MONITORING AND EVALUATION SYSTEMS FOR URBAN PLANNING AND DEVELOPMENT – THE CASE OF HANOI MASTER PLAN

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ABSTRACT

Cities play a key role in ongoing development processes, and metropolitan areas are especially important as hubs of global innovation networks that offer various socio-economic challenges and opportunities (Rok, 2013). While many developed countries have used commonly Monitoring and Evaluation (M&E) and have managed to build well on their performing urban development, many cities in developing countries are still on the way to design and implement performance enhancing management for theirs urban planning systems to deal with the challenges they are facing (Henning *et al*, 2011; Chen, 2009).

Recent years, many developing countries are just beginning to use M&E as a key public management tool. There is growing interest in the development and use of indicators to enhance urban policy decision-making and performance management, despite obstacles that preclude planning evaluation (UN- Habitat, 2009). This brings ability to conduct self - assessment, learns from good practices elsewhere (Henning *et al*, 2011) to identify M&E systems of performance management.

As the nation' capital city and second largest agglomeration, Hanoi is one of the key sites of urban transition and facing the similar problems like other developing countries, as M&E for urban planning is still less consideration. The establishment of a M&E system can give a powerful public management tool to enhance urban planning, but up to now, only poor concrete methods given because of both political and socio-economic condition.

This research studies M&E systems for urban planning, in order to propose a comprehensive M&E system for the performance of urban plans in practice, utilizing the Logic model to develop KPIs, Benchmarking for the target outcomes, and PDCA management. To test the M&E system, the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050 is illustrated, to investigate how the system work for an urban plan's performance, from that possibly to reach higher performance in urban planning in general.

This research thesis comprises 7 chapters.

Chapter 1 introduces background of rapid urbanization and urbanization problems in Vietnam and Hanoi (section 1.1), problem statements that is necessary to build a M&E system for urban planning (section 1.2), and put forward to research objectives (section 1.3), thesis structure (section 1.4), research methodology (section 1.5), and expected contribution of the research (section 1.6).

Chapter 2 gives a literature review of different issues relate to M&E, in order to support public management in urban planning. To achieve that, chapter 2 starts from reviewing the general ideas in urban planning in section 2.2, 2.3 and 2.4 including concept/idea, objectives and institutional issues in urban planning, respectively. Then, chapter 2 introduces public management issue by general ideas and application in urban planning in section 2.5. Following that, the next sections review different ideas possible to support public management in urban planning. Section 2.6 introduces PDCA cycle in urban planning and its utilization in Japan to support public management. Section 2.7 and 2.8 presents issues of engagement of stakeholders and data management in urban planning, respectively. Section 2.9 presents issues of M&E system for urban planning. The useful points of view for M&E for urban planning are presented in section 2.10, 2.11 and 2.12, including KPIs, Logic model and Benchmarking. Section 2.13 introduces methodology and tools for evaluation and one of significant tools is CUE model. Finally, section 2.14 concludes main findings in chapter 2.

In chapter 3, Hanoi urban development and Hanoi master plan are introduced and analyzed, as case study of the research. Section 3.1 introduces Hanoi city and outline for chapter 3. Section 3.2 and 3.3 reveals some thoughts to the features and characteristics of Hanoi city portrait, urban expansion underlying urbanization in Hanoi and its spatial feature. Section 3.4 gives an general analysis of Hanoi master plan movement for seven periods with achievements and challenges of each period, as well as the impact to the newest Hanoi master plan. General assessment of Hanoi master plan evolution through seven times is given. Section 3.5 gives an introduction of the newest Hanoi master plan, as a case study of the research, and its procedure of implementation. The Hanoi Capital Construction master plan to 2030 and vision to 2050 is clarified in these issue: vision and goals; current challenges; development forecast; orientation of spatial development; general infrastructure planning; transportation planning; project phases; and main findings.

Following that, section 3.6 analyzes the movement and implementation procedure of Hanoi master plan by and the role of each party: central government as guidance, Hanoi People's Committees (HPC) as leader of master plan establishment and supporting ideas from experts and scientists. Section 3.7 presents the implementation issue of Hanoi master plan in order to achieve it goals, close coordination and collaboration among stakeholders, and the importance to establish a M&E system. The last section (3.8) concludes main findings in chapter 3.

Chapter 4 gives a proposal of comprehensive M&E system for urban planning, focusing on the performance of urban plans. Section 4.1 introduces the background to build M&E systems for urban planning and outline for chapter 4. Section 4.2 presents functions need to be contained in the M&E system, including Quantitative management of policy's effects, PDCA cycle management of planning process, Engagement of Stakeholders, and Data management. Section 4.3 theoretically analyzes the structure of the system by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle, in order to support those four functions. In this section, the way to combine different point of views, and the way they work together in a concrete M&E system will be investigated. Section 4.4 presents the operation of M&E system for urban planning by 7 steps until getting outcomes. In section 4.5, the management issue of urban data system for KPIs is given. Section 4.6 concludes main findings in chapter 4.

Chapter 5 investigates the M&E system proposed in chapter 4 by application for the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050. This investigation shows how the M&E system works for an urban master plan's performance, from that possibly to reach higher performance in urban planning in general. Section 5.1 introduces the background of necessary to apply the M&E system for Hanoi master plan and outline for chapter 5. Section 5.2 identifies planning policies to support planning goals. The application of Logic Model for developing KPIs is presented in details in section 5.3, including: zoning Hanoi for Logic model, framework of KPIs selection, Logic model for KPIs and analysis of logical linkage between model's components. Section 5.4 introduces the issue of KPIs calculation and filling gap that will be presented in more details in chapter 6. In section 5.5, the management issue of M&E system by implementing PDCA cycle is given. Section 5.6 presents the role of stakeholders in this system for Hanoi master plan. Section 5.7 gives an important investigation of current Hanoi urban data

availability for KPIs and its management issue. The last section (5.8) concludes main findings in chapter 5.

Chapter 6 gives a detailed process of KPIs calculation and gap analysis with Computable Urban Economic (CUE) model, application for the case of Hanoi master plan. Section 6.1 introduces the importance of KPIs calculation and gap analysis in Hanoi master plan and outline for chapter 6. Section 6.2 introduces modeling for KPIs calculation and CUE model as a powerful tool. Section 6.3 introduces input, output, operation flow and limitation of CUE model in calculation. Section 6.4 presents Hanoi urban data for KPIs calculation by CUE model, including: demographic, land use and transportation data. Section 6.5 presents the detailed process of KPIs calculation and gap analysis with CUE model applied for the case of Hanoi master plan, focus on one specific outcome as "decrease growth rate of population in city center". As a result, this process will estimate the planning policy's effects, in order to improve the decision-making for Hanoi master plan. Section 6.6 concludes main findings in chapter 6.

Chapter 7 gives the conclusion of the whole research finding by chapters in section 7.1 and recommendation for the future work in both academic and practical fields in section 7.2.

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LIST OF ABBREVIATIONS

M&E	Monitoring and Evaluation
PDCA	Plan-Do-Check-Act
KPIs	Key Performance Indicators
HPC	Hanoi People' Committee
CUE	Computable Economic Model
HSO	Hanoi Statistic Office
GSO	General Statistic Office
MOC	Ministry of Construction
MOT	Ministry of Transport
MPI	Ministry of Planning and Investment
MONRE	Ministry of Natural Resources and Environment
MARD	Ministry of Agriculture and Rural Development
MOIT	Ministry of Industry and Trade
HUPI	Hanoi Urban Planning Institute
DPA	Department of Planning and Architecture
DOC	Department of Construction
DOT	Department of Transportation
DPI	Department of Planning and Investment
DONRE	Department of Natural Resource and Environment

CHAPTER 1

INTRODUCTION

1.1. Background

Urbanization, generally, can be defined as changes in the territorial and socio-economic progress of an area that includes a general transformation of land cover/use categories (Weber and Puissant, 2002). A major challenge of our time is the rapid urbanization of the world. In the period of 1970 – 2000 – 2030 the urban population will rise from one third of 3 billion people, via half of 6 billion to two thirds of 8 billion (Frielling, 2006). In *Managing fast growing cities* (1993), Devas mentioned about the dramatic growth of the cities of the developing world has become something of a cliché. He also supposed that many cities in developing countries in South-East Asia, China, Latin America and Africa are facing to big population and its rapid growth which has obvious implications for the infrastructure and service needs of the city. In addition, although big cities have brought chances of education, works, science, technology, entertainment, health care… for people, urban poverty is still an inevitable consequence of the rapid growth.

In general, urbanization is inherently neither good nor bad. Rapid urbanization not only brings opportunities to new urban development but also comes with serious loss of arable land, degradation of ecosystems as well as social and environmental changes to the urban populations. These bring an enormous task for planners and managers of the cities in the developing world.

Vietnam is currently experiencing one of the most intensive urban transitions in the world. Over the next 25 years, its cities and towns are expected to grow at an average rate of 6% per year, increasing the national share of Vietnam's urban population from one-third to one-half (MOC, 2009). This shift from a rural to an urban society is closely associated with socioeconomic reforms instituted in the 1980s (Doi Moi) that progressively liberalized the economy and relaxed the grip of the state on population movements and activities.

The challenge of urbanization in Viet Nam is one of the major issues facing planners today. As the nation's capital city and second largest agglomeration after Ho Chi Minh City, Hanoi is one of the key sites of urban transition. The rapid growth of population and activities in and around the city put intense pressure on the local authority to keep pace with rising demands for infrastructure, social services, housing, environmental controls, transportation, and employment. Therefore, while there is consensus on the potential benefits of urbanization, concerns are also raised by local and foreign academics, professionals, and decision-makers about the importance of anticipating and addressing problems ensuing from the urbanization process.

1.2. Problem Statements

Cities play a key role in ongoing development processes, and metropolitan areas are especially important as hubs of global innovation networks that offer various socio-economic challenges and opportunities (Rok, 2013). While many developed countries have used commonly Monitoring and Evaluation (M&E) and have managed to build well on their performing urban development, many cities in developing countries are still on the way to design and implement performance enhancing management for theirs urban planning systems to deal with the challenges they are facing (Henning *et al*, 2011; Chen, 2009).

Indeed, cities in transition and developing countries are experiencing problems in urban population growth, transportation, environment… (Henning *et al*, 2011) that challenge policymakers. Recent years, many developing countries are just beginning to use M&E as a key public management tool. There is growing interest in the development and use of indicators to enhance urban policy decision-making and performance management,

despite obstacles that preclude planning evaluation (UN- Habitat, 2009). This brings ability to conduct self-assessment, learns from good practices elsewhere (Henning et al, 2011) to identify M&E systems of performance management.

Hanoi and other Vietnam cities are facing the similar problems like other developing countries, as M&E for urban planning is still less consideration, and also interaction about planning performance between local governments and planning experts is normally weak, so identification of a suitable system of M&E is not simple issue. In fact, many professionals understand that establishment of a M&E system can give a powerful public management tool to enhance urban planning, however, up to now only poor concrete ideas have been given.

Many authors and professionals have realized the importance of M&E systems for Vietnam cities in general and Hanoi city in particular. Pham, Sy Liem (2013) supposed the management of planning process has to be in the relationship with assessment of actors and actions, including program for implementation; monitoring and evaluation (by using indicators, results of policies) to improve policies and solve problems. In a research of Hanoi urban development in 2013, Nguyen, V Hai (2013) gave critical ideas to the implementation of Hanoi planning: planning method innovation to improve coordination and more strategic vision for main weaknesses; involvement of different partners to improve urban planning's quality and feasibility (scientists, local community, investors…); decentralization & coordinate organization to implement and accelerate the planning progress and approvals. However, those studies have stopped at giving ideas, not a concrete method to build up a system of monitoring and evaluation. The reasons come from both political and socio-economic condition. Indeed, urban plans mostly focus on products, rather than process and poor management of planning process to achieve planning goals, additionally there are still lack of future prediction methods, the interaction between stakeholders (in land use, transportation…) and transparency in urban management (Do, Dung., 2009).

1.3. Research Objectives

How can we make sure that an urban plan goes the right way, not just this time but every time? Urban planning seeks to be efficient (make optimal use of resources) and

effectiveness (create desired and meaningful impacts and outcomes) (Jody and Ray, 2004). To achieve this, we need to have a concrete system for M&E during the planning process until we get goals, a system that will ensure the plan, test and incorporate feedback for its well performance.

Therefore, this research is going to achieve three objectives below:

- To investigate the necessary to build M&E systems for urban planning to manage the planning process until achieving goals/objectives;
- To understand the structure of M&E systems by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle, in order to build a concrete M&E system for urban planning by functions and the way system works;
- To apply the M&E system for the real case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050, examine the effects of planning policies by developing KPIs system and gap analysis framework.

1.4. Thesis Structure

The thesis works in the scope of urban planning, focus on urban master plan monitoring and evaluation. The thesis structure presents the following contents.

Chapter 2 gives a literature review of issues relate to M&E for urban planning in order to support public management, from general ideas in urban planning (concept, objective, institutional issues), to public management issue, including PDCA cycle and its utilization, engagement of stakeholders, data management, M&E systems, and the useful points of view for M&E (KPIs, Logic model and Benchmarking), additionally methods and tools for evaluation. In general, this chapter identifies M&E system is a powerful public management tool for urban planning practice.

Chapter 3 introduces and analyzes Hanoi urban development and Hanoi master plan, as the case study of the research. This chapter reveals some thoughts to the features and characteristics of Hanoi city portrait, urban expansion underlying urbanization in Hanoi and spatial feature; and gives an general analysis of Hanoi master plan movement for seven periods with achievements and challenges of each period, as well as the impact to the newest Hanoi master plan. Then, this chapter gives an introduction of the newest

Hanoi master plan and its procedure of implementation. Following that, this chapter identifies the implementation issue of the newest Hanoi master plan in order to achieve it goals, and the importance to establish a M&E system.

Chapter 4 gives a proposal of comprehensive M&E system for urban planning, focusing on the performance of urban master plans. The four functions need to be included in the M&E system will be clarified including Quantitative management of policy's effects, PDCA management of planning process, Engagement of Stakeholders, and Data management. The role of different points of view to support four functions including the Logic model, KPIs, Benchmarking and PDCA cycle will be theoretical analyzed of how to combine them, and how they work together in a system. Then, this chapter presents the operation of the M&E system for urban planning by steps until achieving outcomes and the management issue of urban data system for KPIs.

Chapter 5 investigates the M&E system proposed in chapter 4 by application for the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050. This investigation shows how the M&E system works for an urban master plan's performance, from that possibly to reach higher performance in urban planning in general. This chapter identifies planning policies to support planning goals, and application of Logic Model for developing KPIs, and gap analysis process. The management issue of the M&E system by implementing PDCA cycle and the role of stakeholders in Hanoi master plan are presented. Finally, this chapter gives an important investigation of current Hanoi urban data availability for KPIs and its management issue.

Chapter 6 gives a detailed analysis of KPIs calculation and gap analysis with a powerful tool as CUE model, application for the case of Hanoi master plan. The contents include the introduction of modeling for KPIs calculation and CUE model; CUE model input, output, operation flow and limitation of CUE model in calculation; the detailed process of KPIs calculation and gap analysis with CUE model applied for the case of Hanoi master plan. As a result, this process will estimate the planning policy's effects, in order to improve the decision-making for Hanoi master plan.

Chapter 7 gives the conclusion of the whole research finding by chapters and recommendation for the future work in both academic and practical fields.

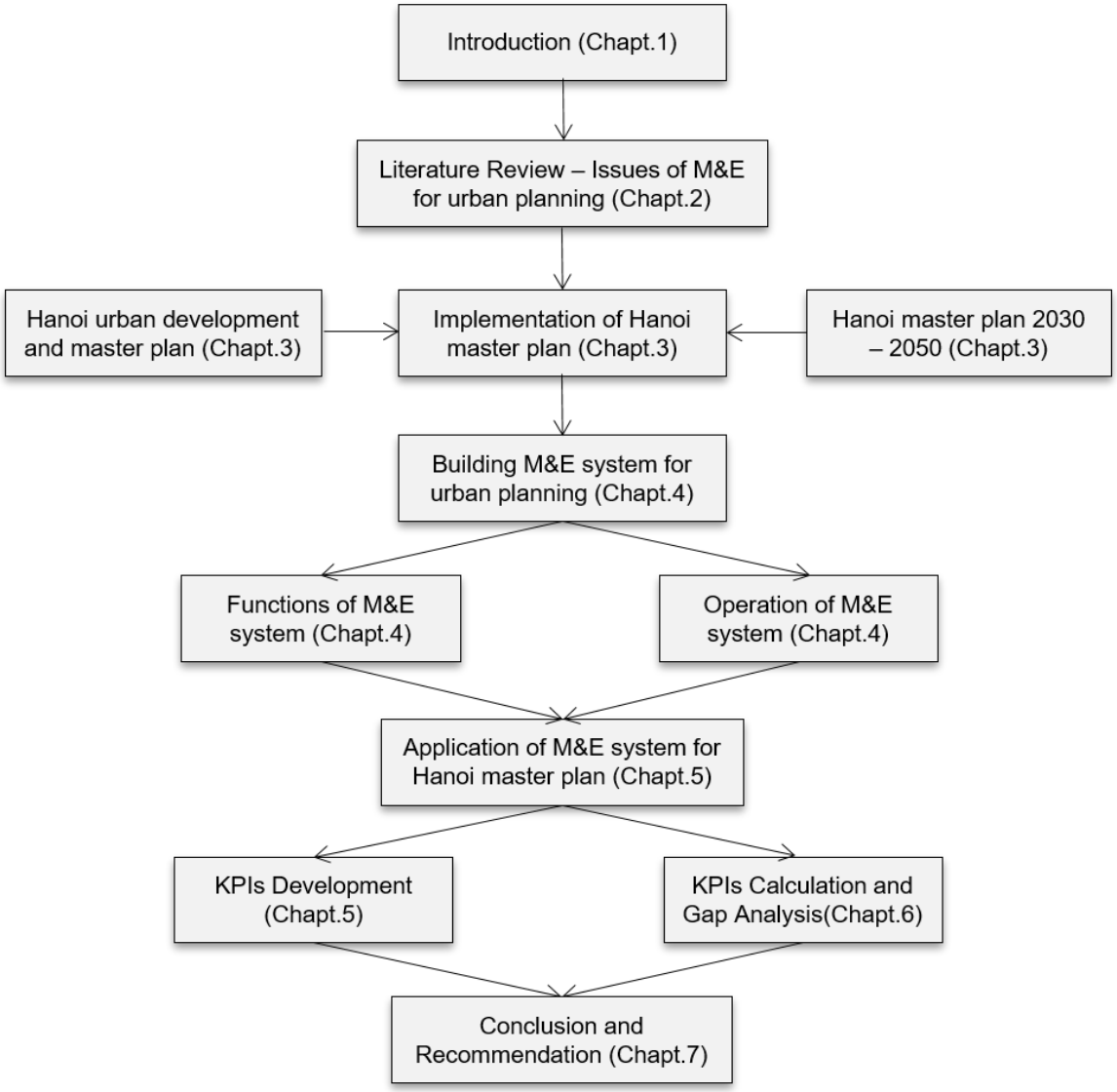

Figure 1.1 Research Process and Framework

1.5. Methodology

To achieve the indicated objectives of this research, we are going to utilize the research methods as below:

- *Method of expert:* is used to pick up ideas, experience, comments from scientists, experts by organizing seminar named "Urban Planning and Development" in Hanoi (in 2015 and 2016) with the participant of different agents: Ministry of Construction (Vietnam), University of Transportation and Communication (Vietnam), Kyoto University (Japan)…

- *Method of data collection:* is used to collect data of Hanoi urban planning and development and Hanoi master plan from sources: MOC, HSO, GSO, PT Survey and other sources.
- *Method of building M&E systems for urban planning:* is used to structure the functions and operation of the M&E system by utilizing Logic model, KPIs, Benchmarking and PDCA cycle. In this method, the role of each point of view will be theoretical investigated in order to combine them into the M&E system.
- *Method of developing KPIs:* is used to develop a system of KPIs in Hanoi master plan by the Logic model, in order to analyze how planning policies work to get outputs and outcomes, and how to measure them by output-KPIs and outcome-KPIs.
- *Method of simulation by modeling:* application of CUE model to benchmark the planning policies' effects by calculating KPIs, in order to do gap analysis.

1.6. Expected Contribution

For the scientific area, the research attempt to build an M&E system for urban planning. Actually, the issue of M&E systems for urban planning is not new, generally, to manage the planning process until we get goals/objectives. However, the way to structure the M&E system by utilizing several points of view in a system has never been mentioned in previous researches. In this research, the idea to combine the Logic model, KPIs, Benchmarking and PDCA cycle in a concrete system for managing an urban plan is investigated and tested by a real case of Hanoi master plan.

For Hanoi and Vietnam urban planning and development, a concrete M&E system is very necessary, in the context of rapid urbanization, poor management tools, lack of future prediction methodology and interaction between stakeholders. However, building a suitable system of M&E is not simple because of the political and socio-economic condition in Vietnam. Many professionals understand that establishment of an M&E system can give a powerful public management tool to enhance urban planning, but up to now only poor concrete ideas have been given. Therefore, the application of the M&E system we propose in this research for urban plans in Vietnam is very significant, to help decision-makers in revising and improving policies.

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CHAPTER 2

ISSUES OF MONITORING AND EVALUATION FOR URBAN PLANNING – A LITERATURE REVIEW

2.1. Introduction

System of Monitoring and Evaluation (M&E) has been considered a powerful public management tool in urban planning practice in term of achieving related goals and objectives, improving quality of life, enhancing sustainability and effect to decision-making (UN-Habitat, 2009; Jody and Ray, 2004). Therefore, M&E are crucial during the urban planning process, to support public management issue. From this point of view, it raises a question of what issues relate to M&E that we need to consider in urban planning?

Chapter 2 gives a literature review of different issues relate to M&E, in order to support public management in urban planning. To achieve that, chapter 2 starts from reviewing the general ideas in urban planning in section 2.2, 2.3 and 2.4 including concept/idea, objectives and institutional issues in urban planning, respectively. Then, chapter 2 introduces public management issue by general ideas and application in urban planning in section 2.5. Following that, the next sections review different ideas can support public management in urban planning. Section 2.6 introduces PDCA cycle in urban planning and its utilization in Japan to support public management. Section 2.7 and 2.8 presents issues of engagement of stakeholders and data management in urban planning, respectively. Section 2.9 presents issues of M&E systems for urban planning. The useful points of view

for M&E for urban planning are presented in section 2.10, 2.11 and 2.12, including KPIs, Logic model and Benchmarking. Section 2.13 introduces methodology and tools for evaluation and one of significant tools is CUE model. Finally, section 2.12 concludes main findings in chapter 2.

2.2. Concept/Idea of Urban Planning

2.2.1. Definition of Urban Planning

Urban/regional planning is a notion that encompasses the whole set of social activities aimed at anticipating, representing and regulating the development of an urban or a regional area (Pinson, 2007). According to Pinson (2007), Urban/regional planning thus articulates intellectual activities of study and prospective, of social and economic forecasting with more concrete activities such as infrastructure programming, land reservation and land use regulation. Planning operates at different scales: neighborhood, city or region (Pinson, 2007). Also, urban planning takes many forms and it can share perspectives and practices with urban design (Van Assche *et al*, 2013).

Alternatively, Sutcliffe's (1981) definition may be equally appropriate, that "Town planning is a deliberate ordering by public authority of the physical arrangements of towns or parts of towns in order to promote their efficient and equitable functioning as economic and social units and to create an aesthetically pleasing environment".

Urban planners in the field are concerned with research and analysis, strategic thinking, architecture, urban design, public consultation, policy recommendations, implementation and management (Taylor and Nigel, 2007). Furthermore, urban planning systems are essential for developing and implementing city-wide policies for sustainable development in which environmental, health and socio-economic objectives are increasingly linked (Breuer, 1999).

The concept of governance has subsequently been used to describe the devices through which urban and regional plans were elaborated and implemented (Pinson, 2007). Indeed, the political effectiveness of the plan is no longer expected to stem from its regulatory status but rather from the consensus that the elaboration process of the plan has enabled to build up between a plurality of stakeholders. For Healey (Healey *et al*, 1997), the new

forms of planning practices using networks, interactive, iterative and incremental decision-making processes are also aimed at producing institutional capital, i.e. a set of cognitive, relational and identity resources that will enable to create a common rationale for the interventions of 3 different actors on the territory.

2.2.2. Urban Master Plan

Master plan is a tool to guide and manage the future growth of cities in a planned manner and the soul of a master plan lies in its implementation framework (Hameed and Nadeem, 2008). Conceptually, master plan is based on study of existing situation of each and every component of a city comprising land use, socio-economic and other facilities' surveys, based on analysis of existing situation, forecasting of future trends, and finally making proposals for the growth and management of the city (Hameed and Nadeem, 2008).

Although Master planning is an outdated concept replaced by structure planning, it is still being practiced in many developing countries including Vietnam. Devas and Rakodi (1993) identifies various reasons why despite of several weaknesses master planning approach continue to dominate the urban planning systems of many developing countries. These include: professional training and ideology of planners at the top of their profession emphasizing planning standards difficult to attain in real world situation; vested interests of donor agencies, consultants, professionals, administrators, city managers, and politicians; and inappropriate legislative basis for planning in terms of plan preparation and implementation.

An urban master plan includes the following tasks: defining the functions of the city, development objectives and scale; setting construction norms, quotas and index; planning urban land use, transport network, water supply, sewage, urban greenery and other municipal facilities making short-term construction implementation plans; and planning the town and settlement system within the municipal government's jurisdiction (Stares and Liu Zhi, 1995).

Moreover, an urban master plan is thus not only a drawing, but an instrument of government and an optimization of the goals, which permits its revision in the course of time, being adapted to new assets and opportunities for new investors, new needs of the population and unpredicted problems (Cavallo, Komossa and Marzot, 2014).

Many papers and development cases have shown that master plan should be considered as a process, rather than a product. Indeed, only the preparation of master plan for a city does not ensure implementation of the proposals as conceived by the plan (Rizwan and Obaidullah, 2008). Therefore, for the successful implementation of a plan, we need a comprehensive implementation framework based on judicious allocation of financial and institutional resources, and special attention is needed to focus on implementation tools (Rizwan and Obaidullah, 2008). These tools include legal protection of the plan, capital improvement program, zoning regulations, land sub-division regulations, building regulations, and urban renewal program (Bahtti, 1993).

In European contexts, master plans can operate at the municipality or city-wide levels and provides broads land-use zones for an entire administrative area and can be implemented through a more detailed local plan (Breuer, 1999).

In Vietnam, regional zoning plans and urban development master plans are prepared for regions and major cities, following its published framework. According to the Government Decree 91/CP (1994), city master plans define the layout of spatial structure and guidelines for urban development, infrastructure and living environment for 15-20 years in long term and 5-10 years in short term. Also, master plans are prepared for districts, wards and other levels of administration, guided by the relevant People's Committees according to Ministry of Construction (MOC) criteria.

2.3. Objectives of Urban Planning

According to Lichfield *et al* (1975), the meaning of goals in the context of urban planning is the general directions in which the activity of planning is aimed. Instances of goal statements are "To achieve maximum possible opportunities for employment", "To achieve the highest possible quality residential environment", or more general still, "To use resources in the most efficient manner". Therefore, they supposed that goals are very general and abstract statements as to the aims of planning activity, and are intended to be applicable to virtually all planning studies. Goals relate to the main considerations of planning activity: residential environments, accessibility, employment opportunities, and so forth. Objectives relate to particular problems within the study area in question, and are

thus specific to anyone study. Further, the achievement of the objectives is valued for themselves rather than for their contribution to achieving the goals.

Solesbury (1974) mentioned about objectives and goals in urban planning that are expressions of value in the form of statements of desired circumstances, conditions or states in the environment to which action is being directed. They may be more or less generalized. “To increase recreational opportunities”, “To provide more parks”, “To increase the number of tennis courts” are examples of objectives of increasing specificity. The term of goal is sometimes reserved for the more general expressions, the term objective for the more specific. But both carry with them the implication of a circumstance – of increased recreational opportunities, greater park provision or more tennis courts – that is attainable once for all, although some difficulties might be found in the purely definition task of determining what represents attainment of the more generalized goals. They all represent targets to be strived for. As such goals and objectives are not a useful form in which to express policy.

Lichfield *et al* (1975) mentioned about the importance of objective identification in urban planning. In that objectives constitute a central part in the process of plan generation and evaluation and have an operational significance which is of a more substantial nature than any of the other concepts. Following that, evaluation exercises should be directed towards the assessment of the comparative performance of plans in terms of the achieved levels of sectoral objectives. When choosing objectives, a great number may be considered, some of which may be consciously rejected. The processes of rejection of objectives and of arriving at a final set are clearly critical for both design and evaluation (Lichfield *et al*, 1975).

2.4. Institutional issues of Urban Planning

2.4.1. Institutional Framework in Urban Planning

Institutions are a set of norm, values, and beliefs that have formed to ensure that targets are achieved while framework is the linkage that supports two or more subsystems ensuring the easy flow of information/data from one subsystem to another (Wapwera *et al*, 2015). According to Wapwera *et al* (2015), the major components of institutional

framework include: governance framework, organizational framework, legislative framework and administrative framework.

According to Breuer (1999), competent and accountable urban governance is a key factor in the potential contribution of cities to economic and social development. Indeed, transparent institutional cooperation between national, regional, and local authorities and unbureaucratic information and involvement procedures of the target group are major instruments to accelerate and improve the quality of urban planning (Mosha, 1994).

Breuer (1999) gave an overview of planning framework of European contexts in different levels including the regional or metropolitan (city) framework. The framework consists of three steps. In the first step, regional plans or guidelines for the local authorities will be given, followed by structure plans that giving a board policy context. The second step is the establishment of a city master plan or general town plan, based on those guidelines. In the last step, many detailed plans will be carried out such as structure plans, land use plans, economic development plans, transportation plans, environmental plans, etc. Following that, numerous policy documents, declarations and experience refer to the importance of the urban planning process in achieving local sustainable development.

The type of planning system has depended on the country's legal system and institutional framework, the relative roles of the different actors in the development process and the degree to which a separate planning profession has emerged (Breuer, 1999). While in several countries the plan is only a guide, in some countries it is a law.

Although urban planning systems are clearly different between countries, they generally comprise three functions, including long-term strategic planning, plan-making and development control (Breuer, 1999). Among them:

- Long-term strategic planning provides vision for the future based on strengths, weaknesses, opportunities and threats.
- Plan-making provides a framework through development strategies and plans at different scales including national, regional, city, neighborhood and sites. The plan includes a wide spectrum of content: strategies, policies, projects, structures, facts, figures, land use, settlement patterns, statutory measures, housing, retails, leisure

tourism, community development and transport schemes, environmental action, measures to achieve social equity, economic decisions and investment.

