Ruralization vs. Urbanization Sprawl as Guiding Regional Planning: Development Scenario for Rivers Watershed in the Southern Syrian Coastal Region

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Ruralization vs. Urbanization Sprawl as Guiding Regional Planning: Development Scenario for Rivers Watershed in the Southern Syrian Coastal Region

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Abstract. This study aimed at opening discussions concerning new ideas of suggesting sustainable scenario based on the principle of an integrated spatial development ring between urban-rural areas along and between AL-Abrash and AL- Hseen rivers watershed, as an application of the bottom-up planning model, seeking to achieve ruralization in parallel with urbanization. This paper adopted data collections and analysis through using a step-by-step approach. Firstly, investigated the land-cover change (LCC) during 30-years. Therefore, using multi-temporal satellite data from different dates for the same study area to create thematic land cover maps which can be used for land cover change detection. Three Landsat satellite images from 1987, 2002 and 2017 were classified separately using the supervised classification method in ArcGIS, to provide an economical way to quantify, map and analyse changes over time in land cover. Then, SWOT analysis for the possibilities and determinants within the two-way flow of the current and futuristic economic activity, besides discussion the opportunities of the land-use (LU) taking into account slop map to achieve conservation priority for natural resources. Finally, evaluate results and establishing a sustainable spatial scenario approachable to upgrade into scaling up/out to covering the coastal region watersheds, can support regional planning and decision-making in the future.

1. Introduction
Urbanization is one of the leading causes of damage and loss of natural vegetation, arable land, and habitat [1]. Prodded by the desire for development, converting rural areas into urban areas at an unparalleled rate in recent history. This unrelenting effort to urbanize is showing its effects on the natural functioning [2]. Monitoring changes in land cover and understanding the spatial properties of it will lead to an insightful appreciation of how human activity affects the general ecological state of the urban environment [3]. Developing countries are showing a significant human activity-attributed land use and land cover changes than the more developed countries [4]. Historically, people in many countries marked preference for settling in mountain areas due to favourable climate and the easy access to water. These days, mountain areas are affected by tourism, transportation, and industrialization activities. Hence, more people now living in the mountain regions led to being depleted of their natural resources. Consequently, people need to understand the relationship between development and land dynamics [5].
On the other side, rivers watershed offers an essential unit for sustainable development; considering, human settlements built within a watershed area record stronger physical, social, and economic ties with each other compared to settlements found outside the watershed area. In this unit, rural development programs should take into account, especially to establish the linkage between land resources, populations and interests [6]. Nevertheless, the deterioration of watersheds sources seems to be going through quickly, particularly in developing countries [7]. Watersheds vary in size. It can measure a few hectares to be as large as a thousand square kilometres. Regardless of size, a watershed is a complex system of water, wildlife, forests, cultivation, and human practices [8]. Watershed management previously focused on the biophysical aspects. Nowadays planners recognize that watershed management should take into consideration the fact that a watershed is a combination of both human and biophysical processes [9]. The intricate interactions can have harmful far-reaching effects on the environment, as well as on economic activities [10]. Hence, Watershed management today requires cooperation from among varied sectors including tourism, hydraulic engineering, transport, spatial planning, and agriculture – all of which have a stake when it comes to the sustainable development in the rural areas, particularly in the mountain regions [11]. Geographic information systems ArcGIS tools extensively used to map and analyses land cover changes in a lot of watersheds [12]. GIS and remote sensing techniques are also employed to prioritize watersheds that need conservation as tools that have proven very useful for planning and development. Furthermore, multi-temporal remote sensing data help to accurately map the extent of the different land cover types of a particular area and to monitor the changes over a particular period of time. GIS has spatial tools that help to monitor land use and land cover LULC changes [13]. In the same time, there is increased interest in using sustainable activities in the rural area to be a gateway toward achieved ruralization as a planning tool aimed at re-polarization with a stronger interest in using agropolitan strategies for regional development by spur agro-economic growth. These solutions should include infrastructure, protection of settlements, security of landscape, and respect for the values of biodiversity and fair allocation of economic benefits [14].

