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Sustainable Rural Urbanism Development in Egypt
التنمية الريفية العمرانية المستدامة فى مصر

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الملخص

العمران المستدام – المدن وحدها مستدامة نظرا لأنها "مجتمعات قابلة للسير على المقياس الانسانى، مع الطابع المحلي والإحساس بالهوية، التي تنص على التوازن الاجتماعي وإظهار احترام البيئة". يتساءل البحث عن ماهية هي العمليات التي من خلالها قد تصبح المجتمعات (الريفية) أكثر استدامة، وأفضل طريقة يمكن للدولة وغيرهم تعزيز ودعم هذه المسار؟. هناك موضوعات تكتشف وقد تشمل الصراع والطاقة والأيديولوجية، والعمليات التداولية، والحكم، ودور الحكومة .

ويحاول ابحث أن يقترح نهج متكامل لاستخدام العملي لعمليات التنمية الريفية "**RUD**"، مع الاسترشاد برؤى قومية لمستقبل المجتمعات الريفية المرتقبة في مصر. ويعرض كذلك قاعدة البيانات الرئيسية المطلوبة لوضع تصور توجيهي لاستخدام المجتمعات الريفية في المجتمعات الجديدة في المستقبل.

ويستعرض البحث ما تم في احد الامثلة " **Wellington Neighborhood**" من استخدام لمفردات الاستدامة وتحقيقها بالطرق المناسبة للبيئة هناك. ويدرس ايضا ما تم فى قرية البسايسة من تطبيق لآليات التنمية المستدامة للوصول الى آليات وتوصيات لتطبيقها على القرى المصرية.

Abstract:

Sustainable Urbanism - only cities are sustainable since they are “walk able communities on a human scale, with local character and a sense of identity, which provide for social balance and show respect for the environment.” What are the processes through which (rural) communities may become more sustainable, and how best the state can and others promote and support this: Particular themes to be explored might include conflict, power, ideology, deliberative processes, governance and the role of government?

The research suggests an integrated approach to practical utilization of RUD guided with the national visions of the future of prospected rural communities in Egypt. It further presents the main database required to Conceptualize a guideline to the utilization of rural communities in new future communities.

The paper aims to study the potential ways on models of neighborhood environmentally "Wellington Neighborhood" and what has been used from sustainable element and the ways to achieve the appropriate environment there.

And also reviewed what has been applied in the village of Al Basaisa of the mechanisms of sustainable development to get to the recommendations of the mechanisms to be applied to the Egyptian villages.

Keywords

Sustainable Elements, Urbanism, Rural Urbanism Development (RUD).

Introduction

TO DATE, most development theory and practice have focused on either “urban” or “rural” issues with little consideration of the interrelations between the two. By contrast,several empirical studies show that the linkages between urban centres and the countryside, including movement of people,

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goods, capital and other social transactions, play an important role in processes of rural and urban change. Within the economic sphere, many urban enterprises rely on demand from rural consumers.. In addition, a large number of households in both urban and rural areas rely on the combination of agricultural and non-agricultural income sources for their livelihoods. This paper reviews some of the recent literature on rural urban interactions, with particular attention to the ways in which they have been affected by recent and current economic, social and cultural transformations. The paper is organized as follows:
the first three sections discuss definitions of rural and urban areas and activities, review conceptual frameworks and consider how rural-urban interactions are conceptualized
within development planning. The last four sections review empirical studies on different flows connecting rural and urban areas (flows of people, of goods and of wastes), and on sectoral interactions (agriculture in the cities, non-agricultural employment in the countryside and rural-urban interlinkages in peri-urban areas.[1]

Amis of study

This study aims at approaching the following:

- Discussion, analysis, and development the concepts for the Egyptian villages and creation of new urban communities.
- Emphasizing the role of sustainable element, handling the implementation of self-sufficient/productive villages.
- Proposing some urban and architectural design guidelines for discussion, debate, and further input.

Methodology

This paper is determined to study the major potential approaches for developing the Egyptian villages. In collaborative effort with authors two and three, this study mainly stems from theoretical studies carried out by the first author through his Masters Thesis in progress, conducted academic research. Through all these contributions, in urban development have been mainly focused, and major international experiments studied to draw out practical criteria to pave the way for the Egyptian villages to be home to new communities and future generations.

