The Corridor of development and reconstruction lifeline
Transportation proposal for sustainable development integrated with the corridor of the Nile Valley in Egypt

Hisham El Shimy
Architecture Department, Faculty of Engineering, Pharos University

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Sustainable Development Criteria Set for the Transportation Hubs of the National Association of Provinces Planning

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Abstract
Sustainable development of national schemes requires knowledge of natural, environmental, economic and social resources. It also requires identifying the mutual influences between these resources to achieve the equation of the interaction producing the sustainable development of nationalism, transportation hubs of National Association and the piercing of the regions planning for the country. One of the means used and the research’s aims is to identify the criteria needed to determine the best course for these axes so as to achieve best performance and lowest cost in the construction phase and sustainable development in the post-construction and start-up.

This theory has been applied to the axis of development and reconstruction through the penetration of the Western desert in order to transfer the lifeline to it. A new approach to a sustainable and integrated development with the artery of the Nile in Egypt was also suggested. This approach provides opportunities for development on the Western side of Egypt. It also gives balance and harmony in the geographic distribution of development from East to West along the center of development in the Northern coast and parallel to the Nile valley using the diagrams of geological and geographic analysis for the planned regions in Egypt.

A set of results can be concluded from this search and the most important is that the priorities is for providing arteries for nationalism transportation, being an ideal solution for sustainable development of national plans in the long run to achieve future sustainable development in Egypt. The area between the axis of development and the Nile River valley is the first fruit of project.
There are also a set of conclusions, the most important is that whenever the axis penetrating more than one region, it gives an advantage which is the diversity of resources to achieve integration between the regions. Given the interdependence and integration of sustainable development foster geographical and arterial corridor-off is necessary to link the horizontal so as to create spaces commensurate with the stages of national sustainable development. It is recommended that research should be the actual implementation of this theme appeared in a phased manner from north to south, and the need for political and legislative support necessary for implementation

**Keywords**
Sustainable Development- Transportation- National planning- The Corridor of development and reconstruction
معايير التنمية المستدامة لتعيين محاور النقل الوطني للربط بين قطاعات التخطيط العام

مرم المنهجية والمعايير اقتراح النقل شريان الحياة للتنمية المستدامة والتكامل
مع الشريان من وادي النيل في مصر

د/ هشام جلال الشيمي
قسم الهندسة المعمارية-كلية الهندسة-جامعة فاروس-الاسكندرية-مصر

مقدمة

التنمية المستدامة للمخططات القومية تتطلب الالتزام بالموارد الطبيعية البيئية والاقتصادية والاجتماعية وتحديات التأثيرات المتبدلة فيما بينها لتحقيق معايير القناع المتصلة للمؤشرات المتصلة للتنمية المستدامة. وتعتبر محور المواصلات القومية الرابطة، والمحور المتصل للاقليم، أحد السبل المستخدمة. وهدف البحث لإعداد هذه المعايير والكيفية التخطيطية لتحديد المسار، وهذا المحور متصل مع الضفاف، ما يحقق أفضل كفاءة مرحلة انتقال الإنسان. وتم استخدام نظام تحليق جغرافي وجغرافي لللاقليم التخطيطية السفلى لمصر. وصول البحث إلى مجموعة من النتائج اهمها: شريان المواصلات القومية هو المحور الدولي للتنمية المستدامة للمخططات القومية على مدى النهرين والدوران للتنمية المستدامة للإقليم على النطاق الواسع. والمنطقة المحصوره بين المحور المتحورة واضع النيل في النهر الهيئه الأولى للمحور المتجاوز. وهذا يمكن تفسيره من النتائج اهمها: كم كان المحور المحصور أكثر من قليلاً، على MPH وضعت مساحة تتضمن تخطيطياً ترتيب تكتل المحور المتصل بالنسبة للمؤشرات المتصلة للتنمية السياسية. ويعتبر البحث بضرورة التنفيذ الفعلي لهذا المحور بصورة مرحلية بدلاً من الشامل للجذب وضرورة توفير الدعم السياسي والتشريعي اللازم لتنفيذ.

