

A Strategic RIS Model for Sustainable Urban Growth Management based upon Smart Growth

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도시성장관리를 위한 스마트성장 기반 RIS 전략모형 연구

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Abstract Modern urban cities are experiencing various problems like chronic traffic congestion, environmental pollution, reduced open space, shortage of affordable housing, deterioration of old downtown and sprawl. Under these circumstances, the urban sustainability can be grasped in many view points. Among these view points, urban growth management is one of the most recent and important issues that should be implemented by local government for the urban sustainability. This study will investigate the concept of Smart Growth as an executable strategy for the realization of sustainable urban growth management.

On the other hand, one of the most important problems that hinder the urban sustainability is the lack of consistency in driving the sustainable strategy originated from the fragility of virtuous cycle of internal organizations themselves.

This study will suggest an alternative local government organization model that enables the consistency and virtuous cycle of sustainable urban growth management based upon Regional Innovation System concept.

요 약 주택문제, 도심 오픈 스페이스의 감소, 난개발, 교통체증, 도심쇠퇴와 같은 문제점을 겪고 있는 현대도시의 지속가능성을 논의함에 있어서 도시성장관리는 지방자치정부의 차원에서 중요한 이슈중의 하나이다. 이러한 지속가능성을 가능케 하는 실천전략으로 본 연구에서는 스마트성장의 개념을 살펴보았다. 또한 도시의 지속가능성에 가장 큰 걸림돌 중의 하나는 지속가능한 전략을 일관성 있게 추진할 수 있는 선순환 구조가 결여된 자치단체의 내부구조상의 문제점을 들 수 있다. 본 연구에서는 지역혁신시스템(RIS)에 기반하여 각종 도시성장관리 전략에 있어서 지속적인 선순환 구조를 가능케 할 수 있는 지방정부조직의 개념적 모형을 제시하였다.

Key Words : Sustainability, Urban Growth Management, Smart Growth, Regional Innovation System(RIS), Urban Information System(UIS)

1. Introduction

In relation to sustainability, the problems of modern urban cities can be grasped with following two aspects. The first, in the view of physical environmental aspect, we need an executable strategy to solve a lot of problems

like chronic traffic congestion, environmental pollution, reduced open space, short of affordable housing, deterioration of old downtown and urban sprawl. The second, in view of application of this strategy, we need a coherent implementational organization to keep this strategy running without discontinuation or discrepancy

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that hinders virtuous urban development cycle.

With the above mentioned ideas in mind, the purpose of this study is to explore the executable strategies and suggest an organization model for the sustainable urban growth management. This study will explore the concept and characteristics of sustainable development, urban growth management, Smart Growth, UIS (Urban Information System) and RIS (Regional Innovation System) as an executable strategy. Then a set of RIS (Regional Innovation System) based model as a coherent implementational organization will be suggested.

2. Smart Growth as an executable urban growth management

2.1 Sustainable development

Sustainable development is a pattern of resource use that aims to meet human needs while preserving the environment so that these needs can be met not only in the present, but also for future generations. It ties together concern for the carrying capacity of natural systems with the social challenges facing humanity. The field of sustainable development can be conceptually broken into three constituent parts: environmental sustainability, economic sustainability and sociopolitical sustainability. Eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's carrying capacity. This means comprehensively considered development of land use, transportation, telecommunication, energy, socio-politics, environment, historical and cultural preservation and regeneration. The concept has included notions of weak sustainability, strong sustainability and deep ecology. Sustainable development does not focus solely on environmental issues[1].

2.2 Urban growth management

Growth management is a set of techniques used by government to ensure that as the population grows that there are services available to meet their demands. These

are not necessarily only government services. Other demands such as the protection of natural spaces, sufficient and affordable housing, delivery of utilities, preservation of buildings and places of historical value, and sufficient places for the conduct of business are also considered.

The application of growth management techniques are often governed by the development of a comprehensive urban plan. The plan can be used to measure the impact that new growth will have on the community and define the method by which that impact is mitigated. Generally, the plan can be prepared by these 6 criteria: consistency between related plans, concurrency between environmental development and SOC, compact urban development, affordable housing, preservation of historical and natural resources, economic development[2].

2.3 Smart Growth

Smart growth is an urban planning and transportation theory that concentrates growth in the center of a city to avoid urban sprawl; and advocates compact, transit-oriented, walkable, bicycle-friendly land use, including neighborhood schools, complete streets, mixed-use development with a range of housing choices. Smart growth values long-range, regional considerations of sustainability over a short-term focus. Its goals are to achieve a unique sense of community and place; expand the range of transportation, employment, and housing choices; equitably distribute the costs and benefits of development; preserve and enhance natural and cultural resources; and promote public health[1].

Its specific topics can be organized into 7 issues[3,4].

- (1) Community Quality of Life: Smart growth offers a framework to build community and help create and preserve a sense of place. It does this through housing and transportation choices, urban green spaces, recreational and cultural attractions, and policies and incentives that promote mixed-use neighborhoods.
- (2) Design: Smart growth creates communities that offer health, social, economic, and environmental benefits for all. It achieves this by promoting resource-efficient building and community designs, green building practices, low-impact development, and mixed-use and walkable neighborhoods.