In Syria, the coastal region considered the main water tower at the national level. Since the 1980s government adopted engineering solutions by building large and small dams as a tool to water resources management to storage of water for power generation, agriculture, irrigation and domestic use. Coastal geography was divided into 21 river basins in Lattakia and Tartous governorates, based on river sources, feeder springs, and slope direction. However, the idea of river-watershed management as an integrated socio-economic planning unit between urban-rural areas and between mountain-coastal areas is a new down-up planning approach, as long as most of the researchers adopted administrative unit’s basis to achieve the required development. For that, this paper discusses new down-up model using a step-by-step approach, begins in the mountainous rural areas, then applies the scaling-up progression for upland and lowland interactions, Taking into considering three priority fields “Tourism - Agriculture - Transport” as the basic assets of the Mediterranean coastal regions. The scaling-out processes are used to include the adjacent watersheds for an integrated regional planning.

This empirical study attempts to identify the spatiotemporal pattern of LCC for rivers watershed in the study area using geospatial data so that both the scientific community and decision-makers can assess the various dynamics affecting in this environment. The objectives of this study were thus to explore the characteristics of current land use and LCC and characterize the underlying driving forces in the study area by making use of remotely sensed data and socioeconomic information. Specifically, the objectives are: (a) to elucidate and evaluate the LCC between 1987 and 2017; (b) to analyze the driving forces of land use change and urban expansion, and (c) to propose a futuristic scenario to achieve ruralization in the face of urbanization.

2. Research Overview and the Study Area

There is very little data available regarding the temporal and spatial aspects of LULC changes that have influenced the urban development of the coastal region of Syria. Tartous province area is 190,000 HA, 1% of the total area of Syria, and the population of 780,000 in 2010 and 3.8% of the total population of the Syria. Tartous population increased from 383,000 in the early 1970's to 663,000 in 1990 and 938,000 in 2010, an average annual increase of 14,000 between
1970-1990 and 13.800 between 1990 and 2010. Moreover, expected to reach more than one million by 2030, according to the average natural growth rate of 1.79% between 2000-2010, which recede from 3.16% during 1970-1981 to 2.19% during the period 1981-1994 due to socio-economic and cultural developments, in additional to Internal and external migration force [15]. All previous statistics recorded until 2010, while there are no official statistics yet after 2011 because of the war, where a huge displacement recorded to the coastal region as a safe area reached to more than 1.5 million populations.

2.1. The Study Area: River Basin (watershed).
The study area is a part of the Syrian coastal region, it is located between 34°40' to 35°3' north latitude and 35°51' to 36°19' east longitude, covering an area of 1040.50 sq. km. Four rivers watershed in Tartous province 1- watershed Abrash river WS/A, 2- watershed Hseen river WS/H as major river basins and 3- watershed Ghamqa river WS/G, 4- watershed Mntar river WS/M as secondary river basins, with about 77% of province population. Characterized by a Mediterranean climate with limited impact and geographic variability. Mean elevation is 473 m above sea level, with a maximum of 1100 m a.s.l. In the north-west areas, a strong influence from the Mediterranean climate brings high precipitation. For the period 1987–2016, the mean annual air temperature across the target basins was 15 °C, ranging from -4 to 38 °C. The mean annual precipitation was 1100 mm/y, ranging from 900 mm/y near the river mouth to 1200 mm/y in the western mountains. The area under study has the following primary sections; Lower, Middle, and Upper Sections ‘Figure 1’. These sections are further subdivided on the basis of land-cover and topography into basin socio economic management regions.

2.1.1. The Upper Area. The Upper Area runs between 600 and 1100 m a.s.l. It includes the water sources found within the Western Forest Mountains – the Hseen and Abrash rivers in Masyaf and Al-Kafrun. In this section, the basins maintain a source character, where small mountain settlements with a simple rural agricultural lifestyle are engaged in planting vegetables and fruit trees and raising livestock. While a kind of ruralization based on winter tourism and eco-tourism parallel with agricultural in the south.

2.1.2. The Middle Section. The Middle section runs between 200-600 m a.s.l. The plateaus region that forms the wider home of the coastal rural-area, while bed slope decreases. River banks become sandier and bounded by forests of large-leaved and coniferous trees. Olive trees are abundant. At the end of 1997, Al- Abrash dam built to the south of “Safita district” as the most important project in the coastal region and put under investment in 2000. The dam measures 733 meters in width and 50 meters in height. The lake at the rear of the dam runs 32 km and has a storage capacity of 689/ha. Moreover, irrigation network and pumping stations contribute to irrigation of 10160 HAs of agricultural land [16].