الكلمات المفتاحية
التنمية المستدامة - النقل - التخطيط القومي - محور التعمير والتنمية

El-Shimy H.; paper published at 17th International Conference on Urban Transport and the Environment, 6 – 8 June, 2011,Biza, Italy Organized by : Wessex Institute of Technology, UK(App 9-17)
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Keywords
Sustainable Development- Transportation- National planning- The Corridor of development and reconstruction
1- Introduction
National Sustainable Development emerged in 1987 and was adopted by the World Commission for Environment and Development. It is defined as a development that has the ability to confirm the needs of the future generations without encroaching on their ability to meet their needs [1].

There are two major trends for Sustainable Development:

a) Attention to current needs.
b) Conservation of natural resources to meet future needs.

Sustainable Development is the process of measuring and assessing the situation as well as the environmental, social and economic variables. [2]

2- Determinants for the Sustainability of National Development:
Achieving Sustainable National Development requires the interaction of the systems of the biosphere, social and technological environments. Achieving sustainable urbanization depends on the knowledge of citizen’s need for a place that provides a decent social life and the targeted economic level [3].

In order to support sustainable development projects, it is required to develop geographical information system to identify priorities for development in the urban corridor. The attached figure shows the system information for achieving sustainability, fig. 1.

Figure 1: Inputs and Outputs of Sustainable Development [4]
3- Mechanisms for Selecting the Axis of Transportation for Sustainable Development:

In order for the mechanism of selecting the Axis of Transportation for the National Sustainable Development to be achieved, it requires the provision of a set of exploratory stages for spatial environment of the project. These stages consist of:

- Land Cover
- Topographic
- Geology of the Earth
- Underground water
- Urbanism
- Services

The transportation hubs are considered one of the most important foundations of civilization upon which civilizations are built; especially that Egypt has a historical precedent represented in the facility of water, the Nile River, which facilitates the movement from South to North with the current and vice versa with the wind. With the expected increase in the number of people, we find that the current transportation does not meet the needs of the future that opens new horizons for urban, industrial, agricultural, trade and tourism expansion. We find that the required axis that supports development is the one that is parallel to the axis of the Nile River which leads to a parallel longitudinal development from North to South.

4- International Experiments for Developmental Intellect the Axes and Sustainable Development Corridor and Its Objectives:

There were many development and reconstruction projects in different countries which differed according to development intellect and its objectives.

4.1 Development Corridor Project (Tanzania - Kenya - Uganda) [5]

This project was established in order to bring national economic development to attract agricultural, industrial and tourist investments. The overall objective of the project is to define the least cost expansion plan with a 20 year planning horizon for the power generation systems of Kenya, Tanzania and Uganda. In order to achieve this the client appointed Scott Wilson to carry out a study to establish the existing and future demand-supply balance, evaluate the existing and committed generation and transmission system, and determine the least cost means of expanding the power system to meet the demand growth of the three countries and strengthen the interconnection links.
4.2 Development Corridor Project in Kuwait, Development Bridge [6]
This project was proposed to bring about urban development along the axis that serves all parts of the Arabian Gulf and includes entertainment, financial and sports projects.

Figure 2: Development Corridor Project (Tanzania - Kenya – Uganda) [5]
Figure 3: Development Corridor Project in Kuwait, Development Bridge [6]

4.3 Development Corridor Project in the state of Virginia [7]
The basic idea of this project depends on linking reconstruction in the American states surrounding Virginia.