- (3) Economics: Smart growth encourages community-based small business investment and development, adds to the variety of local employment opportunities, and helps attract new businesses and industries. More efficient government services are key to this, as are public and private investments that focus on quality of life improvements.
- (4) Environment: Many of our current environmental challenges -air and water pollution, global warming, habitat fragmentation and conversion- are due in part to the way we have built our neighborhoods, communities, and metropolitan areas during the past half-century.
- (5) Health: Smart growth reduces health threats from air and water pollution and indoor air contaminants through resource-efficient building design and offering transportation options such as mass transit, bike lanes, and pedestrian walkways. These engage residents and workers in a more active, healthy lifestyle.
- (6) Housing: Smart growth promotes housing options for diverse lifestyles and socio-economic levels. It does this through mixed-use, affordable housing and compact development that revitalizes neighborhoods and provides an alternative to automobile-dependent communities.
- (7) Transportation: Smart growth protects public health and environmental quality, conserves energy, and improves the quality of life in communities by promoting new transportation choices and transit-oriented development.

3. UIS and urban growth management

3.1 UIS and the need of prediction model

UIS (urban information system) is a kind of application of GIS. (geographic information system) It utilizes urban information DB which includes urban geometric and attribute data. It also designates a decision making supportive computer system that can make it efficient to perform urban planning, urban maintenance and civil affair through data input, update, edit, search and analyzing[5].

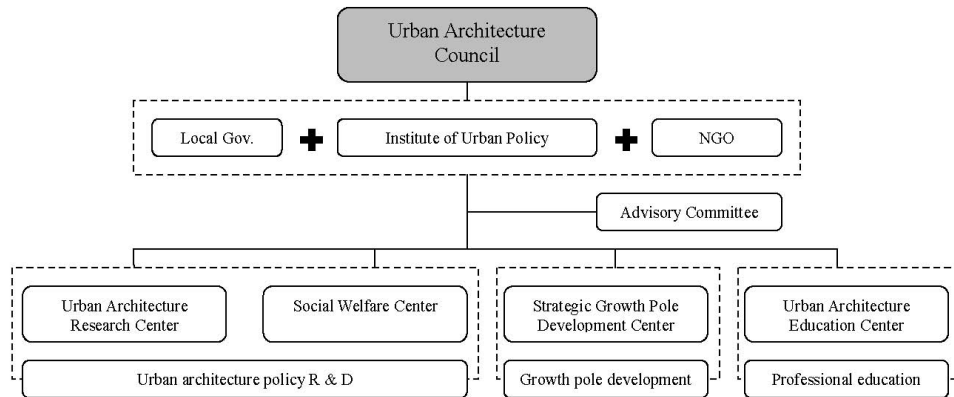
With the change of the nature of local government from e-government to g-government, lots of urban information DB was built by governmental department or division separately. These respective DB can be used more sophisticatedly by synthesizing and networking between themselves. It can be used not only for the departmental purpose but also for the comprehensive purpose like planning the urban development and prediction of urban growth etc. Furthermore, census data can be included for the qualitative urban analysis.

3.2 Building UIS and its application

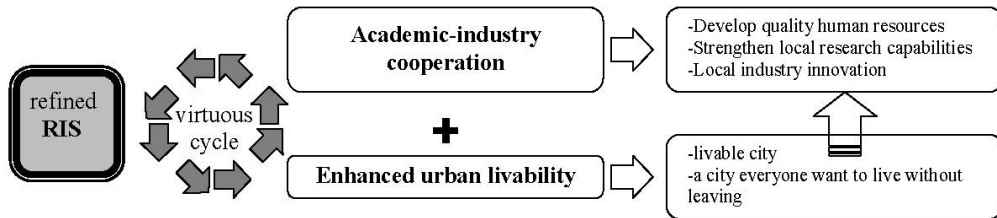
Building UIS can be started from constructing its own infra structure. The infra structure is comprised of structured urban spatial information and data modeling, defining departmental application objectives, and systematic data maintenance and updating. The development process of integrated UIS for urban growth management should include researches for urban performance indicators and various case studies. In regard of the application, developing prediction model for urban growth, involving community and aiming at next generation should be considered.

3.3 Urban growth management and urban architecture council model

Urban growth management can not only improve physical urban appearance but also affect various urban growth resources like fostering urban expert, participating community, enlarging life-long educational chances and renouncing urban characteristics. These kinds of resources can be achieved through enacting urban policies. And the policies can be conceived by urban architecture council. The council is comprised of local government, NGO and institute of urban policy. Civilian, enterprise, government and academia will be included as participatory agents. The council intervenes in the whole process of urban policy establishment from the conceptual planning to actual operation. Community participatory design and pursuit of practical design solution are the basic characteristics of the council. (Fig 1)



[Fig. 1] Urban architecture council model



[Fig. 2] Refined RIS concept

4. RIS model for sustainable urban development

4.1 Refining RIS concept

A regional innovation system (RIS) is conceived as the set of economic, political and institutional relationships within a given geographical area that generates a collective learning process, leading to the rapid diffusion of knowledge and best practice[6]. RIS is an organic system of regional government, universities, enterprises, NGOs, institutes and journalists. These innovation actors cooperate each other for regional development and improvement in various fields like R&D, industrial production, policy renovation and cultural activities etc. The network system between the actors strengthens the potentiality of the innovation. RIS carries a roll of regional policy establishment and its integration and coordination[7].