2.1.3. The Lower Section. The Lower Section extends between 0 and 200 m a.s.l. You will see a huge contrast in land use in this section. In the north lies the biggest commercial port in the region. You will also find Tartous City, recognized as the principal urban area of the south of the coastal region. In the south lies a fertile plain filled with field crops, fruit trees, and green-house produce. Along the coast line, founded a kind of tourist industry. There is a proposal to declare the area a free economic zone, in parallel to upgrade the agricultural airport to a civil airport requirements. Regional decision makers now see this area as a gateway to maritime economic development. On the other hand, the main highway and railway which penetrate coastal plain considered the vital commercial artery connecting the coastal region and the interior.

3. Database
Landsat Surface Reflectance data of the study area from the Landsat 5 TM (Thematic Mapper), Landsat 7 ETM+ (Enhanced Thematic Mapper Plus) and Landsat 8 OLI/TIRS (Operational Land Imager) satellites were ordered as higher-level products through the United States Geological Survey (USGS) http://earthexplorer.usgs.gov/. These three processed Landsat images were used to create land cover changes (LCC) maps for 1987, 2002 and 2017 (Table 1).
### Table 1. Details about images used in the study.

| Image acquisition date | Sensor (Image ID) | Resolution (m) | Bands | Product |
|------------------------|------------------|----------------|-------|---------|
| 28 May 1987            | Landsat5 TM (p174r36_5i19870526) | 28.5           | 2,4,3 | GeoTiff |
| 11 May 2002            | Landsat7ETM+ (LE71740362002131SGS00) | 30             | 2,4,3 | GeoTiff |
| 26 May 2017            | Landsat 8 OLI/TIRS (LC81740362017148LGN00) | 30             | 3,4,5 | GeoTiff |

Survey of Syria (SOS) toposheet numbers NI37-M-3-d, NI-37-M-3-c, NI-36-R-4-d, NI-37-S-1-a and NI-36-R-4-b covers the study area on 1:50,000 scale. Base map of the study area was prepared from the SOS toposheets. Moreover, the height information to generate the Triangulated Irregular Network (TIN) and slope maps ‘Figure 1’, from the free DEM data of the SRTM 1 arc-second (30 meters resolution).

#### Figure 1. TIN model and slop map for the study area

### 4. Methodology

This paper uses a mixed methodology. Both quantitative and qualitative techniques are used to analyses the available data and information within the study area. Additionally, an abundance of published literature related to functionally and spatially integrated river watershed planning has been reviewed.

In this study, the supervised classification method was chosen and applied for images of three different years using the ArcGIS software. There are different algorithms for supervised classification. One of them most common algorithm of the supervised classification is Maximum Likelihood Classifier algorithm which was used in this study. This algorithm examines the probability function of a pixel for each of the classes and assigns the pixel to the class with the highest probability. Determination of classes is a very important step in supervised classification. Four classes – Built-up Area & Quarries, Forest & Dense Vegetation, Agriculture Land & Open Vegetation and Water Body – were created for each image ‘Figure 2’. We attempted to select the best samples representing the classes; however, some mistakes may have occurred because the spatial resolution of the images was 30 meters.

A total of 180, 125 and 100 well distributed training sites representing all LC classes were selected for classifying the 1987, 2002 and 2017 images respectively. As there was no ancillary data available for 1987 and 2002, we resorted to visual interpretation of the Landsat image based on the authors' knowledge of the study area. A total of 160 sampling points were created using random points tool and used for validating the 2017 land cover map. The overall accuracies were 83.7%. An accuracy matrix was created using the observed and the classified land cover map showing each class's and overall accuracy as confusion matrix. (Table 2). Frequency tabulations of classification results alongside referenced ground cover classes were developed. These were converted to pivot tables from where
error/confusion matrixes detailing the overall accuracy and user accuracy for each class were calculated.

