes the inhabitants create and improve ways to deal with their problems spontaneously. Spontaneous areas, especially those grow on agricultural land which have several types, are a dynamic form of urbanization in constant transformation. These are rich in diverse socio-economic relationships, physical morphology and have some self- sufficient communities` features. Also these areas have self-sufficiency potentials to be developed as we indicate in this paper.

In this paper, an indication of the State's efforts to develop the Egyptian villages was the strategic plan for the development of the village of Al Guabin in Damietta. Comparative analyzes were then performed between Al Guabin's development plan and two projects which were able to achieve self-sufficiency.:

- The first project is one of the private sector local projects called Basata eco ledge. The comparison highlighted the potential of the spontaneous Egyptian communities to achieve self-sufficiency.
- The second project is an international project called the Regen village in Almere, Holland. The comparison illustrated. The elements used in achieving self-sufficiency to improve the Egyptian strategies of developing spontaneous areas.

#### **We can conclude**

1- The Egyptian strategy in developing villages provides it with the basic services and roads based on current situation analysis. However, it is a step in a comprehensive plan which should include economic dimension and environmental dimension solutions to be effective.—It should reduce dependence on the state as in the regen village experiment.

2- Taking advantage of both the local and the international experiences improved ALGuabin village strategy. Through indicating that: producing environmental and economic strategies to build a plan with the involvement of citizens using self-sufficiency resources is a must through four dimensions (spatial, environmental, social and economic).

3-We present some recommendations to develop the strategy with the concept of self-sufficiency:

-Where the spatial dimension could be realized with the good distribution and linking for the services, recourses, housing and each other through targeting formation of community, mobility, Infrastructure and functions.

-The environmental dimension could be realized through targeting these categories energy, emissions, waste, water, food and the management system.

-The socio-cultural dimension could be realized through targeting the identity, needs of people and participation.

-And the economical dimension could be realized through targeting the economic base, productivity, marketing, employment, alternative transfer, the integrated systems and through the concept of circular economy.

4-This criteria could be a step of strategy that could guide the growth of spontaneous communities with the concept of self-sufficiency.

#### **CREDIT AUTHORSHIP CONTRIBUTION STATEMENT**

**Hager M. Elkhodary:** conceptualization, methodology, analysis, writing. **Heba A. Hussein:** supervision, conceptualization, methodology, review, editing. **Medhat A. Samra:** supervision, conceptualization, methodology, review, editing. **Ashraf A. Elmokadem:** supervision, conceptualization, methodology.

#### **DECLARATION OF COMPETING INTEREST**

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

#### **REFERENCES**

- [1] N. Nafeh, "[in]formal Pattern Language ", Architecture the University of Waterloo, 2015.
- [2] D. Sims, "Residential Informality in Greater Cairo: Typologies, Representative Areas, Quantification, Valuation and Causal Factors ".
- [3] M. M. D. Harlina Mohamad Ali, Muhamad Shamin Sahrum "Self-Sufficient Community through the Concepts of Collective Living and Universal Housing," *Procedia - Social and Behavioral Sciences* vol. 68, 2012.
- [4] S. Z. Mayra López , Ilkim Er ,Seda Tugutlu , Mohit Chaugule , Çağlar Gökbulut , Chiara Dall’Olio , Chenghuai Zhou , Rahul Pudale "SELF-SUFFICIENT NEIGHBORHOOD PROTOTYPE," IAAC, 2016.
- [5] M. F. Regina Kipper, "Cairo’s Informal Areas Between Urban Challenges and Hidden Potentials " *Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH*, 2009.
- [6] C. f. S. Development, "Egypt’s Strategy for Dealing with Slums," 2014.
- [7] S. M. Letizia Dipasquale, Bilge Özel "Productive settlements," *DIDA University of Florence*.
- [8] *ministry of local development* vol. projects, 2018.
- [9] gopp, "the national urban development framework," 2014.
- [10] GOPP, " مشروع إعداد المخططات التفصيلية لقري الجمهورية- المخطط الاستراتيجي لقرية الغوايين بدمياط " ٢٠١٤
- [11] M. Dabaieh, D. Maguid, and D. El Mahdy, "Towards Adaptive Design Strategies for Zero-Carbon Eco-Cities in Egypt," in *Sustainable Cities-Authenticity, Ambition and Dream*, ed: IntechOpen, 2018.
- [12] M. Dabaieh, D. El Mahdy, and D. Maguid, "Living labs as a pedagogical teaching tool for green building design and construction in hot arid regions," *Archnet-IJAR: International Journal of Architectural Research; 1*, vol. 12, 2018.
- [13] <http://discoversinai.net/>.
- [14] <https://www.habibacommunity.com>.
- [15] P. Carneiro, A. Jerónimo, V. Silva, F. Cartaxo, and P. Faria, "Improving building technologies with a sustainable strategy," *Procedia-Social and Behavioral Sciences*, vol. 216, pp. 829-840, 2016.
- [16] M. Miljan, M. Miljan, J. Miljan, K. Akermann, and K. Karja, "Thermal transmittance of reed-insulated walls in a purpose-built test house," *Mires and Peat*, vol. 13, pp. 1-12, 2014.
- [17] J. Ehrlich, "The “Tesla of Ecovillages”," 2016.
- [18] P. L. L. C. Ford, "The “Tesla of Ecovillages,Tech-Integrated and Regenerative Neighborhood Development," *UN Sustainability Platform brief*, 2016.