- Development control includes administrative procedures operating at the local level to control the location.

Urban centers in developing countries have shown development and distribution of new settlements to be haphazard and making it very difficult for the development authorities to govern and manage such settlements as a result of varying factors. According to Mosha (1994), in many developing countries, national planning institutions (at Ministry levels and metropolitan cities or in special planning committees and similar agencies) sometimes delay urban planning decentralization to local levels due to the misuse of their "development permit entitlement". In addition, outdated bureaucratic urban planning procedures, lack of qualified staffs, well equipped planning offices, innovative and efficient technology are further drawbacks of urban planning practice in many developing countries.

2.4.2. Institutional Issues for Implementation in Urban Planning

According to Wapwera *et al* (2015), implementation is a continuous process, with no clear-cut endpoint. It involves multiple actors including individuals and organizations, from national to local authority as well as from all branches of government associations. Wapwera *et al* (2015) note that the action of bureaucrats, especially civil servants or planning officials, is most important in implementation. Also, the role of private and non-governmental actors is prominent.

One major challenge of implementation is the context in which the plans are set. Wapwera *et al* (2015) note that plans are made by the state and are expected to be implemented by local government. So both the state and local government get their subvention from the federal government. Usually, goals are vague to accommodate multiple points of view and to translation of vague statements into specific concrete implementation actions renewing the potential for conflict and compromise (Wapwera *et al*, 2015).

One of the important issues in urban planning implementation mentioned in many studies is engagement of stakeholders. According to Bowie (2010), it is critical to develop both governance structures and methodologies for implementation and take the important role

of local planning authorities and increase resident engagement in the planning process. Findings from many studies help to define and authenticate methods for stakeholder analysis and engagement in constructional projects (Jing *et al*, 2011). A typology of approaches for stakeholder analysis and engagement is synthesized in Jing *et al*' study (2011) with around thirty methods and their descriptions, strengths, and considerations are developed based on not only the findings of the empirical studies in Hong Kong and Australia, but also several previous studies. They include: Construction advice letters; Feedback bulletins; Focus groups; Forums Guidelines; Interviews; Media management; Meetings; Negotiations; Social Network Analysis; etc. (Jing *et al*, 2011).

2.4.3. Institutional Issues in Urban Planning in Vietnam

In Vietnam, planning generally in is still heavily influenced by inherited Soviet procedures and assumptions. The planning approach has been an ideology for the unitary state of Vietnam in the last few decades where the resource allocation was decided by the central authorities according to administrative plans.

Since the introduction of the Doi Moi (Renovation) program, the government has implemented the public reform programs in which the reformative approaches have been applied to the national planning system. There are three programs in Vietnam Planning System includes: Land Use Plan is managed by Ministry of Natural Resources and Environment (MONRE), the Vietnam Socio-economic Development Plan is managed by Ministry of Planning & Investment (MPI), and the Urban and Regional Plan is managed by Ministry of Construction (MOC) (Geertman and Le).

Among them, urban/regional planning is an essential tool for the spatial arrangement of land uses in cities and urban areas. It is a spatial expression of socio-economic development strategies and policies. The role of spatial planning has become more important as the country changed from a centrally planned economy to an oriented market economy. The various forms of spatial planning, which have been practiced since 1954, are divided into three linked categories as described in the followings (Geertman and Le):

- *Regional planning:* identify potential development, resources and forces driving the development of a region and its urban and settlement system.

- *City master planning:* form the layout of spatial structure and guidelines for urban development for 15-20 years in long term and 5-10 years in short term.
- *Detailed planning:* determine the lands uses of specific urban space.

In 2009, the Vietnamese government promulgated the Urban Planning Law, which contains several institutional improvements, was made distinct with the introduction of zoning plans as intermediate spatial plans between general plans and detailed plans (Matsumura, 2012).

The planning process starts with instructions and frameworks moving from central government down to lower levels of government. In the preparation of the recent 5-year plan (FYP), the planning work started two years in advance with discussions among central planning officials and sector agencies on issues to be addressed in the next plan. The central planning agency then proposed "ideas" for the next FYP at a national planning conference which was usually held one year in advance with participants from sector ministries and local governments. The central planning agency's report at a later conference provides guidelines, methods and deadlines for sector and local plan submissions and thus sets the framework and the tone for the whole planning process.

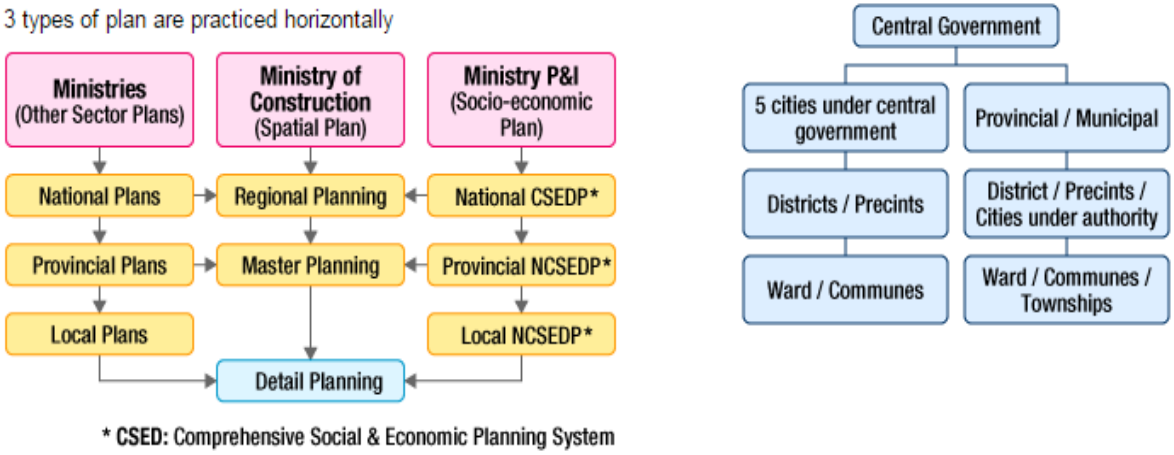

Figure 2.1 Vietnam Planning and Administrative System (MLIT, 2009)

The planning processes have substantially changed from the top-down approach of the past to an open and participatory one today. Can Vietnam's current planning process fit into a global market economy or is there need for another approach? On the way to approach that objective, Vietnam has to deal with some challenges, as shown below:

- Lack of horizontal coordination among agencies.
- High levels of centralization, and reliance on planning the settlement system by fiat (command and control).
- High population densities in the two largest cities (Hanoi and Ho Chi Minh City).
- Inconsistencies between national plans and local plans.
- Lack of a clear national urbanization strategy/urban policy framework, exacerbated by uncoordinated divergent technical assistance on urbanization from the international community.
- Environmental management requirements are now taken into account in area general plans or master plans, but separation between ministries, lack of skills for monitoring and analysis.

In general, Vietnam's planning system is still based on a vertical, top-down approach under a unitary system. The lower level plans are sub plans of the national plan. In other words, it is still a comprehensive plan. Applying a strategic planning approach would overcome the pitfalls in the current planning process. It involves building and sharing visions (governance), diagnosing current environments and alternating strategic courses of action (management) (Bryson, 1988), and enhancing participation (democracy) (Jones, 1996; Brody, Godschalk and Burby, 2003).

2.5. Public Management in Urban Planning

2.5.1. Overview of Public Management

Public policy, public administration and public management are all terms that refer essentially to the same thing, which how the administrative parts of government are organized, and how they process information and produce outputs in policies, laws or goods and services (Hughes, 2012). It is argued in *Public Management and Administration* (Hughes, 2012) that the transition from what was once known as public administration to public management, starting in the latter years of the twentieth century, has been a time of change with quite wide ramifications in the governance of many societies around the world.

According to Perry and Kraemer (1983), "Public management is a merger of the normative orientation of traditional public administration and the instrumental orientation of general management". Hughes (2012) argued that public management is quite different from public administration. The key difference between public administration and public management is that a public manager is personally responsible for the delivery of results. A public administrator is someone who follows the rules of the letter, who carries out instructions given by someone else, in theory the political leadership, and he/she is responsible only indirectly for the delivery of results. On the other hand, a public manager is personally responsible for the achievement of results, and from this fundamental change much else follows. If results are to be delivered, a way needs to be found to show that results have occurred. If a public manager is personally responsible for the delivery of the results, he or she will draw on any kind of theory – management, economic, behavioral or sociological – that will help in carrying out the task. In general, public management has now effectively supplanted the traditional of public administration (Hughes, 2012).

By the 1990s, many countries were undertaking reforms that the change could be seen as a global movement (Kettl, 2005). In 1991, the term "New Public Management" was coined (Hood, 1991), often abbreviated to "NPM" to conceptualize in academic terms those changes that has occurred notably in the United Kingdom. NPM did become the most widely used term for the overall managerial program. In what appears to be the first use of the term, Hood (1991) declared that the managerial program "New Public Management", comprises 7 main points:

- Hands-on professional management in the public sector.
- Explicit standards and measures of performance.
- Greater emphasis on output controls.
- A shift towards disaggregation of units in the public sector.
- A shift to greater competition in the public sector.
- A stress on private sector styles of management practice.
- A stress on greater discipline and parsimony in resource use.

Hood and Peter (2004) then noted that there was no definitive treatise on NPM. It is just the change becomes tendency rather than a clear program that marks a major discontinuity from past practice.

The word “Governance” has become important within the public sector. Governance is not easy to define because governance is taken in broad meaning. Essentially, governance is about devising institutional arrangements, about steering (as in the original derivation), how to organize, and how to set procedures for the running of an organization. Generally, governance is about setting up structures, institutions, and ways of providing some kind of accountability (Hughes, 2012). Bevir and Rhodes (2003) gave a definition is “governance as the New Public Management”. This means that the reform programs referred to as NPM was about governance to such an extent that its requires a new definition for governance itself.

Public management has a strong relationship with performance management. Kroll (2015) examined this relationship by discussing how performance measurement processes – formulating a mission, setting a strategic goal, measuring performance, reporting to stakeholders – define and record public value. This relationship has been significant when applying in managing progress of projects in many aspects. In practice, mandates to implement performance management have boiled down to a few key processes: requiring public agencies to identify their mission, set strategic goals and performance targets, track measurable indicators of performance, and broadly disseminate this data (Hatry, 2006).

2.5.2. Public Management in Urban Planning

The earliest stages of a strategic approach in the public sector were based around strategic planning. A useful definition is that of Olsen and Eadie (1982) in which ‘strategic planning is a disciplined effort to produce fundamental decisions shaping the nature and direction of governmental activities, within constitutional bounds’. A more comprehensive account of strategic planning account of strategic planning is that provided by Bryson (2004). Bryson outlined 10 steps in strategic planning:

1. Initiate and agree on a strategic planning process.
2. Identify organizational mandates.
3. Clarify organizational mission and values.
4. Assess the external and internal environments to identify strengths, weaknesses, opportunities and threats (SWOT).
5. Identify the strategic issues facing the organization.

6. Formulate strategies to manage the issues.
7. Review and adopt the strategies or strategic plan.
8. Establishing an effective organizational vision.
9. Develop an effective implementation process.
10. Reassess the strategies and the strategic planning process.

In general, strategic planning, as set out by Bryson, may offer much in a public sector context. A stages approach, proceeding logically through the various steps, would enable public sector agencies to produce plans in the way that is increasingly demanded by governments (Hughes, 2012).

Public management by using performance information could be seen in many aspects including urban planning issue. In that, the performance measurement process could be written down in figure 2.2 for public value (Bryson *et al*, 2015):

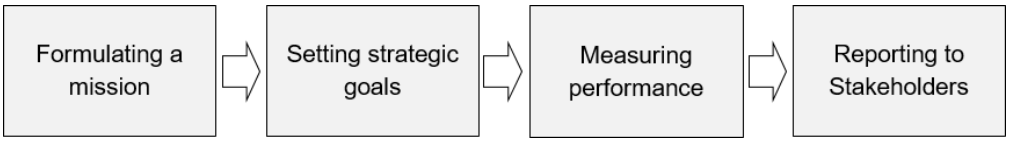

Figure 2.2 The Performance Measurement Process (Bryson et al, 2015)

Performance management reforms promised to redirect attention toward the mission and goals of organizations and in turn restore public faith on government. Performance management systems have been widely implemented, and invoke certain values – most obviously efficiency and effectiveness but also transparency, accountability, and the legitimacy of the state (Hughes, 2012).

In term of urban planning issue, NPM seeks to find that how appropriate management can organize services and provide to people. Indeed, NPM can influence the urban management effectively and considerably and its application can promote the performance of urban management (Sanaei *et al*, 2015). In general, urban management is a form of local government and, in its ideal form, a democracy and local self-government where people highly participate in governance. Actually, NPM philosophy is to move towards a regime in which the emphasis on transparency, accountability and public participation in the management of public sectors are set into the agenda (Andersson, 2011). Therefore, NPM can be identified in a certain form and framework for managing urban planning and

development, to improve performance improvement. A fairly standard model of policy-making has been adopted as a conceptual framework for performance management by Pollitt and Bouckaert (2004).

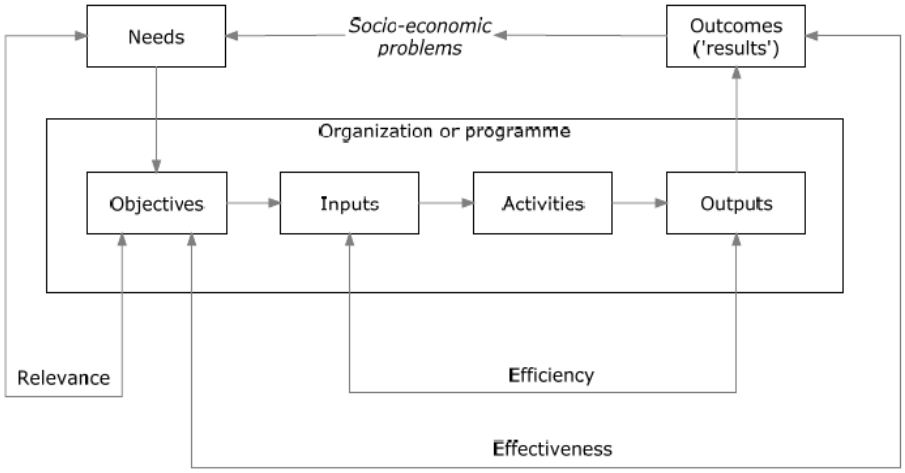

Figure 2.3 Performance – A conceptual framework (Pollitt and Bouckaert, 2004)

According to Bowie (2010), during the urban planning process, it's critical to develop both governance structures and methodologies for implementation and take the important role of local planning authorities and increase resident engagement. It means that to achieve planning goals, the interaction between plan-making, plan implementation and plan revision has to be considered.

2.6. PDCA Cycle in Urban Planning

2.6.1. PDCA Cycle Overview

How can we make sure that an urban/regional plan gets its right, not just this time but every time? The solution is to have a process that we follow when we need to make a change or solve a problem, a process that will ensure the plan, test and incorporate feedback before committed to implementation.

Lichfield *et al* (1975) gave the whole urban planning process including 11 stages and the linkage between different stages during the process. This linkage shows that linear model is not inconsistent with a cyclic approach to plan-making, as shown in figure 2.4. It is also likely that many planning activities will be undertaken simultaneously.

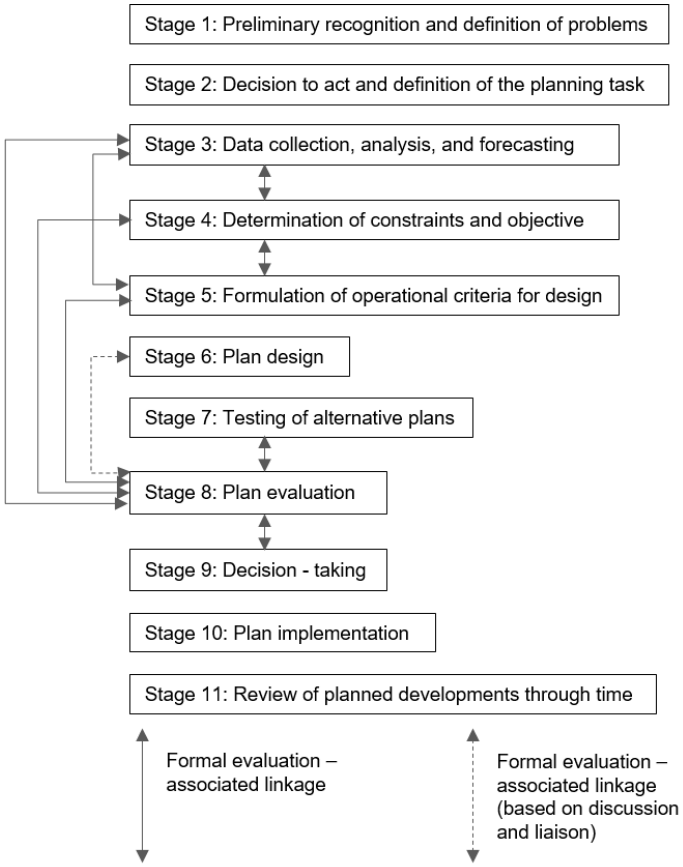

Figure 2.4 Urban Planning Process (Lichfield *et al*, 1975)

A popular tool for doing just this is the Plan-Do-Check-Act Cycle (PDCA Cycle). The PDCA Cycle is known as the Deming Cycle or the the Shewhart Cycle, aims to support the improvement process of organizations, assuring that this process is development in a coherent, structured and systematic way (Legre and Covas, 2015). According to Deming's theory, 1986, The PDCA Cycle includes four steps: Plan, Do, Check and Act. The PLAN step will recognize an opportunity and plan a change. After that the DO step will test the change and carry out a small-scale study. The CHECK step will review the test, analyze the results and identify what you've learned. Finally, the ACT step will take action based on what you learned in the CHECK step.

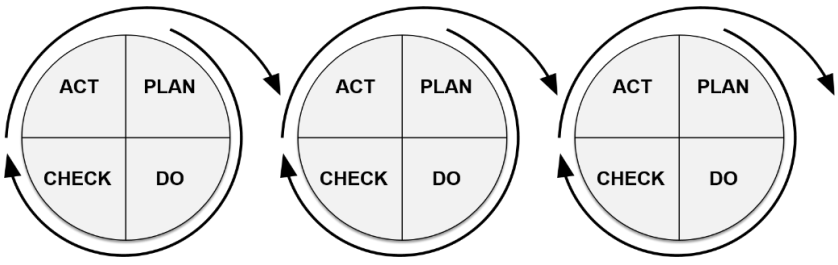

Figure 2.5 The PDCA Cycle

Indeed, the PDCA framework was originally developed by quality control movement, its application has not to be limited – in fact, it is a learning method (Cowley and Domb 1997, Maruta 2012). In addition, the PDCA Cycle is defined in collaboration with local government partner in order to measure the effective impact of the innovation policies developed by the public administration (Candiello and Cortesi, 2011).

The PDCA cycle is used for managing the implementation of planning projects. Specifically, on the basis of verification and evaluation results, as well as socioeconomic trends and changes, necessary reviews and improvements should be proceed, so as to better achieve plans.

2.6.2. Background to support PDCA Cycle as a management framework in Urban Planning

PDCA Cycle is governed by two rules: Time constrained and Activity visualized (Maruta, 2012).

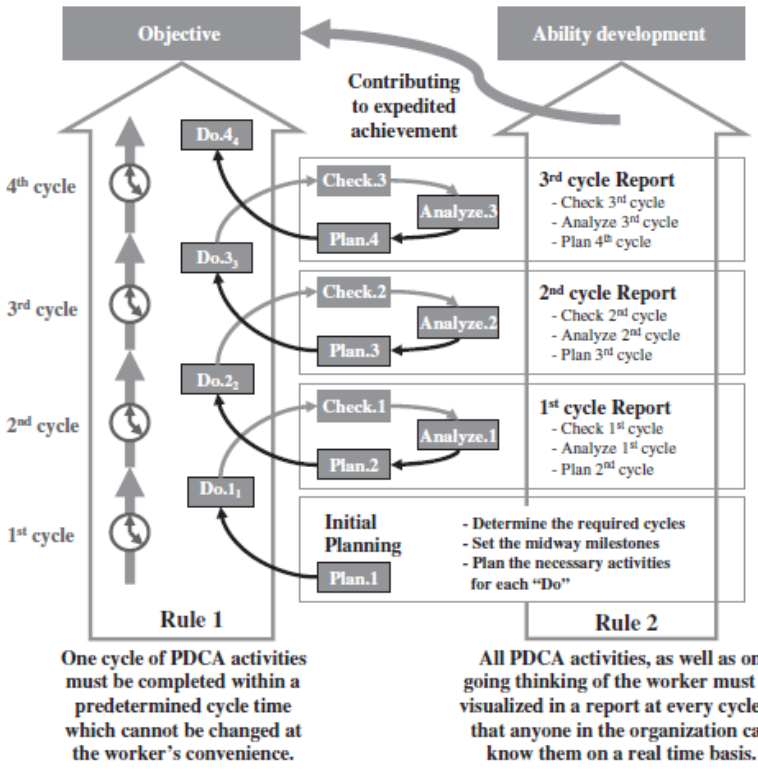

Figure 2.6 The PDCA cycle with two rules: cycle time constraint and activity visualization (Maruta, 2012)

The first rule is to set a predetermined cycle-time, so that the cycle-time cannot be changed arbitrarily. The second rule, Activity visualized, is to make the work progress (PDCA activities) visible and transparent throughout the organization (Maruta, 2012). These two rules can be applied for the system of monitoring and evaluation of urban planning. Indeed, the target timeline in PDCA cycle will be used for managing planning activities and getting planning objectives, as well as detecting problems and stopping unuseful activities. To achieve planning progress, PDCA details need to be entered in a report available at the end of every cycle to get transparency. Moreover, when PDCA cycle is repeated several times, the planning process will be managed and monitored in a good way to get improvement.

In strategic level, PDCA cycle has used to support the improvement process in a coherent, structured and systematic way (Alegre and Covas, 2015). This utilization is similar with Deming's aim by looking at the changing process as an improvement process with successive cycles. In each cycle, objectives should be increasingly more ambitious than in the previous ones. This way will help the organization maturity increases over time (Alegre and Covas, 2015).

The PDCA Cycle can be set up as a concrete tool for managing urban plans, as shown by steps below.

The PLAN step is the identification of the goals, strategies and objectives. This step includes identification of the main problems of the city/region; Defining the duration to achieve the goals/objectives; Defining the outcomes expectation; Decide scope of governance: what governance policies are needed? How many agencies are required?; and Prediction of KPIs for evaluation.

According to Lichfield *et al* (1975), goals of the urban plan relate to the main consideration of planning activities: residential environments, accessibility, employment opportunities…, and objectives relate to particular problems within the study area in questions. So objectives will be the basis for plan generation and formulate operational criteria for design step, and also can be stated in general policy term. In addition, prioritisation should be consistent with the requirements of the strategic plan. If it is, then it will also support the achievement of strategic objectives and the pursuit of strategic

goals. Confirming that this is the case is an important component of monitoring and evaluation systems (GICHD, 2014).

The DO step is the implementation of the plan's objectives. This step is concerned with the transformation of the set of objectives for the plan into some operational form, useful for design (Lichfield *et al*, 1975). Following that, this step requires the individual and organizational capacitation of the involved teams and their role: leader, planning departments, planning commissioners…

Implementing the processes of the urban/regional plan defined in PLAN step includes: Data collection (studies and surveys): identification of trend and direction of growth, traffic survey, research on demography, climate, resources and other potentials; Data analysis in the form of study maps, graphs, charts… and long-term and short-term objectives are identified; Forecasting: demographic projection and forecasting based on migration, employment, industrialization and urbanization; Fixing the priorities: identification of priorities based on the need, importance and urgency; Design: preparation of development plans, formulation of zones, alteration to the existing zoning regulations, widening of road, etc.

The CHECK step is evaluation of the plan, including: Implementation control should consist of monitoring strategic thrust and milestone review (Jeyrathnam, 2008); Evaluating the actual results of the plan; Comparing to the expected results from PLAN step (check the deviation, appropriateness and completeness); Selecting key performance indicators for evaluation the plan toward urban sustainable development based on theoretical and practical criteria. Keys for checking: *effectiveness indicators* and *efficiency indicators* (Bertuglia, Clark and Wilson, 1994); Generate information that will allow the plan review, being essential for the PDCA process.

According to GICHD (2014), evaluation involves assessment, as systematically and objectively as possible, of an on-going or completed program, its design, implementation and results, to determine the relevance and fulfillment of objectives, developmental efficiency, effectiveness, impact and sustainability. Evaluation is different from monitoring in that it seeks to make a quality judgement based on the results of monitoring.

One of the most important benefits of monitoring and evaluation in urban planning is to fill the gaps between the objectives, the plan and its implementation.

The ACT step is Review and action of the plan. In this step, actions/adjustments will be taken based on the results in CHECK step with possible abilities: if the plan is successful, we should incorporate what we learned from the plan and suggest new improvement for the plan; if the plan does not work, we have to go through the PDCA cycle again and make the different plan, propose new objectives and goals. Efficient and effective review processes are tightly focused and well controlled. They have clear objectives and agendas, and yield well defined actions that are implemented in a timely manner (GICHD, 2014).

2.6.3. Public Management practiced in Japan by PDCA Cycle

By the 1960's the PDCA cycle in Japan had evolved into an improvement cycle and a management tool. This is one of concrete tools that became the foundation for improvement (kaizen) in Japan, in providing a framework for the application of improvement methods and tools guided by theory of knowledge.

PDCA cycle has been considered as an effective method for planning management in many Japan cases such as the fifth Kobe master plan toward 2025, the Land Use Plan IV of Osaka prefecture… In the Fifth Kobe master plan toward 2025, planners want to manage implementation of Kobe as per the PDCA cycle to carry out the Kobe 2015 vision smoothly and steadily. Based on the evaluation results, as well as socio-economic trends and changes, they are going to make necessary reviews and improvements (follow Overview of the Fifth Kobe City Master Plan).

In the case of Osaka prefecture, the prefecture has approached PDCA Cycle for the National Land Use Plan IV in 2015. Based on the Decisions on National Land Use Planning Law, prefectures decide upon land use planning within their domains. Land Use Planning (LUP) specifies into 5 regional segments: Urban, Agricultural, Forest, Nature Park, and Nature Conservation areas. Basic Land Use Planning achieves comprehensive coordination of prefectural land use planning via individual land use regulation laws. Duties of Basic Land Use Planning include decisions on idle lands, imposing land trade regulations, and regulation of development activities.

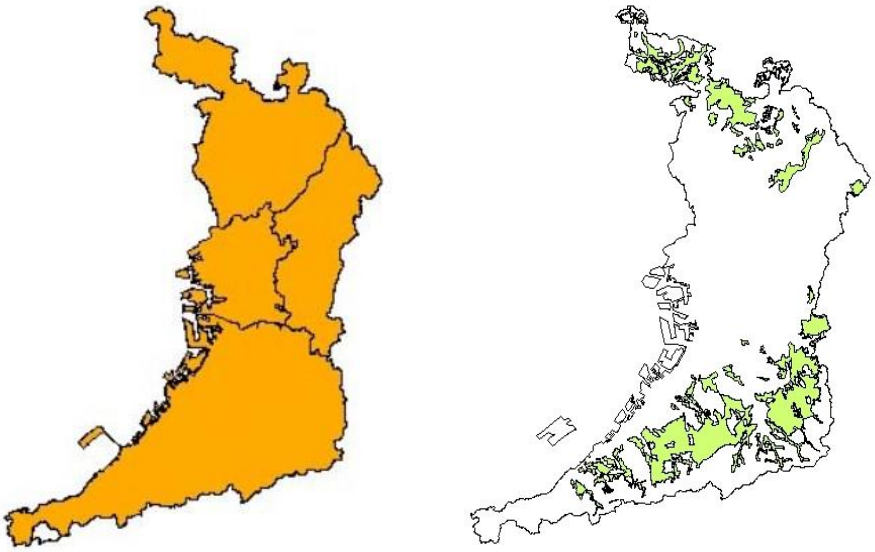

Figure 2.7 a) Urban Planning areas: Areas created by the agglomeration of cities that require comprehensive maintenance, development, and conservation; b) Agricultural Area: Areas that require comprehensive agricultural development (Osaka Prefecture LUP IV, 2015)

Osaka prefecture promoted and executed the Basic Land Use Planning with basic objectives of land use (guiding principles, Osaka of the future and its basic policies) and adjustment of guidance policies of land use planning in overlapping areas of the 5 regional segments.

Osaka prefecture implemented the PDCA Cycle for inspection, evaluation, improvement, and understanding the plan, as shown below:

- *Plan:* Decisions on Osaka Prefecture - National Land Use Plan
- *Do:* Promote and Execute the Plan
- *Check:* ・Inspection of Objectives and Methods
  ・Report to National Land Use Planning Council
  ・Lobbying the review of the methods
- *Act:* Review of the methods and Investigate application opportunities

Among those steps, review of the methods and investigate application opportunities were proceed at the end of the process. Review in ACT stage has showed gaps between results and objectives, so Osaka prefecture will have to adjust their policy in land use planning and strategies in socio-economic development.

The causes of gaps have been identified. The first cause was problems on vitality of Osaka (outflow of head offices to Tokyo; transfer of factories overseas; shortage of industrial sites; severe business environment; and deterioration of urban infrastructure). To deal with that, the land use plan needs to revitalize industries and utilize land areas more efficiently. The second cause was problems on environment and landscape (loss of good landscape and historical resources; decline of agricultural lands due to a shortage of successors; decline of the level of agricultural land management; shortage of green lands in urban areas; and loss of biological diversity). The land use plan then has to secure safety against natural disasters and improve the living environment. The third cause was problems on safety (possible disasters: Nankai-Trough, massive earthquakes; the most concentrated urban area in Japan; population and assets are located in the low-lying areas; increase of residential area under decrease in population; and possible increase in land areas that are not managed).

To solve that problem, the land use plan needs to secure safety against natural disasters and improve the living environment.