Figure 2. Land cover maps of the study area based on USGS image

Table 2. The accuracies of classification for the 2017 land cover map.

| Class Name                              | class | 1  | 2  | 3  | 4  | User Accuracy | Number of validation points |
|-----------------------------------------|-------|----|----|----|----|---------------|----------------------------|
| Built-up Area + Quarries                | 1     | 3  | 0  | 1  | 0  | 75%           | 4                          |
| Forest + Dense Vegetation               | 2     | 0  | 60 | 2  | 0  | 96.80%        | 62                         |
| Agriculture + Open Vegetation          | 3     | 0  | 23 | 70 | 0  | 75.30%        | 93                         |
| Water Body                              | 4     | 0  | 0  | 0  | 1  | 100%          | 1                          |
| Overall Accuracy                        |       |    |    |    |    | 83.75%        | 160 Total                  |

The user accuracy represents the number of correctly classified pixels in one class divided by the total number of sets recognized in that class. While the overall accuracy represents the sum of all of the correctly classified pixels divided by the total number of all sets recognized in all classes.
Spatial analysis on land cover classes of 1987, 2002 and 2017 respectively was performed in the ArcGIS environment. The area under each category calculated (in sq. km), areas and percentages were compared to stand at changes during the monitoring period. (Table 3).

**Table 3.** The land cover change analysis of the study area between 1987 and 2017.

| LC classes                      | On 1987 | On 2002 | On 2017 | LCC (1987-2017) |
|--------------------------------|---------|---------|---------|-----------------|
|                                | Area    | Area (%)| Area    | Area (%)       | Change    | Change (%) |
| Built-up Area + Quarries       | 23.914  | 2.34    | 30.058  | 2.94           | 46.689    | 4.57       | 22.775 | 2.23 |
| Forest + Dense Vegetation      | 651.844 | 63.75   | 579.794 | 56.70          | 389.436   | 38.08      | -262.41 | -25.67 |
| Agriculture + Open Vegetation  | 346.803 | 33.92   | 407.649 | 39.87          | 582.705   | 56.98      | 235.902 | 23.06 |
| Water Body                     | 0       | 0       | 5.059   | 0.49           | 3.73      | 0.36       | -1.329  | -0.13 |

*Between 2002-2017. Dams were built after 1994.*

The internal affecting factors were classification into three classes due to current land use, the tourism map, the demographic and industrial spread, and the environmental and agriculture map “Figure 3, 4, 5”. SWOT “Strengths, Weaknesses, Opportunities, Threats” analysis to approved maps, taking into account the connection routes between them, That’s to understand the impact/risk factors that relate to the current situation and the future of the study area. Based on data and information from the relevant government departments and interviews with regional decision-makers during the summer of 2016. Furthermore, to suggest a ruralization scenario more suitable to the research goal, in parallel with the results of monitoring LCC due to climate and human factors. As a new step for the balanced permanent development of the coastal region starting from rivers watershed units. Given that each river watershed has a distinctive character regarding the proportion of the urban-rural population and
places of settlement spread between the three sections of each watershed through projection data on the slope map. In addition to the difference in the human activity affecting. Hence, SWOT analysis used for each basin taking into account the most prominent features (Table 4).

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**Table 4.** SWOT analyse for Land-use of the sub-watersheds.

