Published as: Azadi, H., Ho, P., Hafni, E., Zarafshani, K. & Witlox, F. (2011), Multi-Stakeholder Involvement and Urban Green Space Performance. *Journal of Environmental Planning and Management*, vol. 54 (6): 785-811.

Multi-Stakeholder Involvement and Urban Green Space Performance

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Abstract: This study aimed to identify the main factors influencing urban green space performance. For this purpose, a conceptual framework on the relations of multi-stakeholder involvement (MSI) and the performance was conducted by a mixed-method approach. The study covered all urban green space projects (UGSPs) published in international journals as its population which were obtained from three main databases: ISI Web of Knowledge, Scopus, and Picarta. Using a few keywords' combinations, 29 relevant journals were identified which included 42 UGSPs as the main units of analysis in this study. A content analysis was used to determine the contribution of MSI to the performance of urban green space. Also, the main internal (state, private, society, planning/design, implementation, maintenance, input for management, and financial support) and external (regulation, good leadership, and financial support) MSI's indicators were further identified. The findings showed that the main indicators which significantly influence urban green space performance are "state, society, implementation, and regulation". The study concluded that the state plays a critical role in the UGSPs' performance though it is not the only actor. The influential role of the state and society should also be considered since most of green space projects are non-profit oriented. Besides, "society" involvement also contributes to the performance and "regulation" is needed as a legal basis for green space development and management as well. To validate the conceptual framework and

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mixed-method approach developed in this study, conducting more studies were recommended to compare the relationship of the MSI and the UGSPs' performance in different categories.

Keywords: urban green space, multi-stakeholder involvement, performance, mixed-method.

1. Introduction

The development and management of green spaces in urban areas is mostly the responsibility of governments. On the current issue of green space development and management, there is a tendency that the government is no longer the single agent. "The state is a big force for development - but it is not the only one" (UNDP, 2004). Erickson (2006: 280) argued that "rarely, if ever, the initiator of open space project is its sole implementer". A comparative study about development and management of green spaces in 26 European cities conducted by Baycant-Levent et al. (2004: 10) suggests that "a collaborative and enable partnership among local authorities, local business and voluntary groups should be formed" to improve the quality of urban green spaces. This kind of collaboration can be regarded as Multi-Stakeholder Involvement (MSI) in urban green space development and management. In general, MSI in green space development and management is a process of collaboration, in which two or more than actors work together to pursue a common goal. According to Smith (2009), collaboration can be either formal (mandated by the state) or informal; intra and inter-organizational; vertical or horizontal; and involve many organizations. This definition is similar to the term multi-stakeholder process used by Hemmati (2002) who described it as processes which:

a) aim to bring together all major stakeholders in a new form of communication, decision-finding (and possibly decision-making) structure on a particular issue;
b) are based on recognition of the importance of achieving equity and accountability in communication among stakeholders;
c) involve equitable representation of three or more stakeholder groups and their views;
d) are based on democratic principles of transparency and participation; and
e) aim to develop partnerships and strengthened networks between two or more various stakeholders.

Referring to the definition of collaboration by Smith (2009) and multi-stakeholder process by Hemmati (2002), the term MSI in this study is defined as 'a harmonic collaboration among actors which will/can (be) influence(ed) by urban green space development to pursue perceived goals. This kind of collaboration can be implemented in all the steps of urban green space development and management, from planning and designing up to management processes.

Smith (2009) argued that in other policy areas, increased collaboration and networking will have a positive effect on performance. According to him, it will also be relevant that increased collaboration will lead to a better urban green space performance. The performance can be defined as the output of green space development and management process which can be measured quantitatively by (e.g.) total area/person or qualitatively by some indicators (e.g.) created environmental or socio-economic benefits. In so doing, this study aims at identifying the main factors influencing urban green space performance. For this purpose, a conceptual framework on the relations of multi-stakeholder involvement (MSI) and the performance is conducted by a mixed-method approach. The quantity and quality of urban green spaces can be measured by several indicators which are elaborated in the following sections.

2. Theoretical framework

In 2004, Baycan-Levent and Nijkamp conceptualized a taxonomy of value for urban green spaces which was later used by some researchers to assess green space performance. This taxonomy is based on the contribution (roles) of urban green space from social, planning, economic and ecological perspectives. Later, Baycan-Levent et al. (2004) developed an operational taxonomy for evaluation of urban green space performance that used the four previous perspectives and added a new item; multi dimensional values which consisted of scientific value (education function) and policy value (financial and public function).

Urban green space performance can also be assessed from its responsiveness to actual issue or the ability to solve the background problem. In 2006, Denters and Klok used "responsiveness" as one of indicators to assess institutional performance of urban sustainability. They discussed that responsiveness is related to goal achievement while sustainability is related to its contribution to economic prosperity, ecology, social cohesion, integration, and coordination.

This study combines and adapts some criteria from previous studies to assess urban green space performances mostly focused on quality and sustainability of green space. The latter is interpreted as the status of such performance in the long-run while the former is related to their contribution (roles) to environmental, economic and social aspects of life (contribution to sustainable development) which refers to Baycan-Levent and Nijkamp (2004) and their responsiveness to actual issues (Denter and Klok, 2006).

Some previous studies have also separately analyzed some factors related to MSI and UGSP. This study tries to collect those findings and build a conceptual framework to identify those factors which have a significant influence on UGSP. Overall, this study classifies these factors into internal and external. Internal factors are regarded as those embedded to the actors (actor-centered) that are consisted of who the actor is (structure) and what they do (roles). Internal factors are consisted of other factors beyond actor-center factors. Combining those aspects of UGSP and MSI, the conceptual framework of this study is illustrated in Fig. 1.