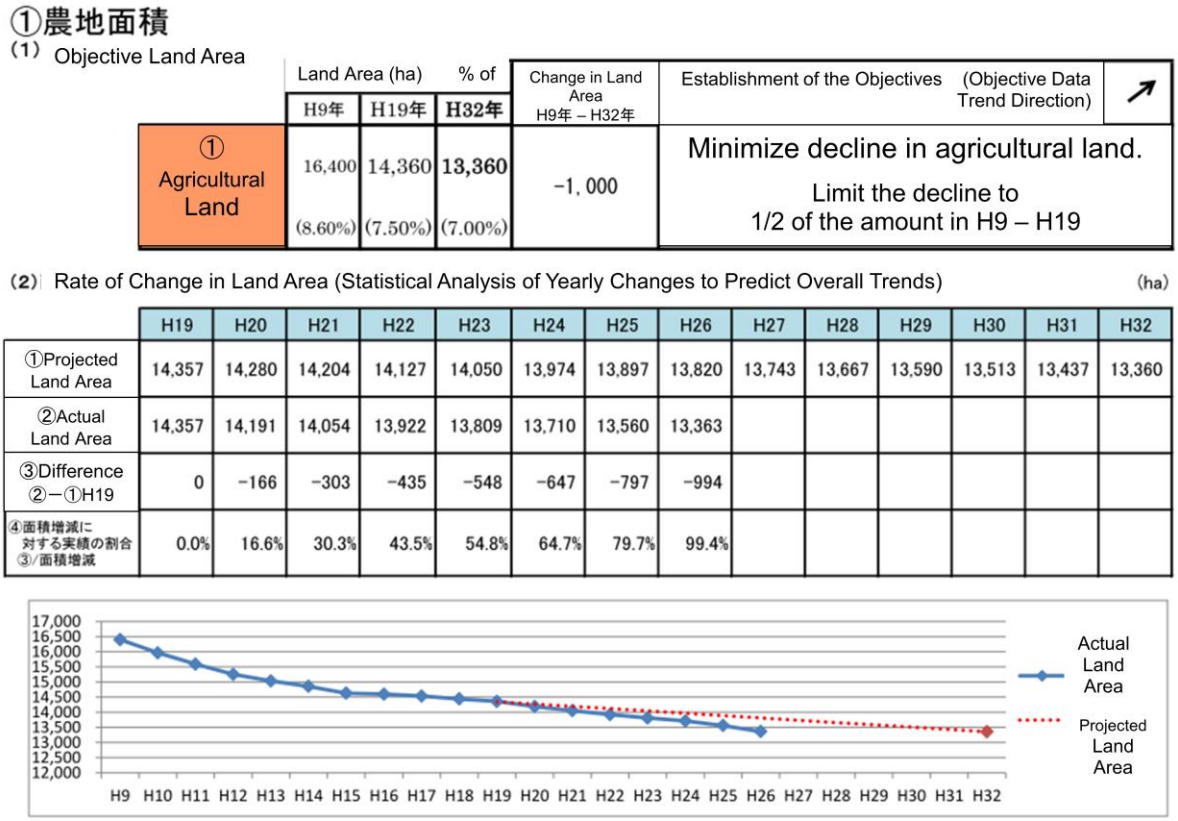

Figure 2.8 Agricultural land area (Osaka Prefecture LUP IV, 2015)

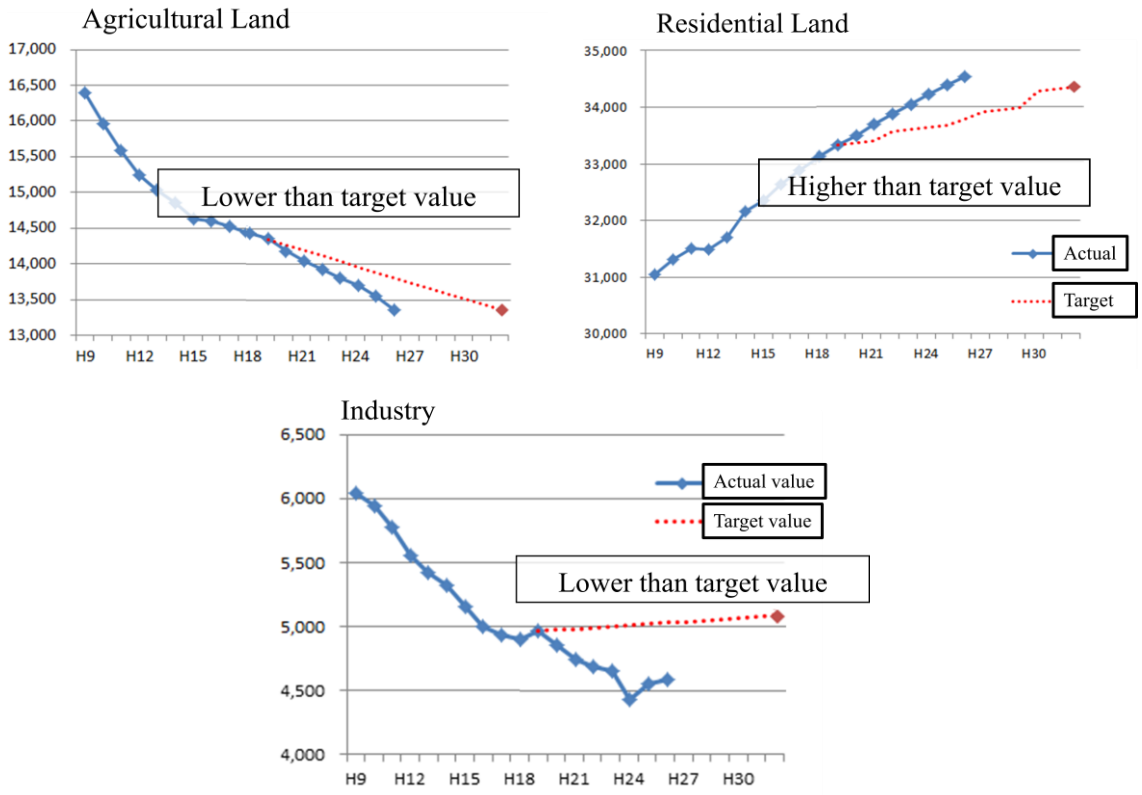

Figure 2.9 – a, b, c: Considerable difference between actual and target values of land use for agriculture, residence, and industry (Osaka Prefecture LUP IV, 2015)

The experience from the implementation of land use planning in Osaka prefecture have been analyzed to consider the need for planning in future, includes: changing in the status of the social economy (need for disaster prevention, environmental/landscape degradation, compact＋network, etc.); and decisions on Nationwide Plan V in Osaka prefecture.

2.7. Engagement of Stakeholders in Urban Planning

Stakeholders are individuals and organizations “who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion” (Project Management Institute, 1996). Since the perspective of urban development and construction plans is uncertain and complex, stakeholder analysis and engagement from diverse groups and levels is more challenging for project teams. To achieve project objectives, it is essential to formulate a process for stakeholder management and to identify effective approaches for stakeholder analysis and engagement (Chinyio and Akintoye, 2008).

To engage stakeholders in urban and development plans, it is important to consolidate and propose stakeholder analysis (Jing, 2014), in order to efficiently obtain a full picture of stakeholders' concerns, and effectively manage antagonism, prejudice and conflicts between stakeholders (Robinson, 2005). Jing (2014) gave a proposal on multi-stakeholder analysis in urban planning, classify them according to their characteristics, with two key steps, namely, stakeholder identification and stakeholder prioritization. Among them, stakeholder identification refers to development of a list of stakeholders and identifying their interests regarding urban development; and stakeholder prioritization refers to analyzing stakeholders' influence on urban development, and decisions about which stakeholders' interests should be addressed preferentially.

In building consensus among stakeholders, many authors have studied and proposed different methods for stakeholder analysis. Schmeer (1999) defined a process of systematically gathering and analysis qualitative information to determine whose interests should be taken into account when developing and /or implementing a policy or program. Varvasovazky and Brugha (2000) defined an approach, a tool or set of tools for generating knowledge about actors so as to understand their behavior, intentions, interrelations and interests; and for assessing the influence and resources they bring to bear on decision-making or implementation processes. In order to analyze and engage stakeholders, Weible (2006) addressed a set of questions: who are the stakeholders to include in the analysis; what are the stakeholders' interests and beliefs; who controls critical resources; with whom do stakeholders form coalitions; and what strategies and venues do stakeholders use to achieve their objectives. Also, Reed *et al* (2009) discussed the methods for stakeholder analysis used within natural resource management research activities. This study identified and proposed a range of approaches that have helped the practitioners to manage stakeholders.

2.8. Data Management in Urban Planning

Urban data system plays an important role in city's planning. Actually, many attempts have been made towards designing smart cities data management solution, however, the missing insights on the impacts that technologies, stakeholders/users requirements (Suzuki *et al*, 2013). Information and data should be valid, verifiable, transparent, and widely available to the government and interested stakeholders – including the general public

(Jody and Ray, 2004). To achieve that, the importance of urban data management needs to be considered and enhanced.

Fina (2009) gived an analysis of data availability, usability and relevance in order to monitor the urban dynamics and complement indicators. In that, he built multi-land cover data is suitable to track changes in urban development overtime, complemented by detailed statistics and information on locational changes in population and the housing stock.

For the management of green areas through computerization in Milano, Cattaneo *et al* (2009) updated web GIS application, in order to guarantee the complete functionality of the GIS of green areas, update, procedures have been set up with the aim to improve the quality of data and the representation of reality.

The domain of inquiry of Suzuki *et al'* research (2013) is the collection, organization, integration, distribution and consumption of knowledge derived from urban open data, and how it can be best offered to application cities' stakeholders through a software middleware. They argue that the extensive investigation proposed in the research will contribute to a growing body of knowledge about data integration and application in smart cities, and offer opportunities to re-think an integrated urban infrastructure.

2.9. Monitoring and Evaluation systems for Urban Planning

System of M&E has been considered a powerful public management tool in urban planning practice in term of achieving related goals and objectives, improving quality of life, enhancing sustainability and effect to decision-making (UN-Habitat, 2009; Jody and Ray (2004). Generally, The OECD (2002a) defined monitoring and evaluation as below:

- *Monitoring* is a continuous function that uses the systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing development intervention with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds.
- *Evaluation* is the systematic and objective assessment of an ongoing or completed project, program, or policy, including its design, implementation, and results. The aim is to determine the relevance and fulfillment of objectives, development

efficiency, effectiveness, impact, and sustainability. An evaluation should provide information that is credible and useful, enabling the incorporation of lessons learned into the decision-making process of both recipients and donors.

Therefore, if *monitoring* clarifies project, *evaluation* will analysis whether project's goals can be achieved or not; if *monitoring* connects resources and activities to goals, *evaluation* will assess specific contributions of activities to goals.

In the field of urban planning, UN-Habitat (2007) gave definition about monitoring and evaluation and the conduction of these two activities, as below:

- *Monitoring* is "an internal project activity designed to provide constant feedback on the progress of a project, the problems it is facing, and the efficiency with which it is being implemented".
- *Evaluation* assesses the outcome of a project or a distinct segment of a project, with the aim of influencing the design of future projects.
- *Monitoring and Evaluation (M&E)* of development activities provides government officials, development managers and civil society with better means of learning from past experience, improving service delivery, planning and allocating resources, and demonstrating results as part of their accountability to key stakeholders.

To achieve the effectiveness and efficiency in urban planning (Jody and Ray, 2004), it is necessary to have a concrete system for M&E during the planning process until goals are met, a system that will ensure the plan, test and incorporate feedback for its well performance.

2.10. KPIs in Urban Planning

2.10.1. KPIs Development

According to Bertuglia, Clarke and Wilson (1994, p.37), "Key Performance Indicators" (KPIs) and simulation models are instruments of both measurement and evaluation. As far as KPIs are concerned, this double function is immediately evident. The idea of an indicator and the concept of measurement are obviously closely related, and clearly, the

concept of performance also carries the direct implication of some form of evaluation (Bertuglia, Clarke and Wilson, 1994).

About the historical context of KPI in urban planning, Bertuglia, Clarke and Wilson (1994, p.4) reviewed the ranges of studies which have used economic and social indicators for measuring spatial variations in quality of life. This provides the platform for developing a more systematic and comprehensive framework for the conceptual identification and calculation of performance indicators for use in a variety of situations in urban planning and policy analysis.

Indeed, KPI has been introduced its basic origins from the 1960s to the present day, with the so-called "social indicator movement". It was the comparison of different cities across a country, however, that received most attention after 1970. As Murphy (1980) notes, this urban indicator research was simply an off-school of the social indicator movement, seeking to describe the social, economic and political conditions of metropolitan areas in particular.

In *Modeling the City*, Bertuglia, Clarke and Wilson (1994, p.48) mentioned about two main kinds of performance indicators. The first provide a way of measuring the extent to which the population is served by, or utilizes, the service organizations referred to above. These are the *effectiveness indicators* and they are calculated for each zone of residence of the population. The second measure the extent to which the organizations are utilized by the population, i.e. they are *efficiency indicators* which are calculated for the zone in which the organization is located. These indicators differ from the classical social indicators in that they are able to take into account spatial interaction between the population and organizations. They should not necessarily be considered as alternatives, however, but additionally as a useful complement. The *effectiveness indicators* and *efficiency indicators* are based on the concepts of 'potential service provision in a zone of residence' and 'catchment population of a service located in a zone'.

2.10.2. KPIs in Urban Planning for Evaluation

This section explores the scope of KPIs used in urban plans and national and local government policies and initiatives. The key focus is how KPIs may be used to support the sustainable development and comprehensive urban plans.

KPIs are utilized in both urban development plans and government policies and initiatives. Indeed, many ideas and researches have shown the benefit of KPIs in city development. In *Modeling the city*, the use of KPIs is critical to measure and to quantify efficiency improvements in city services through the implementation of master plans (Bertuglia, Clarke and Wilson, 1994). Toward urban sustainability in European cities, indicators provide a useful tool for policy making (prospective) and for assessing policy implementation (retrospective indictors) (Mega and Pedersen, 1998).

In the field of sustainable urban design (Crosbie *et al*, 2014), the authors have analyzed how KPIs can be used to inform the delivery and on-going monitoring and evaluation of a project, as procedure tools to support local and project decision-making. The authors also classified two typed of indicators: "process" indicators – measuring the implementation of policies or actions (guide policies and practice) and "outcome" indicators – measuring the impact of the urban planning process. Further in this study, KPIs system is not just to measure processes but as a reminder of the scope and definition of sustainable urbanism.

In addition, the idea below taken from ITU (2015) shows the benefit of KPIs system in the development of smart sustainable cities:

> "The development and implementation of KPIs is essential to provide a basic set of criteria to evaluate existing cities and to measure the results of different projects, with the aim of increasing smartness and sustainability. The use of KPIs is critical to measure and to quantify efficiency improvements in city services through the implementation of SSC services".

The argument of Bertuglia, Clarke and Wilson (1994, p.11-19) was that most existing indicators are calculated in relation to data, and in relation to single zones with little reference to other zones. In addition, the indicators are calculated from variables which are systemically related and are directly connected to our knowledge of urban structure and processes (Bertuglia, Clarke and Wilson, 1994, p.56). Mega and Pedersen (1998) supposed that KPIs are based on policy principles and goals, so KPIs are meaningless without specified objectives and they cannot contribute to the improvement of the urban quality of life if there is not a policy framework. A similar idea shows that KPIs have to be measured and relevant to urban planning outcomes, in that they reflect local objectives and priorities or processes (Zhang *et al*, 2008). Their selection also requires setting a useful baseline for local level monitoring (Munier, 2011).

Overall, the development and implementation of KPIs are essential to provide a basic set of criteria to evaluate existing cities and to measure the results of different projects, with the aim of increasing smartness and sustainability. KPIs can be benefited in monitoring and evaluation of planning projects; in measuring the results of urban planning process and the implementation of policies; and in supporting decision-making.

2.11. Logic Models and utilization in Urban Planning

The Logic models, as known for several years, as a tool for program planning, management and evaluation (Chen, 1990). A logic model can be used for telling the program's performance story by describing the logical linkages among program resources, activities, outputs, customers reached, and short, intermediate and longer term outcomes (McLaughlin and Jordan, 1999).

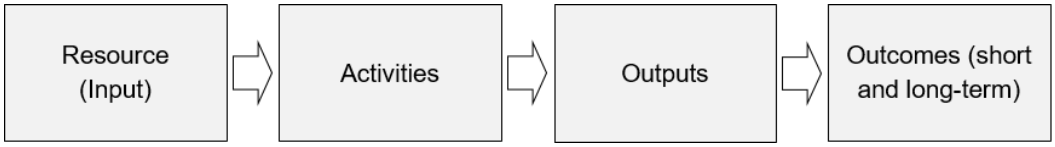

Figure 2.10 The Logic Model

Figure 2.10 illustrates the simple Logic model. Accordingly, *resources* include the inputs are dedicated to or consumed by the program; *activities* show the way the program working; *outputs* include are the products from program; *outcomes* indicate benefits resulting from activities and outputs. Therefore, the chain of outcome can be short term (direct results of activities and outputs), intermediate (link a program's short-term to long-term outcomes), and long term (result from the achievement of short and intermediate term outcomes and often take a longer time to achieve).

According to McLaughlin and Jordan (1999), utilization of the Logic model has general benefits below:

- Builds a common understanding of the program and expectations for resources, customers reached and results, thus is good for sharing ideas, identifying assumptions, team building, and communication;

- Helpful for program design or improvement, identifying projects that are critical to goal attainment, redundant, or have inconsistent or implausible linkages among program elements;
- Communicates the place of a program in the organization or problem hierarchy, particularly if there are shared logic charts at various management levels;
- Points to a balanced set of key performance measurement points and evaluation issues, thus improves data collection and usefulness, and meets requirement of the government performance and results act.

The Logic model has been used popularly in heath and community-based programs to support program development and evaluation. The Logic model was applied at the system level planning and evaluation local human services delivery (Julian, 1997) when this application has been usually limited. In this study, Logic model provided a mean of conceptualizing the systems and the array of actions or programs designed to achieve specific impacts and goals, as well as provided a mechanism for coordinating services to produce valued system impacts and/or goals.

Many studies have shown logic model utilization in engaging stakeholders during the project, achieving consensus among diverse groups by several methods: staff training (Reed & Brown, 2001); applying the scientific method for community-based initiatives, (Kaplan and Garrett, 2005); focusing on concrete, measurable objectives (Helitzer *et al*, 2010); workshop exercises (Atkinson *et al*, 2014); guiding evaluation of community health promotion programs (Cullen et al, 2016).

Another important purpose of using Logic model is developing indicators to check performance and measures success for evaluation (Self-Supported Municipal Improvement Districts) or translating the Logic model's components into indicators to check progress in inputs, activities, outputs, outcomes, and goals in providing necessary feedback to the management system (Jody and Ray, 2004).

In general, Logic model has several values have demonstrated in many studies above: building common understanding about the program; building consensus among stakeholders; clarifies program theory and fills gaps; identify the specific and useful data; and develop KPIs system. However, there are limited studies have brought Logic model

into the field of urban planning, even it possible to be applied for the urban plan's implementation.

2.12. Benchmarking in Urban Planning

Benchmarking, in the context of urban development, has major objectives (Cowper and Samuel, 1997) that enable: to objectively assess the performance of the city or specific spheres of its activity; to identify areas where improvement is needed; to find comparable units or entities with a superior performance with a view to using good practices; to evaluate the effectiveness of programs intended to restructure and improve the operation of a given city; and to enhance accountability to various groups of stakeholders, particularly the public at large. Rok (2013) identified the essence of urban Benchmarking is the comparison of indicators describing a given territorial unit, from that urban Benchmarking allows identifying the main opportunities and challenges of a given area, particularly in relation to the adopted strategic priorities – hence its usefulness for local authorities in conducting evidence-based policy. In general, urban Benchmarking is particularly effective as a method for a relative evaluation of results in measuring complex phenomena for which no unequivocal measure of success can be found (Rok, 2013).

Benchmarking is significant for performance improvement of cities in development. While performance measurement has a past and present focus, Benchmarking has a present and future focus and encompasses the key elements of performance measurement, include performance measurement, comparison, identification of best practices and adopting them for improvement (Geerling *et al*, 2006).

As the benefits of Benchmarking practices are found and experience accumulated, the scope of Benchmarking process can be broadened (Henning *et al*, 2011). For example, in EU contexts, urban governments use Benchmarking to monitor and assess the results of their policies (Rok, 2013). Also, Benchmarking is one of the most effective tools that enable informed decision-making for urban transport issues, which are very complex and multi-faceted in nature (Henning *et al*, 2011). According to Henning *et al* (2011), Benchmarking should be developed as a long-term approach and not a one-off exercise. The tangible benefits to policymakers from this process are: to achieve benchmarking indicators that are comparable through many years and iterative cycles (Anderson, 2006);

to allow performance trends to be identified through time series analysis; and to help monitor the effectiveness of good practices on performance improvements (Henning *et al*, 2011).

In general, in urban development, suitable Benchmarking framework is possible to be identified to manage a city's performance, in which KPIs can serve as benchmark for evaluating city planning.

2.13. Tools for Evaluation

Bertuglia, Clarke and Wilson (1994) have described how mathematically based methods came to be introduced into the planning process and used with a reassessment of the role of models (and more generally the scientific method) in planning and evaluation. The systems approach not only has influenced the way in which the urban system is conceived but has also raised fundamental questions about what "planning" is trying to achieve and how it should go about it. For this reason, it is worth examining the conceptual premises which underlie the application of a mathematical model.

According to Hay (1985) the scientific method can be defined as a way of thinking in which four ingredients come into play: theory, regularity, logic and reduction. The scientific method is an extremely powerful instrument which has been effectively applied in many disciplines. To maintain that this is the only way of acquiring knowledge, however (an attitude we can define as *scientism*), can be dangerous for two reasons:

1) The temporary to apply the specific method in contexts which are not appropriate;
2) The risk of ignoring issues that cannot be investigated with the scientific method.

The most popular evaluation methods developed in the last fifty years are: the Cost-Benefit Analysis (CBA), the Planning Balance Sheet (PBS), the Goals-Achievement Matrix (GAM), the Multicriteria Analysis (MA), and the Environmental Impact Assessment (EIA). The method developed by Lichfield is inseparable from CBA.

The early models for evaluation are social indicator models, accessibility indicators and benefit indicators based on consumer surplus. Among them, accessibility and benefit indicators have formed the basis for many studies on land-use and transportation changes.

It has also been recognized for some time that many other "goal indicators" could be developed.

In some studies recently, the Computable Urban Economic (CUE) model was employed as a tool for policy analysis. The CUE model has proved to be a very powerful tool for urban policy analysis and therefore widely used many other developed countries, especially in Japan and United States of America. CUE model is referenced in some papers as a useful tool for policy evaluation (Nguyen Trong Hiep, 2014; Zhang, R *et al*, 2016 & 2017; Yamasaki *et al*, 2007).

Basically, CUE model was developed from the tradition of the Transport-Land Use Interaction (TLUI) model. The output variables outputted from the model can be used for demonstrating the urban system at real state such as land-use, labor/population, aggregate commodity/service, traffic flows... CUE model can output these variables by working with transport models consistent with microeconomic theory. The CUE model was developed with practical prediction and evaluation capabilities based on research by Yamasaki *et al* (2007, 2013).

In urban planning and management issue, under a general equilibrium framework, the considered sub-urban systems will be interacted each other through socioeconomic and spatial mechanisms. The set output variables represent the real urban economy such as spatial distribution of household, workers; the distribution of land use for residential, commercial, manufacturing…, land price; and aggregated also utility of civilian living in study zone. It is clearly that the variables are expected KPIs which representing for physical operational state of urban area. In general, CUE model has not only proved to be a powerful tool for urban policy analysis but also a platform for discussion among urban stakeholders.

2.14. Conclusion

Overall, chapter 2 reviews the literatures related to M&E for urban planning and development. Indeed, M&E system can be considered as a powerful key public management tool in urban planning. PDCA cycle is significant in managing the urban planning process, to ensure the plan, test and incorporate feedback before committed to

implementation. The two more important issues in urban planning are engagement of stakeholders and data management have been investigated.

From all points of view related to M&E for urban planning, the logic model is considered a significant tool in telling the plan's performance story by describing the logical linkages among project resources, activities, outputs and outcomes, and developing KPIs. The development and implementation of KPIs are essential to provide a basic set of criteria to evaluate existing cities and to measure the results of different urban planning projects. Benchmarking is one of the most appreciated methods to manage a city's performance, in which KPIs can serve as benchmark for evaluating city planning. Lastly, one of the tools for evaluation in urban planning mentioned is CUE model which is not only a powerful tool for urban analysis but also platform for discussion among urban stakeholders.

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CHAPTER 3

HANOI URBAN DEVELOPMENT AND MASTER PLAN

3.1. Introduction

In chapter 3, Hanoi urban development and Hanoi master plan are introduced and analyzed, as case study of the research.

Firstly, section 3.2 and 3.3 reveals some thoughts to the features and characteristics of Hanoi city portrait, urban expansion underlying urbanization in Hanoi and itsspatial feature.

Secondly, section 3.4 gives an general analysis of Hanoi master plan movement for seven periods with achievements and challenges of each period, as well as the impact to the newest Hanoi master plan. General assessment of Hanoi master plan evolution through seven times is given.

Thirdly, section 3.5 gives an introduction of the newest Hanoi master plan, as a case study of the research, and its procedure of implementation. The Hanoi Capital Construction master plan to 2030 and vision to 2050 is clarified in these issue: vision and goals; current challenges; development forecast; orientation of spatial development; general infrastructure planning; transportation planning; project phases; and main findings. Following that, section 3.6 analyzes the movement and implementation procedure of Hanoi master plan by and the role of each party: central government as guidance, Hanoi

People's Committees (HPC) as leader of master plan establishment and supporting ideas from experts and scientists. Section 3.7 presents the implementation issue of Hanoi master plan in order to achieve it goals, close coordination and collaboration among stakeholders, and the importance to establish a M&E system. The last section (3.8) concludes main findings in chapter 3.

3.2. Hanoi portrait: location, territory, history, population and economy

Hanoi is the political, cultural, socio-economic and commercial center of the Socialist Republic of Vietnam. Being the Capital and the "City for Peace" recognized by the United Nations Educational, Scientific and Cultural Organization, Hanoi celebrated its 1,000 years anniversary in 2010. During the time, Hanoi continuously and rapidly developed in all aspects, from its structure, form to the quality of the people's life.

Figure 3.1 Hanoi – Vietnam in Asia (http://breannaroundtheworld.com/wp-content/uploads/2013/06/southeastAsia-vietnam.jpg)

Hanoi lies in the center of the Red River Delta in the North of Vietnam, with an area of 3,300 km2 and the population of 7.4 almost million inhabitants (HSO, 2015). The city-province is bordered by the provinces of Thai Nguyen to the north, Bac Ninh and Hung Yen to the east, Vinh Phuc to the south, and Phu Tho and Hoa Binh to the west. Most of Hanoi's area lies within the low floodplain of the Red River, historically a site of intensive wet rice agriculture.

Among contemporary Asian cities, Hanoi stands out as having one of the longest histories. Any understanding of Hanoi's distinctive built environment requires the exploration of its dynamic evolution across periods marked by diverse external influences (Trinh Duy Luan, 1997). The city's origins officially date back to 1010, when the emperor Ly Thai To built a citadel and established the capital of his empire on the right bank of the Red River.

Progressively, a small trade area developed next to the imperial city that is now referred to as the “Ancient Quarter”. By the time the French settled in the city, in 1874, Hanoi was a relatively small agglomeration of less than 100,000 people. Socio-spatially, it consisted of a combination of three distinct spaces: a citadel, a merchant quarter, and an agglomeration of rural villages surrounded by a dike (Logan, 2000).

Hanoi was the capital of French Indochina from 1902 to 1953, during that period it remained a modest city both in size and population, never exceeding 400,000 inhabitants (Wright, 1991). Yet French planners greatly transformed the appearance and functioning of the city. Up to the end of the 19th century, colonial authorities expanded the city area toward the south and west. There, they developed a new area with broad avenues which, organized in a grid system and flanked by spacious villas and gardens, is now referred to as the “French Colonial Quarter”.

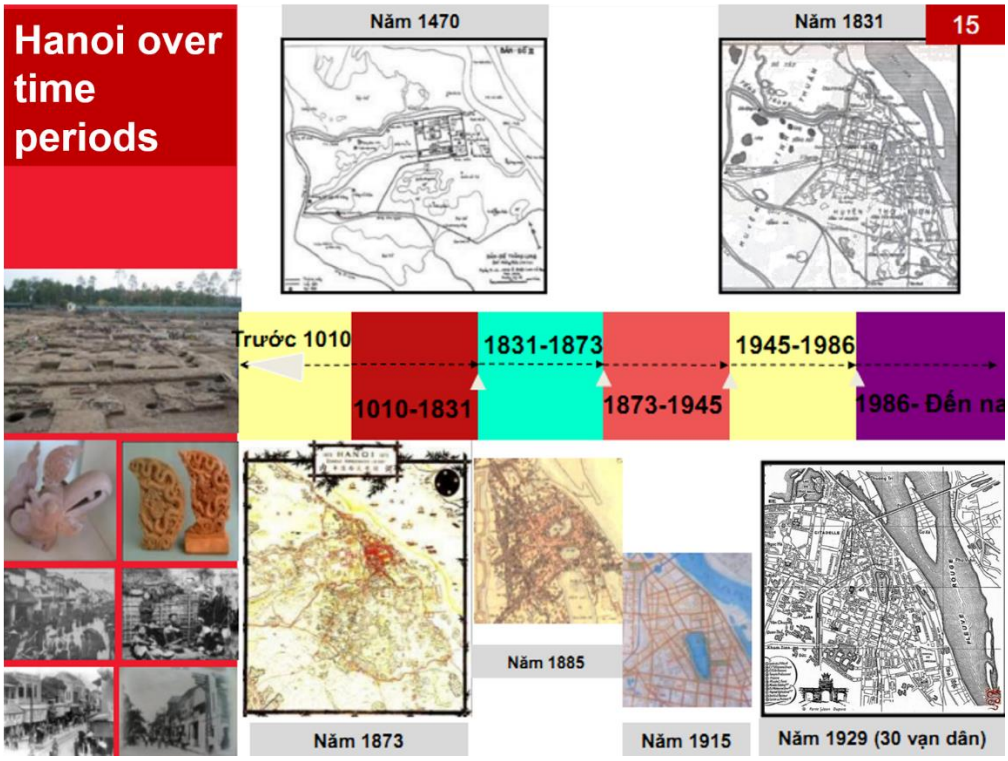


Figure 3.2 Hanoi overtime period (MOC)

In 1946, the Democratic Republic of Vietnam took power and declared Hanoi its capital. The newly independent nation went through the First Indochina War (1945- 1954), followed by the Vietnam War (1962-1975). The government policy of de urbanization or dispersal of the population and industries away from Hanoi during the wars limited both

the physical and demographic growth of the city (Nguyen Duc Nhuan, 1978). Nevertheless, by 1965, Hanoi's total population had reached one million. The city was not to exceed this figure for several decades, for two main reasons: continued control on rural to urban migration, and economic hardship of the 1980s (Thrift & Forbes 1986). Since 1986, the introduction of *Doi Moi* (Renovation) and the opening of Vietnam to Western influences had caused Hanoi to experience major pressure to rebuild the urban core with "the skyscrapers of the modern western cities", growing transportation problems, and an increase in street markets (Trinh Duy Luan, 1997). From then on, the city's population grew at an annual rate of approximately 3% to reach 3.2 million by 2007 (HSO, 2007). Most of this new population consisted of rural migrants from surrounding provinces, with natural growth playing only a minor role in the population increase (Ledent, 2002). However urban Hanoi is only ranked 62nd among Asian cities in term of population, it is not that big and will continue to grow in the next decades.