Sustainability: urban vs. rural

In face of the changing world, the shift towards a sustainable society is viewed as a critical means to preserve and protect our deteriorating environment.
While significant efforts and many changes have been introduced both locally and internationally in public policies to ensure the transition to “green” economy, they remain insufficient to achieve this goal. Existing studies suggest that solution to the problem cannot be resolved by looking at a macroscopic scale, but rather by looking at small details, such as lifestyle.
However, the growing attractiveness of cities to people has led to overpopulation while intensive industrialization has resulted to environmental problems. At present, cities are actually blamed for majority of the world’s pollution. [2]

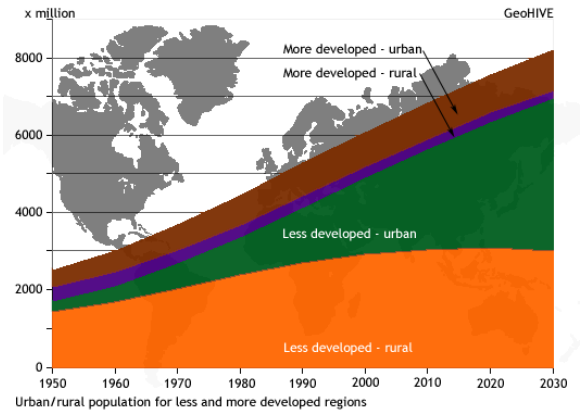
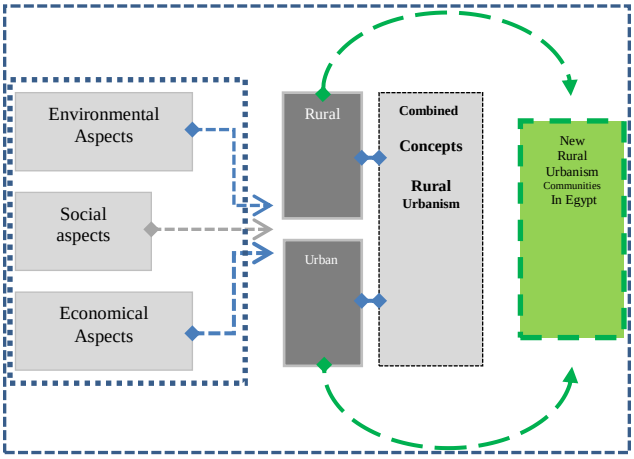


Figure 1
Urban/ rural population for less and more developed regions.

To put things in perspective, cities consume more than two-thirds of the world’s energy and account for over 70 percent of global carbon dioxide emissions, according to figures from

the C40, a global network of cities across the world**.** [3]



Increasingly we want to preserve the natural world around us, for reasons range from the purely sentimental, to strictly economic or even biological- struggling to preserve our places, values, and lives. Most of us forgot that these exploitative forces were an intention that was organized here from the start. To be saved is an illusion – nothing can completely escape the by- products, side effects, stimuli, and response of modernity and our consumptive habits. [2]

Formulating a sustainable system

Sustainability is an idea that absorbs our genuine hope to create cultures and places with enough integrity to persist for our grandchildren and beyond. It rests on three pillars:

i) Economic conditions and processes, such as production, employment, income, wealth, markets, trade and the technologies that facilitate all of these.

ii) Social conditions and processes, such as national and personal security, liberty, justice, education, health care and other aspects of civil society and culture.

iii) Environmental conditions and processes, including our planet's air, water, soils, mineral resources and biota, and all the natural and anthropogenic processes that affect them. [4]

These three dimensions each one separately is considered to be the traditional measures of communities. The number is used to show progress: "unemployment rose 0.4 percent in January, "or" the economy grew 2% last year." However, the traditional numbers only show changes in one part of community without showing the many links between the community's economy, society and environment. It is as if a community was made of three parts –an economic part, asocial part and an environmental part that do not overlap like in fig.2. [5]