| STRENGTHS – S                  | WEAKNESSES – W                                                                 | OPPORTUNITIES – O                                                                                                                                               | THREATS – T                                                                                                                                 |
|--------------------------------|-------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Forests & nature reserve areas.| Weak tourism infrastructure.                                                    | Integrated environmental tourism.                                                                                                                              | Urban expansion on agricultural land.                                                                                                    |
| Diversified agricultural production. | Cement factory at the marine basin window.                                  | The possibility of integrated agro-tourism.                                                                                                                     | River pollution due to waste olive mills.                                                                                                 |
| Low population density.        | A narrow coastal plain.                                                       | Rural Development "Agropolitan centre".                                                                                                                          | Loss of traditional rural lifestyle.                                                                                                      |
| Important points for wildlife. | Weak services in the upper section.                                           | Vertical intensification of agro-production.                                                                                                                      | Increased vegetation due to climate change.                                                                                                |
| Marine tourist gateway, Tartous port. | Weak of the direct link with other basins.                                  | Agro-industry strategy for marketing olive oil.                                                                                                                  | Transformation towards urbanization.                                                                                                       |
| Includes the biggest, urban centre "Tartous" | High population density.                                                     | A traditional maritime tourism industry.                                                                                                                         | Increase fragmentation of agricultural property.                                                                                           |
| The strategic olive product at the regional. | Loss of runoff water despite heavy rainfall.                              | Build a set of storage dams.                                                                                                                                     | The phenomenon of real estate development.                                                                                               |
| Launch of the University of Tartus. | Decline of olive quantity production.                                        | Expand the scope of therapeutic tourism.                                                                                                                        | Polarization towards the city of Tartous.                                                                                               |
| Wide seafront + great archaeological sites. | Expansion of housing within agro-land.                                      | Establishment of a free economic zone.                                                                                                                           | Industry condensation at the future.                                                                                                      |
| Vast plain + intensive agro-production. | Weak tourist services.                                                      | Establish agropolitan centre, Yahmur area.                                                                                                                        | Beach condensation of real estate investment.                                                                                             |
| Low population density.        | Citrus-producing non-competitive quality.                                     | Agro-tourism strategy.                                                                                                                                           | Random polarization of real estate investment.                                                                                           |
| Transport links at the national level. | Reduced marine fish wealth.                                                   | Establishment of marine fish farms.                                                                                                                              | Expansion of licensing of quarries                                                                                                       |
| Important lake and natural site. | Weak tourism marketing.                                                      | Establishment of fish farms beside the lake.                                                                                                                      | Pollution of lake water due to sewage.                                                                                                    |
| Archaeological water mills along the river. | Shortage of sewage treatment plants.                                    | Dam Investment in Electric Generation.                                                                                                                           | Decline of the lake's level.                                                                                                              |
| Integrated tourist destination. | Weak infrastructure in the lower section.                                   | Invest In wind energy in the upper areas.                                                                                                                          | Targeting natural areas by extractive industries                                                                                         |
| Integrated field crop production | Subsistence farming non-competitive.                                      | Starting for a future national tourist route.                                                                                                                     | Pressure on mountain natural resources.                                                                                                  |
5. Results and Discussion

5.1. Land Cover Change Analysis

As far as land cover changes from 1987 to 2017 is concern, the study area as a whole presents a general degradation of land resources. It has been observed that during 30 years the Forest and Dense Vegetation decreased by 25.66%. At the same time, the Agriculture Land and Open Vegetation increased by 23.07%. This expansion in the depletion of arable land at the expense of dense vegetation is due to an attempt to increase agricultural production, whether as agriculture of subsistence or as a major source of income for rural areas. Furthermore, the amount of arable and fallow land in Tartus Governorate fell to zero in 2005 [17]. But in parallel with the fragmentation of agricultural holdings as a result of inheritance factors, the average tenure is currently only 1.3 HA and is subject to fragmentation [18], the loss was double. On the one hand, large areas of dense green cover have been lost. On the other hand, agriculture in many areas has not achieved the expected material return. Whereas, the Built-up Area and Quarries area increased by 2.23% at the expense of forest and agricultural lands. Sub-watershed wise details of the land cover and the changes in area under each class from 1987 to 2017 (Table 5).

| Table 5. The land cover analysis in the years 1987 and 2017 of the sub-watersheds. |
|---------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| LC classes                      | On 1987 | On 2017 | LCC (1987-2017) |
|                                | Area (sq.km) | Area (%) | Area (sq.km) | Area (%) | Change (sq.km) | Change (%) |
| WS/A Basin (274.9 sq.km)        |          |         | |      |  |  |
| Built-up Area + Quarries        | 2.98339  | 0.012138 | 8.2971 | 0.033754 | 5.313706 | 0.0216154 |
| Forest + Dense Vegetation       | 159.935  | 0.650745 | 83.7981 | 0.340907 | -76.137174 | -0.3098384 |
| Agriculture + Open Vegetation   | 82.8535  | 0.337115 | 150.508 | 0.612296 | 67.654339 | 0.2751811 |
| Water Body                      | 0        | 0        | 3.2058  | 0.013042 | 3.2058  | 0.01304183 |
| WS/H Basin (354.5 sq.km)        |          |         | |      |  |  |
| Built-up Area + Quarries        | 6.98616  | 0.019524 | 8.5194  | 0.023812 | 1.533238 | 0.0042878 |
| Forest + Dense Vegetation       | 270.8521 | 0.756951 | 191.3616 | 0.534861 | -79.490473 | -0.2220898 |
| Agriculture + Open Vegetation   | 79.98145 | 0.223524 | 157.5072 | 0.440237 | 77.525755 | 0.2167129 |
| Water Body                      | 0        | 0        | 0.3897  | 0.001089 | 0.3897  | 0.0010892 |
| WS/G Basin (246.5 sq.km)        |          |         | |      |  |  |
| Built-up Area + Quarries        | 10.293644 | 0.041343 | 18.9225 | 0.076021 | 8.628855 | 0.0346784 |
| Forest + Dense Vegetation       | 149.00482 | 0.598459 | 79.1244 | 0.317884 | -69.880425 | -0.2805752 |
| Agriculture + Open Vegetation   | 89.68215 | 0.360197 | 150.8625 | 0.606094 | 61.180353 | 0.2458967 |
| Water Body                      | 0        | 0        | 0       | 0        | 0       | 0       |
| WS/M Basin (164.6 sq.km)        |          |         | |      |  |  |
| Built-up Area + Quarries        | 3.6567495 | 0.021505 | 10.9566 | 0.064473 | 7.2998505 | 0.0429675 |
| Forest + Dense Vegetation       | 72.075003 | 0.432883 | 35.1522 | 0.206850 | -36.922803 | -0.2170329 |
| Agriculture + Open Vegetation   | 94.30307 | 0.554610 | 123.831 | 0.728675 | 29.507962 | 0.1740654 |
| Water Body                      | 0        | 0        | 0       | 0        | 0       | 0       |