For ten centuries, the history of Hanoi has been connected to its urbanization process. The Citadel, *Ancient Quarter* and *French Colonial Quarter* are seen as the core or center of the historical, cultural and administrative city.

Hanoi's economy is growing steadily. The city's GDP expanded three-fold between 2000 and 2008 (HSO, 2009). While Hanoi is only home to 7% of Vietnam's population, it contributes 12.5% of the national GDP. However, Hanoi is indeed a less industrialized region than HCMC. As can be expected from a capital city, the proportion of the population working in the government sector is relatively high, representing 9% of the province's workforce (compared to 6% in HCMC and 2% in Hai Phong) (HSO, 2009).

The current intentions of the national and municipal authorities are geared to develop a knowledge-based urban economy. This is manifest in the decision to build a large high technology satellite city 30km west of the city. Upon completion, the so-called "Lang Hoa-Lac Hi-tech City" will accommodate major universities and high-quality industrial production and human resources (Nguyen Thai Huyen, 2009). The creation of this "high-tech city" is part of a larger regional development approach that fosters the creation of a multi-polar urban region consisting of autonomous satellite cities dispersed around the existing agglomeration.

3.3. Urbanization Process of Hanoi

Almost a thousand years have passed since its establishment, and Hanoi has changed drastically through different periods in the country's history. One aspect of the history of Hanoi that can give significant insights into the political and socio-economic development of the city is its spatial expansion through the urbanization process. The urbanization process of Hanoi during the late 20th century and its urbanization patterns has been analyzed by many authors. In these three decades following the reunion of the country after a long period of war and the Doi Moi (Innovation) of the late 1980s, many changes have occurred in Hanoi.

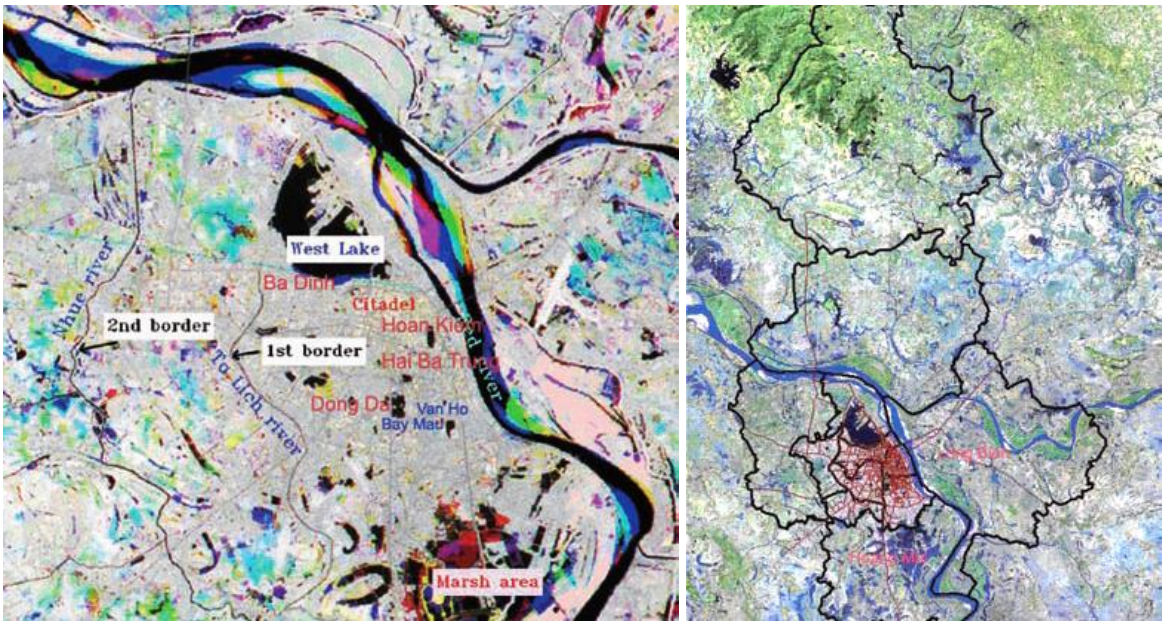


Figure 3.3 a) Spatial Expansion of Hanoi. Note: Red River (east), To Lich River (west) and a marsh area (south) have been natural barriers against the expansion of old Hanoi. b) Hanoi Administrative Boundary (2002) with Inner-city Road Network (Ho and Shibayama, 2009)

In 2008, the administrative boundaries of Hanoi were extended to include the neighbouring province of Ha Tay as well as a handful of districts and communes that formerly belonged to the provinces of Vinh Phuc and Hoa Binh. Upon completion of this project, the territory of the capital reached 3,300 km² (3.6 times the size of the previous area). This expansion also implied a doubling of the official population of the capital city, namely, from 3.2 to 6.4 million inhabitants in 2008 (HSO).

Shannon (2009) pointed out that Hanoi urbanization results in the expansion of administrative boundaries, stretching in various directions and leading to changes in land use, mainly at the periphery. The expansion plan is largely political. Representation of power seemingly remains imperative and size matters. The main mode of defense against such a covering of the territory and obliteration of its agricultural productivity and degradation/homogenization of the region's now rich environmental diversity is the perhaps outdated model of satellite cities.

The spatial growth of Hanoi is limited by natural barriers, such as streams to the northeast and east, water bodies to the north, and a swamp area to the south. The expansion of Hanoi stretches in four directions South, Southwest, West and East following main transportation axes connecting the inner city to neighboring areas. Agricultural lands, natural vegetation, and other sites are converted to residential areas with enhanced transportation systems, increased housing density, and lost green space (Tran Mai Anh *et al.* 2005).

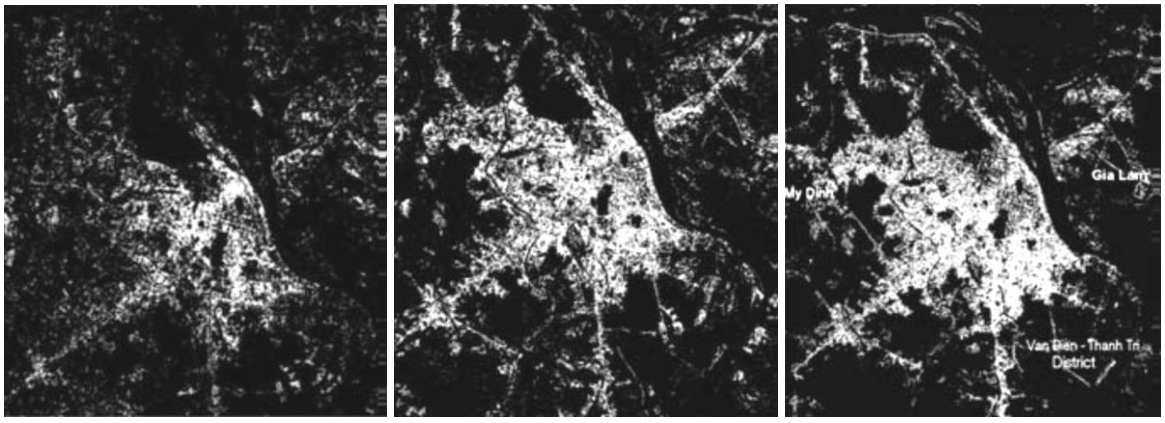


Figure 3.4 – a, b, c: Urban Expansion of Hanoi during 1993, 2000, and 2003. Note: In-fill and expansion patterns can be seen (Ho and Shibayama, 2009)

Over time, urban Hanoi has greatly expanded to the west and southwest. Indeed, the spatial growth of Hanoi is limited by natural barriers, such as streams to the northeast and east, water bodies to the north, and wetland to the south. Spatially, the expansion of Hanoi stretches in the obvious directions, and the urbanization process follows the main transportation axes connecting the inner city to neighboring areas.

Overall, it is very useful to identify the changes, urban margins, and physical limits and urban borders, to support the identification of growth patterns of Hanoi over time.

Through the long history, a large difference between the urban center and the surrounding areas can be seen in term of spatial features, construction features, density, land use.

Figure 3.5 Administrative Map of Hanoi after 2008

(http://www.joyfm.vn/sites/default/files/pictures/ban_do_ha_noi.png)

3.4. Review of Hanoi Master Plan Development

3.4.1. Seven times of Hanoi Master Plan

From 1954, Hanoi adjusted the master plan by 7 times (with 3 times officially appraised) to adapt with the socio-economic situation of the Capital in each period. Each plan

preparation and adjustment was based on the principle of inheritance, promotion the positive aspects of the previous plan; with adjustment and supplementation to adapt and satisfy the requirements.

1954 – 1960: The first master plan after independent (Vu Minh, 2014)

In the first master plan, 1954 – 1960, there was nearly no change in urban boundary of the city. The core urban area was only about 70km2 on the right bank of Red River, comprised Ba Dinh, Hoan Kiem and a part of the current Tay Ho Districts.

The first master plan has contributed to raise the living standard for poor laborers and construct offices, schools, hospitals… of Socialism.

1960 – 1964: The first 5-year development plan of Socialism (Vu Minh, 2014)

The first expansion plan for Hanoi had been approved with the help of Russian experts. The city comprised 4 urban districts Ba Dinh, Hoan Kiem, Dong Da and Hai Ba Trung and 4 rural districts Gia Lam, Dong Anh, Tu Liem and Thanh Tri, with the total area of about 130km2.

In the period 1960 – 1964, although Hanoi faced economic difficulties, the new plan achieved the births of industrial areas like Thuong Dinh, Minh Khai…, residential areas (as called KTT) like Kim Lien, Nguyen Cong Tru. In addition, many big universities were established such as university of Science & Technology, university of Pedagogy, university of Agriculture-Forestry… and hospitals were improved.

After that, the city development plan had to stop temporarily because of the sabotage war during American war.

1981: Hanoi master plan to 2000 (Vu Minh, 2014)

In December 1978, in the second expansion, Hanoi was extended toward the North and West of the city, comprised by eight original districts (4 urban and 4 rural districts). Total area was 2,130km2, population was of 2,435,200.

Following that, in April 1981, Hanoi established new master plan with the help of Russian experts. This was the first fully worked-out master plan which had clear targets for

development in 20 years (1981 – 2000). The spatial development was limited in 4 urban districts, and extended to 2 rural districts Dong Anh and Gia Lam and the south of Hanoi.

The master plan 1981 has created the real urban portrait for Hanoi, with the technical infrastructure framework, green spaces, and heritage conservation. However, the Hanoi expansion had caused difficulties in urban management and synchronous development. Moreover, this plan was elaborated in subsidiary period that urban construction was based on State budget, therefore the urban development pace was definitely slow.

1992: Hanoi master plan to 2010 (MOC, 2009 and Vu Minh, 2014)

This is the first stage of socialist market oriented economy with a motto that urban foster urban area and mobilizes every economic sector to participate in urban construction.

In 1991, the Hanoi administrative boundary was narrowed because of the limitations in urban planning management, by returning administrative right of Me Linh District to Vinh Phu Province, Son Tay Town and 5 rural districts of Hoai Duc, Phuc Tho, Dan Phuong, Ba Vi and Thach That to Ha Tay Province. After this adjustment, total area of Hanoi was 921.8km2, population of 2,052,000. In 1992, the master plan was adjusted follow the new administrative boundary and vision to 2010, focused on urban development within belt 3 area in the south of Red River.

This time period was easier for Hanoi in management but inhibited the development of the city as a capital center of Vietnam. The lack of urban area for bigger population and higher density was also a problem Hanoi had to deal with.

1998: Hanoi master plan to 2020 (MOC, 2009 and Vu Minh, 2014)

In June 1998, the Hanoi master plan to 2020 was established. The sphere of study project included Hanoi city center (population of 2.5 mil) and surrounding cities of Ha Tay, Vinh Phu, Bac Ninh, Hung Yen provinces, with limited radius of 30 – 50 km. In which, the city center connected to the balanced urban chain in the West of about 1 million people (Son Tay, Hoa Lac, Mieu Mon, Xuan Mai).

The plan in 1998 proposed that the development restricted area is the area of 4 old inner districts; the necessity of green belt surrounding the city (width from 104km) to protect

the city center, so that it has sustainable and stable development. Therefore, Hanoi played central role in the regional network and was developed in both two banks of Red river. In addition, the plan has been a premise to develop several new towns in Hanoi by now located in the north, east bank and mostly south – west of Red river delta.

Generally, Hanoi master plan 1998 is considered a successful master plan supposed by many planning experts and architects in many aspects (spatial development, strategies, priorities…). Therefore, it has a big influence to the newest Hanoi master plan.

2007: Master Plan Study: Urban Development Program in Hanoi to 2020 (HAIDEP, 2007)

In 2007, the Comprehensive Urban Development Program in Hanoi Capital City (HAIDEP) has established the master plan for urban development strategy for the whole Hanoi City and devised the future urban development strategy of the city to 2020. The plan also conducted pilot projects including a detailed development plan for new downtown at the northern part of Hanoi City. HAIDEP placed Urban Mass Rapid Transit (hereinafter referred to as UMRT) as one of main components. UMRT has also developed in the master plan afterward as one of the important keys of transportation development.

The general plan proposed in the HAIDEP was prepared by updating the 1998 Master Plan and expressing the shared vision and goals as a spatial development strategy. The plan is based on the strategic "water-greenery-culture" concept and aims at realizing a public-transportation-based urban development and land use while ensuring the city's competitiveness, livability, and environmental sustainability. The plan also proposes a structure integrating Hanoi with its neighboring urban areas and provinces.

However, HAIDEP study didn't include any concrete district development vision and methods for the realization of the development plan having UMRT as a core. Moreover, station vicinity development plan as the traffic node and measures to regulate neighboring local development and to guide it, were not considered in the pilot project.

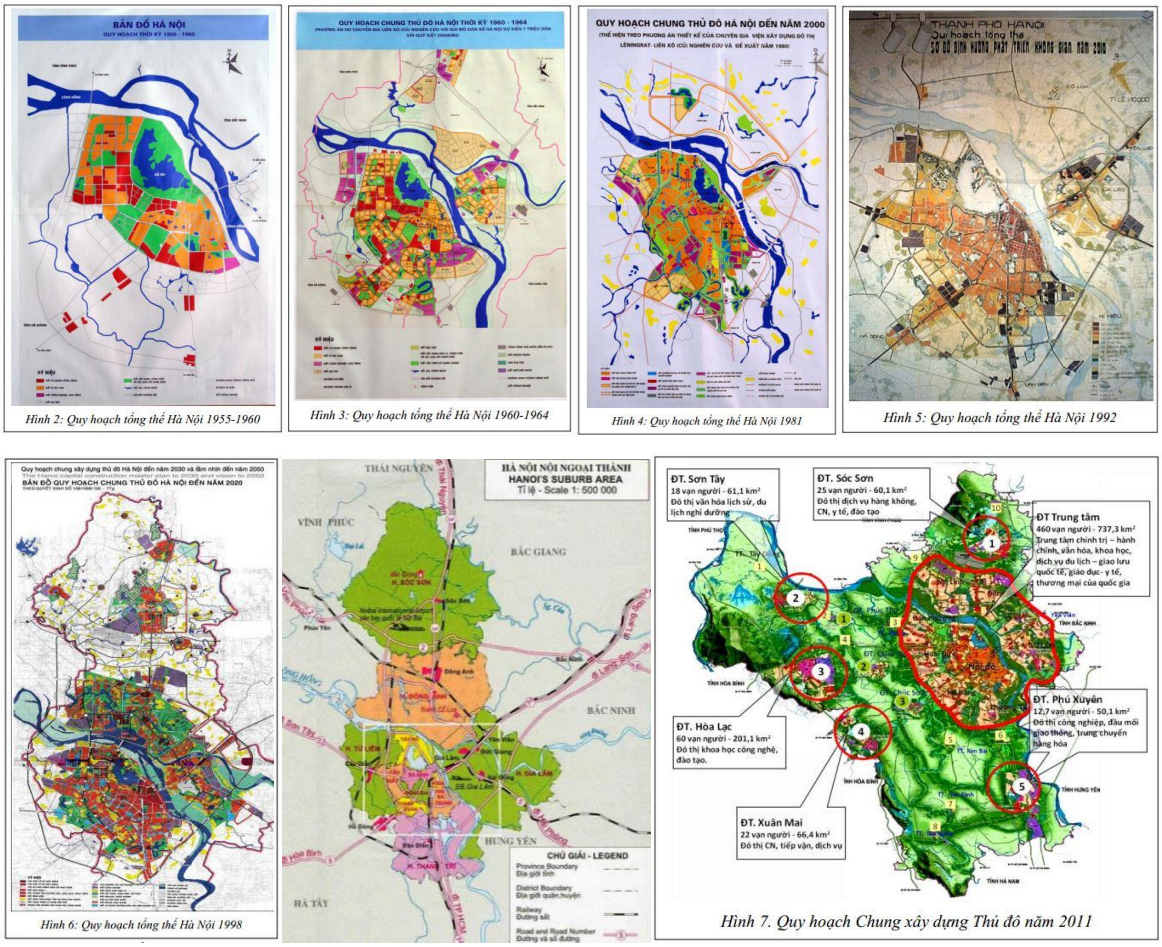
2011: Hanoi Master Plan by 2030 and vision to 2050 (MOC, 2009)

The city's boundary administrative has fixed until the third expansion in 2008. In Vietnamese Parliament meeting on May 29th 2008, the Resolution on the third expansion

plan for Hanoi, also to be the last administrative boundary adjustment by now, of 3.344,6km2. The newest construction master plan "The Hanoi Capital Construction Master Plan to 2030 and Vision to 2050" was established in 2009 and approved by Prime Minister in 2011 and now to be in force. This master plan is considered the largest-scale plan until now and gives opportunity to Hanoi achieves the new vision, although Hanoi still have to face the contemporary challenges as well as complicated issues of a big city.

This plan orients all urban infrastructure facilities constructed inside Hanoi Metropolitan until the year 2030 and can be lasted to 2050. According to key goals, Hanoi is developed in harmonious spatial pattern, with integrated and modern urban infrastructure systems. The most important contents of this master plan will be summarized in the next section.

3.4.2. The evolution of Hanoi master plan through seven times



Hình 2: Quy hoạch tổng thể Hà Nội 1955-1960
Hình 3: Quy hoạch tổng thể Hà Nội 1960-1964
Hình 4: Quy hoạch tổng thể Hà Nội 1981
Hình 5: Quy hoạch tổng thể Hà Nội 1992
Hình 6: Quy hoạch tổng thể Hà Nội 1998
Hình 7. Quy hoạch Chung xây dựng Thủ đô năm 2011

Figure 3.6 – a, b, c, d, e, f, g: Hanoi seven times Master Plan adjustment (http://cafef.vn/chinh-sach-quy-hoach/bat-mi-nhung-quy-hoach-ha-noi-60-nam-qua-20140919141104840 10.chn)

During 7 times Hanoi master plan establishment, the capital city has several times of expansion and narrowing. Although many ideas for renovation have acknowledged and contributed to the city planning and development, especially in spatial and infrastructure development, some negative points still have to reviewed and solved in future. “Expand – narrow – expand” has caused difficulties for Hanoi in development and management until today, while many big cities in the world have had stable boundaries for years. This also means planners still lack of strategic vision for a long time.

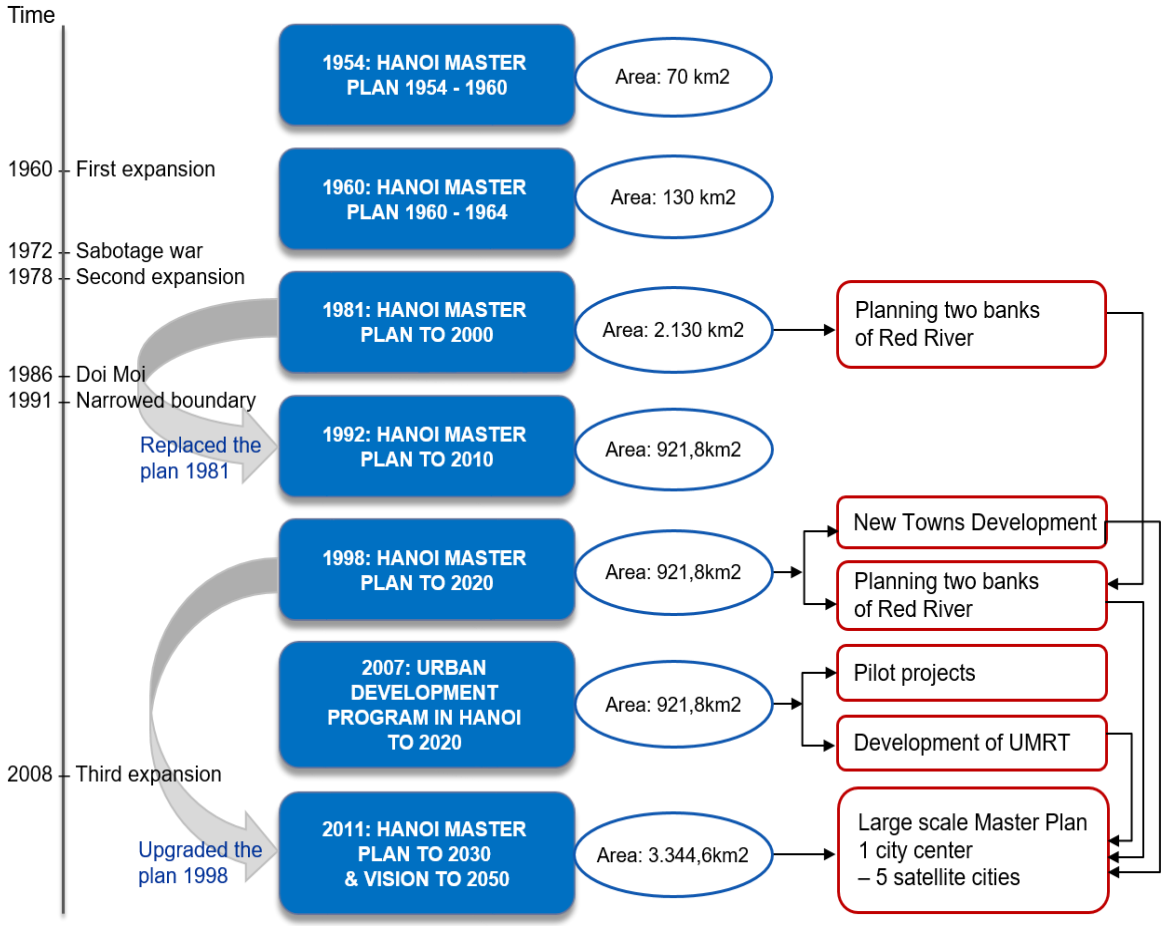


Figure 3.7 The movement of Hanoi Master Plan through seven times

3.5. Hanoi Capital Construction Master Plan by 2030 and vision to 2050

The establishment of Hanoi master plan to 2030 and vision to 2050 has been based on the orientation of national urban planning and development (Decision 10/1998/QD-TTg) and legal documents includes (MOC, 2009):

- Construction Law in 2003
- Urban Planning Law in 2009
- Decree No. 08/2005/ND-CP of the Government on Construction Planning
- Decree No. 37/2010/ND-CP on preparation, appraisal, approval, and management of Urban planning.
- Decision No. 490/QD-TTg dated May 5 2008 of the Prime Minister on approving the Regional Construction Planning of Hanoi Capital to 2020 and vision to 2050.
- Resolution No. 15/2008/QH12 on adjusting administrative boundaries of Hanoi City in the session 3 of the XII National Assembly.
- Decision No.1878/QD-TTg of Prime Minister dated December 22nd 2008 on approval design tasks of Hanoi Capital Master plan to 2030 and vision to 2050.

The Hanoi newest expansion in 2008 has been the big challenge for Hanoi master plan, but also the convenient condition for Hanoi achieves new goals and vision.

The Hanoi Master Plan has oriented for all urban infrastructure facilities constructed inside Hanoi Metropolitan until the year of 2030 and can be lasted to 2050 (MOC, 2009). According to the goals of the plan, Hanoi will be developed in harmonious spatial pattern, with integrated and modern urban infrastructure system.

3.5.1. Current challenges for Hanoi Master Plan

Hanoi is facing many problems in urban development because of the rapid pace of urbanization process. There, the Hanoi new master plan has to deal with many difficulties in population growth, transportation, environment, education, medical… In more details, the Hanoi new master plan has many urban issues need to consider and solve, including 15 main points:

1. The role of Hanoi in northern Vietnam is not strong enough, especially in economic development. So Hanoi will face more challenges from its expansion.
2. Forecast of population growth and reasonable distribution for Hanoi in 2030 and vision to 2050.
3. Conservation planning and improvement of the historical core urban includes Hanoi citadel, Ancient quarter, French quarter and other vestiges.

4. Solutions for rapid urbanization which has bad effects on cultural heritages, landscape and agricultural land.
5. Solutions for more than 750 constructional projects are updating.
6. Exploit rivers and lakes of Hanoi for urban development and control drainage and flood (mostly concentrate in the old Ha Tay).
7. Development of Red river bank to be main landscape for Hanoi.
8. Transportation network needs to be improved, especially public transport.
9. Technical and social infrastructures need to be improved.
10. Location choice for new national administrative center vision to 2050 in reducing pressure for the city center.
11. Location choice for decisive industrial zones and reasonable distribution of firms.
12. Solutions for overloaded educational and medical services in the city center.
13. Development of social housing programs.
14. Urban finance for new construction master plan.
15. Establishment of tool for urban management.

3.5.2. Vision and Goals of Hanoi Master Plan

The Hanoi master plan gives a long-term vision and three general planning goals, as shown below:

- *Vision:* "Hanoi Capital is Central of Political – Administrative Central of the Nation; the big central of Cultural-Science-Education-Economic-Tourism and International Transaction central of Asian Pacific Region; high quality of environment, Hanoi will be a modern, dynamic and effective city, a national symbol of the whole country".

- *Planning goals:*

The development of Hanoi Capital needs to reach the following 3 big targets:

- Ensuring the sustainable development of urban structure;
- Exploit the potential value of geographic landscape/knowledge-technology/history, culture, tradition;
- Using land effectively and having a synchronous, modern, environment-friendly urban infrastructure system.

3.5.3. Development Forecast

According to the Hanoi Master Plan (MOC, 2009), the development forecast has given in 4 aspects including economic growth, GRP per capita (GRP: gross regional product), population growth and construction land, as shown below.

Economic growth:

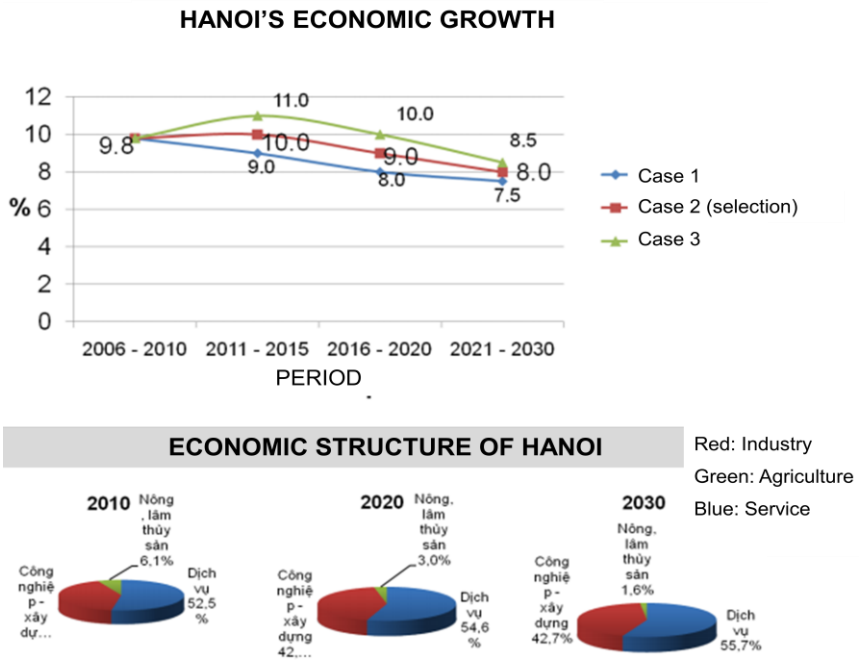


Figure 3.8 Forecast of economic growth and structure (MOC, 2009)

Population growth and GRP per capita:

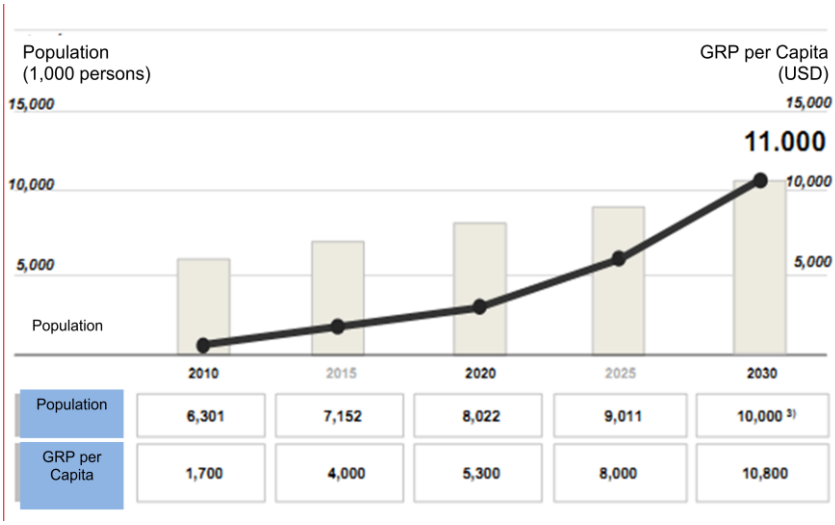


Figure 3.9 Forecast of GRP per capita (MOC, 2009)

Construction land:

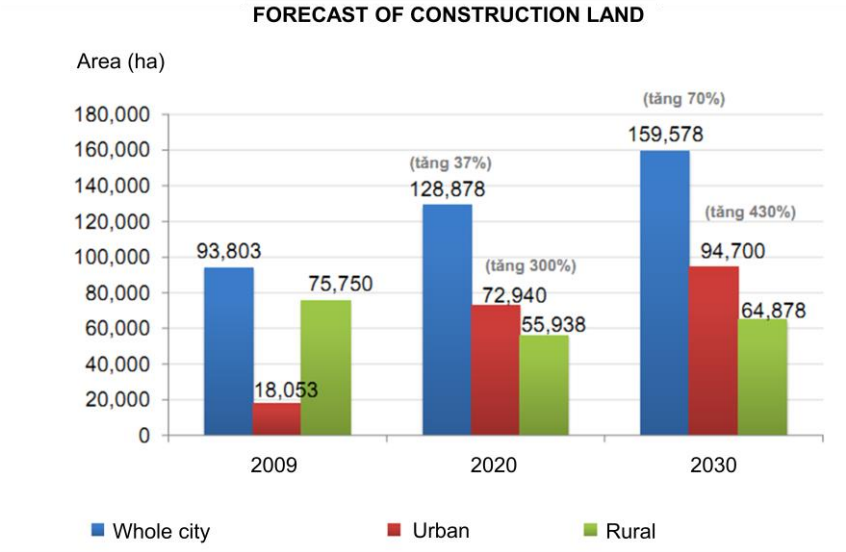


Figure 3.10 Forecast of construction land (MOC, 2009)

3.5.4. Orientation of Spatial Development

3.5.4.1. City Structure

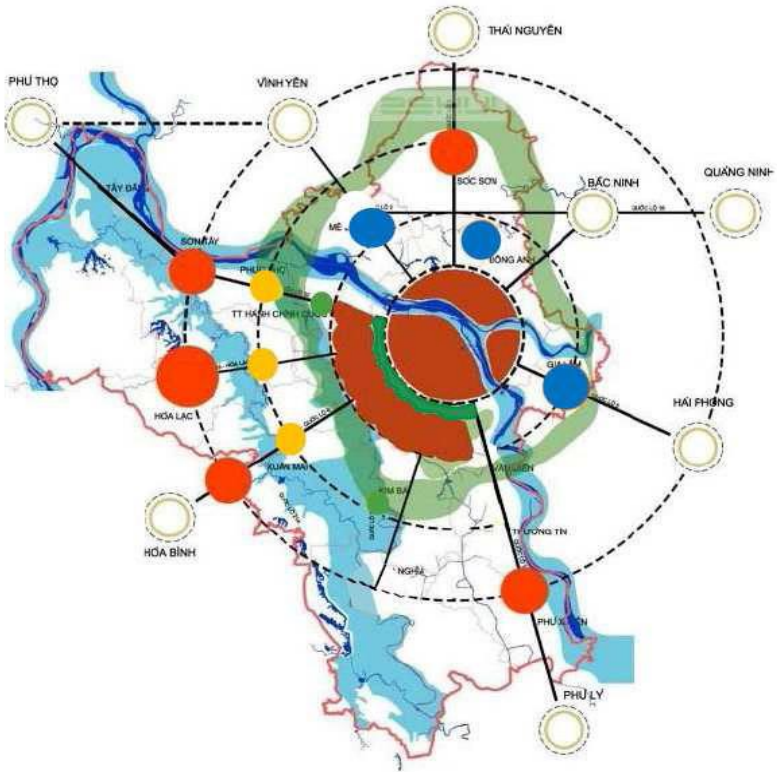


Figure 3.11 Hanoi city structure (MOC, 2009)

According to the Hanoi master plan, the city will comprise the core urban center with three sub-urban centers Gia Lam, Dong Anh, Me Linh and five satellites cities Soc Son, Son Tay, Hoa Lac, Xuan Mai and Phu Xuyen, 3 ecological cities, 10 towns and rural areas. Between the core center and the satellite cities will be the green corridor (for agriculture, water surface, ecological villages/towns or green space for relaxation) or green belt (for park, water surface or public services). Land area for urban development will be 28.3% of natural land resource.