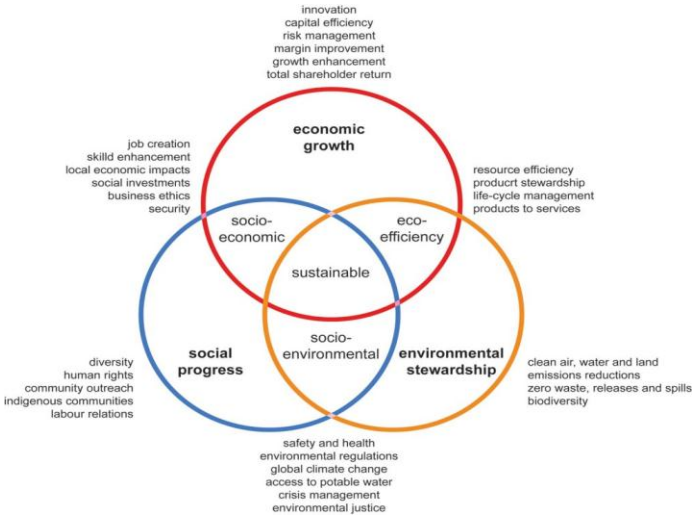


FIGURE 2
The three spheres of sustainability

Principles of resource management

A resource is a source of raw materials used by society. These materials include all types of matter and energy that are used to build and run the society. Minerals, trees, soil, water, coal and all other naturally occurring materials are resources. Types of Resource depletion spread widely in our natural environment**.** [6]

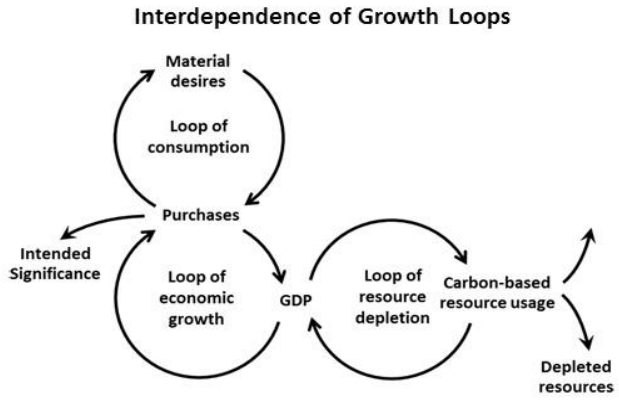


FIGURE 3
Interdependence of Growth Loops.

Resources could be further classified in to two types:

- Renewable resources

These can be replaced within, a few, human generations.

- Non-renewable resources

Non-renewable resources cannot be replaced within a few human generations.

Proper resource management is based on the recognition that less resource use can lead to long-term economic benefits and reduced environmental costs. There are three basic options that resource management can apply to minimize resource use and they are summarized as follows:

i) Preservation

Preservation refers to nonuse. For example, preservation of a national park or a wilderness area as an ecosystem that is set aside and protected.

ii) Restoration

Restoration seeks to return a degraded resource to its original state. For example attempts are being made to redirect the "Kissimmee River of Florida into the original path that is followed before it was altered by human.

iii) Conservation

Conservation could be achieved by lowering resource use. The advantages of conservation are as follow:

1) Slow depletion of resource.

2) Reduces pollution by showing the flow of matter and energy.

3) Saves money. [7]

Pollution control

Natural pollution is as old as earth. Ancient volcanoes, for instance, spewed vast amounts of eases into the atmosphere. Many of these gases affected the global climate. Nor are humans the only animals that pollute. Pollution generally refers to excess outputs by society into the environment. [8]

Changing our perception by Sustainable Ethics

The principles of sustainable ethics may include the following issues:

- The earth has a, limited supply of resources.
- Humans are a part of nature, subject to its laws.
- Our future depends on creating and maintaining a healthy, well-functioning global ecosystem.

From here we can conclude that managing the natural environment involves an integrated solution of the three legged stool of sustainability as mentioned before. [9]

Operation and maintenance process

The use and operation of the building may affect and have a great impact in the environment because of the energy and recourses imported for their operation when in use (electricity- gas – water) and the waste product (water – garbage) exported from them. By economy of resources and sustainable design method illustrated above: sustainable operation of buildings might be achieved. [10]

a. Micro-Financed Straw Houses **b. Recycled Plastic Bottle House Built in Nigeria**

FIGURE 4
Eco Friendly Homes Built with Recycled Material

Example for a sustainable neighborhood

Wellington Neighborhood development in Breckenridge. Colorado is considered an example for a sustainable neighborhood development; the project profile is as follows:

- Residential project includes 122 units. 98 affordable units, 24 market rate units.
- Net density (Residential area): 5 units per acre. Parking: 2 spaces per unit.
- Developer David O'Neil. Wellington neighborhood. LLC.

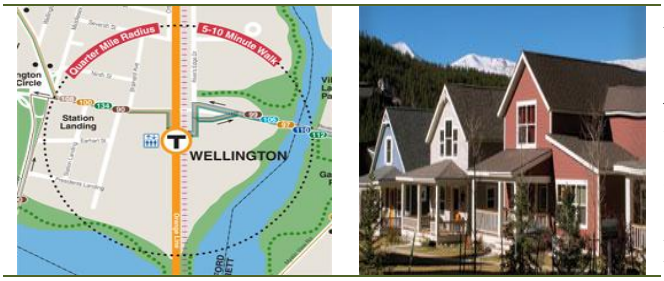


FIGURE5
Wellington Neighborhood in Breckenridge/ Attached single family housing.