Figure 4: Development Corridor Project in the state of Virginia [7]
Figure 5: Objectives of Urban Development in National Corridor [8]
5- General Approach to Development and Reconstruction Corridor in Egypt [9]:
The proposed idea of the development and reconstruction corridor in Egypt emerged in order to provide new areas for development in a central longitudinal associated with the based urbanism. This will be done through several transverse axes characterized by their ability to grow easily through resettling activities that are able to compete globally, increase employment to about 5 million jobs and enable the continuation of local resources.

The development and reconstruction corridor proposal includes five major components which are:

a) Longitudinal axis for the high way according to the international specifications. This way begins near El Alamein and continues until the Southern borders of Egypt with a length of 1.2 km.

b) Twelve axes of transverse roads linking the main road to the main population centers along its route length of 1.2 km.

c) A railway for express transportation parallel to the main road.

d) Water pipe from Lake Nasser South until the end of the road on the Mediterranean coast. This pipe is for human use along the longitudinal axis.

e) Power line to provide energy in the project’s initial stages until facilitating renewable energy sources for future projects.

The implementation mechanism requires determining the priority of the implementation of the project from South to North. It needs to commensurate with population density and its distribution in the Valley and Delta. The implementation mechanism needs to start working in the transverse axes in a way that enables the presence of an exit for the immediate development near the cities and villages and allows urban expansion to the West.

When planning to establish the longitudinal axis from North to South, it can be divided into several parts, like starting it from the North to the Centre especially in durable areas such as Toshka.

6- Levels of Analysis for Development Map for Development and Reconstructions Corridor:
Putting a development map for Reconstruction and Development corridor requires knowledge of urban and economic dimensions to determine the validity and priorities of development areas along the corridor. It is based on a residential areas database and linkage between the current urban pattern and the new urban communities, which are divided into three categories:
First category: Map of Development and Reconstruction of the Republic.

Second category: Regional Maps of Regions and Governorates

Third category: General and Strategic Schemes for cities

7- Why the Development and Reconstruction Corridor in Egypt? [9]

Development corridor project is one of the most important projects that the country seeks to institutionalize for the following reasons:

a) Reduce encroachment on agricultural land in the Nile Valley from both the private and government sectors.

b) Opening up new areas of urban near places of demographic composition.

c) Development of several areas for land reclamation in western Delta and the Nile Valley.

d) Providing hundreds of thousands of jobs opportunities in the fields of agriculture, industry, trade and reconstruction.

e) Developing new sites for tourism and relaxation in Western Desert, adjacent to the Nile.

f) Reducing congestion in the transportation and expanding the network of existing roads.

g) Rehabilitation of a quiet and comfortable life in a clean environment that allows for some creativity at work.

h) Connecting Toshka, East of Owainat and the rest of the New Valley oases to the different areas of the country through a quick and safe means.

i) Creating new opportunities for small investors to gain from projects in different fields.

j) Participation of a wide range of people in development projects, which develops a sense of loyalty and belonging.

k) Opening new horizons to work and enjoy the fruits of achievement in a national project.

l) Creating hope to the youth of Egypt to secure a better future.
8- Analytical Survey of the Partial Transverse Axes of the Development and Reconstruction Corridor:

Analytical survey of the transverse axes is based on a study of all the exploratory stages of each region according to a scientific analytical method that depends on maps and data.

8.1 Axis of Alexandria:

a) Parallel to the sea coast providing tourism development and the development of fishery resources and fruit cultivation.

b) Availability of lands that is suitable for agriculture in Western Desert on a Geological level.

c) There is the low plains region which supports agriculture, especially in the Eastern region.

d) There is a range of groundwater wells in Western Desert.

e) Urbanization is centered in the North side where the city of Alexandria exists.

f) Matrouh is on the coastline.

g) Services are associated with urbanism and its location.

h) Topography of the land surrounding the axis is low, around 20-25 m above sea level.

i) Geological nature of the land is Undifferentiated Quaternary Deposits.
8.2 Axis of Tanta:
Tanta is located on the Nile Delta landfill and is considered a centre for local roads that branch off from it. Proposed axis extends west to Western Desert to reduce congestion on the agricultural lands since it is one of the most congestion cities of the Delta.