3.5.4.2. The city center, sub-urban centers and satellite cities

The Hanoi city center is oriented to play the key roles on politics, culture, history, service, healthcare, high-quality education for the whole country, region and Hanoi city. Its population has been projected to be 4,6 – 5,5 million. The development boundary of this area will be limited inside the ring road No. 4 and development direction will be to the West and the North of Red river. The historical core area (including Hanoi Citadel, Ancient Quarter and French Colonial Quarter) will be strictly controlled and to preserve the cultural characteristics and lifestyle of ancient Thang Long. The population will be restrained lower than 0,8 million.

The urban chain located in the North bank of Red River, includes sub-urban centers Gia Lam-Long Bien, Dong Anh and Me Linh is developed in many areas and helps the city center in reducing high pressure. Among them, Gia Lam- Long Bien will be concentrated on commercial, finance, banking and specialized medical development; Dong Anh will be the international commercial and hi-tech industry center and also integrated studio and eco-tourism with Co Loa Historic Monument and Van Tri Pond; Me Linh will be green, hi-tech and multi-industrial zone with exhibition center combining with Noi Bai Airport.

In order to support the economic development objectives for the City, five satellite cities will be developed with specific functions to create jobs and share with the center urban area on housing, high quality education, industrial and urban services. These satellite cities will be developed with population size varying from 210 to 750 thousands. Hoa Lac will be the science and hi-tech center, attracting the most advanced technologies with intellectual concentration of the whole country. It also will be the high education center for the region and country as the whole. Son Tay will be the nuclear to boost up the

development of the north-west area of Hanoi. The main direction for economic growth will be eco-tourism, ecological agriculture and handicraft. Xuan Mai will be the "University Town" and service for the south-west Gate of the City. Phu Xuyen-Phu Minh located in the south of the City is oriented to be industrial zone integrated with warehouse, transshipment, logistic coordination and agricultural product distribution.

Table 3.1 Orientation of Development of five satellite cities (MOC, 2009)

	Son Tay	**Xuan Mai**	**Soc Son**	**Phu Xuyen**	**Hoa Lac**
Orientation of Development	Cultural, historic, tourism, relaxation town	Development of handicraft, traditional village system	Industry, air service, development of Noi Bai Airport	Industrial, transportation hub, commodity transshipment	Science, Technology and Education
Population (thousand persons)	180-200	220-300	250-200	127-155	60-75
Area (km2)	40-42	35-45	40-42	25-30	180
Residential land (m2/person)	90-95	80-85	75-80	60-70	80-90

3.5.5. General infrastructure planning

The Hanoi Master Plan gives idea for planning and development of general infrastructure network in both social and technical. The orientation of social infrastructure includes political center, education and training, healthcare, service network, culture, sport, green and public space, industry and residential housing development (with old collective areas – sites of improvement, historical site – sites of conservation and new towns – plan and construction). The orientation of technical infrastructure includes transportation network (with public transportation (bus, railway), air transportation, waterway), electricity, water supply, information and communication, environment and technical preparation (with solid waste and cemetery management).

3.5.6. Urban Transportation Infrastructure System Planning

One of the most important issues in the Hanoi master plan is transportation planning which influents to spatial development, economic development, land use… There, transportation planning is presented in more details in this section.

Firstly, in the Urban center area, primarily, the main urban road network has to improved reaching the basic road density criteria of 3 - 5 km/km2, and land for transportation has to be about 20 - 26% total land area. The urban public transport network has to meet the technical ratio of 2:0 - 3:0km=km2 and will cover for the 45 - 55% total travel demand. In existing urban center, ring road No. 2 and No. 3 should be completed. Following that, between ring road No. 3 and No. 4, a new ring road 3.5 connecting the new urban area will be supplemented. The interchange on the urban arterial roads will be constructed and an appropriate land also will be arranged and controlled for parking purpose. The urban mass rapid transit (UMRT) system will be developed and combined with rapid bus network to make up an efficient and interconnected network. The 8 UMRT lines will be extended to connect the center urban area with the satellite cities.

Secondly, the satellite urban areas will achieve a completely new and modern transportation system, which will be customized and established in each satellite city so that it can fit well with the functions and specific characteristics of each, unified with the land-use plan. On the other hand, the inter-town transportation network will also be developed to ensure the rapid contact between the satellites and urban center area and also among them. Primarily, the public transport will be enhanced by introducing some shuttle bus routes. In the future, depending on the travel demand of each connection, the network can be upgraded to mass rapid transit type.

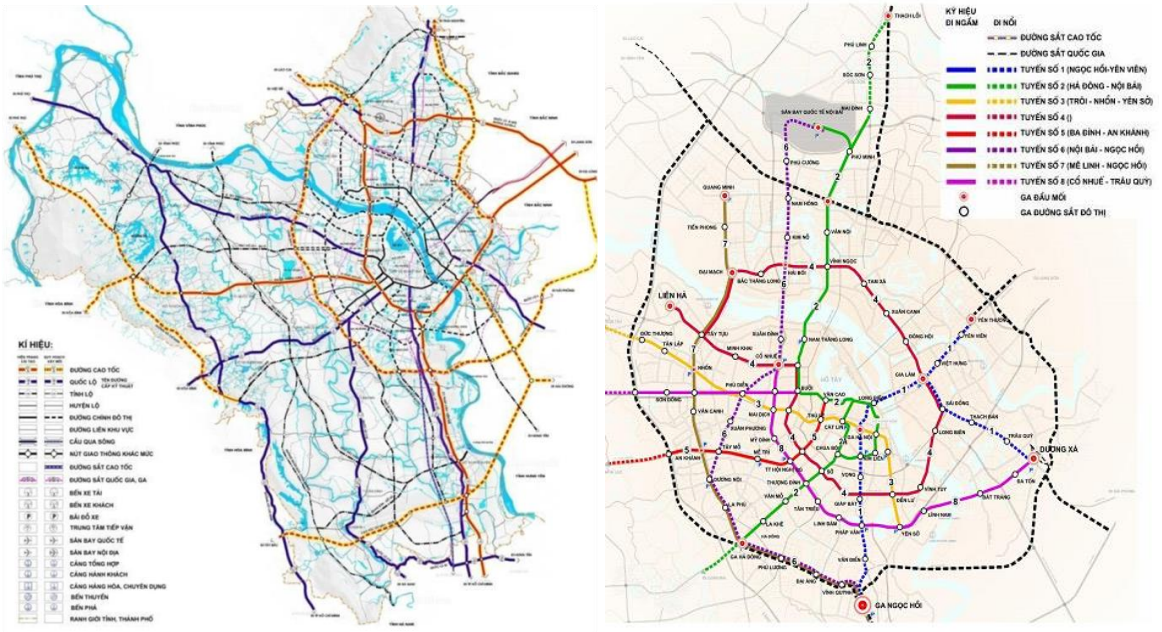


Figure 3.12 – a, b: Road and railway network planning (MOC, 2009)

Generally, urban traffic system of Hanoi is overloaded by socio-economic development and rapid population growth. From the planning viewpoint, it can be seen that traffic indicators are much lower than required. Urban transportation mainly focuses on individual vehicles, while public transportation gets a low rate (14%). Therefore, the planning of a concrete and suitable public transportation network is definitely necessary.

3.5.7. Project Phases

In the whole planning process, the Hanoi master plan has been divided into three phases, with the set of priority of each.

Phase 2010-2020: Construction of fundamental technical infrastructure system with the priority for public transportation network, infrastructure for industrial zones and trading centers, infrastructure for universities, and urban centers along the ring road No.4 and northern Red River. The Hoa Lac satellite city will be in construction of social and technical infrastructures.

Phase 2020-2030: Keep building construction items that will have been conducted during Phase 2020-2020. Construction of social infrastructures in newly expanded urban and technical infrastructures in other satellite cities will be taken place. In addition, the project will carry out the reinforcement of historical core urban and the construction of infrastructures for rural centers.

Phase 2030-2050: Keep building construction items that will have been conducted during Phase 2010-2030.

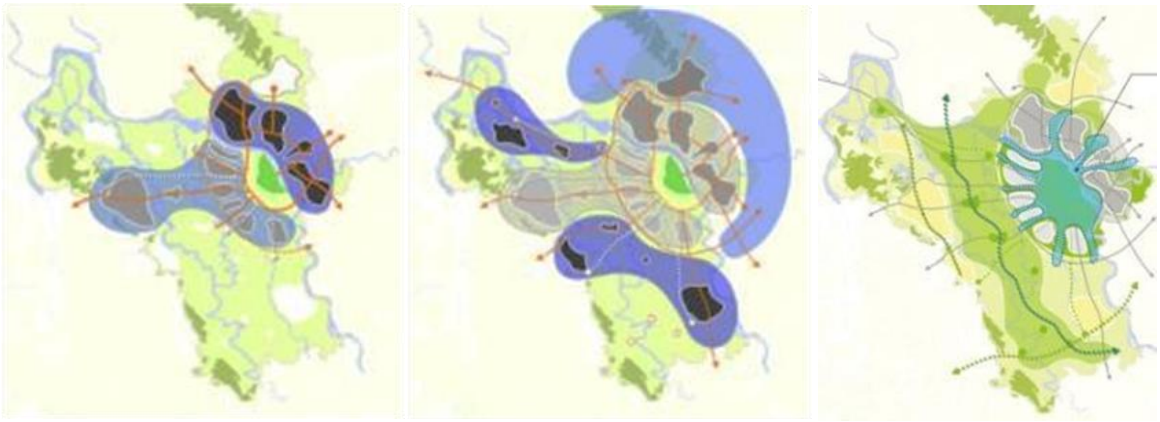


Figure 3.13 – a, b, c: Three phases of Hanoi Master Plan (MOC, 2009)

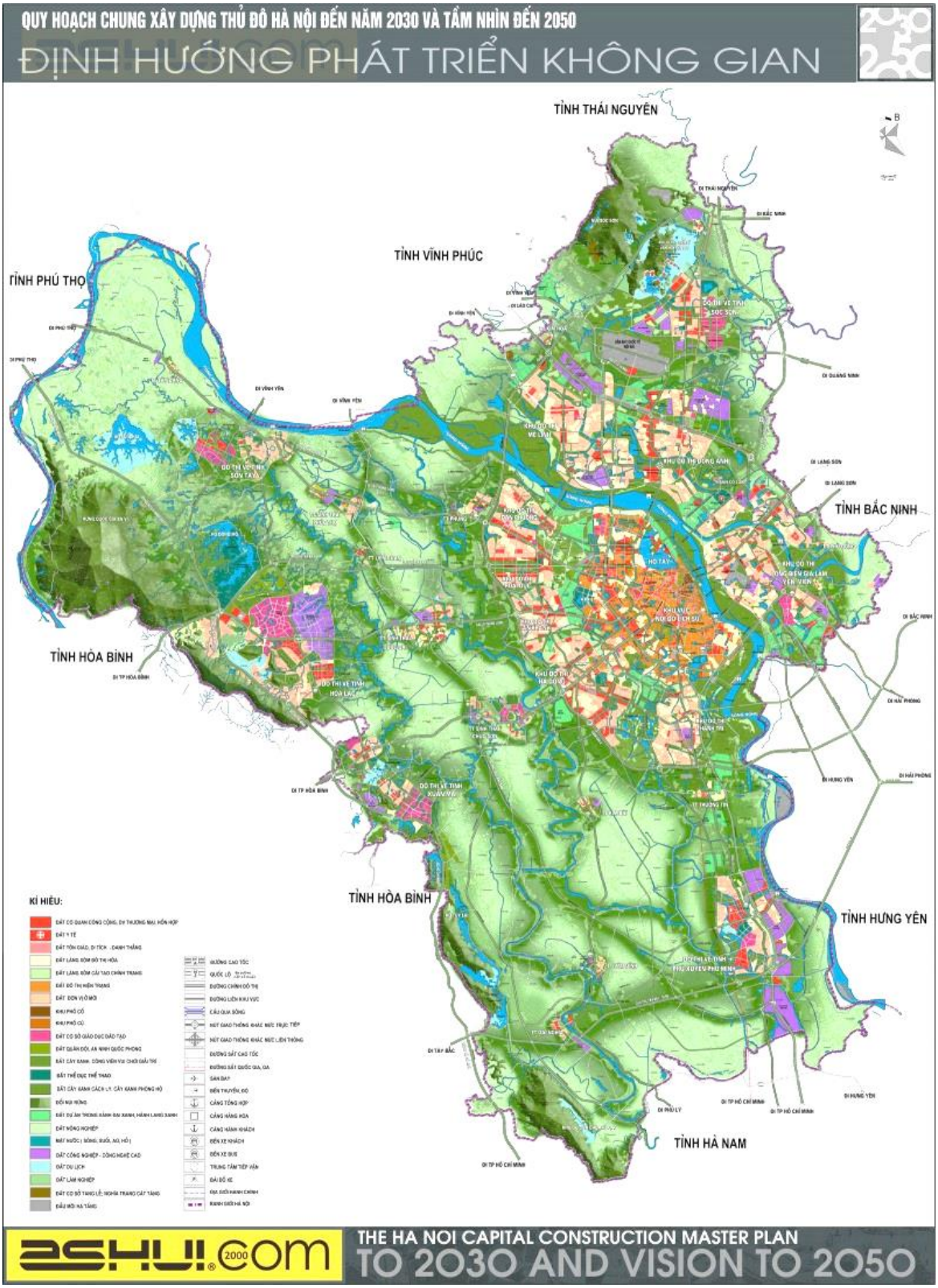


Figure 3.14 Spatial Development of the Hanoi Capital Construction Master Plan to 2030 and vision to 2050 (http://hanoi.org.vn/planning/wp-content/uploads/2010/02/khonggian_ashui_wikihanoi_201101-800x1099.jpg)

3.5.8. Main Findings

The newest master plan "Hanoi Capital Construction Master Plan to 2030 and Vision to 2050" is considered the largest-scale plan and gives opportunity to Hanoi achieves the new vision, although Hanoi still have to face the contemporary challenges as well as complicated issues of a big city. It has oriented for all urban infrastructure facilities constructed inside Hanoi Metropolitan until the year of 2030 and can be lasted to 2050 (MOC, 2009). According to the goals of the plan, Hanoi will be developed in harmonious spatial pattern, with integrated and modern urban infrastructure system.

Through the introduction of Hanoi master plan in some main issues, main findings are identified as below.

Strategies:

- Hanoi has to be motive force in the Northern region and Red river delta region.
- Identification of two big targets: economic development and reduction of pressure for city center (by planning satellite cities and promoting the development of sub-centers).
- Hanoi master plan has to be in the relationship with Capital regional planning.

Spatial development:

The Hanoi master plan has identified the connection between the city center and satellite cities, urban and rural areas. It has to deal with two big targets: economic development and reduction of pressure for city center (by planning satellite cities and promoting the development of sub-centers). In more details, Hanoi will achieve urban agglomeration includes: city center, 3 sub-centers, 5 satellite cities, 3 eco-cities. In general, Hanoi will develop mostly in the center and the Northern, Western part (dues to its socio-economic condition and political strategies). Hanoi can be divided into 5 regions for development, as shown below:

- Urban Center – 7 central districts: taking central role for development in different fields.

- The North – Soc Son satellite city, Me Linh and Dong Anh sub-centers: development of industry, services for Noi Bai Airport as important Northern accessibility of Hanoi.
- The West – Hoa Lac, Son Tay, Xuan Mai satellite cities (Hoa Lac plays central role): reducing pressure for city center by development of science, education, medical center, high-technology, recreation.
- The South – Phu Xuyen satellite city: development of industry, concurrently promote the economic development of poor districts in the old Ha Tay.
- The East – Gia Lam sub-center: development of industry and residents, connection of important economic corridor Hanoi – Hai Phong.

Hanoi generally will develop mostly in the center and the Northern, Western part (dues to its socio-economic condition and political strategies). In addition, the Hanoi master plan has shown the determination of reasonable population sizes, land areas for the city center, sub-centers, satellite cities, depend on the role of each.

Infrastructure development:

On the basis of urban development, the Hanoi master plan has formed the technical infrastructure framework to create economic corridors to support the city center

- The North axis: gateway to Noi Bai Airport.
- The West axis (Lang-Hoa Lac axis): connects to Ho Chi Minh road.
- The South axis (national technical corridor): connects to 1A national highway.
- The East axis (national industrial and technical corridor): connects to No.5 national highway.
- The waterway axis along Red river connects to the capital urban landscape.

Transportation development is one of the most important issues in Hanoi spatial development. The master plan has given the enhancement of public transport, including Urban Mass Rapid Transit (UMRT) and Bus Rapid Transit (BRT) system, as well as control of private vehicles (mostly motorbikes and cars). It also gave the determination of important projects for technical infrastructure clues: electrical supply, water supply, solid and water waste management, cemetery…

Environmental Protection:

- Consideration of rural development: agriculture, rural infrastructure, trade village.
- Identification of the specific conservative areas: citadel, ancient quarter, French quarter, trade villages, ancient villages, historical vestiges (Co Loa) … to control the development, protect and retain their own cultural features of Hanoi.
- Green belts around the city center will ensure the balanced, stable and sustainable development, easier to control the city development. Parks and green spaces connect to green belts to create the city green network for recreational activities and environmental improvement.

Economic development:

In Hanoi master plan, the distribution and clarification of firms are clarified reasonably:

- City center will develop mostly spearhead industries with high levels of intelligences, limit medium and small industrial zones.
- Sub-centers, satellite cities will encourage the development of firms and trade villages which attach manual labors from districts and rural areas, concurrently limit the mechanical migration into the city center.

Overall, it can be seen the newest Hanoi master plan is a large-scale project and relates to many fields in term of urban development. In this context, the project has given positive contributions, especially in efforts to reduce the urban sprawl, conservation of green areas, historical sites as well as review of riverside Red river development and improvement of infrastructure systems. However, the project is facing many challenges in the process to achieve its goals. Scientific and feasibility of a master plan not only merely the satisfaction of a target culture, society or effective economic but also has important implications to the sustainable development of a city. The mistake of planning orientation is not easy to be adjusted and takes a long time, even across generations, to overcome.

3.6. The Movement and Implementation Procedure of Hanoi master plan

This section describes the process of Hanoi master plan from the establishment to implementation, in order to understand its official procedure and supporting ideas.

3.6.1. First Party – Central Government – Guidance

The Hanoi new construction master plan was established in the status when Vietnam got rapid development and urbanization. Urban population will achieve upper 50% in 2025 (compares to 30% in 2010), as population growth forecast of Vietnam Government.

Therefore, the Party and the Government have leaded the urbanization that meets the goal of industrialism-modernism and harmonious and sustainable residential distribution. The Government has strategies and priority to develop Hanoi to become a large-scale capital, internationally, a cultural, scientific, economic, educational and international trade center. In this process, the Parliament has issued the Resolution 15/2008/QH12 of capital administrative expansion, due to the narrowed Hanoi before 2008 was not enough to achieve new goal and vision.

After that, Prime Minister has issued the Decision 1878/QD-TTg/2008 approved the mission of Hanoi construction master plan to 2030 and vision to 2050 and MOC had to be in charge to this mission. Following that, MOC organized the competition to select an international consultant company to work with them. In the Document No.1585/TTg/2008, the Government approved the International advisory consortium named PPJ to establish Hanoi master plan.

3.6.2. Second Party – Hanoi People's Committees – Leader of Master Plan establishment

During the process of planning research, MOC coordinates with Hanoi People's Committees have leaded PPJ to work with relevant ministries: Ministry of Planning and Investment (MPI), Ministry of Transportation (MOT), Ministry of Natural Resource and Environment (MONRE), after which the plan are submitted to the Prime Minister for approval.

According to MOC, Hanoi master plan has been researched base on experiences in planning and urban design of 16 big cities in Asia, Europe, Middle America, South America and United Stated. Those cities have similar characteristics with regional capital Hanoi, including Bangkok – Thailand, Manila – Philippines, Beijing, Nanjing, Shanghai, Hangzhou – China, Kuala Lumpur – Malaysia, Seoul – Korea, Barcelona – Spain,

Mexican city – Mexico, Brasilia – Brazil, New York, Chicago, Washington DC – US, London – UK, Paris – France. The planning experiences suitable for Hanoi have been summed up by international consultant experts, including 4 main fields:

- Vision (Urban development issues);
- Infrastructure of the core urban (Infrastructure issues);
- Smart growth (Spatial and Environmental issues);
- Urban features.

At the same time, MOC organized conferences to get ideas from associations of occupation (Association of Architects Vietnam, Association of Vietnam Cities, Association of Planning & Urban development Vietnam, General Assembly of Construction, Association of Historical Sciences Vietnam, Association of Cultural Heritage, Association of Environmental Construction Vietnam…).

In 2009, Dr. Architect. Nguyen The Thao – Chairman of HPC (period 2007 – 2015) had published Report of the HPC for *Sustainable Development Planning of Hanoi capital city*, at Nationwide Urban Conference. The report has affirmed the importance of Hanoi Planning in socio-economic condition nowadays.

After that, many ideas have been taken from associations of occupation. MOC and PPJ have been in charge to receive, give supplementary ideas to the Hanoi master plan project. In addition, the project was uploaded in the website of MOC for stakeholders and publics.

In addition, there are some important achievements have been inherited from previous master plans to the newest Hanoi master plan, as below:

- Hanoi master plan 1998: achieves the development of new towns mostly in the West and South-West of Hanoi, the development of city in both two banks of Red river.
- Master Plan Study 2007 (HAIDEP): achieves the planning of UMRT network.

3.6.3. Third Party – Supporting Ideas

Several workshops and conferences were given to take ideas for Hanoi new construction Master Plan from planning experts, scientists, before and after the master plan

establishment in 2011. Following that, many discussions about positive and negative points of Hanoi master plan, as well as orientation for development have been given. Some of typical ideas and events are shown below:

- In 2008, Ass. Prof. Arch. Huynh Dang Hy – General Secretary – Association of Planning & Urban development Vietnam gave his critical ideas to support Hanoi planning and development in general and the new construction master plan in particular in some intensive areas such as spatial development, infrastructure development, especially the challenges for Hanoi urban planning and development from its expansion.
- From 2009 to 2012, 4 seminars named *Transportation planning in Hanoi to 2030 and vision to 2050* with the attention of Department of Architecture & Planning Hanoi (DAP), Department of Transportation & Communication (DTC) and Transport Engineering Design Inc. (TEDI) company had been organized to take ideas for transportation planning and development – one of the most important and complicated components in Hanoi master plan.
- In 2010, the seminar named *Ideas for Hanoi construction Master Plan to 2030 and vision to 2050* was given by MOC and Association of Environmental Construction Vietnam. The main argument was about agriculture land use while Hanoi urban expansion.
- In 2010, Arch. Phung Anh Tien presented his speech "Statistic of Planning and Urban development in Hanoi" in *International scientific conference commemorated 1000 years of Thang Long – Hanoi*. The speech gave the general vision of Hanoi master plan development in different periods, concurrently, gave the positive detailed evaluation for Hanoi master plan as well as the future development of Hanoi.
- In 2011, Vietnam Union of Science & Technology Association (VUSTA) gave their objective opinions about achievements as well as problems of Hanoi new master plan.
- In 2014, the seminar *Hanoi construction Master Plan to 2030 and vision to 2050 Implementation* was organized with three main participants: Economic & Urban Magazine, DAP and Hanoi Urban Planning Institute (HUPI) to give strategic ideas for promoting Hanoi planning and development in future.

- In 2015, the conference *Urban Planning in both sides of the street* was organized by HUPI and took positive ideas from experts, scientists for Hanoi development.

Besides, many other planning experts, scientists give their helpful ideas to Hanoi master plan for its implementation, as shown in figure 3.15.

In general, in terms of research, Hanoi master plan is still facing challenges in the implementation process but overall, it is a comprehensive, scientific and intellectual plan, with the intellectual contributions of qualified planning experts, although some conferences, seminars and feedbacks are still formalism.

Figure 3.15 below shows the whole implementation procedure and movement of Hanoi master plan from the time of establishment to 2015.

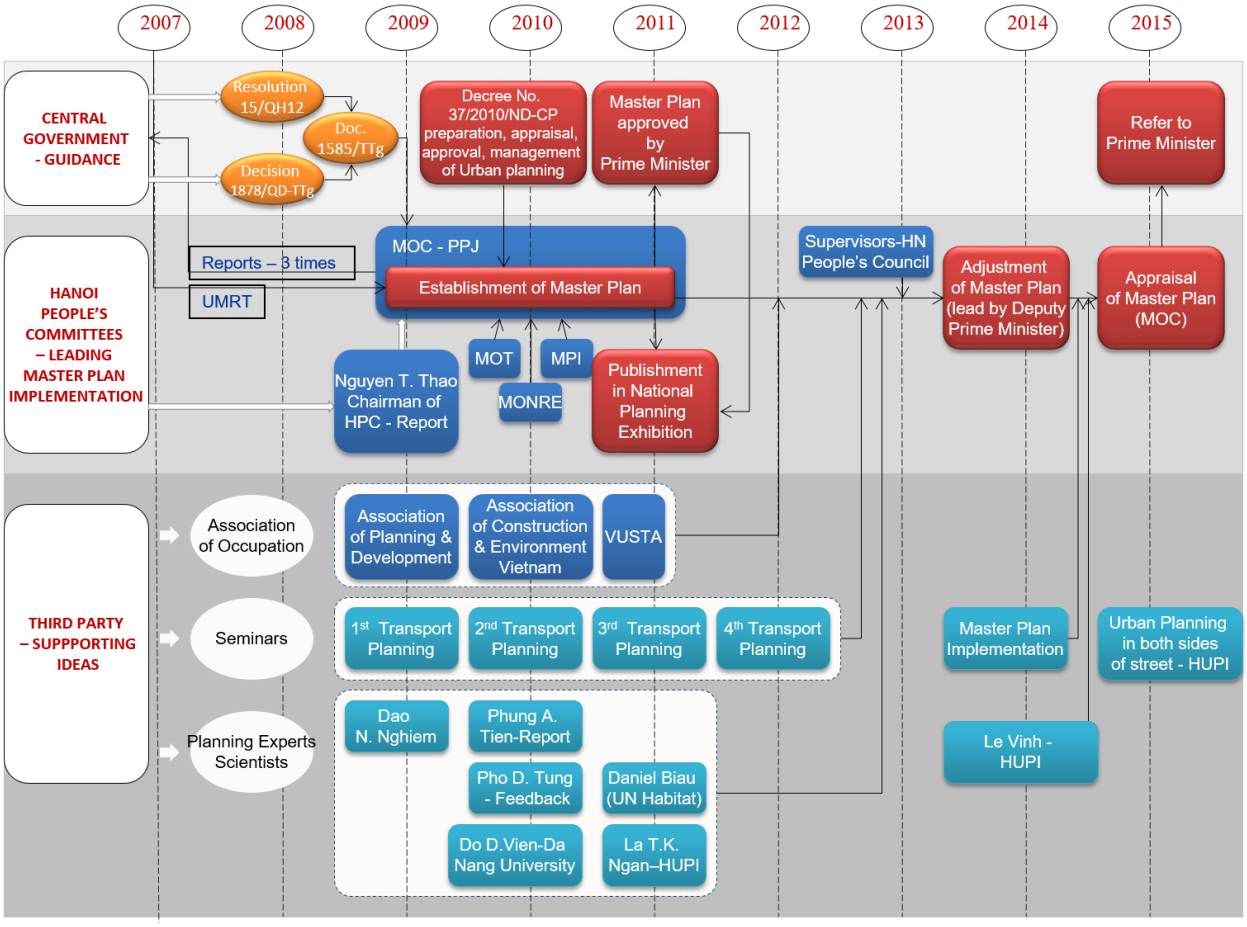


Figure 3.15 Implementation procedure and movement of Hanoi master plan until 2015

3.7. Implementation Issue of Hanoi Master Plan

3.7.1. General issue for implementation of urban plans

Implementation of urban plans is a continuous process. It involves multiple actors, such as individuals and organizations, from territorial levels of government as well as from all branches of government associations (Wapwera *et al*, 2015). The Hanoi master plan was established with clear goals and vision. To achieve goals in 2030 and vision till 2050, the master plan process should be monitored and evaluated in the right way. However, implementation of Hanoi master plan is not a simple issue because of socio-economic and political condition and poor management tool. It requires categorized forms of constraints include: institutional, financial, cultural, political, physical, knowledge, legal and analytical constraints. The approach to make the master plan more effective has the following components:

- Coordination between national plans and policy guidance and local information and interests.
- Community participation to set clearer objectives for planning interventions; to encourage a feeling of ownership; to promote public awareness; to strengthen urban management instruments; and to encourage community involvement (Breuer, 1999).
- Involvement of all stakeholders in the city from the initial stages of the planning process to implementation and maintenance.
- Interaction of urban and economic planning to ensure the link between the various planning processes for the city; addressing local community employment.
- Defining budget – reinforce the competences in budgetary control: the master plan should be with full awareness of the financial implications of proposals.
- Using indicators to facilitate decision-making.