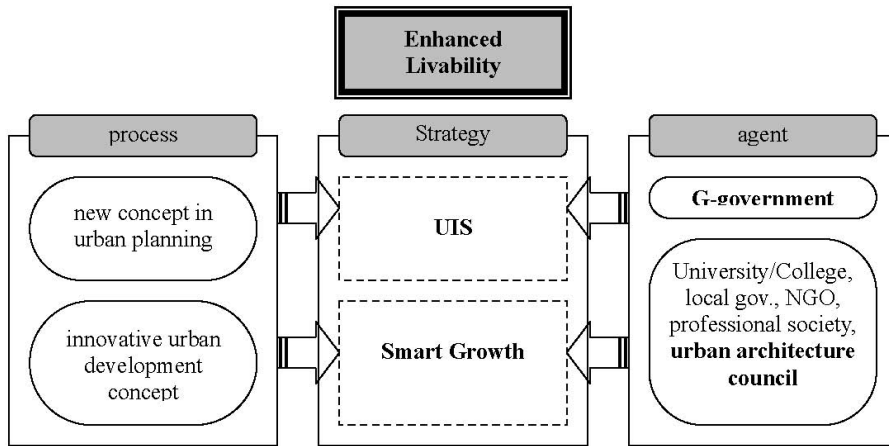
The decision of successful RIS should be measured under long term vision because innovative momentum in short term is vulnerable to a inconsistency and lack of virtuous innovation cycle. This discontinuation could be

resulted in outward dependency and urban sprawl when the region (urban) has weak livability. The success of RIS in the truest sense can be achieved when the innovation potential continues without discrepancy. And this continuation can be fulfilled when citizen lives in the livable city where everyone wants to live without leaving.(Fig 2)

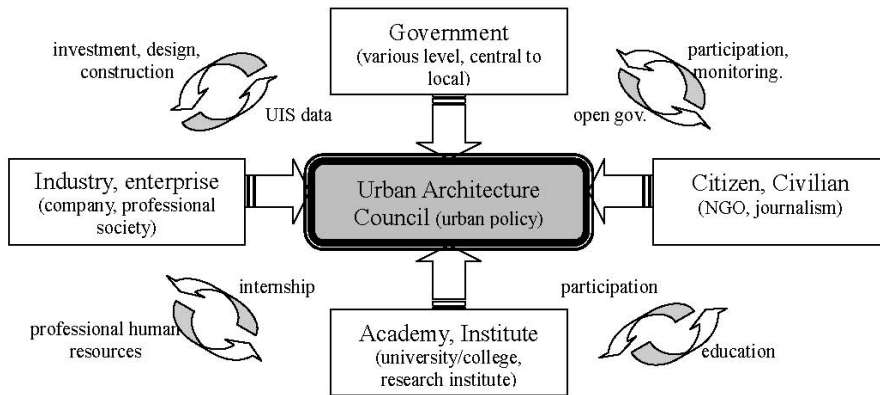
4.2 Livability enhancement model

The enhancement of urban livability can be considered in three aspects. The concept of traditional urban planning and development process needs to be innovative. With this innovative concept, new livable urban growth policy can be well adopted. The participation of various agents needs to be active. With this active participation, livable urban growth policy can be sustained. In the core of the strategy of livable urban growth, UIS technology and Smart Growth policy can realize enhanced urban livability.(Fig 3)

4.3 Strategic RIS model for sustainable urban growth



[Fig. 3] Enhanced livability model



[Fig. 4] Strategic RIS model for sustainable urban growth

A strategic RIS model for sustainable urban growth means integrated network of civilians, governments, industries and academies centered on urban architecture council. These interlinked agents interact each other helping synergetic outcome possible. Each agent will give its own outcome and take other's outcome. All these process will be coordinated by urban architecture council for the coherency and continuation of sustainable urban growth policy.(Fig 4)

5. Conclusion

Sustainable urban development in modern city is one of the most important issues. In addition, the sustainable development in existing urban area needs to be addressed

by urban growth management. Also, this management should be implemented with continuous and coherent urban policies because any policies that lacks its sustainable implementation has meaningless no matter how they are good. The starting line of this sustainable policy for sustainable urban growth management should be urban livability for civilians.

This paper has suggested urban architecture council as a policy making organization and Smart Growth concept as an executable strategy. And redefined RIS concept and organizational model have been proposed for the enhancement of urban livability based upon UIS technology and Smart Growth concept. Finally, RIS based schematic model for sustainable urban growth has been presented. The actual application and its evaluation should be followed in further studies.

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