Figure 7: Topography map of Alexandria Axis and Tanta Axis

8.3 Axis of Cairo:
This is a vital axis because of the possibility of linking it to Cairo - Alexandria Desert road; especially that Cairo is one of the largest communities in Africa.

8.4 Axis of Fayoum:
Axis extends from the South-East and extends north to the North-East. It is a unique axis as it is surrounded by landscapes and green areas.

Figure 8: Topography map of Cairo Axis and Fayoum Axis
8.5 Elbahry Axis:
This axis is important because it links the Marine oases to the fabric of the proposed urban development which allows linking to Siwa oasis in the North. This area is considered a fertile land in this region for the cultivation of wheat and palm. Also, weeds spread in this area which allows livestock.

8.6 Axis of Al-Minya:
Minya Axis is one of the shortest axes that lead to the development and reconstruction corridor. It extends within the area of sand dunes, allowing the existence of agricultural development in the Northern side. Services are found in the beginning of the axis by Al-Minya Governorate.

8.7 Axis of Assiut:
The proposed axis extends West Assiut in the Nile Valley plain until the flat plateau of the Western Desert.

8.8 Axis of Qena:
This axis extends by the Nile River breaking into the Sand Dunes area.
8.9 Axis of Luxor:
This axis is located in the North-Eastern and is intended to support tourism development which opens new horizons in support of the tourism sector.

8.10 Kom Ombo-Aswan Axis:
Is a dual Axis since it starts by Kom Ombo in the north and Aswan in the south, joins in a single point and then moves in one direction towards the development and reconstruction corridor.
8.11 Toshka Axis:
The suggested Toshka axis is considered a vital one that supports the National Toshka project as it provides a means for transporting personnel working in the project to the centers of congestion of population in the North.

8.12 Axis of Abu Simbel - Lake Nasser:
This axis extends between two points; the first is Lake Nasser in the North where it converges with Abu Simbel in the South until the development corridor. Its beginning is considered vital because of the spread of agriculture and sources of fish wealth.

Figure 12: Topography map of Toshka Axis and Axis of Abu Simbel - Lake Nasser

9- Detailed Analysis using the S.W.O.T for the Development and Construction Corridor project:
The detailed general analysis using the S.W.O.T of the Development and Construction Corridor project depends on knowing the strengths and weaknesses of the project as well as understanding the risks and the overall objectives of the project. The attached table shows the most important determinates.
### Table 1: S.W.O.T Analysis of the Corridor of Development and Reconstruction

<table>
<thead>
<tr>
<th>Threats</th>
<th>Objectives</th>
<th>Weakness</th>
<th>Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. People are not motivated to invest in the new urban areas.</td>
<td>Social development for Tanta axis in order to attract more investment in Tanta.</td>
<td>There are several urban areas in the immediate area of the Tanta axis which are considered valuable in terms of real estate development.</td>
<td>The possibility of creating social development along Tanta axis.</td>
</tr>
<tr>
<td>2. The lack of a social dimension among the local population and the indigenous communities.</td>
<td>Establishing an urban development along the axis of Faiyum Oasis.</td>
<td>Establishing an urban development along the axis of Faiyum Oasis.</td>
<td>Social development along an axis.</td>
</tr>
<tr>
<td>3. Increased construction on agricultural lands.</td>
<td>Tourism development for Minya axis.</td>
<td>The lack of a social dimension among the local population.</td>
<td>The potential of social development along Minya axis.</td>
</tr>
<tr>
<td>4. Pollution caused by cement factories in Faiyum.</td>
<td>Increasing road networks for the area.</td>
<td>The potential of social development along Minya axis.</td>
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</tr>
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<td>5. Increased construction on agricultural lands.</td>
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#### Economic