3.7.2. Close coordination and collaboration among stakeholders

For the purpose of implementation of the master plan, the organization who is responsible for the implementation should be set up under the management of HPC. The members of this organization should be people who worked on the development of the master plan

first hand. This organization will be in charge of reinforcing the competences in budgetary control, and should be able to specify relevant agreements, and develop a communication plan.

In fact, there are many stakeholders from different levels and agents involved in Hanoi master plan. However, the capacities of these individuals and organizations, and the frameworks for interaction and cooperation, are not adequate. Therefore, it is important that the skills and ownership of the people involved in urban planning and urban development, including residents, are increased, and that systems and frameworks that go beyond the organizational level are created, and that they act as an integrated whole.

For the effective and synchronous implementation of Hanoi master plan, the different partners below should be involved to improve the master plan's quality and feasibility:

- The participation of local community (HPC);
- The participation of different planning agents in national levels (MOC, MOT, MONRE, MPI, MOF) and local levels (HUPI, DAP, DOC, DOT, DONRE, DPI);
- The participation of experts, scientists;
- The participation of investors, enterprises.

3.7.3. Establishment of the Monitoring and Evaluation system

To manage the planning process in the right way, Hanoi master plan needs an effective M&E system to implement and accelerate the progress of planning and planning approvals in order to achieve its goals comprehensively, including:

- Accelerate the progress of master plan completion
- Upgrade the planning and planning management quality
- Evaluating, reporting and learning from related experiences.
- Choice of suitable evaluation methods: by doing so, it is possible to obtain better control of the evolution of the execution plans, deadlines and the upgrading of indicators.
- Dissemination and Communication: the master plan will be followed by a communication strategy in order to maintain interest in the process. Instruments

such as the creation of a corporate image for the project, outreach publicity, publication of technical documents, etc. will support this objective.

3.8. Conclusion

In this chapter, many perspectives of Hanoi urban development and Hanoi master plan have been investigated, focus on the newest Hanoi master plan 2030 – 2050. Through the long history, a large difference between the urban center and the surrounding areas can be seen in term of spatial features, construction features, density, land use. It is useful to review the urbanization process of Hanoi to identify the growth pattern of Hanoi over time.

During 7 times Hanoi master plan establishment, the capital city has several times of expansion and narrowing. Although many ideas for renovation have acknowledged and contributed to the city planning and development, especially in spatial and infrastructure development, some negative points still have to reviewed and solved in future.

The newest construction master plan "The Hanoi Capital Construction Master Plan to 2030 and Vision to 2050" is considered the largest-scale plan and gives opportunity to Hanoi achieves the new vision. To achieve goals and vision, it is necessary to build a concrete M&E system for Hanoi master plan to implement and accelerate the progress of planning and planning approvals in order to achieve its goals comprehensively.

The idea of how to build a M&E system for urban planning from different methodological points of view will be clarified in chapter 4.

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CHAPTER 4

BUILDING A MONITORING AND EVALUATION SYSTEM FOR URBAN PLANNING

4.1. Introduction

How can we make sure that an urban plan goes the right way, not just this time but every time? As we have known from the concept of urban planning and its objectives, urban planning seeks to be efficient (make optimal use of resources) and effectiveness (create desired and meaningful impacts and outcomes) (Jody and Ray, 2004). To achieve this, we need to have a concrete system for M&E during the planning process until we get goals and objectives, a system that will ensure the plan, test and incorporate feedback for its well performance. M&E systems is certainly not a new phenomenon (Jody and Ray, 2004) and has been described in many ways, however it generally formulates goals and outcomes, determines planning progress, and must reflect organizational realities.

The goal of this chapter is to propose a comprehensive M&E system for urban planning, focusing on the performance of urban master plans, utilizing the Logic model to develop KPIs, Benchmarking for the target outcomes, and PDCA management. To achieve this, this chapter attempts to answer the following questions:

- What kind of functions should be provided in the M&E system?
- What is the structure of the M&E system by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle, in order to support those functions?

- How to operate the M&E system for an urban plan and what are the possible outcomes?

This chapter gives a proposal of comprehensive M&E system for urban planning, focusing on the performance of urban plans. This chapter is organized in order to answer above questions. Section 4.2 presents functions need to be contained in the M&E system, including Quantitative management of policies' effects, PDCA cycle management of planning process, Engagement of Stakeholders, and Data management. Section 4.3 theoretically analyzes the structure of the system by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle, in order to support those four functions. In this section, the way to combine different point of views, and the way they work together in a system will be investigated. Section 4.4 presents the operation of the M&E system for urban planning by 7 steps until achieving outcomes. In section 4.5, the management issue of urban data system for KPIs is given. Section 4.6 concludes main findings in chapter 4.

4.2. Functions need to be included in the Monitoring and Evaluation system for Urban Planning

System of M&E has been considered a powerful public management tool for urban planning practice. According to UN-Habitat (2009), M&E can demonstrate whether urban planning has made a difference, whether it has improved the quality of life and wellbeing of the city's residents, enhanced sustainability, or achieved related goals and objectives. Urban plan M&E generated many benefits as shown in the studies of Jody and Ray (2004): coherence helps decision-makers to make informed decisions about resources allocation; and demonstrate whether urban planning has made a difference, whether it has improved (or undermined) the quality of life and wellbeing of the city's residents, and also enhanced sustainability, or achieved related goals and objectives.

There is no one correct way to build M&E systems, and many countries and organizations will be at different stages of development with respect to good public management practices in general, and M&E in particular (Jody and Ray, 2004). Building a comprehensive M&E system is not a simple task, it requires continuous works in progress, time, effort and resources. To well management of an urban plan, four important functions need to be provided in the M&E system, including Quantitative management of policy's

effects, PDCA management of planning process, Engagement of Stakeholders, and Data management (figure 4.1).

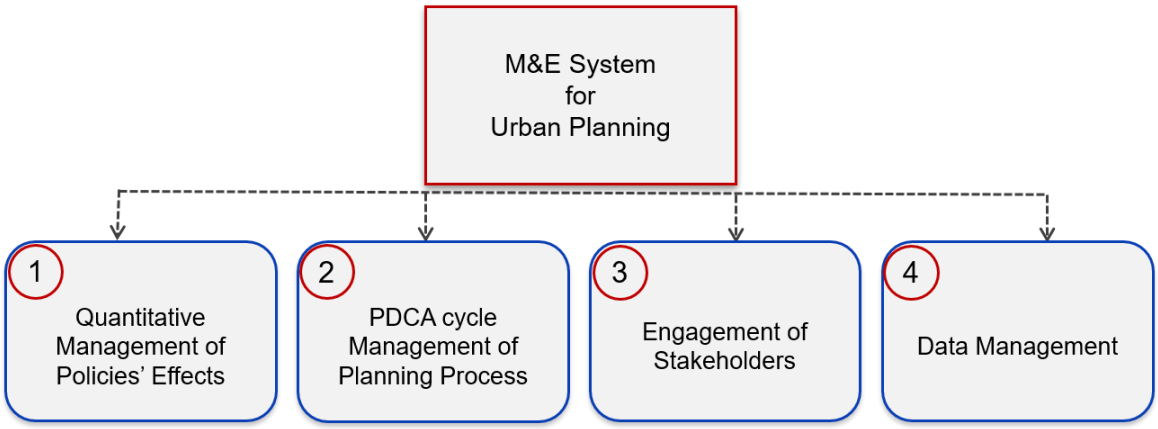

Figure 4.1 Functions of the M&E System for Urban Planning

4.2.1. Quantitative Management of Policies' Effects

In an urban plan, it is crucial to understand the logical linkage between policies and outcomes, what the goals are, what policies are established to support goals, how the goals can be achieved, and how we can measure goals or policies' effects in quantitative way? This issue has emphasized in "New Public Management" program (Hood, 1991) based on the two points "Explicit standards and measures of performance" and "Greater emphasis on output controls".

There, in the first function of M&E system, policies' effects will be managed quantitatively by development of KPIs system. Development of KPIs system is necessary to monitor the planning progress with respect to inputs, activities, outputs and outcomes. Accordingly, in the first function, to manage entire policies' effects, outputs and outcomes of policies will be measured by output-KPIs and outcome-KPIs. Among them, output-KPIs will measure the direct results of policies and outcome-KPIs will measure the benefits of policies for users and community.

In general, the development and implementation of KPIs are essential to provide a basic set of criteria to evaluate urban plans and to measure the effects of different planning policies. The use of KPIs is critical to measure and to quantify efficiency improvements in policies through the implementation of master plans.

4.2.2. PDCA cycle management of Planning Process

The second function of M&E system is management of the whole planning process by PDCA cycle until achieving goals. Indeed, an urban plan can be implemented for 10 years with the short-term plan or 20 years with the long-term plan. To manage the urban plan to be always in the right direction until achieving the final goals, we need to operate plan-do-check-act process for the periodical investigation of the whole urban plan. This PDCA cycle will monitor what and how policies are implemented, and evaluate whether those policies are effective or ineffective, as gap analysis, and then revise policies for the better effect. PDCA Cycle is significant in application for managing the planning process by providing a simple but effective approach for problem solving and managing change, ensuring that ideas are appropriately tested before committing to full implementation.

In the M&E system, gap analysis between target and actual results is the key activity because it is significant for the performance improvement process and influence to what planners expect to be true or not, then will influence to decision-making. In managing the planning process, the application of PDCA Cycle is significant by providing a simple but effective approach for gap analysis, problem solving and managing change, ensuring that ideas are appropriately tested before committing to full implementation.

4.2.3. Engagement of Stakeholders

In the third function, we need to engage stakeholders during the planning process. This is the institutional framework of the M&E system.

During the planning process from establishment to destination, there is the attention of different stakeholders in different levels (including national and local levels). To achieve the final result, it is crucial to assign responsibility of participants for concrete tasks of different elements, based on the articulation and clarification of the plan's goals. There, building consensus between diverse groups of stakeholder is definitely important for the best outcome of urban plan. From that point, we can give clear assignment for different actors by different actions.

4.2.4. Data Management

The last function is data management. Urban data system plays an important role in city's planning. The M&E system can only run well with a good urban data system which is available, qualitative, transparent and can be best offered to apply to city's stakeholders. To achieve that, the issue of urban data management has to be considered and guaranteed.

In the M&E system, data management is an important function which is strongly related to availability of KPIs. Indeed, it is necessary to identify the urban data that would be the most specific and useful in identifying specific outcomes of the urban plan. Following that, in the development of KPIs, we have to establish the base data relative to planning outcome, identify data sources that can supply potentially relevant data, collect data by suitable methodology and technology, and manage data in transparency, availability and quality.

Overall, M&E systems for urban planning can be described in many ways, however a concrete M&E system should manage policies' effects quantitatively, manage the planning process by effective PDCA cycle, build consensus among stakeholders, and manage urban data system effectively. Up to now, there are not any papers cover all of these four functions in an M&E system for urban planning. Therefore, the M&E system we propose in this research is significant to manage the urban plan comprehensively and concretely in order to achieve the final goals.

4.3. Structure of Monitoring and Evaluation system for Urban Planning

The M&E system for managing the urban planning process has been proposed with four functions. To support those four functions, the structure of the system will be theoretically analyzed by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle.

4.3.1. Logic model

To build an M&E system for urban planning, Logic model is significant with several benefits. Logic model is a tool for program planning, management and evaluation (Chen, 1990). Logic model is considered a powerful tool to picture the plan including what you

are putting into, what you are doing, and what you are trying to achieve. Indeed, Logic model can be used for telling the program's performance story by describing the logical linkages among program resources, activities, outputs, customers reached, and short, intermediate and longer term outcomes (McLaughlin and Jordan, 1999).

One of the important purposes of using Logic model is developing indicators to check performance and measures success for evaluation (Self-Supported Municipal Improvement Districts). It is useful to translate the Logic model's components into indicators to check progress in inputs, activities, outputs, outcomes, and goals in providing necessary feedback to the management system (Jody and Ray, 2004). Logic model provides a mean of conceptualizing the systems and the array of actions to achieve specific impacts and goals, as well as provided a mechanism for coordinating services to produce valued system impacts and/or goals (Julian, 1997). Julian (1997) also mentioned about the importance of defining indicators to provide a basis for assessing progress in achieving objectives in his study about the application of Logic model at the system level planning and evaluation, even he hasn't focused on selecting indicators.

Many studies have shown the Logic model utilization in engaging stakeholders. Logic model helps to organize staff training by moving the focus from client activities within service, to how clients are likely to change as a result of participating (Reed & Brown, 2001). In application of Logic model by community-based initiatives, Kaplan and Garrett (2005) summarized the benefits in building consensus and fostering collaboration among diverse groups by guiding program participants in applying the scientific method to their project development, implementation, and monitoring. For evaluation of community-based programs, Logic model integrated with factor analysis can achieve consensus among diverse stakeholders, by allowing them to focus on objectives that are concrete, measurable, and mutually acceptable (Helitzer et al, 2010).

Besides, Logic model can identify the specific and useful data. Logic model points to a balanced set of key performance measurement points and evaluation issues, thus improves data collection and usefulness, and meets requirement of the government performance and results act (McLaughlin and Jordan, 1999).

Some studies have indicated the help of Logic model in gap analysis. One of the benefits of using Logic model in community-based programs is articulation of the underlying

assumptions that the sites were able to identify gaps in programs (Kaplan and Garrett, 2005). Atkinson et al (2014) illustrated a logic model in brown field regeneration to green space to optimize the social and environmental objectives by workshop exercises and reveal common gaps in process of brown field greening.

In general, Logic model can be considered as the backbone of the M&E system with several benefits. In an urban plan, we can utilize the Logic model to identify the logical linkage between goals to outputs and outcomes, as one of its usual benefits, then translate into key performance measurement, which has been less considered in urban planning. Besides, Logic model can help to build consensus among different stakeholders and manage urban data in logic way. Therefore, Logic model is definitely significant for the first function, also for the last three functions in the M&E system. However, there are still limited studies have brought Logic model into a concrete M&E system in the field of urban planning.

4.3.2. Key Performance Indicators

The use of KPIs is critical to measure and to quantify efficiency improvements in city services through the implementation of master plans (Bertuglia, Clarke and Wilson, 1994). During the M&E process, indicators provide the quantitative data and/or qualitative information that demonstrate trends and patterns (UN- Habitat, 2009). Also, indicator development is a core activity in building a result-based M&E system and it drives all subsequent data collection, analysis and reporting (Jody and Ray, 2004).

In the field of sustainable urban design (Crosbie *et al*, 2014), KPIs have been analyzed of how they can be used to inform the delivery and on-going M&E of a plan, as procedure tools to support local and project decision-making. Mega and Pedersen (1998) supposed that KPIs are based on policy principles and goals, so KPIs are meaningless without specified objectives and they cannot contribute to the improvement of the urban quality of life if there is not a policy framework.

A similar idea shows that KPIs have to be measured and relevant to urban planning outcomes, in that they reflect local objectives and priorities or processes (Zhang *et al*, 2008). Their selection also requires setting a useful baseline for local level monitoring (Munier, 2011).

Many studies have enhanced the role of indicators in urban development about measuring urban conditions and changes, providing a simple form of information than complex statistical data (Zainuddin, 1996). The argument of Bertuglia, Clarke and Wilson (1994) was that most existing indicators are calculated in relation to data, and in relation to single zones with little reference to other zones.

Therefore, KPIs system not only helps to evaluate the performance of an urban plan but also helps cities and stakeholders understand what they may be perceived after the plan. KPIs can be benefited in monitoring and evaluation of planning projects; in measuring the results of urban planning process and the implementation of policies; and in supporting decision-making. KPIs also play an important role in the Check step of PDCA cycle, from measuring and evaluating policies through KPIs. However, the development of KPIs system is definitely not a simple process which will have to be checked and updated periodically.

In general, understanding the role of KPIs and how KPIs system is selected is very significant especially to the first function, then the second, the third and fourth function of the M&E system.

4.3.3. Benchmarking

Benchmarking is a significant tool for monitoring performance improvement. While performance measurement has a past and present focus, Benchmarking has a present and future focus and encompasses the key elements of performance measurement, include performance measurement, comparison, identification of best practices and adopting them for improvement (Geerling et al, 2006). Also, Benchmarking provides policy-makers and managers with information on relative performance and guides them through a process of performance enhancement (Henning et al, 2011).

Besides, Benchmarking is a way of discovering what is the best performance being achieved. According to Rok (2013), one of the most appreciated methods for managing the development potential of cities is Benchmarking, which allowing for a comparative analysis against a flexible set of indicators. The main objectives of Benchmarking are to learn from top performers and adopt best practices for effective performance improvement (Henning *et al*, 2011). As the benefits of Benchmarking practices are found and

experience accumulated, the scope of Benchmarking process can be broadened (Henning *et al*, 2011), includes M&E in urban planning. Henning et al (2011) also mentioned this kind of Benchmarking framework for urban transport, focusing on the performance of public transport and comparison between pilot areas, but did not focus on how to simulate benchmark values.

In urban planning issue, suitable Benchmarking framework for M&E should be identified to manage a city's performance, in which KPIs can serve as benchmark for evaluating city planning. To analyze gaps, KPIs calculation is the base step in predicting the target of policies, as Benchmarking. It can be seen that an urban plan generally defines broad policy objectives or goals. To achieve the desired goals/objectives by a logic way, we should establish a Benchmarking framework to refine in light of specific policy objectives, to forecast benchmark values (by suitable theories or tools) with relevant KPIs and available performance data, in order to analyze and identify performance gaps.

In general, doing Benchmarking in the M&E system will be significant for the performance improvement process to provide policy-makers a tool to seek enhanced performance for their urban plan. Therefore, Benchmarking is powerful for the first and second function by forecasting benchmark value in KPIs calculation, which is a base step for gap analysis. Moreover, Benchmarking should be developed as a long-term approach to measure the planning progress, provide comparable performance data, identify good practices and implement changes in performance, and identify the best performance for a territorial unit.

4.3.4. PDCA cycle

PDCA cycle can be considered as a comprehensive approach for the management, monitoring & assessment of urban planning process and implementation until achieving long-term goals, with their clear orientation and objectives, and can help to adjust urban planning projects. PDCA cycle, known as the Deming cycle or the Shewhart cycle, aims to support the improvement process of organizations, assuring that this process is development in a coherent, structured and systematic way (Legre and Covas, 2015).

The PDCA framework was originally developed by quality control movement, its application has not to be limited – in fact, it is a learning method (Cowley and Domb 1997,

Maruta 2012). In addition, the PDCA Cycle is defined in collaboration with local government partner in order to measure the effective impact of the innovation policies developed by the public administration (Candiello and Cortesi, 2011).

In an urban plan, it is crucial to highlight gaps in the logic of the plan by checking the deviation, appropriateness and completeness between the actual and expected results by suitable tools, then find causes for gaps and solutions to fill gaps. A key argument was that a model-based approach can be used to make us reliant on data availability – model predictions can be used to fill "gap" (Bertuglia, Clarke and Wilson, 1994). Therefore, in managing the planning process, the application of PDCA Cycle is significant by providing a simple but effective approach for gap analysis, problem solving and managing change, ensuring that ideas are appropriately tested before committing to full implementation.

In general, PDCA cycle is absolutely powerful for management of the full planning process, there, it can support the first and second function, also the third and fourth function of the M&E system.

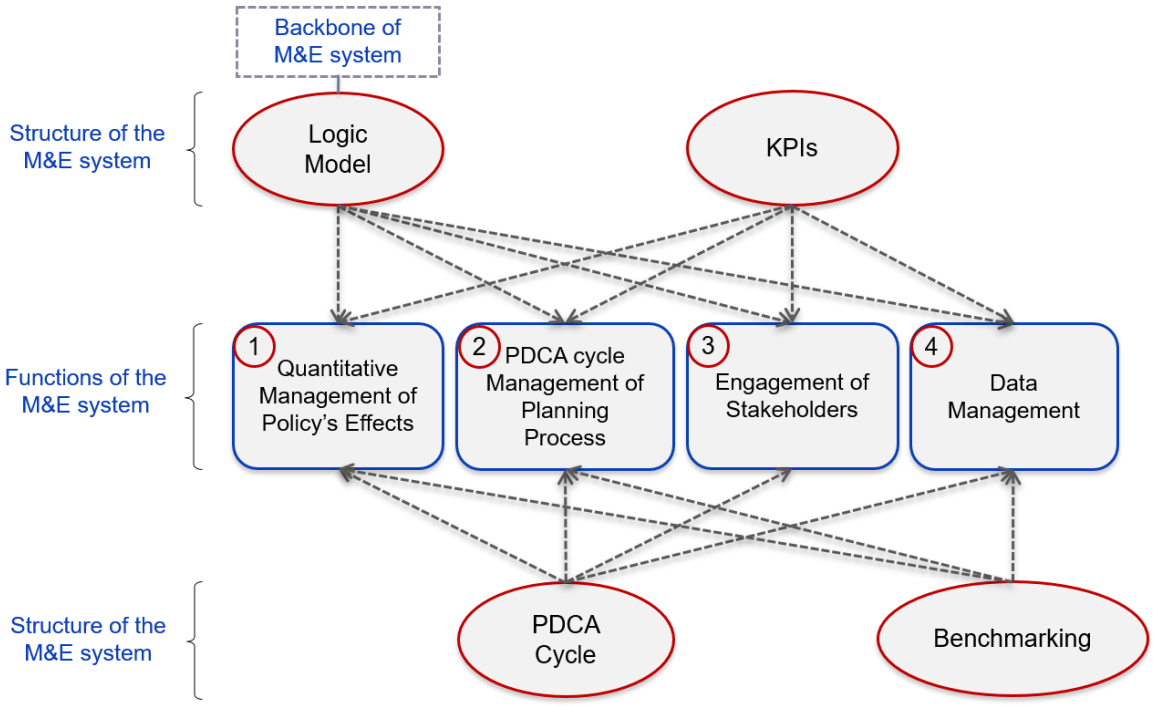

Figure 4.2 Structure to support Functions of the M&E System

As can be seen from all above points of view, Logic model, KPIs, Benchmarking and PDCA cycle have their own benefits and have been used popularly in different areas including urban planning and development. However, the idea to combine and structure

them in a concrete M&E system for urban planning is still limited. Among them, the Logic model has become the main backbone of the M&E system based on its several values demonstrated above. In the next section, the process of how the M&E system operates will be built by steps in order to illustrate the four functions.

4.4. Building key steps in the Monitoring and Evaluation system for an urban plan

To insist four functions in the M&E system proposed for an urban plan, we operate the system with 7 steps in order to achieve the final planning goals.

In the step 1 of the M&E system, detailed *planning policies* support to planning goals will be identified. From wide range of planning policies in the urban plan, priorities should be identified based on their direct relationship to urban planning issue at city and district levels and the availability and quality of urban data.

In the step 2, the details of *Logic model application* will illustrate how planning policies (inputs) work (through activities) to get results (outputs) and benefits (outcomes). The inputs of the Logic model will be list of planning policies of different areas. After that, suitable planning activities will be taken place to implement those policies. As consequences, outputs will be gotten as direct results of policies, then bring outcomes as short-term or long-term benefits to users, community, organization and social.

Step 3 will be *selection of KPIs.* In this step, we have to translate outputs and outcomes into measurable performance indicators, as output-KPIs and outcome-KPIs, respectively. KPIs will help us to determine if outputs and outcomes are being achieved. Outputs and outcomes are probably general ideas, however, output-KPIs and outcome-KPIs must be measurable and observable and linked to accumulated urban data. KPIs are the quantitative or qualitative variables that provide a simple and reliable means to measure achievement. The availability and quality of urban data would bring useful information, in order to set up a comprehensive and transparent KPIs system. For suggestion of KPIs, we use the SMART principle (NAMS, 2007) which can cover all of the criteria for performance measurement:

- Specific – a KPI must cover concisely one aspect of the activity;

- Measurable – KPIs must be quantifiable as subjective measures;
- Achievable – KPIs must be measured by available and qualitative data and common items;
- Relevant – a KPI must be relevant to the activity being considered;
- Timebound – KPIs of similar timeframes have to be used in order to be an effective comparison tool for benchmarking.

Each KPI should meet all of these 5 criteria, otherwise they will suffer and be less useful. KPIs may be qualitative and quantitative, however, in urban planning, we enhance a simple and quantitative system, rather than a completed qualitative one. KPIs will be systemized comprehensively from specific results of planning policies. When select and systemize KPIs, we may face some cases such as more than one policies share the same outcome, so those policies will share the same KPI; or, one policy can have more than one outcome, so each outcome will have an outcome-KPI. Therefore, developing KPIs inevitably takes more than one try, and arriving at the final set of KPIs will take time.

Figure 4.3 shows how to develop KPIs in detail by Logic model. Accordingly, output-KPIs and outcome-KPIs will help to answer two fundamental questions, respectively:

- How can we measure the direct results of planning policies?
- How can we measure the benefits for users, community, organization from planning policies?

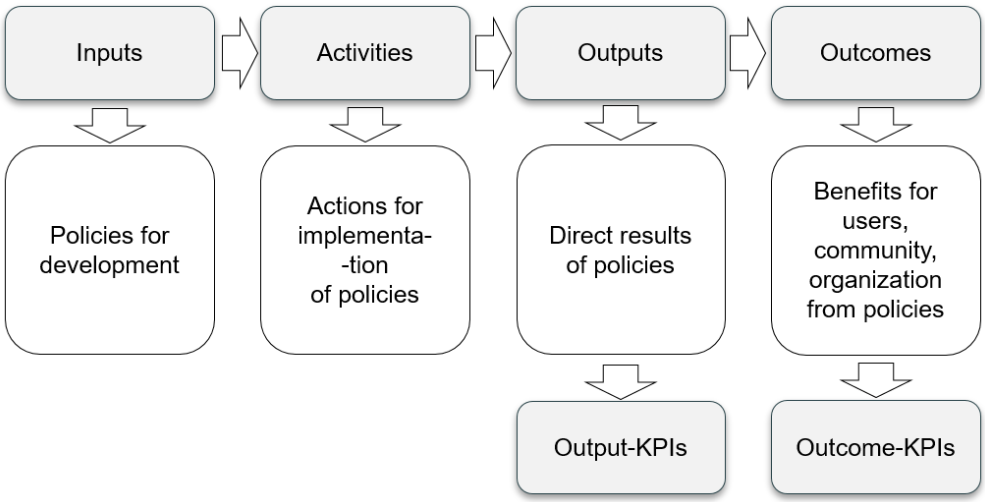

Figure 4.3 The utilization of logic model to develop KPIs

Step 4 will be *KPIs calculation*, as Benchmarking the policy's effect to the target value, by a suitable simulated tool. In this step, target value of each policy will be predicted to reflect the desired policy goals or objectives, by specific KPIs and available performance data quality and availability. It is considered the logic way to achieve goals/objectives of the urban plan.

In the step 5, the performance information is compiled and analyzed to identify *performance gaps*. This step shows how far the planning goals have been achieved by checking the deviation, appropriateness and completeness between the actual and expected results. Gaps between the plan and reality could be in population, employments, economic development, infrastructural planning… For proposing adjustments to fill gaps, it is necessary to find causes for gaps, such as: lack of cooperation among actors when take actions, derogation in managing of implementation, derogation of investors, strategies and goals as planned are unsuitable and too difficult to achieve, over urbanization…

Figure 4.4 Process of Gap Analysis in the M&E system

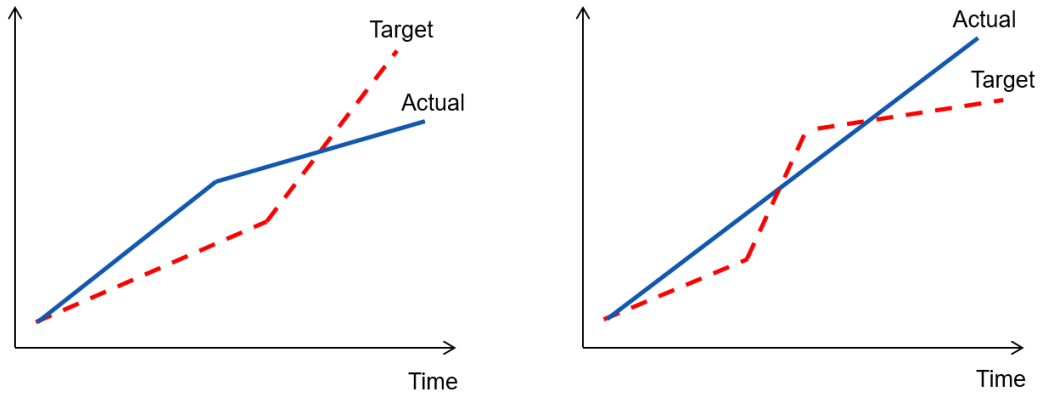

Figure 4.5 Identification of gap between actual and target results

Monitoring for performance improvement, as step 6, will be carried out based on the identified performance gaps and follows by an action plan. If KPIs calculation shows the

similarity between the target and reality, the plan is successful. In this case, we should think about what we could learn from the planning process, and also suggest improvements for the plan. In the opposite case, if the gaps happen between the target and reality, the plan does not work. For dealing with that, we have to make the different plan, propose new planning goals or objectives. It is also the time to step back, evaluate the reasons for the difference, and assess whether new strategies are need.

To achieve planning progress, in the step 7, all findings need to be entered in a *report* to get transparency. This step will not only help decision-makers give necessary improvements in the urban plan and policies, but also shares knowledge and experience within stakeholders and organizations.