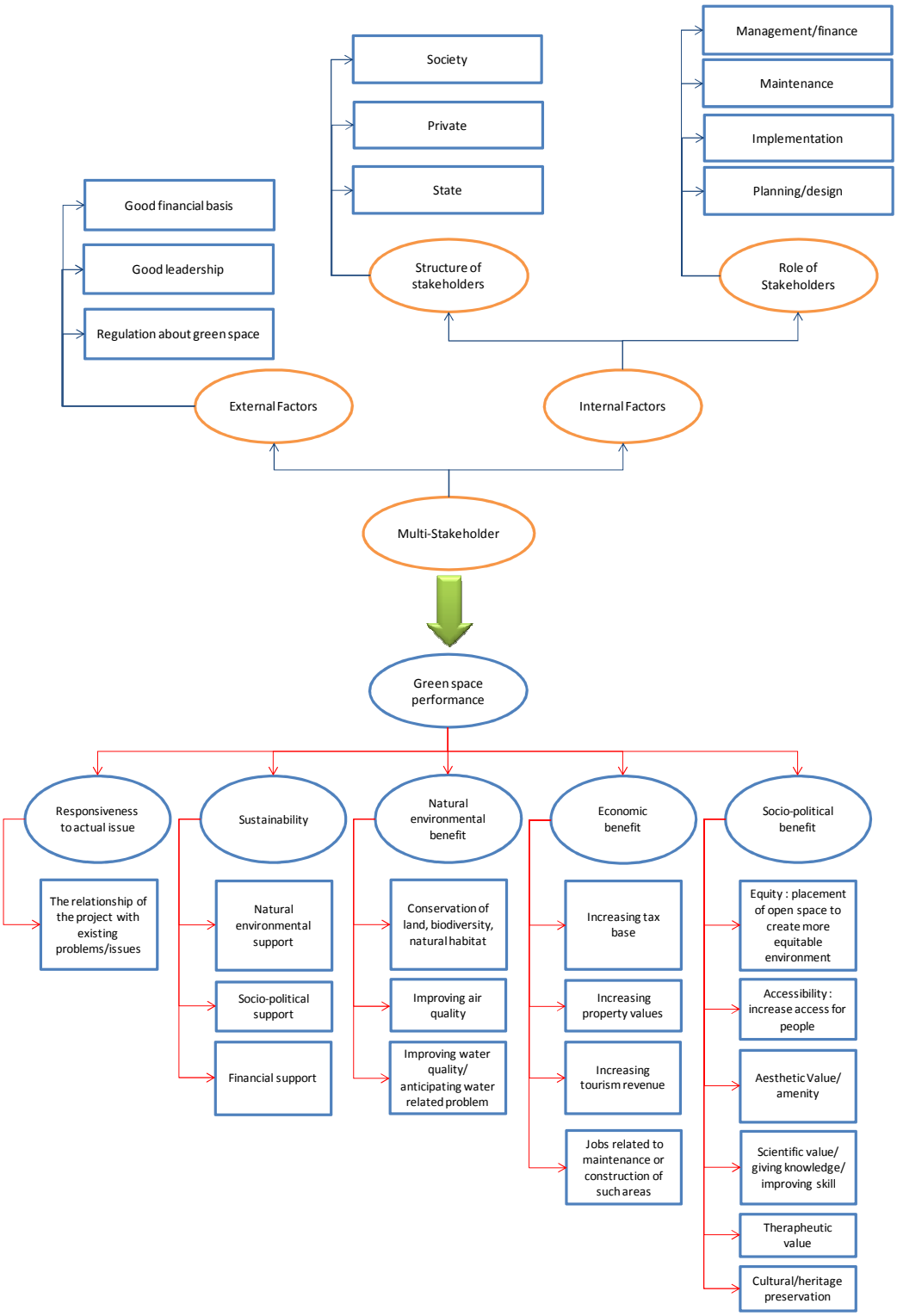

Fig. 1. Conceptual framework of the study: the proposed UGSP and MSI's indicators.

3. Methodology

Since MSI's indicators and the UGSPs' performance include both qualitative and quantitative measurements on the one hand, and on the other hand, as this study is conducted based on qualitative data which will be used for quantitative measurements, a mixed-method approach is used to process the data. Tashakkori and Teddie (1998:17) defined mixed method studies as "studies that combine qualitative and quantitative approaches into the research methodology of a single study or multiphased study". They argue that the main data analytic strategies in mixed methods are converting qualitative data into quntitative data and vise versa. Depending on the nature of research statements, the main focus of a mixed method can be on qualitative measurements or quantitative. Ulin et al., (1996) in Tashakkori and Teddie (1998; p.44), refer to the focus as the main "scenarios" of mixed methodology in which this study has used qualitative scenario to develop quantitative tools (techniques).

Despite adapted some methodologies and conceptual framework from other authors, the technique used in this study is unique in a sense as it is among few studies using mixed methods to analyzed urban green space development and management, particularly focused on the relationship of UGSP and MSI.

3.1. Population and sample

This study has focused on urban green space institutions. The units of analysis in this study are urban green space institutions which are elaborated in previous studies[2]. Those studies are therefore the elements of this study[3]. Since all of the data depends on the results of previous studies, sampling will much be influenced by the availability of relevant studies, means that the studies have the information or characteristics needed for analysis (Little et al., 2008).

3.2. Data collection

The data were obtained from three broad and most appreciated scholarly databases: ISI Web of Knowledge, Scopus and Picarta. The main key word used to obtain the data was "green space" which might also be presented by other terms in different studies such as "green space", "open space", and "urban park". The terms were combined with "multi-stakeholder" involvement as well as "participatory", "participation", "governance", "stakeholder", "partnership", "collaboration", "institution", "management" and "planning". Some of those key words seem too general but they were used in order to not missing any possible relevant studies.

The first selection of the journal articles resulted in 20,522 studies. In the second round, the studies were sorted out based on their relevant tittles and abstracts resulted 40 journal articles. In the third round, the 40 articles were re-sorted based on the availability of UGSP and MSI indicators that they had in their contents, ended up to 29 journal articles. The 29 journal articles contain 42 urban green space cases. The flow of data elicitation is illustrated in Fig. 2.

[2] The population only included English studies due to the preference of the authors' language vocabulary.

[3] Babbie (2007) defines population as the aggregation of elements from which the sample is actually selected, unit of analysis as people or things whose characteristics observed by social researcher and element of the research as unit about which information is collected and provides the basis of analysis. Element is used in data collection while unit of analysis is used in data analysis.

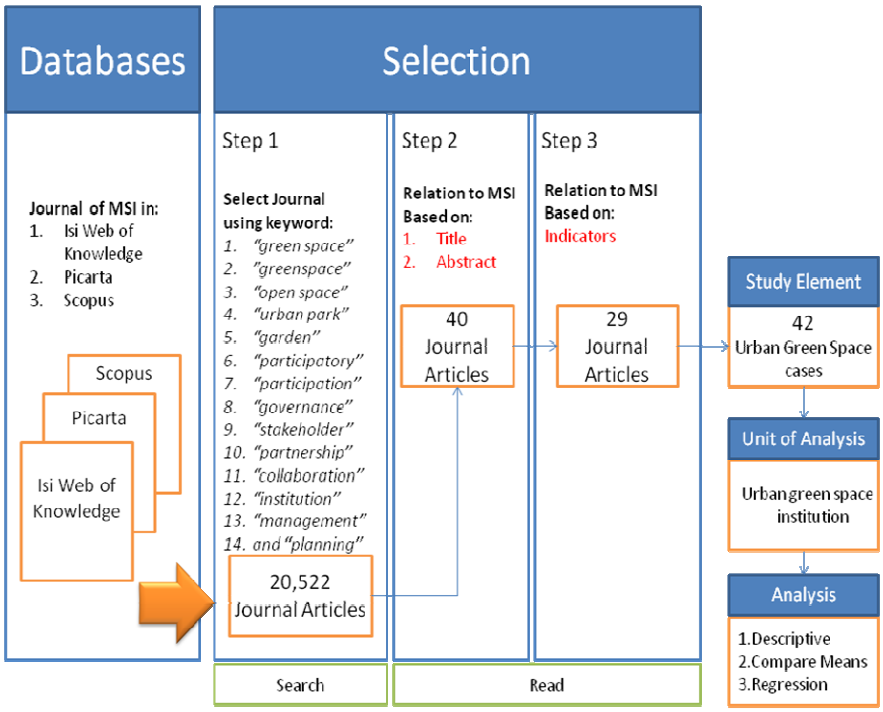

Fig. 2.Sampling approach

3.3. Qualitative analysis

The transformation of descriptive (qualitative) data to (quantitative) measurements was done through a qualitative analysis in two phases as elaborated below.

3.3.1. Scoring

The data on UGSP in the 42 projects were scored based on the UGSP's five general principles[4]. The five principles and their explanations are shown in Table 1.

[4] The performance indicators in this study are adapted from the framework developed by Denters & Klok (2006) combined with the framework developed by Baycant-Levent et al. (2004) as elaborated in theoretical framework.