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<tbody>
<tr>
<td>1. Agriculture is an important sector that should be promoted.</td>
<td>Tourism development for Alexandria axis.</td>
<td>Tourism development for Alexandria axis.</td>
<td>Tourism development for Alexandria axis.</td>
</tr>
<tr>
<td>2. Urbanization allows significant economic development to the existing urban areas such as roads and bridges.</td>
<td>Creating an extension of Cairo axis on the eastern side towards Alexandria in order to attract more investment.</td>
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<tr>
<td>3. The potential of establishing an industrial zone on the plateau along the axis of Tanta.</td>
<td>Tourism development along Giza axis.</td>
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#### Social

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</tr>
</thead>
<tbody>
<tr>
<td>1. Minya axis is an important area that should be developed.</td>
<td>Tourism development for Minya axis.</td>
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</tr>
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<td>2. tourism allows significant economic development to the existing urban areas such as roads and bridges.</td>
<td>Tourism development for Minya axis.</td>
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</tr>
<tr>
<td>3. The potential of establishing an industrial zone on the plateau along the axis of Tunis.</td>
<td>Tourism development along Giza axis.</td>
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#### Environmental

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<tbody>
<tr>
<td>5. The existence of fish resources for development in the area around the Minya axis.</td>
<td>Environmental development for Abu Simbel.</td>
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<td>Environmental development for Abu Simbel.</td>
</tr>
</tbody>
</table>

### Sources
10- Results and Recommendations:

10.1 Results
1. Tourism development is the best method used in dealing with the historical heritage tourism areas.
2. Most international experience of development thought to the development corridors of the world depends on the progress of development compatible with the rates of implementation of the project, including development occurs in parallel with the implementation rates.
3. Project site for development and reconstruction of the best strategic locations in Egypt, including linking the development between the north and south.
4. Link the new urban communities to the center of development and reconstruction of the provincial census to enumerate parallel to the River Nile, including a balance in population distribution in Egypt.
5. Islands located north of the axis and the islands south of the axis could cause the development of tourism in Egypt, the islands East region is characterized by industrial and agricultural development.
6. Draft the center of development and reconstruction allows the absorption of human density, estimated at 10 million people and allow, with 2 million jobs sectors of industry and agriculture.

10.2 Recommendations:
1. Create Investment Fund to finance the center of development and reconstruction, including funding supports for the security of the project.
2. Implementation of the project should be done at rates that create new urban communities along the axis starting from the corridor-off wheel and then link the vertical axis.
3. Create a map of the combined service and development projects along the corridor development to make a thread and a functional integral.
4. Encourage internal migration from the valley to the corridor development and reconstruction progress to make a dump of population density and the provision of permanent human force along the corridor of development and reconstruction.
5. Connecting waterways to the intersection points of wheel corridor-off of the axis of development and reconstruction with the longitudinal axis of the corridor development.
6. Create a set of laws and legislation encouraging private investors to establish projects and taxes due on what is considered stimulating factors.
7. Encourage a policy of land ownership for young colony to set up communities along the corridor of development and reconstruction.
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Our Ref UT11/99678

3 August 2011

Dr H Elshimy
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Dear Dr Elshimy,

Re: Urban Transport 2011, 6 - 8 June 2011, Pisa, Italy

I am pleased to inform you that the manuscript of your paper entitled "Transportation proposal for sustainable development integrated with the corridor of the Nile Valley in Egypt" by H Elshimy was accepted for oral presentation at the Urban Transport 2011 conference, held 6 - 8 June 2011 in Pisa, Italy. However, as your payment was not received in time we were unable to include the manuscript in the Conference Proceedings.

I am pleased to inform you that your paper will be processed for publication in the Urban Transport 2012 Conference Proceedings. You will be sent a complimentary copy of the book after the conference has taken place.

Yours sincerely,

[Beverley Copland's signature]
Beverley Copland
Conference Coordinator
bcopland@wessex.ac.uk