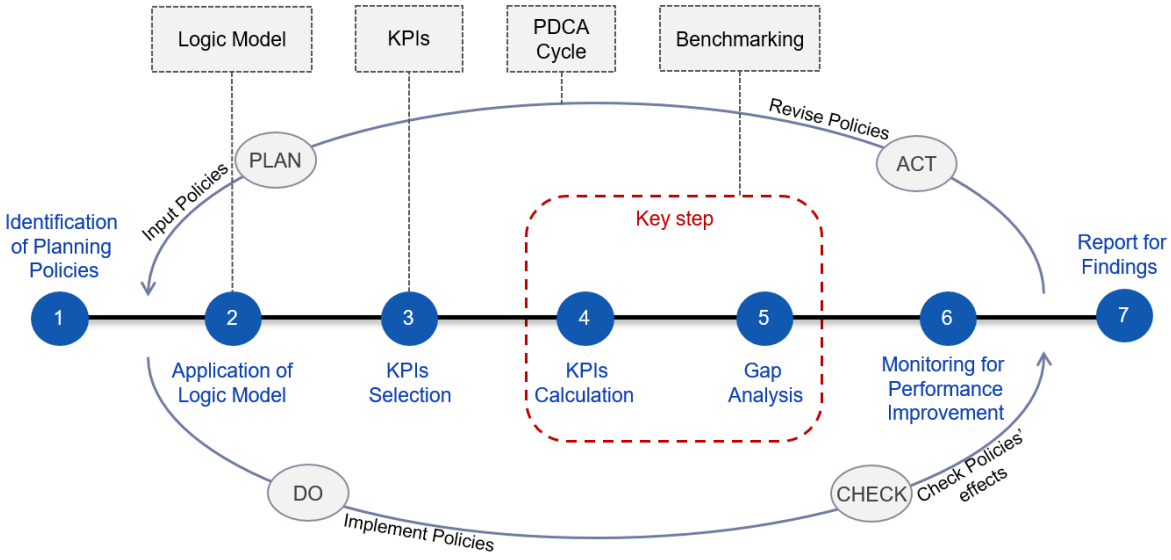

Figure 4.6 Operation and Management of the M&E system

We adapted the PDCA cycle for the performance measurement and improvement of the full planning process, as in figure 4.6 and 4.7. In the PDCA cycle, the PLAN will input policies by defining the vision of the city, goals/objectives of the urban plan, the duration to achieve the goals/objectives, the outcomes expectation through timely review, as well as management tools, responsibilities, urban data to attain the established goals/objectives. The DO is implemented according to the established strategies, additionally identifies the priorities based on the need, importance and urgency. In the CHECK, the effects of the policies are evaluated and compared to the expected results from PLAN. Finally, the urban plan is taken actions or adjustments by revising policies in the ACT from the

assessment of the previous step. The last step is probably a starting point for the application of a new PDCA Cycle. The whole cycle should be monitored by periodical inspections, feedbacks and review reports. Periodical inspections could be short-term or long-term based on the goals/objectives. At the end of each cycle, a report should be completed in details to show the planning progress visibly and transparently.

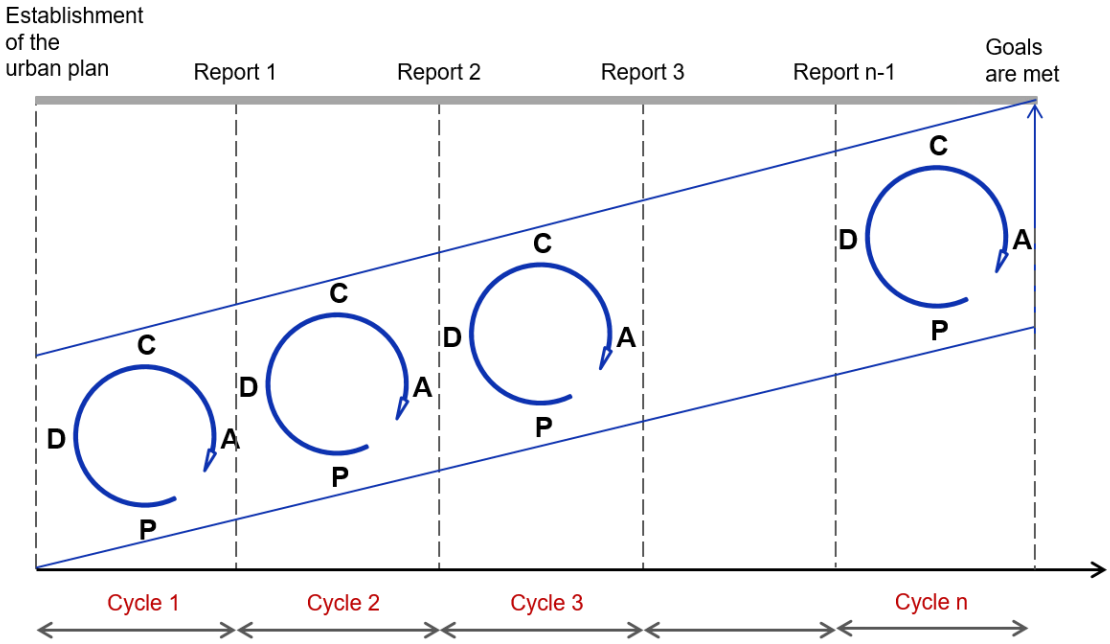

Figure 4.7 Implementation of PDCA Cycle in the M&E system

Overall, the M&E system has established in this research can be benefited for urban plans, with its clear structure, objectives and results. The possible outcomes when applying this system can help to improve and adjust urban plan during the planning process and help local authorities with right policies for urban development. To operate the M&E system for urban planning, clear responsibilities and formal organizational of authority should be established. Also, the guidance, organization and people who will be in charge of the system's functions should be clearly defined.

4.5. Urban data system for KPIs

Urban data system plays an important role in city's planning. Actually, many attempts have been made towards designing smart cities data management solution, however, the missing insights on the impacts that technologies, stakeholders/users requirements (Suzuki *et al*, 2013).

The M&E system has been proposed can cover all implementation issues for urban planning. However, the system can only run well with a good urban data system which is available, qualitative, transparent and can be best offered to apply to city' stakeholders. Information and data should be valid, verifiable, transparent, and widely available to the government and interested stakeholders – including the general public (Jody and Ray, 2004). To achieve that, the issue of urban data management system has to be considered and guaranteed.

As noted earlier, data management is one of important functions of M&E system which is related to the availability of KPIs. Indeed, during the process of selecting KPIs, it is important to establish a based data to measure KPIs, identify data sources for KPIs, collect data and managing data. These ideas will be presented in details below.

4.5.1. Establishment of based data for KPIs

It is necessary to establish the based data at present and relative to outcomes we want to achieve. The based data are derived from outputs, outcomes and KPIs and considered the first critical measurement of KPIs to monitor future of performance. So the based data must be qualitative and quantitative data for monitoring period. For instance, to measure the development of public transport in Hanoi, we need data for percentage of users in public transport in 2011 as the first year of Hanoi master plan implementation, to compare to users in future. In general, for establishing the based data, we have to clarify which data can be produced? Which data system exists in the territory?

4.5.2. Identification of data sources for KPIs

In the process of identifying urban data for KPIs, we need to clarify what source of information potentially can supply relevant data? Can data sources provide qualitative and quantitative data? And can we access the data source timely? Indeed, we only need to collect the data items intended to be used in our project. For example, for selecting KPIs in an urban plan, the data is collected must be related to urban planning issue and its goals. In addition, data can be collected directly by the organization or secondarily outside organizations.

4.5.3. Collection of urban data

When we have indicated data sources, we have to clarify what methods can be used to collect data (direct collection, survey, technologies…)? What procedures are needed? It is difficult to answer which method is the best way to collect data because it depends on the availability and time constraints of organization's resource. We may combine different methods for the best result in building an urban data system for KPIs.

4.5.4. Management of urban data

For the transparency, availability, quality of urban data, the management issue has to be considered. As note earlier, the local government should indicate one organization under their power and relates to urban planning issue to be in charge of urban data system of the city. The organization will take important role to indicate the data sources, provide important directional data, report data to help decision-makers understand where they are in achieving the desired goals. For example, for the Hanoi urban data system, it is expected that Hanoi's People Committee (HPC) takes responsibility for one organization under their power such as Hanoi Urban Institute (HUPI) to manage and operate it for long-term city planning and development.

4.6. Conclusion

This chapter has shown the establishment of the M&E system for urban planning in practice.

To achieve a comprehensive and effective M&E system for urban planning, four functions have been identified, including Quantitative management of policies' effects, PDCA cycle management of planning process, Engagement of Stakeholders, and Data management. In the M&E analysis, why and how to structure and combine different point of views and the way they work together in a system have been analyzed. In that, the Logic model is considered the main backbone of the M&E system to guide monitoring and evaluation in urban planning with several values. The M&E process has been built by 7 steps in order to implement an urban plan until it gets goals and objectives, test and incorporate feedback for its well performance. In this process, KPIs calculation and gap analysis are considered the key steps which influences directly to policies' effects and decision-making.

In the next chapter, we will examine how to apply the M&E system for the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050, follow by the functions and steps we build in chapter 4.

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CHAPTER 5

APPLICATION OF THE MONITORING AND EVALUATION SYSTEM FOR THE HANOI MASTER PLAN

5.1. Introduction

The newest construction master plan "The Hanoi Capital Construction Master Plan to 2030 and Vision to 2050" is considered the largest-scale plan and gives opportunity to Hanoi to become a megacity in Asia. The Hanoi master plan has identified two big targets: economic development and reduction of pressure for city center (by planning satellite cities and promoting the development of sub-centers). Following that, Hanoi will achieve urban agglomeration including: city center, 3 sub-centers, 5 satellite cities, 3 eco-cities. To achieve new goals and vision for Hanoi, a powerful management system should be established for improvement of the way government and organizations achieve results. Therefore, the M&E system we propose in this study will be definitely significant for Hanoi urban development. Moreover, the implementation of the whole Hanoi master plan has been carrying out with the slow rate of progress, especially the implementation of many detailed plans, additionally the concrete tool for management of planning progress is lacked, while the city is still developing at a rapid pace. In this condition, the application of M&E system is more and more necessary.

Chapter 5 investigates the M&E system proposed in chapter 4 by application for the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050. This investigation

shows how the M&E system works for an urban master plan's performance, from that possibly to reach higher performance in urban planning in general. Accordingly, section 5.2 identifies planning policies to support planning goals. The application of Logic Model for developing KPIs is presented in details in section 5.3, including: zoning Hanoi for Logic model, framework of KPIs selection, Logic model for KPIs and analysis of logical linkage between model's components. Section 5.4 introduces the issue of KPIs calculation and filling gap that will be presented in more details in chapter 6. In section 5.5, the management issue of M&E system by implementing PDCA cycle is given. Section 5.6 presents the role of stakeholders in this system for Hanoi master plan. Section 5.7 gives an important investigation of current Hanoi urban data availability for KPIs and its management issue. The last section (5.8) concludes main findings in chapter 5.

In general, the analysis of the case of Hanoi master plan is corresponded to the four functions of the M&E system we established in chapter 4.

5.2. Identification of planning policies to support goals

The planning policies of Hanoi master plan were listed up to support the three general planning goals. The full list of policies in Hanoi master plan are presented in wide range areas of development at different levels, so we need to limit them in priority. While goals describe long-term and widespread improvement in the society, outcomes present intermediate effects of outputs on users. In order to identify outcomes move closer to goals, the prioritization of selecting policies has to focus on urban planning issue, goals of the master plan and availability of urban data system. We identifies the list of planning policies from Hanoi master plan, as shown below with type of policies in consistent with 1st, 2nd and 3rd goal, as 1st, 2nd and 3rd general outcome, representatively:

- 1st general outcome: "Ensuring the sustainable development of urban structure" – policies focus on:
  - Spatial development orientation;
  - Spatial connection (transportation planning);
  - Planning and development of strategic areas (satellite cities, sub-urban centers…);
  - Production (agriculture, industry).
- 2nd general outcome: "Exploit the potential value of geographic landscape/knowledge-technology/history, culture, tradition" – policies focus on:

- Landscape issue (open space, green space…);
- History and Culture (conservation, tourism…);

➢ 3rd general outcome: "Using land effectively and having a synchronous, modern, environment-friendly urban infrastructure system" – policies focus on:

- Technical and Social infrastructure planning;
- Environment protection.

The KPIs system will be developed by filling the logic model in inputs, outputs and outcomes, as shown in the next section.

5.3. Application of the Logic Model for KPIs

5.3.1. Zoning Hanoi for the Logic Model Simulation

As shown in figure 5.1 and 5.2, the coverage area is subdivided into 5 regions (within 29 districts) by district border for the Logic model simulation, including: R1 – Central Region (7 central districts), R2 – North Region (3 districts), R3 – West Region (8 districts), R4 – South Region (9 districts), R5 – East Region (2 districts).

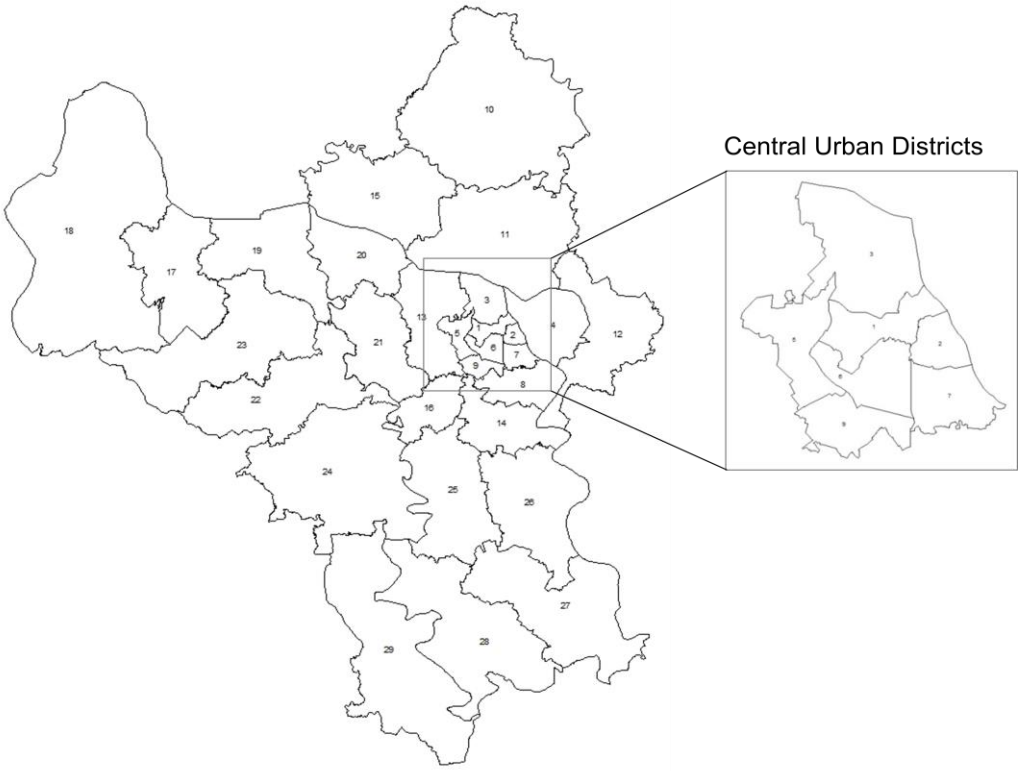

Figure 5.1 Zoning by districts (29 zones)

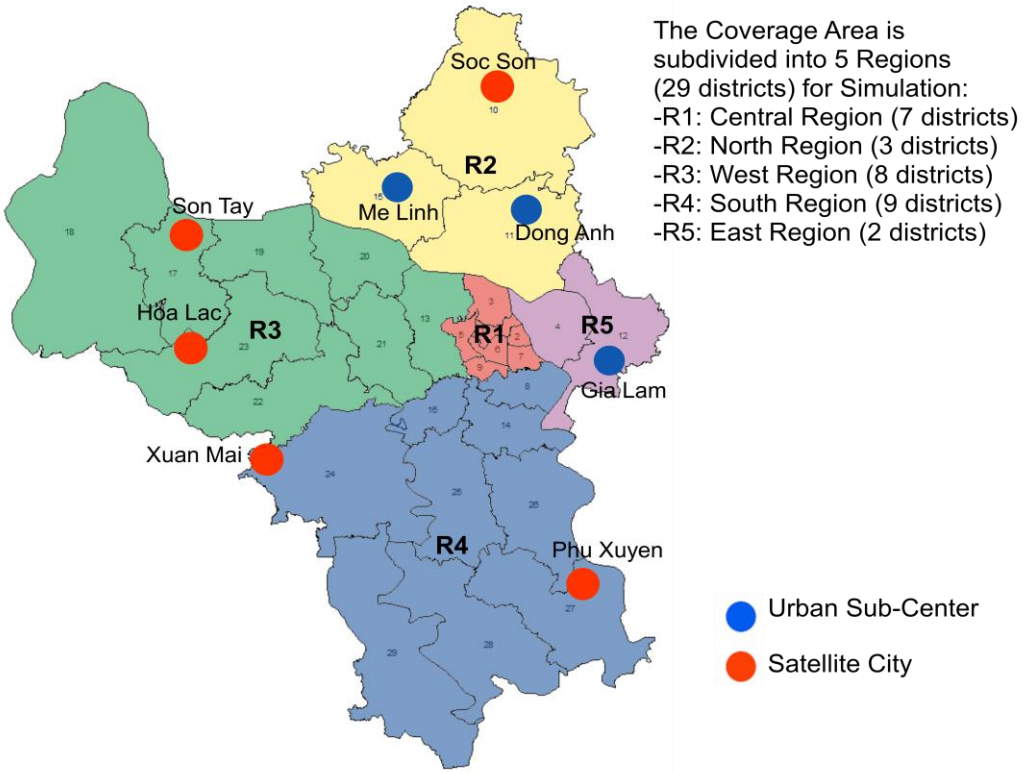

Figure 5.2 Zoning by regions

This zoning system has been based on Hanoi expansion and policies of spatial orientation development from Hanoi Master Plan. Hanoi has expanded mostly in the West, South-West and South, so R3 and R4 are two biggest regions and contain 4 satellite cities (Son Tay, Hoa Lac, Xuan Mai and Phu Xuyen). The three existing sub-urban areas – Me Linh, Dong Anh and Gia Lam, located in R2 and R5 – are significant to help the city center to reduce high pressure.

5.3.2. Framework of KPIs Selection

In general, KPIs are developed from the of the Logic model' results as outputs and outcomes. The selection of KPIs is based on 5 criteria of SMART principle (NAMS, 2007) mentioned in chapter 4, including Specific, Measurable, Achievable, Relevant and Timebound.

In the case of Hanoi master plan, framework of KPIs selection should be designed during the initial steps of the M&E system. When translating outputs and outcomes of policies into KPIs, some of the important features are discussed below:

- KPIs must relate to Hanoi master plan goals and policies;
- The number of KPIs should be limited in urban planning issue;
- Each KPI should be comprehensive and observable enough so as to measure the planning policy;
- Hanoi urban data availability and quality are important considerations in deciding which KPI should be included;
- The full system of KPIs in Hanoi master plan should be updated over time to reflect major changes in the policies and direction.

Selecting KPIs will help managers to measure progress in inputs, activities, outputs, outcomes, and goals in Hanoi master plan. Therefore, it is important in providing necessary feedback to the management system.

5.3.3. The Logic Model for KPIs Selection

For selection KPIs system in the Hanoi Capital Construction Master Plan to 2030 and vision to 2050, the Logic model is developed to give an explanation between resources and results of the plan. The inputs are the planning policies that supported to the three planning goals, to urban planning and development issue and related to Hanoi urban data quality and availability. Therefore, we don't have to cover the full list of planning policies from Hanoi master plan. From inputs, activities, as the tasks personnel, will be undertaken to transform to outputs and outcomes. Accordingly, outputs and outcomes are observed as direct results and benefits for users, community, organizations from those policies, respectively. If goals are general ideas, long-term, wide spread improvement for the city, outcomes have to be intermediate effects of outputs on users. Finally, KPIs will be selected based on outputs and outcomes, as shown in the table 5.1.

The KPIs proposed in this study allow for performance measurement in the following main areas (from Hanoi master plan):

- Spatial development;
- Transportation development;
- Service and Trade Network;
- Housing Development;
- Open and Green space;

- University Network;
- Health network and community healthcare;
- Agriculture;
- Industry;
- Conservation.

In addition, the relationship of each planning policy to planning goals is shown to observe the full process of achieving goals.

Table 5.1 KPIs selection by the Logic model in the Hanoi master plan

Areas	Inputs	Outputs	Output-KPIs	Outcomes	Outcome-KPIs	General Out-comes
Spatial Development	Planning 5 satellite cities and development of 3 sub-urban centers around Hanoi center	Increase migration from city center to satellite cities and sub-urban centers	Population in R2, R3, R4, R5 a1	Decrease growth rate of population in city center	Population in R1 b1	1st
	Development of industry and aviation services (for Noi Bai international airport) in Soc Son satellite city	Increase population in Soc Son satellite city and surrounding districts	Population in R2 a2	Increase labors in industry	Number of labors in industry b2	1st, 3rd
				Increase labors in service	Number of labors in service b3	
	Development of education and science and technology in Hoa Lac satellite city	Increase population in Hoa Lac satellite city and surrounding districts	Population in R3 a3	Increase labors in science and education	Number of labors in science and education b4	1st, 3rd
				Increase number of students	Number of students b5	
	Development of small industry and handicrafts in Xuan Mai satellite city	Increase population in Xuan Mai satellite city and surrounding districts	Population in R3 and R4 a4	Increase labors in industry	Number of labors in industry b2	1st
	Development of cultural history, ecotourism and handicrafts in Son	Increase population in Son Tay satellite city and	Population in R3 a3	Increase labors in industry	Number of labors in industry b2	1st, 2nd

	Tay satellite city	surrounding districts		Increase tourist visitors	Number of times of tourist visitors to Hanoi's hotels b6	
	Development of industry, warehouses and transport hubs in Phu Xuyen satellite city	Increase population in Phu Xuyen satellite city and surrounding districts	Population in R4 a5	Increase labors in industry	Number of labors in industry b2	1st, 3rd
	Development of high-tech industry, commercial services, international trade ecotourism with reservation of Co Loa relics and Van Tri swamp, and sport center of Hanoi (ASIAD) in Dong Anh sub-urban center	Increase population in Dong Anh sub-urban center and surrounding districts	Population in R2 a2	Increase labors in industry	Number of labors in industry b2	1st, 2nd, 3rd
				Increase labors in service	Number of labors in service b3	
				Increase tourist visitors	Number of times of tourist visitors to Hanoi's hotels b6	
	Development of services, clean and high-tech industry associated with aviation services in Me Linh sub-urban center	Increase population in Me Linh sub-urban center and surrounding districts	Population in R2 a2	Increase labors in industry	Number of labors in industry b2	1st, 3rd
				Increase labors in service	Number of labors in service b3	
	Development of industry and high quality services in Gia Lam sub-urban center and Long Bien district	Increase population in Gia Lam sub-urban center and surrounding districts	Population in R5 a6	Increase labors in industry	Number of labors in industry b2	1st, 3rd
				Increase labors in service	Number of labors in service b3	
	Construction and improvement of main axes from city center to satellite cities and between satellite cities	Increase travel demand	Number of trips per day between different districts a7	Decrease traffic congestion	Travel time b7	1st, 3rd

Transportation Development	Complete the ring roads IV, V	Increase travel demand	Number of trips per day between different districts a7	Decrease traffic congestion	Travel time b7	3rd
	Planning the UMRT system combines with other public transport systems to create an efficient and interconnected network	Increase users of public transport	Percentage of passengers using public transport a8	Decrease traffic congestion	Travel time b7	1st, 3rd
				Increase traffic safety	Number of fatalities and injures per year by accident b8	
				Decrease air pollution by transportation	Air Quality Indicator (AQI) b9	
				Decrease growth rate of population in city center	Population in R1 b1	
	Planning the BRT system	Increase users of public transport	Percentage of passengers using public transport a8	Decrease traffic congestion	Travel time b7	1st, 3rd
				Increase traffic safety	Number of fatalities and injures per year by accident b8	
				Decrease air pollution by transportation	Air Quality Indicator (AQI) b9	
				Decrease growth rate of population in city center	Population in R1 b1	
	Construction of two-level roads	Increase travel demand	Number of trips per day between different districts a7	Decrease traffic congestion	Travel time b7	3rd
				Increase traffic safety	Number of fatalities and injures per year by accident b8	

Service and Trade network	Planning network of trade and service enterprises	Increase productivity in trade and service	Gross domestic product at current prices by service a9	Increase labors in trade and service enterprises	Number of labors in trade and service enterprises b10	3rd
	Planning and managing network of establishments in private trade and services	Increase productivity in trade and service	Gross domestic product at current prices by service a9	Increase labors in private trade and services	Number of labors in private trade and services b11	3rd
Housing development	Moving residents from the city center to new towns in sub-urban centers and satellite cities	Increase migration from city center to sub-urban centers and satellite cities	Population in R2, R3, R4, R5 a1	Decrease growth rate of population in city center	Population in R1 b1	1st
	Planning and improving new towns in districts surrounding city center and 3 sub-urban centers and 5 satellite cities	Increase housing floor area	Total newly built area of residential housing in the year a10	Decrease growth rate of population in city center	Population in R1 b1	1st, 3rd
Open and green space	Improvement of green spaces and city parks: Co Loa, Den Soc, Ho Tay, Thu Le, Thong Nhat, Yen So…	Increase open and green space	Area for open and green space a11	Decrease air pollution	Air Quality Indicator (AQI) b9	2nd
University network	Building new clusters for universities in Hoa Lac, Son Tay, Xuan Mai, Phu Xuyen – Phu Minh, Chuc Son, Soc Son	Increase areas and space for colleges and universities	Number of colleges and universities a12	Increase number of students	Number of students b5	3rd
				Decrease growth rate of population in city center	Population in R1 b1	
Health network and community healthcare	Construction of new general health clusters in Hoa Lac, Soc Son and Thuong Tin – Phu Xuyen	Increase number of health establishments	Number of health establish-ments a13	Increase number of patient beds	Number of patient beds b12	3rd
				Increase number of health staffs	Number of health staffs b13	
				Decrease growth rate of population in city center	Population in R1 b1	

Water supply	Construction of surface water factories in Hong river, Duong river, Improvement of surface water factory in Da river	Increase fresh water consumption	Average output of water per day a14	Increase percentage of population in using fresh water	Percentage of population in using fresh water b14	3rd
Electricity supply	New construction of 4 transformer stations 500KV, 21 transformer stations 220KV and improvement of 5 transformer stations 220KV	Increase output of electricity	Average output of electricity per day a15	Increase percentage of households are supplied by electricity	Percentage of households are supplied by electricity b15	3rd
Agriculture	Establishment of high-tech agricultural zones	Increase gross domestic product by agriculture	Gross domestic product at current prices by agriculture a16	Increase gross output of agriculture per capita	Gross output of agriculture per capita (at current price) b16	1st
Industry	Moving out polluted industrial zones in the core urban area to new positions determined in the Master Plan	Increase gross domestic product by industry	Gross domestic product at current prices by industry a17	Increase gross output of industry per capita	Gross output of industry per capita (at current prices) b17	1st
				Increase labors in industry	Number of labors in industry b2	
	Establishment of 3 industrial regions (7000 – 8000ha): the North, the South and the West	Increase gross domestic product by industry	Gross domestic product at current prices by industry a17	Increase gross output of industry per capita	Gross output of industry per capita (at current prices) b17	1st
				Increase labors in industry	Number of labors in industry b2	
Conservation	Conservation of Hanoi Citadel, Ancient Quarter, French Quarter, Thang Long bridge, Duong Lam village…	Increase tourism	Number of times of tourist visitors to Hanoi's hotels b6	Increase tourist visitors	Number of times of tourist visitors to Hanoi's hotels b6	2nd

Note:

- a1, b1, a2, b2…: Numbering of KPIs
- 1st outcome: "Ensuring the sustainable development of urban structure"

- 2nd outcome: "Exploit the potential value of geographic landscape/knowledge-technology/history, culture, tradition"
- 3rd outcome: "Using land effectively and having a synchronous, modern, environment-friendly urban infrastructure system"

5.3.4. Logical linkage between model's components

In this section, we will show five illustrations from the table to explain the logical way to select KPIs from planning policies in different areas: spatial development, transportation development, health care development, industrial development.

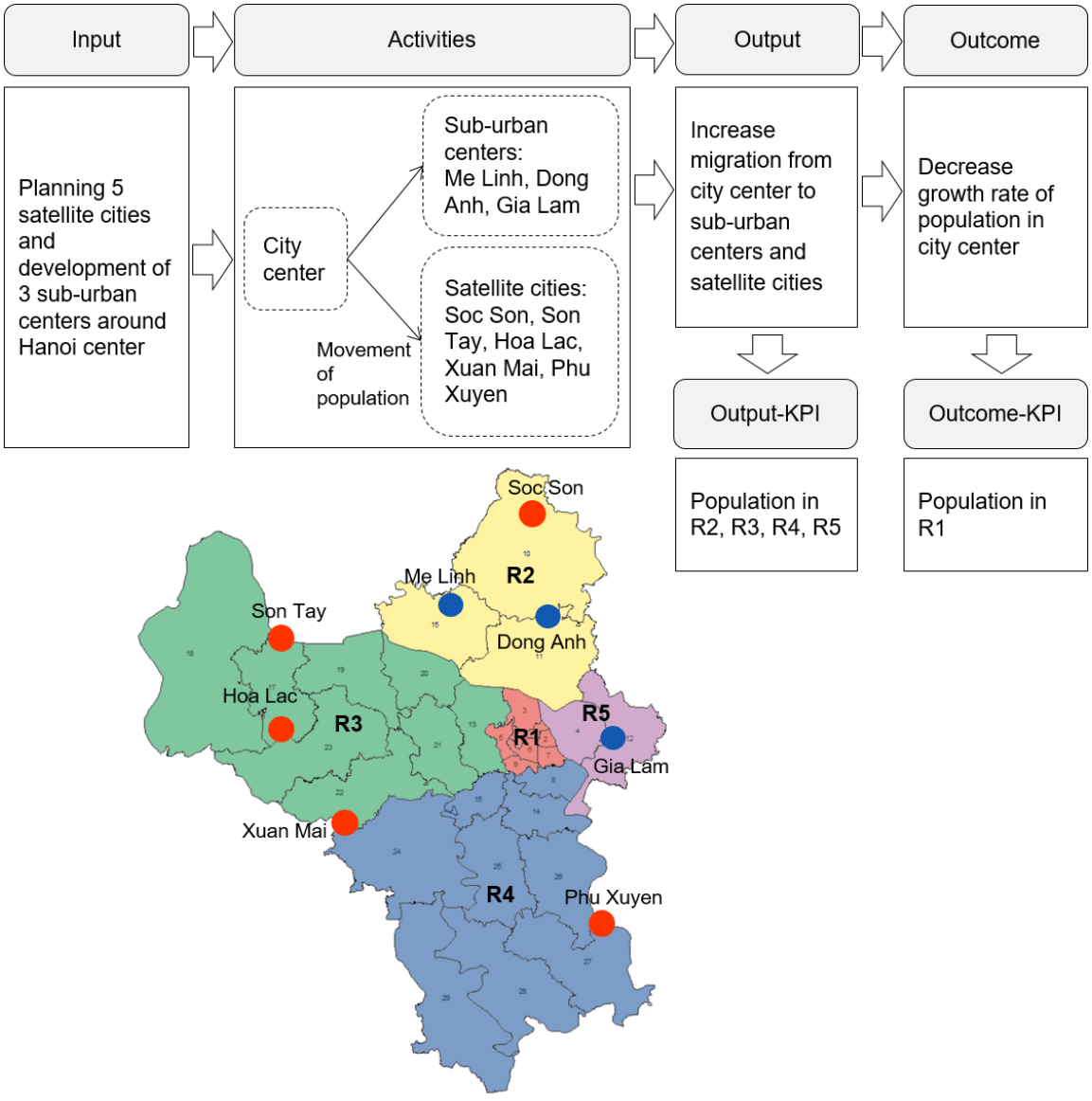

Figure 5.3 Logic model – Planning 5 satellite cities and Development of 3 sub-urban centers

In the first case, as shown from figure 5.3, if 3 sub-urban centers are developed and 5 satellite cities are planned, the demographic movement will happen from the city center to 3 sub-urban centers and 5 satellite cities. As a result, population in the city center (R1) will be decreased in growth rate and population in sub-urban centers and satellite cities, as region 2, 3, 4, 5 (R2, R3, R4, R5) will be increased at the same time. Those KPIs are closed to the planning objective of reducing high pressure for the city center by planning satellite cities. In details, the output-KPI (population in R1) is used to measure the migration from city center to sub-canters and satellite cities; the outcome-KPI (population in R2, R3, R4, R5) is used to measure the population growth rate in city center.