In 1997: the 85-acre site stood unused. Seventy years of mining activity had left huge piles of basketball-sized dredge rock. Meanwhile, Breckenridge faced .a severe shortage of housing. Forcing many of the town's permanent employees to seek housing 50 miles away from town and endure 45-minute or longer commutes. Many sustainable features appear in Wellington neighborhood which is summarized as follows:

i) Short distance in town center

The Wellington Neighborhood is a residential development in the Colorado resort community 1.3 miles east of downtown. This new development has made housing available to people who are essential employees in any town.

ii) Afford housing units

The Wellington Neighborhood is a 122 unit, multi-phase residential development on 23-acre of the 85-acer site. The first phase consists of single-family homes; succession phases will include attached housing live/ work. The remaining 24 units are sold at market rate prices and targeted toward second-home owners. Forty acres of the site are slated for additional development, and the remainder will become open space

iii) Walkability

Residents will have a number transportation choice. The offices, shops and nightlife downtown are within a 15-to 20 minute walk or a short shuttle and bus ride.

iv) Social interaction

Homes are located on narrow lots, close to the street edge. Ranging in size from 1.200 to1.800 square feet the homes blend into the -character of the community.

v) Streetscape feature

Porches, gables and fretwork, and their one-and- a half story structure echo the scale and character of historic Breckenridge, Garages are located to the rear of lots, and adjacent to alleys they have front which provide access for emergency services and trash removal.

vi) Open spaces

Public greens shared open spaces are located within the clusters of housing to provide a safe and appealing for play.

vii) Livable community

Because of its mix of housing types, Wellington has given the community an active where people can get to know their neighbors. [11]

Evaluation The Local level

This level of evaluation is considered to be our main study scope Sustainable at the local level will require cooperation between various levels of Government resource managers, the business sector, community groups and all citizens. Their collective and individual contributions are essential in achieving a common purpose. Improving the Sustainability at the local level will not only benefit their inhabitants, but also significantly contribute to improving the wellbeing of people around the world.

There are many issues that must be sustained in order to achieve sustainability at the local level: some of them are categorized below as an example as follows (their classifications and categories might differ from one community to another according to its needs):

- Education.
- Environment.
- Government.
- Agriculture and Natural Resources.
- Business.
- Economy and Individuals. [12]

Evaluation the National Level

Sustainability at the national level could be analyzed by discussing the current situation of Egypt in the context of sustainability. A brief summary for certain aspects are discussed below as follows:

i) Unemployment and labor force

Unemployment trends are going towards sustainability but efforts should be made to increase work opportunities to the skilled and well-trained labor force especially in agriculture and industry.

ii) Energy consumption

All energy consumption patterns are unsustainable. Next to that, the amount of renewable energy constitutes only 0.089 of the total energy consumption (Energy Information, Administration (EIA).

iii) Education and literacy

The educational trends are-going unsustainable especially at the preparatory level. Number of preparatory repeaters, pupil/teacher ratio and class density are increasing. Also the number of until school buildings is increasing dramatically.

iv) Natural resources

The trends of agricultural land resources (cultivated, irrigated and crop) are sustainable. On the other hand, although total water resources are constant and tend to be sustainable, the amount of water loss by evaporation, and discharge into the sea should be eliminated.

v) Health and public utilities

Most of the health and public utilities trends in Egypt are sustainable. Only efforts should be exerted to increase prenatal care. Children immunization and access to health service in rural areas and piped water and sanitation connections.

vi) Economic aspects

The trends of the industrial product, the private consumption, the gross domestic savings, the annual growth rate per capita and the budget surplus in Egypt are going away from the sustainable trends. On the other hand. The growth domestic investment is increasing.

vii) Pollution

Pollution is various in Egypt either water, air or soil pollution. Several aspects are needed to eliminate them. [13]

Principles of Sustainable Development

Ecological principles

Four ecological principles are central to the concept of sustainable development which is as follows:

i) Dependence

Humans depend on the environment for countless goods and services that are essential to day living and the functioning of the economy. The first ecological principle of Sustainable development is that humans depend on the

ecosystem for a wide array of goods and services. If one recognizes human dependence on the earth and on ecosystems, it becomes evident that environmental protection and environmentally sustainable development are forms of self-protection.