Table 1. The general principles and their explanations of UGSP.
(Adapted from Denters & Klok, 2006; Baycant-Levent et al., 2004)

	General Principle	Explanation
1)	Responsiveness to actual issues	- The relationship of the project with existing problems/issues: a better project is a project which meets its original goal or is able to solve its original problems.
2)	Sustainability	- Natural environmental support: the project is sustainable when there is a natural environmental support (e.g. slope, soil condition, water condition, etc.). - Socio-political support: the project is sustainable when it has socio-political support (e.g. public acceptance and good leadership). - Financial support: the project is sustainable when having a good financial basis.
3)	Natural environmental benefit	- Conservation of land, biodiversity, and natural habitat: green space project contributes to provision and protection of natural habitat, for instance, the establishment of green network, providing place for birds to nest etc. - Improving air quality: green space project can provide a better air quality, for instance, from plants used in the project. - Improving water quality/minimizing water-related problems: green space project can improve water quality, for instance, through the ability or plants to absorb water and filter the pollutant. Green space project such as riparian or green space in sloped areas can minimize water based problems.
4)	Economic benefit	- Increasing tax base: the establishment of green space particularly recreational green space, housing estate, etc. will increase tax base revenue. - Increasing property values: the value of property closed to green space location is usually higher than other areas. - Increasing tourism revenue: the establishment of green space particularly recreational green space will increase tourism revenue, not only from tax. - Jobs related to maintenance and construction of such areas: the implementation of urban green space project will offer some physical jobs for local people.
5)	Socio-cultural benefit	- Equity: placement of open space to create more equitable environment. - Accessibility: the establishment of green space project should provide a better access for people. - Aesthetic value: instead of functional, green space project should also be aesthetics. - Giving knowledge/skill: green space project can provide a valuable knowledge particularly related to basis natural environmental knowledge. - Therapeutic value: the contribution of urban green space to health. - Cultural/heritage preservation: green space project can also function as cultural heritage preservation particularly located in heritage site.

Based on above mentioned indicators, the following equation of urban green space performance has been developed:

$$UGSP = f\,(Re + Su + Na + Ec + So)$$

Where:

UGSP = Urban Green Space Performance
Re = Responsiveness to actual issues
Su = Sustainability
Na = Natural environmental benefit
Ec = Economic benefit
So = Socio-political benefit

The above-used scoring technique was adapted from Floress et al. (2009) who assessed the quality of greenways planning in North Indiana. Following describes the coding approach used in that study as well as in the present:

- "0" when the principle was not mentioned or explicitly stated as low;
- "1" when the principle was implicitly stated; and
- "2" when the principle was explicitly stated.

3.3.2. Ranking

The scores of UGSP were ranked into four categories; "excellent", "good", "fair", and "poor", adopted from Floress et al. (2009). The scores were ranked using SPSS (version 16) as follow:

- 4 – 9 are ranked as 1 (poor performance quality)
- 10 – 15 are ranked as 2 (fair performance quality)
- 16 – 21 are ranked as 3 (good performance quality)
- 22 - 27 are ranked as 4 (excellent performance quality)

Based on the results, the lowest score was determined equal to 4 while the highest was 24 (range = 20), means that the interval of each level is "6"[5].

3.4. Quantitative Analysis

As discussed, the dependent variable of this analysis is UGSP which consists of two kinds of measurement whereas the independent variables include ten MSI elements which can theoretically the influence UGSPs' performance (see Fig. 1). All the variables and their explanations used in quantitative analysis are shown in Table 2.

[5] To check the reliability of the codes, some of the statements in journal articles were quoted.

Table 2. The dependent and independent variables of this study.

Dependent variable	y_i	= performance of urban green space	Dependent variable is a composite measurement of the five performance principles consisted of 17 indicators.
Independent variables	x_{1i}	= state: State includes all types of government from local to national level	Internal factors
	x_{2i}	= private: private sectors comprise of banks, enterprises, manufactures contributed to green space development	
	x_{3i}	= society: Civil society can be an individual (e.g. philanthropists) or groups (NGOs, CBOs, FBOs, academic institution)	
	x_{4i}	= planning/design: Stakeholder can participate in planning and design process by providing input/idea for planning or make a collaborative design with planner	
	x_{5i}	= implementation: Stakeholders participate in transforming the design into a real green space for instance, the construction of parks, tree planting, etc.	
	x_{6i}	= maintenance: Stakeholders participate in taking care of existing green spaces for instance, by pruning, watering, cleaning and replanting green space area	
	x_{7i}	= input for management and financial support: Stakeholders are involved in giving some idea for green space management or providing financial support for green space development	
	x_{8i}	= regulation about green space: Regulation about green space become a legal basis which trigger green space development and management	External factors
	x_{9i}	= Good leadership: a good leadership will contribute to the legitimacy of multi-stakeholder in green spaces development	
	x_{10i}	= good financial basis: many studies also argue that one main constraints in green spaces development is the availability of funding	

4. Findings

4.1. Data distribution

Based on their geographical dispersion, the 42 urban green space cases are located in 15 countries spreading in four continents[6] (Fig. 3).

[6] The classification based on continent refers to the classification by the UN (2009).

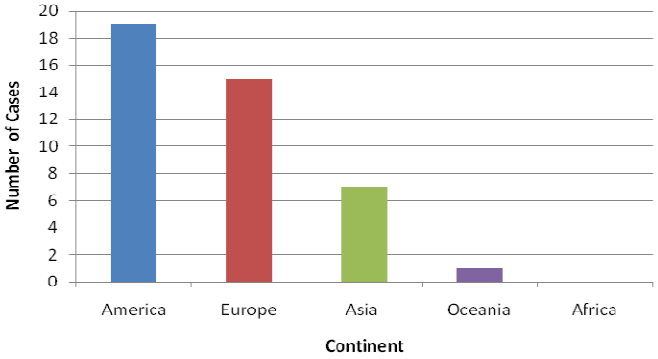

Fig. 3. The UGSPs' distribution in different continents.
Source: The study findings

Most of the projects (42.8%) are located in North America, which are mostly distributed in the US (11 cases; 26.2%). Fig. 4 illustrates the distribution of the study sample in different countries.

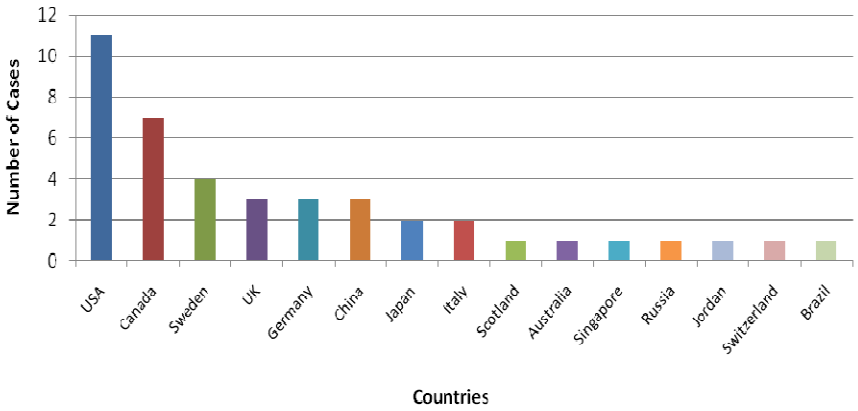

Fig. 4. The UGSPs' distribution in different countries.
Source: The study findings

Referring to the World Bank's Countries Classification (2009) based on income[7], only 12% of the UGSPs are located in developing countries (Porto Alegre, Brazil; Abu Nazer, Jordan; The City of St. Petersburg, Russia, Hong Kong and Beijing, China). The rest (88%) of the UGSPs are located in developed countries. In this study, none of the projects were located in undeveloped countries.