Of course, climate change cannot be ignored during the period of monitoring changes, especially during the last decade. Despite the mean annual precipitation within the overall average, but heavy rainfall during short periods wasted as a surface scrub without interest because of the lack of small storage dams. Compensated by long and concentrated periods of heat during the summer and increase the rate of frosts during the winter. Again, increase in the agricultural land at the expense of forest and dense vegetation cover can be taken as negative change as it indicates the growth of built area later in transfer phenomenon toward real estate development especially in the hills area. Similarly, an increase in the settlement/built-up area is a negative change on land resources can be doubling from two to three times over the next three decades according to the rate of natural growth of population.

5.2. Integrated Analysis of SWOT, LU/LC and Slop Map

Tripartite analysis forms an integrated analysis and a database of crossed information’s and data. This will give a chance to the decision-makers to draw more accurate and harmonized futuristic and development scenarios. Hence, the readings of the changing curve in the classifications of the main...
land-cover and its projection on the slop map will ensure stricter conservation conditions in the areas facing an environmental degradation of the natural sources, like the forest areas and dense vegetation. Moreover, to steer the expanding of built-areas towards the sloping areas which are less than 30%. Where the slope is always a controlling factor in the development of land cover on the surface. Moreover, development of LU and LC over the area with unfavourable slope condition is always prone to potential environmental hazards [7]. In the other hand, SWOT analysis gives a logic reading of the probable risks facing the direction towards investing available chances, especially in the rural mountain areas. Because the rural development should consider all these analysis intersections which give clear indicators that SW/H+ SW/M can ensure the possibility to build the core of the ruralization scenario as a proposed agropolitan centres. Besides the qualitative data and the other agricultural and industrial activity distribution, also of the available building areas and its density which can found through the Land-use maps. At the same time, we can see that the resulting database of information can give an additional indicator towards suggesting a horizontal transportation network connects SW/H+SW/M with its surroundings. Due to these areas with an expanding residential curve through the last 30 years, that holds linked features on social, touristic and agricultural levels, with a growing phenomenon of transfer to random fast development which must administrate rationally.

5.3. Built Ruralization Scenario Based on Current Planning Data: Learning from the Past.
Taking into consideration spatial land-cover changes, areas of urban expansion and its reasons. The proposed scenario mainly based on transfer polarization towards rural areas through secure jobs and increase income and economic asset development consistent. As a roadmap for urban-rural balanced development. Geographical regional planning units "river watershed" to create the enabling environment for expanded economic networks. Cluster tourism networks in parallel with the networks required for promising industries. Since, spatial rural-urban linkages, which are flows of people, goods, money and information between urban centres and rural regions, are important drivers of economic activities [19]. Therefore, propose vital centres within rural areas to enhance agricultural growth to find a new method to increase production, export and agro-industrial products alike. Additionally, increase the employment because poor rural residents can combine peri-urban agriculture with other urban-based, non-farm occupations as agro-tourism services and transportation services.