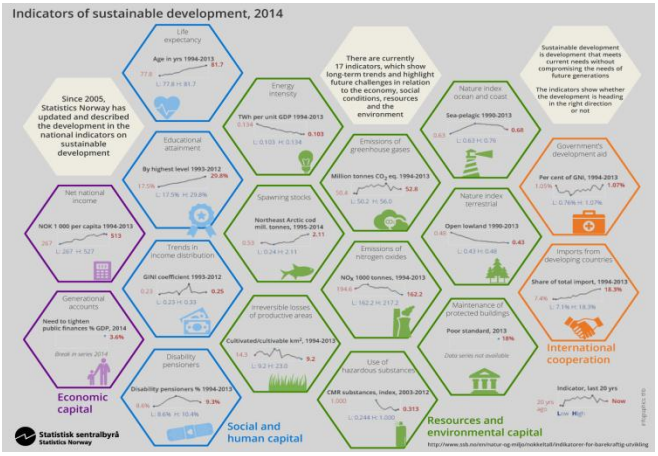


FIGURE 6
Indicators of Sustainable Development, 2014

ii) Biophysical limits

The earth and its ecosystems provides as a wide assortment of resources. Resources either renewable or non-renewable have limits and thus they have to be managed.

Living within the capacity of the environment. One of the sustainable development principles is that population are sustained because they live within the limits Of Carrying capacity of the environment

iii) Interdependence

Clearly, just as we humans are dependent on the environment, the fate of the global environment is dependent on us. [14]

Social/ethical principles

There are three key social principles which are intergenerational equity, intergenerational equity ecological justice.

i) Intergenerational equity

This means that the present generation must act in ways that honor the needs of future generations. We must act in ways that honor the rights and needs of all people alive today.

ii) Ecological justice

Other species have a right to a clean environment and adequate resource too. Sustainable development supports the idea of ecological justice, the notion that the earth is the rightful property of all species, not just humans.

Political principles of sustainable development

Sustainable development also rest on a foundation of political principles which are participation, addressing the root cause and cooperation.

i) Participation

Building a sustainable development will require widespread participation in economic and political decisions making and actions. Surely, business and government will be a key in forging a sustainable future, but the goals cannot he met without broad citizen support and actions.

ii) Cooperation People must not only participate, they must also learn to cooperate at all levels to forge a sustainable future.

iii) Addressing the root cause

To create a sustainable society, we must focus on strategies that address the root Causes of pressing social, economic and environmental problems. [15]

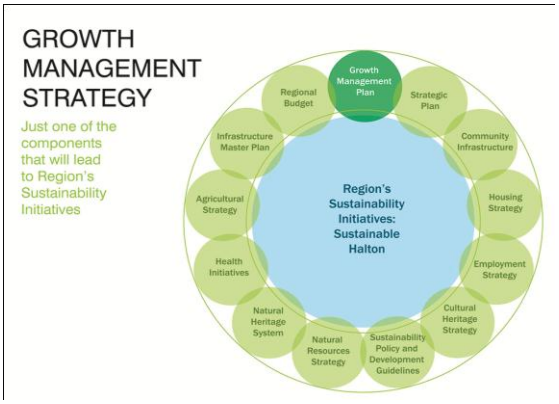


FIGURE 7
Growth Management Strategy for Sustainable Development

Just as sustainability is about finding the balance point between a community's economy environment and society developing a set of indicators for a sustainable community requires balancing many different needs within the

community. There are hundreds of indicators. Deciding how many to keep can be difficult. The right number depends on many factors: how much time is available to research the data.

Dimensions Rural Development

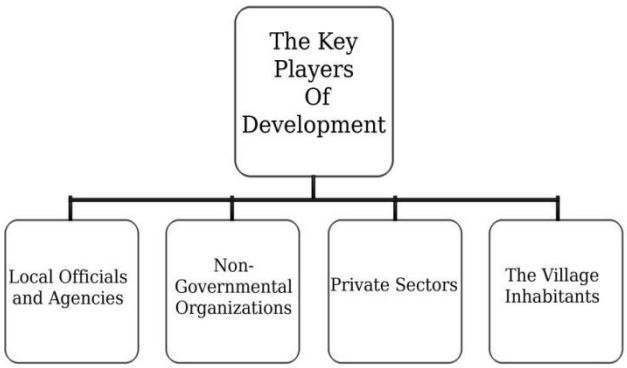


FIGURE 8
The key of development in the development process

Egyptian Village, Al Basaysa

FIGURE 9
Al Basaysa, 1974

One of the villages of about 45,000 affiliates in Egypt located about 100 km northeast of Cairo, and 15 km northwest of Zagazig, the capital of Alsharkya Government.