Fig. 5 demonstrates the data distribution based on the journal publications' year (left) and the year of the cases (right). Most of the journal articles were published in 2006. Most of the cases were conducted during 1991-2000. Some of the cases have been ongoing projects which their initial years are considered in this study.

[7] Based on their income, in July 2009, World Bank classified countries into Low-income economies, Lower-middle-income economies, Upper-middle-income economies, High-income economies, High-income OECD members. In this study, Low income economies countries are regarded as Undeveloped Emerging Economy Countries (Strata 1); Lower-middle-income economies, Upper-middle-income countries are regarded as developing countries or Economies Moving to Self-Sufficiency (Strata 2) while both high income economies categories are merged into one category developed countries.

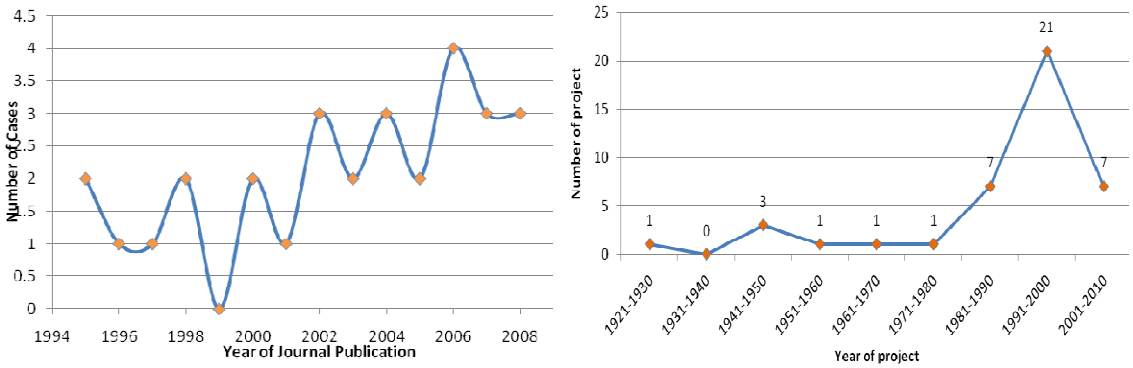

Fig. 5. The UGSPs' distribution based on the journal publications' year (left) and the projects' year (right).
Source: The study findings

As shown in Fig. 5, the number of green spaces projects has drastically increased in the 1990s. The reason could be related to the growing environmental awareness among planners and policy makers to increase the quality of life, culminated in the UN Conference on Environment and Development, Rio de Janeiro, 1992, when the Brundtland Commission popularized the term of 'sustainable development'.

Based on their types, the UGSPs in this study can be classified into eight categories as shown in Fig. 6.

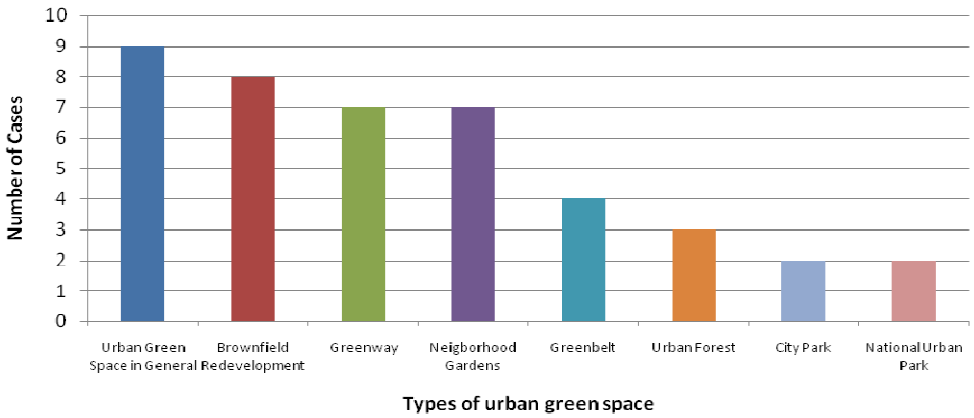

Fig. 6. The UGSPs' distribution based on their types.
Source: The study findings

The cases are mostly about urban green space in general (9 cases; 21.4%). The other types of urban green space which are often become the object of green space research are Brownfield redevelopment (8 cases; 19.0%), greenway (7 cases; 16.7%) and neighborhood gardens (7 cases; 16.7%).

4.2. Scoring and ranking results of UGSPs

Scores and ranks of the UGSP are derived from the transformation of qualitative data into quantitative measurements. The following sub-section explains the UGSP based on their ranks. The ranking results of the UGSPs' performance are shown in Table 3.

Table 3. The ranking results of the UGSPs' performance.

No	UGSPs' performance ranking				Total
	Excellent	Good	Fair	Poor	
(1)	(2)	(3)	(4)	(5)	
1	Brownfield Toronto *(Canada)*	Travis Country *(USA)*	Puerto Alegro *(Brazil)*	Abu Nuseir *(Jordan)*	
2		Leicester *(UK)*	Florence *(Italy)*	Sterling Forest *(USA)*	
3		Edinburgh *(UK)*	Bologna *(Italy)*	San Fransisco Bay Area *(USA)*	
4		Fish Creek *(Canada)*	N.Capital *(Canada)*	UNP Stockholm *(Sweden)*	
5		Meewasin Valley *(USA)*	Milwaukee *(USA)*	Golf Stockholm *(Sweden)*	
6		Greater Toronto *(Canada)*	Ottawa *(Canada)*	Portland *(USA)*	
7		Singapore *(Singapore)*	Los Angeles *(USA)*	Erlenmatt *(Switzerland)*	
8		UNP Stockholm *(Sweden)*	Troy Garden *(USA)*	Gleisdreieck *(Germany)*	
9		St. Petersburg *(Russia)*	Victoria Harbour Hong Kong, *(China)*	King's Cross Central *(UK)*	
10		Montrose point, Chicagi *(USA)*	Red River Valley *(USA)*	Zentrale Bahnfl ächen', *(Germany)*	
11		Don Valley *(Canada)*	USA *(USA)*	Stadtraum Hauptbahnhof *(Germany)*	
12			Tokyo *(Japan)*	Sweden *(Sweden)*	
13			Hiroshima *(Japan)*	Beijing 1st Plan *(China)*	
14			King William Park *(Australia)*	California *(USA)*	
15				Hongkong *(China)*	
16				Garnethil Park *(Scotland)*	
Frequency	1	11	14	16	42
Percentage	2.38	26.19	33.33	38.10	100

Source: The study findings

Scoring results show that only one case (2.38%) is ranked as excellent project (Brownfield development in Toronto). Sousa (2003) argues that Toronto is a city that has been proactive in converting Brownfield into green spaces by focusing on enhancing the green space inventory and overall quality of life in its urban areas. Eleven cases (26.19%) are ranked as good and 14 cases (33.33%) are ranked as fair projects while the other 16 cases (38.10%) are ranked as poor.