5.4. Integrated Cluster-Tourism with Agriculture for Ruralization.
The geographical spread of the river watershed between upstream to downstream provides the suitable environment for establishing an integrated cluster tourism where the leisure tourism, nature tourism, cultural, archaeological tourism and rural-agro-tourism form together tourism network. The problem of small agricultural holdings considered the first barrier to establish a suitable agro-tourism, as well as the lack of experience in agrotourism, marketing, and management among the rural residents. Moreover, before investing in agrotourism, you must carefully analyse your potentials as a host and available resources for investment in an agro-tourism venture [20]. Therefore, propose a new style of agricultural cooperatives are the best solution, where a group of farmers contribute to form a modern agricultural project supported by government investment in enhancing infrastructure requirements. The management will combine representatives of farmers and local government to achieve an integrated agro-industries. It begins with high quality intensive agricultural production using modern agricultural techniques to improved varieties. Moreover, rural families form local units for small industrial lines based on advanced technology which will be managed by scientific expertise from the new generation of young rural. Further, the responsibility of the government sector is securing transport to the neighbourhood and abroad through the agropolitan centre. In the other side, agricultural units will contribute as a new tourist destination to experience the rural agricultural lifestyle and enjoy the original product. This style will lead to a two-way flow relationship between agriculture as a profession, agro-industries, transportation, and agrotourism as an additional source of income, seek to attract young rural away from migration. That can be applied to the vertical upgrading of the strategic agricultural production of olive, tobacco, citrus, and greenhouses according to spatial distribution and agricultural density. Its bottom-up strategy Pro-poor operates at a local level, that
generates net benefits for the poor, not only economic benefits but also positive socio-cultural and environmental benefits.

5.5. Scaling-up Processes and Scaling-out by Comparing Watersheds and Learning from Each Other.

The importance of the agropolitan approach to achieve a new kind of ruralization within the river watershed planning units must be completed by scaling-up progress cover the rural-rural and urban-rural linkages with all the economic assets. In another meaning cover other relationships with non-agriculture activities. In this step, we need to determine the possibilities of various areas targeted by scaling-up processes depend on SWOT analysis. For example, in mountainous rural areas where livestock is raised, it's possible to imitate the Chinese experience of rural-urban construction plans and environment-friendly agriculture in Chongqing province "modern agriculture zones in Changshou District: Modern Stock Raising Zone." The partnership between the public sector and a group of livestock breeders and farmer families in the establishment of livestock breeding projects is the core idea, seek to increase the efficiency of animal products and increase their numbers in private sheds created by the government sector with modern technology. This example repeatable to increase fisheries and beekeeping. Such projects targeting different rural sectors will strengthen rural-rural relations through the participatory process from the source of the product, and also rural-urban relations through the daily mobility towards the agropolitan centres, product marketing, and tourism marketing.

As shown above, the process of scaling-up scenario to include the entire geographic river watershed area is based on an interconnected clustered structure non-linear process; the challenge is how to address cumulative effects over different temporal and spatial scales. Therefore, we can classification the ‘Success’ of the scenario by monitored the causes of land-cover changes to develop environmental alternatives instead of the rapid consumption of natural resources. Subsequently, the results of the scenario are assessed from socio-economic and cultural perspectives on rural areas. The scenario can be converted into a measurable and repeatable plan in scaling-out process for sharing analytical methods. Thus, turning the studied area into a database and a platform for sustainable regional environmental planning, and marketing the strategy of sustainable rural communities as long-term investments.

6. Conclusion

The study demonstrated a new model of regional planning approach based on scaling up/out for geographic planning units "rivers watershed" upper off the administrative levels. Based on land-cover analyses during 30 years and integrated analysis of SWOT with slop vs. land-use. Therefore, the core role was of remote sensing and GIS in classification and combination for prioritizing the rivers watersheds in management and conservation of the natural resources to achieve the main idea of ruralization. Based on this study, it has been observed that SW/H and SW/A are the two main watersheds fall under the category of high priority to establish the development scenario in the rural areas of the watershed. Moreover, SW/G consider as a dynamic basin for accommodate future economic activities with high population concentration. Whereas SW/M with SW/H sharing identified the success of the ruralization scenario through the availability of the requirements for the establishment of the agropolitan centres in the upper and middle sections alike. Therefore, this scenario likely that will provide a sustainable solution to the problem of the rapid transition to urbanization and the loss of rural identity of large sections of the coastal region. Again, this study needs to supplement the results by specialization in the economic income and the long-term implications of the phenomenon of climate change, with constant updating of the database, especially post-war and the reconstruction phase.

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