It's a small rural community, its population was 320 inhabitants in 1974, living in 45 houses, and representing 62 families, population of 25,000 inhabitants.

Life in the village was based on Agriculture and organized according to the session, and all the men, women and children involved in the production of agricultural crops and residues and use traditional methods, and is the main supplier of livelihood for them.

Main Goals

- Education and training of the population to raise their awareness of their environment.
- Care and support for people's participation with a cooperative democratically.
- Development their potentials economically, socially and culturally.

Problems

- Extreme poverty among the population
- Low education quality and quantity
- Low technologies used
- Needing awareness, training and education
- Needing to develop technological skills
- Needing to severe funding and soft loans, especially for small enterprises and human development.

FIGURE 10
Al Basaysa Resources and Lifestyle

The basic principles and methods

- Free open dialogue
- Popular Education
- Effective community participation
- Publishing and localization of appropriate technologies
- Popular management organizations at

the village level.

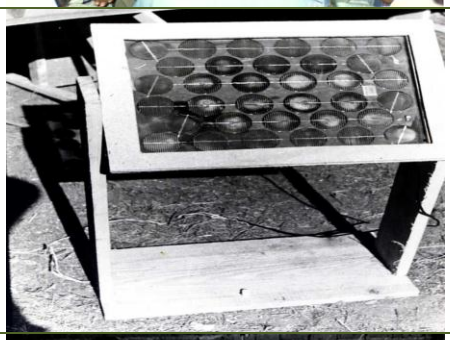
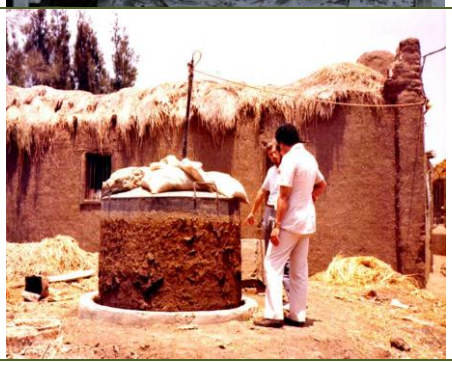
EDUCATION	
- Library -Popular education and knowledge transfer.	
SOCIAL	
-Planning with Participation	
ENERGY	
- Use Solar Energy.	
ECONOMY	
-Small Industries -Investment in Village	
ENVIRONMENT	
- Biogas to conserve the environment and public health.	

Table 1: Sustainability Aspects in Al Basaysa

The results of new local methods

1- Dissemination of biogas technology:
To produce biogas and organic fertilizer from agricultural and animal waste.

2- Recycling of solid and agricultural wastes:
In order to preserve their environment from pollution and to reduce pollution levels for the emerging spread of agricultural solid waste through recycling agricultural waste to produce the organic fertilizers and benefit from the sale of solid waste such as paper, steel, plastic.

3- Deployment of solar water heaters Technology:
To take advantage of the sun's rays to heat water in order to rationalize and reduce pollution from the use of the emerging electric heaters or gas rates.

4- Rural Community to preserve the environment:
By adopting associations that interested in environmental issues and to discuss the reasons or impediments to spreading the renewable energy technology in spite of its importance to the environment. [16]

Conclusion and Recommendations

This paper presents a cohesive concept that combines the international visions for developing the villages with the corresponding national strategic plan. Findings and recommendations of the research paper can be summarized in the following:

- Utilization of renewable energy and solar energy in particular, whether in large or small scale, provides sustainable frame for the new rural-urban communities.
- Developing the village in Egypt needs more innovative visions, studies, and developing of creative thoughts and concepts to make it possible.
- The integration between architectural and developmental visions is a necessity to create sustainable communities in rural areas.

- Obstacles for developing the Egyptian villages can be overcome by fulfillment of the scientific methodology, developmental; not conquering thinking, and national, provincial, political, economic, commercial, cultural and societal ambitions.
- The importance of achieving national vision within the overall developmental, urban, and architectural framework, to insure the feasibility and dissemination of solar technology; especially for desert communities.
- Sustaining rural areas vision with urban and architectural studies will make the proposal more available to as many architects and developers as possible. Therefore, they will be able to pose sustainable and futuristic visions of future rural communities in Egypt.

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