4.2.1. UGSPs and country

As mentioned earlier, the data are scattered by their geographical locations. The following explanation aims to see the UGSPs' distribution based on the countries and their level of performance. The data are distributed within 15 countries. The cross tabulation analysis depicts the distribution of UGSP's performance levels based on their locations which explains the association between the UGSP's location (country) and their performance (Table 4).

Table 4. The cross-tabulation analysis between the UGSP's location and their performance.

Country	Level of performance				Total
	Poor	Fair	Good	Excellent	
USA	4	5	2	-	11
Canada	-	2	4	1	7
Sweden	3	-	1	-	4
UK	1	-	2	-	3
Germany	3	-	-	-	3
China	2	1	-	-	3
Japan	-	2	-	-	2
Italy	-	2	-	-	2
Scotland	1	-	-	-	1
Australia	-	1	-	-	1
Singapore	-	-	1	-	1
Russia	-	-	1	-	1
Jordan	1	-	-	-	1
Switzerland	1	-	-	-	1
Brazil	-	1	-	-	1
Total	16	14	11	1	42

Source: The study findings

As shown in the table, it is interesting to note that those projects located in Economies Moving to Self-Sufficiency Classification can reach a better performance compared to those which categorized as developed countries[8] such as USA, Sweden, Germany, etc. In this study, case location cannot significantly influence the UGSPs' performance. Therefore, the projects' location might not guarantee a better performance of a UGSP. This argument is confirmed by the result of Chi-square test which indicates there is no significant relationship between UGSP and project location in this study.

4.2.2. UGSPs and their initial years

The data are also varied based upon their initial projects' years. The cross tabulation analysis was conducted to understand the association between the UGSP's performance levels and their project's initial years (Table 5).

[8] The classification of countries refers to the classification by World Bank (2009): Developed Countries, Economies Moving to Self-Sufficiency and Undeveloped Emerging Economy Countries.

Table 5. The cross-tabulation between the projects' initial years and their levels of performance.

Projects' initial years	Level of performance				Total
	Poor	Fair	Good	Excellent	
1921-1930	-	1	-	-	1
1941-1950	-	3	-	-	3
1951-1960	-	1	-	-	1
1961-1970	-	-	1	-	1
1971-1980	-	-	1	-	1
1981-1990	3	3	-	1	7
1991-2000	7	5	9	-	21
2001-2010	6	1	-	-	7
Total	16	14	11	1	42

Source: The study findings

Table 5 shows that most of "good" projects (9 cases; 21.4%) were started in the 1990s when the environmental awareness of the projects' leaders was growing. Based on the table, despite the starting period (1990s - 2000s), 30.9% of the projects are ranked as "poor" performances. It shows that different UGSPs' initial years might not affect their performances.

4.2.3. UGSPs types and performance levels

The cross tabulation analysis was also run to find the probable association between the UGSP's performance levels and their types (Table 6).

Table 6. The cross-tabulation analysis between the UGSPs types and their performance levels.

UGSPs type	Level of performance				Total
	Poor	Fair	Good	Excellent	
General	2	4	3	-	9
Brownfield Redevelopment	5	1	1	1	8
Greenway	-	3	4	-	7
Neighborhood garden	4	2	1	-	7
Greenbelt	3	1	-	-	4
Urban forest	-	3	-	-	3
City Park	1	-	1	-	2
National Urban Park	1	-	1	-	2
Total	16	14	11	1	42

Source: The study findings

As shown in the table, the "poor" up to "excellent" performances are distributed in Brownfield redevelopment cases. Most of the Brownfield redevelopment cases are redevelopment of abandoned railway. Their low green space performances can be related to the main concern of their redevelopment. Altherr et al. (2007) conclude in their five case studies, that green space is given a lower priority than other functions such as residential due to the strategic location of these sites. A "Good" urban green space performance is dominated by greenways project while "Fair" green space performance is dominated by urban green space in general. The result of Chi-square test indicates that there is no significant association between the UGSPs types and their performance level in this study.

4.3. Quantitative analysis of UGSPs and MSI indicators

The next steps of analysis aim at seeking the MSI's factors which significantly influence the UGSPs. While previous analysis used qualitative ranking ("excellent", "good", "fair", and "poor") as dependent variable, the following analysis will use quantitative scores (4-24) for dependent variable. Independent variables used in this study include 10 MSIs' indicators extracted from the literature review (see Table 2). Table 7 shows the qualitative distribution of MSIs' indicators using the coding approach (see section 3.3.1.).

Table 7. The distribution of MSI's indicators using the coding approach.

MSI's Indicators	0		1		2		3		Total	
	the variable was not mentioned or explicitly stated as low		the variable was implicitly stated		the variable is explicitly stated but not mentioned as strong		the variable is explicitly stated and mentioned as strong			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
State	-	-	7	16.7	17	40.5	18	42.9	42	100.0
Private	18	42.9	6	14.3	17	40.5	1	2.4	42	100.0
Society	5	11.9	5	11.9	14	33.3	18	42.9	42	100.0
Planning	7	16.7	3	7.1	15	35.7	17	40.5	42	100.0
Implementation	15	35.7	3	7.1	17	40.5	7	16.7	42	100.0
Maintenance	21	50.0	5	11.9	13	31.0	3	7.1	42	100.0
Management fund	12	28.6	7	16.7	15	35.7	8	19.0	42	100.0
Regulation	5	11.9	6	14.3	22	52.4	9	21.4	42	100.0
Leadership	39	92.9	1	2.4	-	-	2	4.8	42	100.0
Financial	30	71.4	12	28.6	-	-	0	.0	42	100.0

Source: The study findings

Based on the statements mentioned in journal articles, the code values can be regarded as the strength level of involvement for the MSI's indicators (0: "not involved"; 1: "less involved"; 2: "moderately involved"; 3: "strongly involved") in the journal articles.

To understand the contribution of each indicator, the interpretation will be focused on the accumulation of the codes 2 and 3 since they were mentioned explicitly. As the table shows, there are five indicators which have high percentages of the codes 2 and 3 (more than 50%). It means that those indicators mentioned explicitly in the text. The indicators are state (40.5% + 42.9% = 83.4%), society (33.3% + 42.9% = 76.2%), planning (35.7% + 40.5% = 76.2%), implementation (40.5% + 16.7% = 57.2%), and regulation (52.4% + 24.4% = 76.8%).

None of the data explicitly showed the existence of leadership in urban green space development and management. Only two cases explicitly stated that leadership is important in UGSPs (greenway development in Singapore and urban forest development in Hiroshima). In addition, none of the data mentioned the strong role of financial aspects of each projects. This finding is confirmed by Ericson & Louisse (1997) in Ryan et al. (2006) about greenway project which argued that access to funding does not guarantee the success of greenway completion. Furthermore, they argued that lack of funding will not also prohibit the project to be implemented since the fund was much supported by state.

4.3.1. Association between the MSI's indicators

Pearson correlation was used to understand whether there is any association between the MSI's indicators. Table 8 shows the correlation matrix between the MSI's indicators.

Table 8. Correlation matrix between the MSI's indicators (Pearson coefficients)

	State	Private	Society	Planning	Implementation	Maintenance	Management fund	Regulation1	Leader-ship	Financial
State	1									
Private	0.195	1								
Society	-.611**	-0.1	1							
Planning	0.061	-0.069	0.044	1						
Implementation	0.139	0.014	-0.19	0.138	1					
Maintenance	0.111	-0.093	-0.064	-.362*	-0.045	1				
Management fund	-0.269	-0.168	0.1	-.488**	0.302	0.144	1			
Regulation1	-0.079	-0.078	0.039	0.025	-0.172	-0.008	0.052	1		
Leadership	0.008	-0.082	-0.018	0.034	0.14	0.047	0.128	0.17	1	
Financial	-0.156	-0.18	0.112	-0.099	-0.12	0.029	0.076	0.059	-0.081	1

* $P \leq 0.05$
** $P \leq 0.01$
Source: The study findings

As shown in Table 8, there is a strong negative correlation between variables "state" and "society" (-0.611; $P \leq 0.01$). It can be interpreted that the roles of state and society are reciprocal. Therefore, when the role of state increases, the role of society will decrease. When one single actor such as state is dominant in urban green space development and management, it might supersede the role of other actors such as society. Furthermore, "planning" has a negative significant correlation with "maintenance" and input for "management" and "financial" support, meaning that when planning increases, the maintenance activity and input for management and financial support decrease. Pearson coefficient for planning and maintenance is - 0.362 which is significant ($P \leq 0.05$) and the coefficient between planning and input for management and financial support is – 4.88 ($P \leq 0.01$). It can be understood because planning, implementation, maintenance and input for management and financial support are a sequential process. When a project is finished, the other process such as maintenance and input for management will be more dominant.

4.3.4. Main MSI indicators influencing UGSPs' performance

Regression analysis in this study is used to identify those MSI indicators which significantly influence the UGSPs. As mentioned earlier, the dependent variable is the score of UGSPs' performance where independent variables are all the MSI indicators. The outputs of this analysis are shown in Table 9.

Table 9. Regression analysis on the main MSI indicators influencing UGSPs performance (Method: backward)

MODEL SUMMARY				
Model	R	R^2	Adjusted R^2	Std. Error
1	.948	.899	.889	4.492

ANOVA					
Source	Sum of Squares	Df	Mean Square	F	Sig.
Regression	6846.313	4	1711.578	84.832	.000
Residual	766.687	38	20.176		
Total	7613.000	42			

COEFFICIENTS[a,b]					
Independent variables	B	Std. Error	Beta	t	Sig.
State	2.138	.653	.377	3.275	.002
Society	1.404	.546	.240	2.573	.014
Implementation	1.504	.606	.200	2.481	.018
Regulation	1.494	.722	.226	2.068	.045

a. Dependent Variable: Performance

b. Linear Regression through the Origin

Source: The study findings

As the table shows, some MSI indicators significantly influence green space performance which are the "state", "society", and "implementation" as the internal factors and green space "regulation" as the only external factor. Hence, the best model of green space performance will be the collaboration of the state and society in green space implementation with a good regulation about green space development. Mathematically, the model of this output can be written as follows:

$$y_i = 2.138\,x_{1i} + 1.404x_{3_i} + 1.504\,x_{5i} + 1.494\,x_{8i}$$

Where:

y_i = Performance of urban green space

x_{1i} = State

x_{3i} = Society

x_{5i} = Implementation

x_{8i} = Regulation about green space

The diagnostic of assumption was run to check whether the model generated by regression analysis could meet all the regression assumptions. The assumptions are normality, no heteroschedasticity, no multicollinearity, and independency of error. Normality assumption requests that the error terms (ε_i) should normally be distributed. No heteroschedasticity assumption requires that the variance (dispersion) of observations of the error terms should be equal (Homosedastic). No multicollinearity assumption requires there is no multicollinearity between independent variables, and finally independency of error assumption asks for no autocorrelation between errors indicated by the value of Durbin-Watson (DW) test.

The results show that the regression model meets all the assumptions except the DW value which indicates the existence of autocorrelation between errors as elaborated below:

a) Independency of error

Table 10 provides the DW lower and upper critical value (*dl* and *du*) for 40 or 45 cases. By interpolation of these values, *dl* and *du* for 42 cases are shown in Table 10 and the outputs of the DW Test are shown in Table 11.

Table 10. Critical DW values

N	*dl*	*Du*
40	1.29	1.72
42	*a*	*b*
45	1.34	1.72

Source: The DW table

Table 11. The outputs of DW test

MODEL SUMMARY [b]

Model	R	R^2	Adjusted R^2	Std. Error	DW
1	.948[a]	.899	.889	4.49177	1.234

a. Predictors: Regulation, Implementation, Society, State

b. Dependent Variable: Performance

Source: The study findings

According to Gujarati (2008), if $d_l \leq d \leq d_u$, there is statistical evidence that the error terms are positively auto-correlated. It means the assumption that errors are not auto-correlated is rejected. Thereby, an adjustment procedure for regression model to adjust this effect is needed. One of the methods provided by SPSS to overcome autocorrelation is Cochrane-Orcutt. Table 12 shows the outputs of DW test based on Cochrane-Orcutt method.

Table 12. The outputs of DW test based on Cochrane-Orcutt

MODEL FIT SUMMARY

Model	R	R^2	Adjusted R^2	Std. Error	DW
1	.919	.844	.822	4.146	1.866

The Cochrane-Orcutt estimation method is used.

Source: The study findings

As shown in Table 12, *DW* is 1.866 which is greater than d_u (1.72). It means that there is statistical evidence that the error terms are not auto-correlated and the regression assumption is not violated (Savin and White, 1977).

b) Adjusted model

Cohrane-Orcutt Method produces a model which excludes the autocorrelation effect. Table 13 shows the coefficients for the model excluded the autocorrelation effect.

Table 13. The coefficients of regression model based on Cohrane-Orcutt Method

Independent variables	B	Std. Error	Beta	t	Sig.
State	2.324	.626	.419	3.713	.001
Society	1.324	.472	.245	2.804	.008
Implementation	1.520	.555	.235	2.737	.010
Regulation	1.187	.685	.187	1.731	.092

The Cochrane-Orcutt estimation method is used.
Source: The study findings

The model can mathematically be formulated as follows:

$$y_i = 2.324x_{1i} + 1.324x_{3_i} + 1.520\,x_{5i} + 1.187\,x_{8i}$$

Where:

y_i = Performance of urban green space
x_{1i} = State
x_{3i} = Society
x_{5i} = Implementation
x_{8i} = Regulation about green space

c) Test of hypothesis

Test of hypothesis functions as the confirmation of data analysis. The test consists of F-test and t-test which are elaborated in this section. The F test shows whether the overall of the estimated equation is statistically significant (Table 14).

Table 14. Test of hypothesis (F-test on Cochrane-Orcutt estimated model).

Source	Sum of Squares	df	Mean Square	F	Sig.
Regression	3344.751	4	836.188	48.64386	0.00
Residual	618.835	36	17.19		

The Cochrane-Orcutt estimation method is used.
Source: The study findings

The t-test is also used to test the hypothesis on the regression slope and to see whether the value of regression coefficient is different from the mean value of sample. As shown in Table 14, the p-value significant (Sig. = 0.00) which means that the null hypothesis should be rejected. Thus, there is sufficient evidence to conclude that at least one of the β's is not zero. Based on the results of both tests, it can be argued that the model predicted by Cochrane-Orcutt estimation method is valid. Table 12 shows that the value of R^2 is 0.844. This means that these four variables can explain 84.44% of the UGSP variance. In other words, when the state involvement increases by one unit, green space performance will increase by 2.324; the increase one unit of society involvement will increase green space performance by 1.324; when the actors of green space increase their role in implementation process for one unit, the increase in the green space performance can be predicted as 1.520 and when the availability of regulation increase by one point, the increase of the green space performance can be expected by 1.187.

5. Results and discussion

5.1. State/Government

One of the main findings resulted from this study is that the government plays a critical role in the UGSPs' performance. The positive coefficient in regression analysis suggests that the increase role of government contributes to a better performance of the UGSPs. Basically, the strong role of government in urban green space development and management is caused by the nature of the UGSPs in this study. All of the UGSPs are public green space which implies that green space is accessible for public which might be owned by government, private sector or society. Sousa (2003) argues that UGSPs designed to serve public non-profitably. It can be understood that the majority of UGSPs which are mostly supplied by the government are non-profit oriented.

The other factor which has created the strong role for government is 'redevelopment' since most of the projects, despite being urban green space in general, are Brownfield which need for redevelopment. This role is important as the Brownfield sites are prone to potential hazards due to their previous dysfunctions. In addition, strong government control is also crucial for greenbelt development. For instance, many Chinese cities such as Beijing, Shanghai, Guangzhou, Chongqing and Senyang have adopted greenbelt concept with the strong emphasize of government control (Yang and Junxing, 2007).

Government contributes to a better performance of urban green space development and management by providing a legal framework. This statement is confirmed by UNDP (2004) arguing state/government functions to control and exert force, is responsible for public services, and creates and enables environment for sustainable development. However, strong role of government in urban green space development and management does not mean that government is the one in decision making.

The success story of government in providing development framework can be seen in the case of Puerto Alegre. This city were able to overcome some crisis of low-middle income nations such as poverty, unemployment, corruption even urban green space provision because of a good management of the city over the last 12 years (Manegat, 2002). The government realized that technical planning approaches are not suitable for current democratic situation so that the government revised urban planning and management including environmental planning and management. According to Manegat (2002: 182), main components of this change are citizen participation, public environmental management programs, comprehensive knowledge of Porto Alegre's natural and built environments and environmental education. Now, the city has a high standard green space/person ($14m^2$/person) (Manegat, 2002) and is famous for its participatory budgeting system.

In addition, the strong role of government is important in coordinating and mediating plural interest of various stakeholders involved. As Altherr et al. (2007) explained, private sector such as developer tends to pay attention to the quality of urban green space in increasing value added of an area; citizens mainly concern about the daily use of space while environmentalists concern mostly about nature conservation. Sousa (2003) argues that lack of coordination among governmental agencies and other stakeholders is one of the barriers in greening Brownfield sites. Furthermore, UNDP argue that government can also empower the people in order to be responsive to citizens' demands. The implementation of all these government's roles is strongly related to a strong commitment and political will of the actor itself.

5.2. Society

Society in urban green space development and management consists of individuals such as philanthropist, resident such as student of a university or organizations like NGOs. More than three-fourth of the data explicitly pointed to the involvement of society in urban green space development and management (see Table 7). The involvement of society is also very important in urban green space development and management due to the nature of urban green space as something dedicated to serve public.

The significant involvement of society in this study can also be influenced by the growing popularity of NGOs such as Land Trust in USA and Europe due to the dissatisfaction of regulatory planning failure. According to Bendaña (2006), most of NGOs in the world have been established since the era of 1990s and officially described by United Nation in 2004. As shown in Fig. 3-5, most of the projects are located in USA, Canada and Europe which were mostly conducted during the 2000s. The participation of NGO can be seen in the case of Edinburgh (case 6) and Leicester (case 5) where Edinburgh Greenbelt Trust and Environt (NGOs) are, among key actors, influencing urban green space policy. In the case of Los Angeles urban green space project (case 17), environmental nonprofits have also influenced the definition of parks and open space in the area, and shaped the ideology urban green space development. For instance, Portland urban green space project (case 26), The City Repair Project (NGO) supported local community in urban green space development and management by conducting workshops.

In addition, the significant involvement of society might also be influenced by the existence of philanthropic tradition in the US. As shown in Fig. 3-4, most of the data are located in the US while according to Pincetl (2003), in the early of the 20th century, the philanthropic tradition was strong in the US with emphasized on land donation or purchase through fund rising. The philanthropists' participation in this study can be seen in fund provision for development and management of Sterling Forest, New York (case 8) and San Francisco Bay Area (case 9), Brownfield redevelopment in Toronto, Canada (case 14), purchase of land and refurbishment of parks and recreations area in Los Angeles (case 17), and urban landscape development in California (case 38).

By involving society, urban green space planner will know exactly what people's needs and perceptions are about urban green space so that planner can provide an appropriate provision of urban green space. Society involvement in urban green space development and management can be seen in some cases. In Travis Country (case 1), landscape architecture students collaborated with Home Owner Association and local government to create a master plan for that neighborhood (Teal et al., 1998).

The involvement of society can also have a contribution to the provision of funding or management of state resources. Society can be involved individually or in groups. Philanthropists' gift or their contribution to provide funds for urban green space development and management as found in many cases in the US, is an example of individual type of society participation while the role of NGOs is an example of group participation. According to Pincetl (2003), civil society institution such as charity organizations and NGOs participate in mobilizing state resources by creating such a business coalition. In the case of Los Angeles (case 17), the NGOs have effectively become a partners in park planning. The land trust as civil society institution applied for government funding to manage park and open spaces in Los Angeles.

Kjaersdam (1988) in Erickson (2006), based on Danish experience argues that public participation in planning process made the plan stable and effective due to the creation of

collective awareness toward the plan. Different input from different perspective of society will enrich urban green space quality.
In addition, society involvement will build a sense of belonging about urban green space. Jones (1990) in Erickson (1996), based on American experience argues that the greater public involvement in urban green space development and management, the greater their sense of ownership, and the greater their sense of belonging, the greater their willingness to nurture urban green spaces. These sense of belonging and willingness to take care of urban green space come from positive cognitive images that they have. Abu-Gazzeh (1996) proved that neighborhood space which gives meaning for people, provides public access, stimulates use and participation that will be loved and cared carefully by the users.
Porteous (1977) argues that the most important thing in the creation sense of belonging is that actions in the real world take place on the basis of the cognitive image of the real world, held by the individuals. The establishment of this belonging sense can also be interpreted as socio and political support for urban green space development and management. Burby and May (1998) in Steelman and Hess (2009) argue that socio political support from society will also increase the commitment of public official to implement urban and green space plan.

5.3. Implementation

Basically, MSI can be conducted in every step of urban green space development and management, from planning, implementation, maintenance and input for management and financial support. But this study argues that, among others, "implementation" is more important.
Porteous (1996) also argued that implementation will involve various human senses to contribute to creating a more positive cognitive image. This positive cognitive image will create sense of belonging so that human will take care of what they thing as theirs.
Good implementation of urban green space development and management in this study can be seen, for instance, in the case of Edinburg (case 6) and Leicester (case 5) in which two NGOs (The Edinburgh Green Belt Trust and Environt) participate in tree planting, participate in a number of conservation projects, the creation and improvement of foot path and stabling hedgerows. Another example is A Waterfront Regeneration Trust (NGO) which processed the implementation of the Lake Ontario Greenway Strategy (case 13). In Los Angeles (case 17), wealthy local businessmen such as John Bixby, oil tycoon and founder of Long Beach, also created parks through gifts. In Red River Valley greenway (case 24), local citizens were involved in creating demonstration garden. In Hiroshima (case 28), Beijing (case 37) and Hongkong (case 39), citizens participated in tree planting activity.
The implementation might be more important than plan quality for a successful open space protection as a good plan does not guarantee its good implementation (Steelman and Hess, 2009). Burby (2003) in Steelman and Hess (2009) analyzed the link between stakeholder participation in planning and implementation of plans in natural hazards policy and concluded that "plans were stronger and more likely to be implemented when there was greater stakeholder involvement". Since all of the data are about MSIs, the dominant role of implementation itself will also significant.
Implementation activities are important to make the project "visible" by producing some physical results (Nilsson et al., 2007). Implementation means a step toward plan objectives. In urban green space development, implementation part of a project consists of site clearing, site construction such as the creation of pathways, water bodies, pergolas, patios, and site plantings. Such implementations activities will involve vision, sound, smell and tactility. According to

Rock and Harris in Porteous (1996), more than 80% of our sensory inputs are visual. Perception and cognitive image will also be much influenced by vision. By actively involved in implementation process, stakeholders will see the real outputs of their interventions. Furthermore, sound provides dynamism and sense of reality (Porteous, 1996) while smell is a direct, specific and unrealizable experience (Than, 1982 in Porteous, 1996) which plugged directly into the limbic of brain (Gloor, 1978 in Porteous, 1996) and tactility is the haptic sense producing a touchscape (Porteous, 1996). When many senses involved, the stimuli to create a better positive image will be higher so that contribute to a better sense of belonging.

5.4. Regulation

As well, the availability of an appropriate regulation on urban green space contributes to its better performance which is also strongly related to the role of government. All of the UGSPs in this study involved government in their development and management process. Therefore and once again, government plays critical roles in the UGSPs' performance. One of the critical roles of government is providing regulation as operational framework of development. It can be argued that when government plays a critical role, the existence of regulation can be strong. Furthermore, regulation can also function as the tool of communication and argument as Mazza and Rydin (1997) named it as "interpretive function". For instance, since 1948, Leicester District Council and Leicestershire County Council (case 5) have implemented a framework and work program for urban green space in the city by using policies consisting of defined landscape standards and the level of play provision based on space needed .The case of greenbelt development in China (case 37) gives an example that flawed policy has caused the failure of this greenbelt project to achieve its objectives.

Altherr et al. (2007) proved that regulation is important in influencing the allocation of green space, particularly in Brownfield redevelopment projects in five case studies from Switzerland, Germany, and the UK. In Switzerland, the existence of red list species such as spotted kanapweed (*Centera stoebe*) and sand-grasshopper (*Sphingonotus caerulans*) in the boundaries of "Erlenmatt", Basel (case 30) contributed to the creation of nature conservation in that area. Similarly, the existence of red list species in "Stadtraum HB", Zurich (case 34) contributed to the establishment of nature protection corridor along the railroads. In Germany, green space allocation was influenced by the appearance of protected habitat types such as the damage happened during the development of "Potsdamer Platz" left one protected habitat type. The re-development of "King Cross Central" London (case 32) was conducted based on this legally binding law.

The contribution of regulation to urban green space performance can also be seen in the case of Singapore (case 18). Nowadays, Singapore is known as a Garden City with luxurious greenery along its streets and many pocket parks (Tan, 2006). According to Tan, this performance is originated since 1963 when The Prime Minister Mr. Lee Kuan Yew launched Tree Planting Day. In 1971, Singapore's Planning Authority created the first Concept Plan to guide Singapore's development including urban green space. The concept plan was regularly reviewed and updated into a master plan. The guiding principles are ambition to have 0.8 ha park per 1000 persons and creating open space in a network system.

Regulation about urban green space contributes to its better performance by providing urban green space actors an operational framework. Regulation can also trigger or even force participation and control development of developers. Developer's interest is mostly pursuing economic benefits from urban green space development and management. The implementation

of policy or regulation will control their development activities while encourages them to establish green open space. For instance in China, Beijing Municipal Government issued Executive Order which orders to developer to construct green space on two-third of their land (case 37).

Regulation can also function as a tool for communication and argument. Regarding these function of regulation, urban green space policy should be supported by the availability of urban green space data such as the nature of existing urban green spaces including their quantity, quality, acreage, topography, location, function, and user. This argument is confirmed by the cases of British and Italian urban green spaces as elaborated by Mazza and Rydin (1997). British cities have a better performance of their urban green spaces than Italian cities. According to Mazza and Rydin (1997), general strategies of urban green space development and management in British cities were supported by the availability of detailed data about quantity, quality, and the nature of its urban green space which were not so available in Italian cities.

6. Conclusions

This study found that MSI does not always contribute to a better urban green space performance. Based on scoring and ranking, only one case constitutes as excellent project while other cases are ranked as good, fair, and poor. It is interesting that the case located in the Economies Moving to Self-Sufficiency classification can reach a better performance compare to developed countries. One may also conclude that location or country classification does not influence the UGSPs' performance as the projects are much influenced by the internal and external MSIs' indicators.

State, society, implementation, and regulation are identified as the most influential MSIs' indicators on the UGSPs' performance. As shown in Fig. 7, the best model of green space performance can be considered when collaboration between the state and society is regarded in green space implementation with a good regulation about green space development.

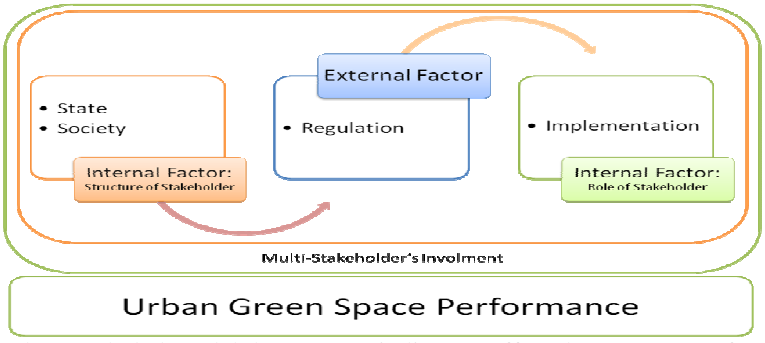

Fig. 7. The concluded model: how MSIs' indicators affect the UGSPs' performance.
Source: The study findings

One of the main conclusions this study is that the government plays a critical role in the UGSPs' performance. However, it does not mean that the state should become a single actor. The influential role of the state and society should also be considered since most of green space projects are non-profit oriented. The state influences urban green space development and management by providing a legal framework, empowering people, coordinating their various interests, and controlling over project implementation and management. In addition, society involvement contributes to a positive cognitive image and ends up with the establishment of a

belonging sense which is important in creating and monitoring the projects. Furthermore, regulation is needed as a legal basis for green space development and management. Thereby, when developing and managing urban green space, the main structure of stakeholder consists of "state and society" to which urban green space managers need to pay more attention. Harmonious collaboration of state and society will lead to a better urban green space performance. Such collaboration may also be optimal in implementation. The role of regulation should also be deemed as the operational framework and communication tools of such collaboration.

The lessons learned from this study can be useful for further development and management of urban green space when dealing with MSI. However, to validate the conceptual framework and mixed-method technique developed in this study, more studies are needed to compare the relationship of the MSI and the UGSPs' performance in different categories.

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