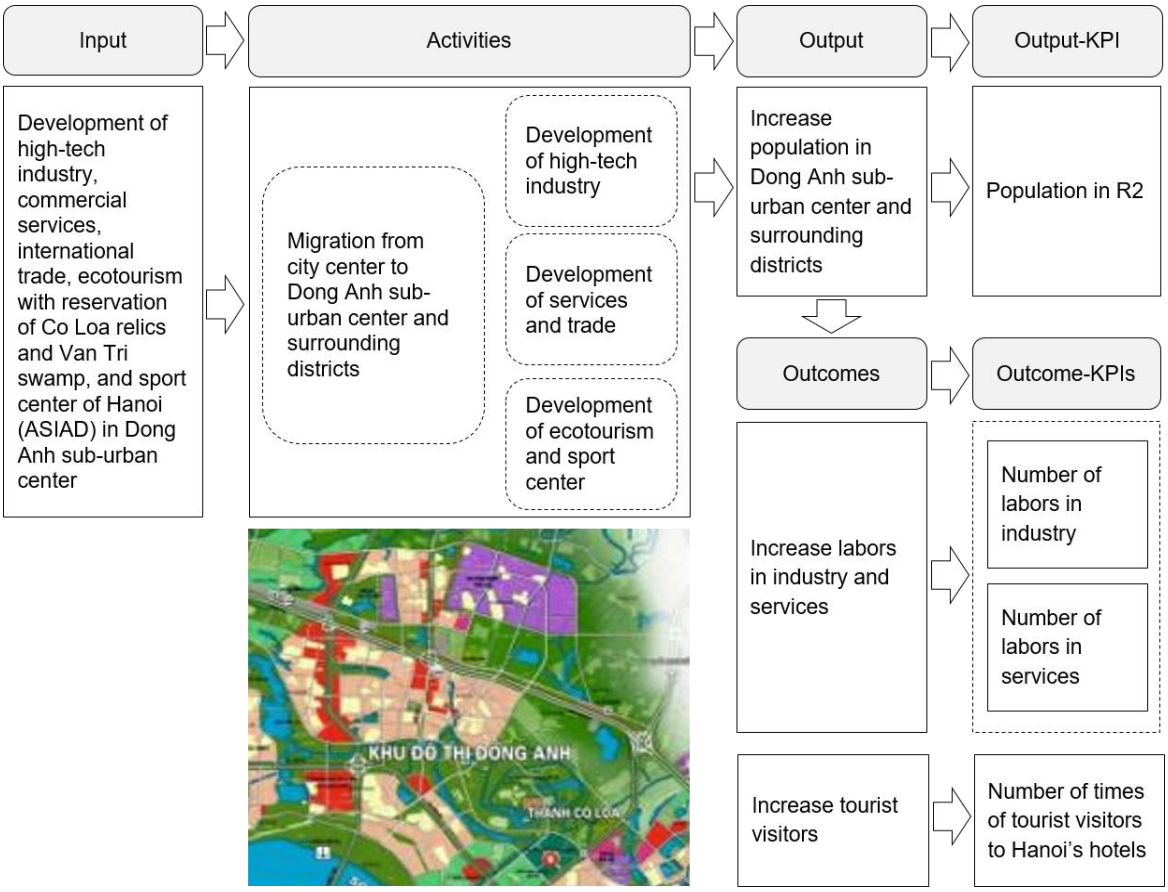

Figure 5.4 Logic model – Development of Dong Anh sub-urban center

In the second case (figure 5.4), the policy of developing Dong Anh sub-urban center is analyzed. Accordingly, Dong Anh will be developed in high-technology industry, commercial services and international trade, ecotourism and sport center. The effect of development is that the migration from Hanoi center to Dong Anh and surrounding districts. As a result, population in Dong Anh and surrounding districts will be increased

and can be measured by the KPI – population in R2. Furthermore, the benefits we can receive from this policy are increasing labors in industry and services, and increasing tourist visitors. For measuring those, we can use outcome-KPIs as number of labors in industry, number of labors in services and number of times of tourist visitors to Hanoi's hotels.

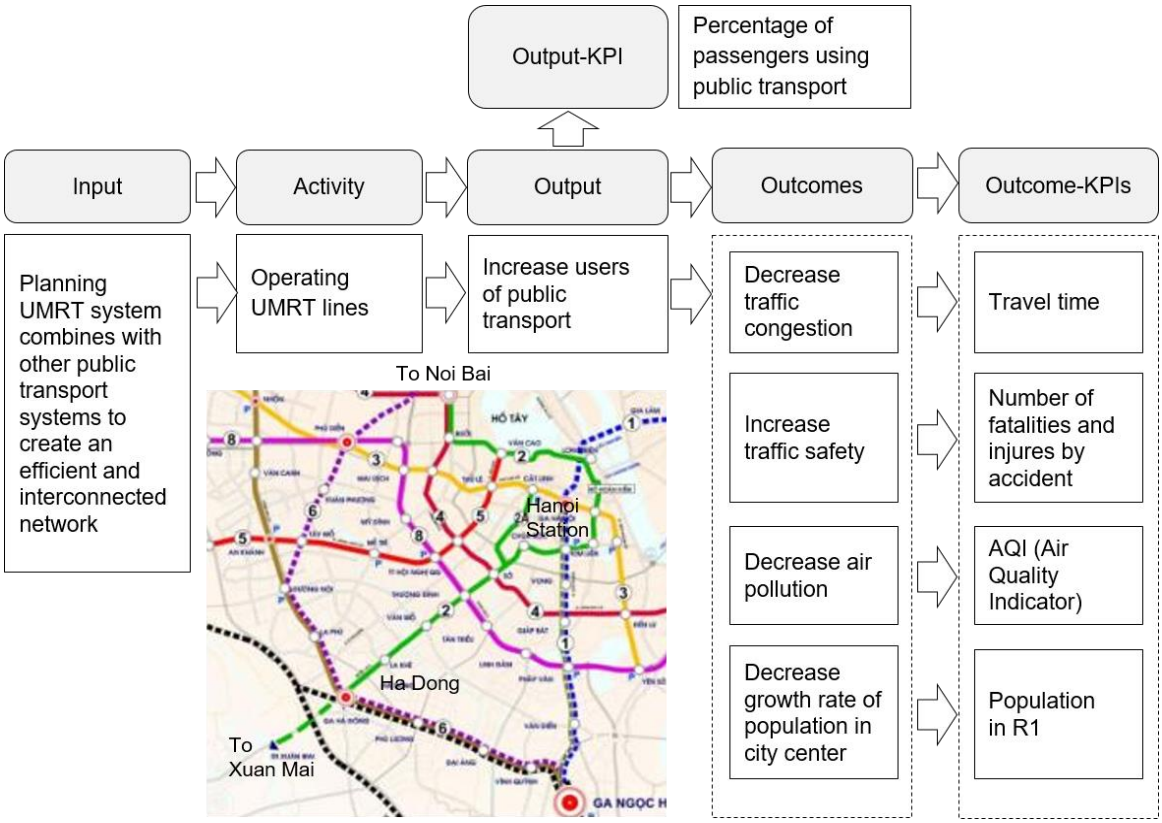

Figure 5.5 Logic model – Planning UMRT system

The third case has illustrated positive impacts of the UMRT system to Hanoi, measured by 5 KPIs. Indeed, the operation of UMRT lines will attract users, so will increase percentage of users using public transport in the whole city. In further benefit for users, the UMRT system will help to increase traffic safety, as well as decrease traffic congestion, air pollution and also growth rate of population in the city center (by changing household's choice of living). Those outcomes can be measured by KPIs respectively as shown in figure 5.5. Accordingly, we measure traffic congestion by travel time, traffic safety by number of fatalities and injures by accident, air pollution by AQI (Air Quality Indicator) and population growth rate in city center by population in R1.

In the fourth case (as shown in figure 5.6), the construction of new general health clusters is analyzed to get direct output and further benefits. When we take place new health clusters in 3 satellite cities: Hoa Lac, Soc Son and Phu Xuyen, the number of health establishments will be increased in the space which is much wider than old one in the city center. This result is measured by KPI as number of health establishments. Further, the number of patient beds, as well as number of health staffs will be increased. In addition, the movement of many old hospitals from the city center to new positions in satellite cities can assist to decrease pressure caused by big population.

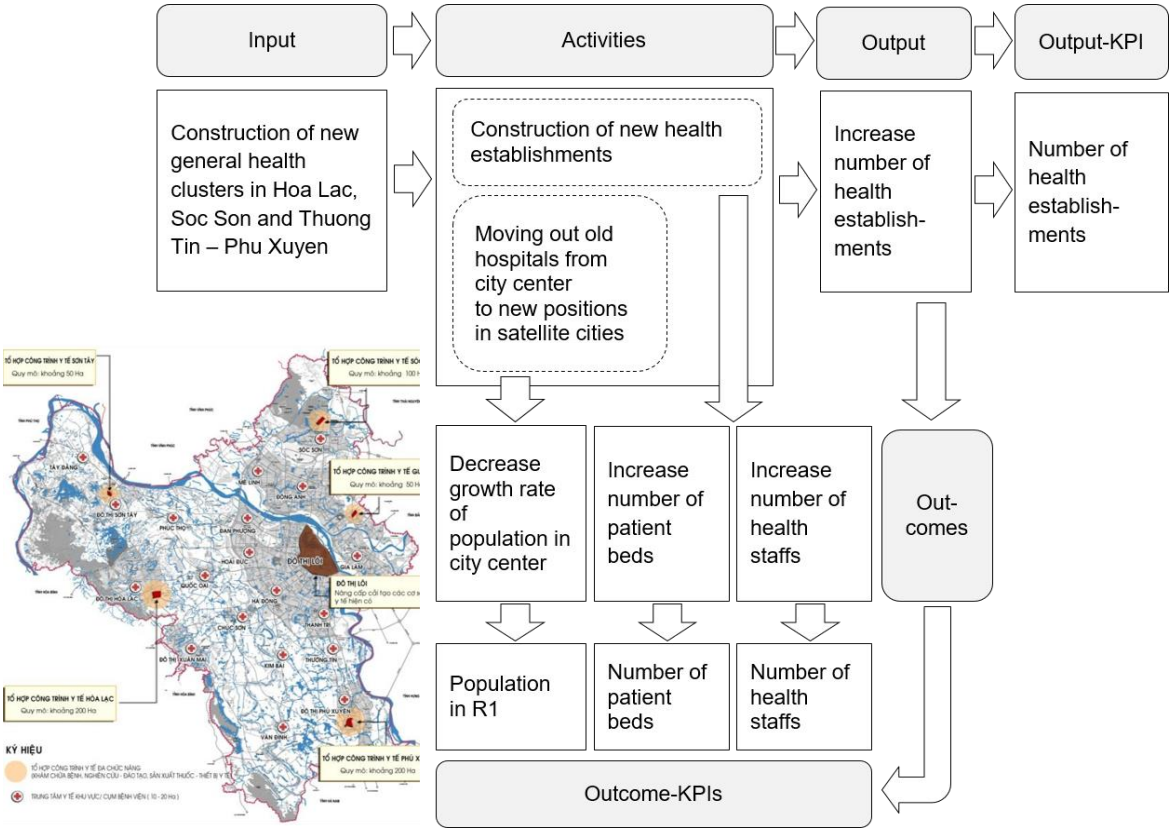

Figure 5.6 Logic model – Construction of new general health clusters

The fifth case (figure 5.7) is about industrial development. In detail, 3 large industrial regions will be established in the North, the West and the South of Hanoi city, with 7000 – 8000 ha for each. This is strategic policy given in the master plan to promote industrial development of the new Hanoi, as well as give job chance to the big population. As a result, number of industrial establishments will be increased. Because there are many type of industrial production in Hanoi (from small to heavy industries), we can measure this result by KPI as gross domestic product at current prices by industry. For further results,

industrial productivity as well as labors in industry will be increased. Those can be measure by two outcome-KPIs as gross output of industry per capita (at current prices) and number of labors in industry, respectively.

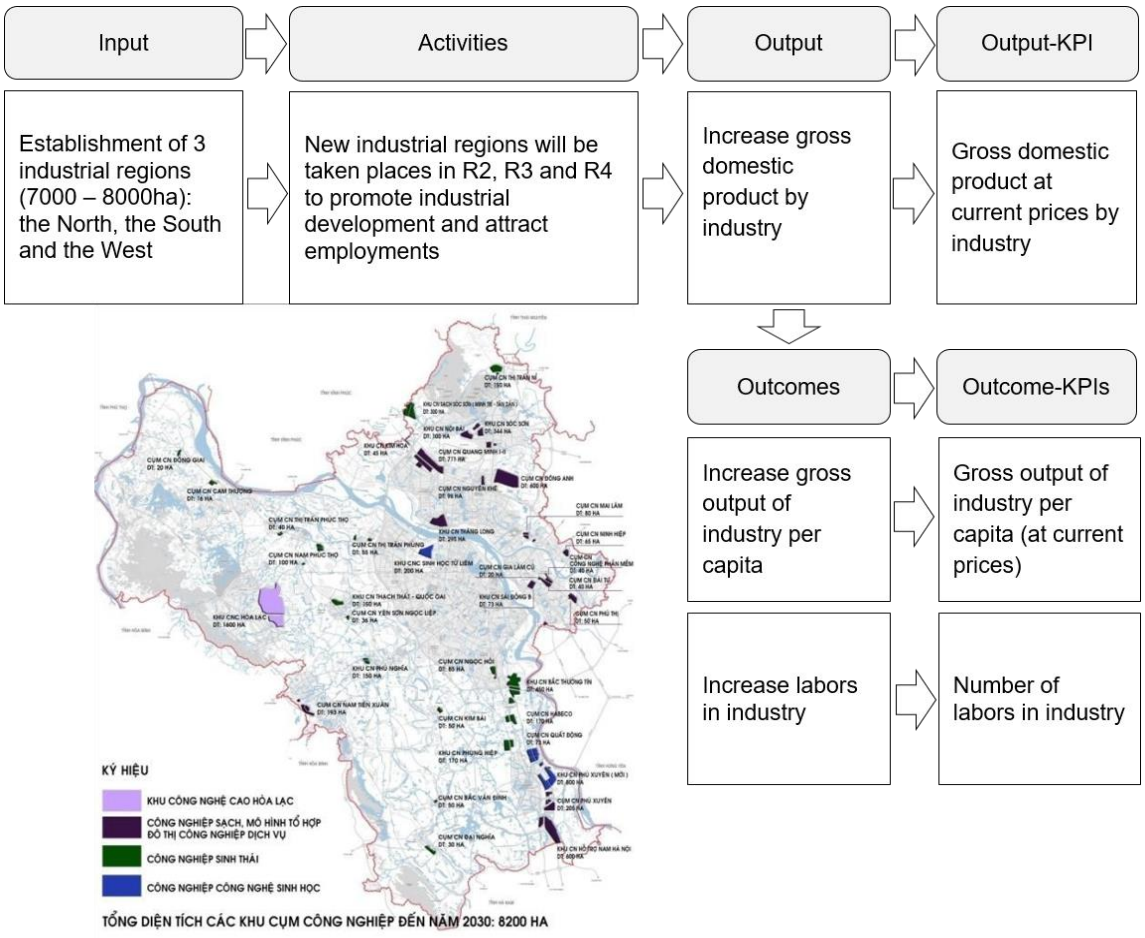

Figure 5.7 Logic model – Industrial development

5.4. KPIs Calculation and Filling gaps

To calculate KPIs, one of the useful tools as the Computable Urban Economic (CUE) model can be applied. The CUE model, which has been mentioned in several papers and utilized widely in Japan with several benefits, is an interaction model of land use and transportation with a microeconomic theoretical base for equilibrium purpose. It was developed with practical prediction and evaluation capabilities based on research by Yamasaki and Ueda (2004) and Yamasaki and Muto (2013). In some studies recently, the CUE model was employed as a tool for policy analysis to solve three main sectors: socio-economic (population and employment), land use and transportation. It will be significant

to apply CUE model in the M&E system as proposed because the model can give final results of policies in details zone by zone. The model can also output a set of variables describing an urban plan by working with transport models consistent with microeconomic theory.

In the case of Hanoi master plan, CUE model will help us to produce final results and detailed zone by zone. The model works based on the urban data, to bring out different patterns in different perspectives. During model analysis, the land use and trips will keep changing until the land market, labor market, transport market and commodity market in each zone reaches equilibrium. Accordingly, applying CUE model will make this system work well for measuring the planning progress while operating CUE model with Hanoi urban data system.

The whole content of gap analysis will be presented in detail in chapter 6 with gap analysis framework, analysis of development cases and findings.

5.5. PDCA Management of the M&E system

For the management of the planning process, the PDCA cycle will be set up.

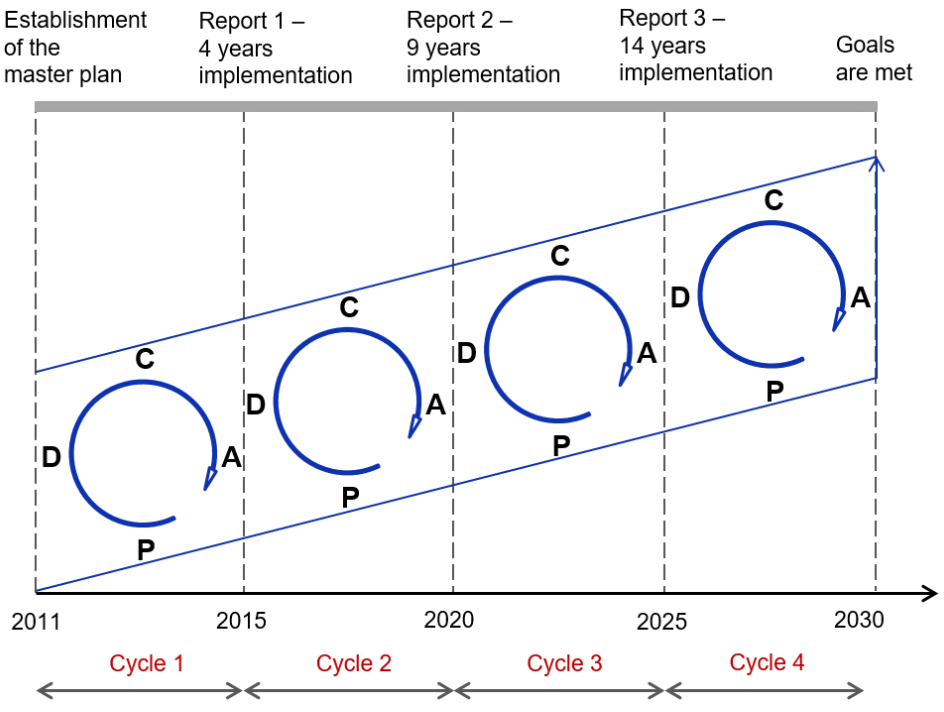

Figure 5.8 Management by PDCA Cycle for Hanoi master plan

The PDCA cycle will help the city government in monitoring and evaluation of the master plan, to get goals and objectives. The master plan should be considered as a process, rather than product. The Hanoi Master Plan has started since 2009, published in 2011 and get objectives by the mid-target year 2020, then the target year 2030 and vision to 2050 (MOC, 2009). Following the timeline, PDCA cycle in the Hanoi master plan could be set by short-term and long-term objectives or vision of the future:

- PDCA Cycle for short-term assessment: 2011 – 2015, 2015 – 2020, 2020 – 2025, 2025 – 2030.
- PDCA Cycle long-term assessment from 2011 – 2030.

At the end of each cycle, a report should be completed in details to show the progress of policies implementation visibly and transparently. In the case of Hanoi master plan, 5 year PDCA checking can be considered a reasonable period to help the authority in monitoring and evaluation of policies' effects.

Actually, during the first PDCA cycle 2011 – 2015, there are not any policies have been completed, no gaps happened between the plan and actual result until 2015. It means that we cannot check policies' effects of the plan as well as do gap analysis. From 2015 to 2020, we need to update the implementation of policies by due date and their effect to the development of Hanoi city.

Table 5.2 PDCA cycle management by period of 5 years

Stage	**Key - Steps**
PLAN	**Identification of the objectives Hanoi need to be achieved** - Identification of objectives Hanoi has to reach after 5 years as planed; - Establishment of the institutional framework lead by HPC for monitoring and evaluation with clear assignment of actors and correlative actions; - Setting up program for monitoring and evaluation: ✓ Fix objectives, priorities ✓ Propose indicators for checking step

	✓ Preliminary strategy for data collection.
DO	**Implementation of the plan's actions and management of them** Operation of the program under the guidance of HPC, involves: administrative management and professional management of projects deploying; - Controllability of: ✓ Population development (in the city center and satellite cities) ✓ Construction activities ✓ Land use, re-development land, agricultural land ✓ Environmental protection; - Preparation of urban data KPIs selection from different sources: Hanoi Statistic Office (HSO), General Statistic Offices (GSO) and others (Person Trip Survey…); - Selection of suitable tool for Checking step (CUE model).
CHECK	**Evaluation of the plan** Evaluation of the actual results of the master plan by comparing to the expected results from PLAN step (check the deviation, appropriateness and completeness) - Selecting KPIs by the Logic model and using CUE model for KPIs calculation; - If KPIs show the similarity between the plan and reality – the plan is successful; - If there are gaps between the plan and reality – the plan does not work. Gaps could be in population, economic development, infrastructure planning, urban sprawl (not in the plan), … We need to find causes for gaps, such as: lack of cooperation among actors when take actions, derogation in managing of implementation, derogation of investors, strategies and goals as planned are unsuitable and too difficult to achieve, over urbanization…; - Generate information that will allow the plan review, being essential for the PDCA process.

ACT	**Review of the plan** Take actions/adjustments based on the results in CHECK step: - If the plan is successful, we should incorporate what we learned from the plan and suggest new improvement for the plan; - If the plan does not work, we have to go through the PDCA cycle again and make the different plan, propose new objectives and goals; - Allow the preparation of the new PDCA cycle.

In general, the application of PDCA cycle will help the implementation process of policies follows the expected itinerary of decision-makers, until achieves the final goals.

5.6. Role of stakeholders in the M&E system for Hanoi master plan

5.6.1. Management of the M&E system and Engagement of Stakeholders

For synchronous and effective management of planning implementation, we expect an organization (department or committee) to take responsibility for the full M&E system should be established at the year of master plan establishment. It will work under the guidance of HPC. The members of this organization should be people who worked on the development of the master plan first hand including leader, experts, scientists from different agencies, investors and enterprises. For effective activities, the organization should connect frequently to the urban data management organization and engage stakeholders in different agencies during the planning process.

The organization has to follow the Revised Construction Law (Law 50/2014/QH13) and Urban Planning Law (Law 30/2009/QH12). The organization will be in charge of reinforcing the competences in budgetary control and mobilizing fund including fund resources (from Government, ODA, FDI...), calling upon investors). The main mission of the organization in management of Hanoi master plan:

- Synchronous and effective management of planning implementation issues, clarifying priorities:
- Public transport integrates compact city, high density;

- Promotes site clearance for UMRT network and progress of Hoa Lac satellite city planning;
- Checks-up the improving projects to obtain better control of the evolution of the execution plans in housing, public services, transportation…;
- Isolation and protection of un-used land for long term development;

- Management of the full KPIs system in Hanoi master plan;
- Periodic revision: 2011 vs. 2020, 2020 vs. 2025, 2025 vs. 2030.

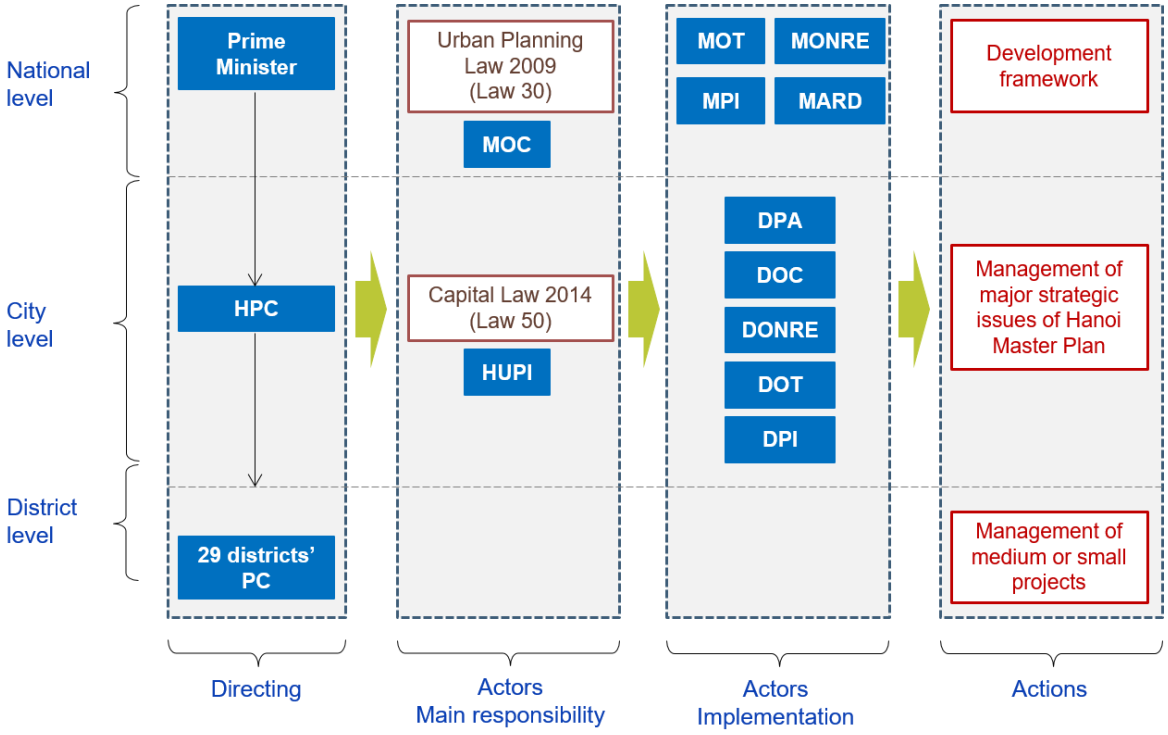

Figure 5.9 Clear assignment of actor's roles in the implementation of Hanoi master plan. (MARD: Ministry of Agriculture and Rural Development, DPA: Department of Planning and Architecture, DOC: Department of Construction, DONRE: Department of Natural Resource and Environment, DOT: Department of Transportation, DPI: Department of Planning and Investment)

To implement and accelerate the progress of Hanoi master plan, we need the close coordination and collaboration among stakeholders, or the involvement of different partners to improve the Hanoi master plan's quality and feasibility, including:

- The leader of local community: HPC has the power to prepare appropriate implementation regulations;

- The participation of experts, scientists from: MOC, MPI, MOT, MONRE, HUPI, DPA... It can involve the use of various mechanisms for knowledge and experience sharing among the different actors;
- The participation of investors, enterprises: good coordination will help investors and enterprises clearly understand authority's priorities and vision on development.

The close coordination and collaboration among stakeholders not only accelerate the progress of the master plan, upgrade the planning and planning management quality, but also assist for planning method innovation to strategic visions for main points:

- Concretize planning, especially specific area planning;
- Control local space and function;
- Consideration of master plan publicity.

5.6.2. Role of Stakeholders in management of KPIs system

To identify the importance of the fifth function in M&E, we need an assignment of stakeholder's role in management of KPIs system. In the KPIs system, there are diverse areas such as spatial development, transportation, land use, architecture, construction… Therefore, it is necessary to clarify who will be in charge of each KPI.

Table 5.3 Role of Stakeholders in management of KPIs system

Types of KPI	Numbering of KPI	Actors
Population	a1, b1, a2, a3, a4, a5, a6	GOPFP
Labor	b2, b3, b4, b10, b11	DLIS
Number of trips per day between different districts	a7	MOT, DOT
Percentage of passengers using public transport	a8	MOT, DOT
Gross domestic product at current prices by service	a9	MOIT
Travel time	b7	MOT, DOT
Fatalities and injures per year by accident	b8	NTSC
Air Quality Indicator (AQI)	b9	MONRE, DONRE

Total newly built residential housing	a10	MOC, HUPI, DPA, DOC
Area for open and green space	a11	MOC, HUPI, DPA
Number of colleges and universities	a12	MOET
Number of students	b5	MOET
Number of health establishments	a13	MOH
Number of patient beds	b12	MOH
Number of health staffs	b13	MOH
Average output of water per day	a14	DONRE
Percentage of population in using fresh water	b14	DONRE
Average output of electricity per day	a15	EVN Hanoi
Percentage of households are supplied by electricity	b15	EVN Hanoi
Gross domestic product at current prices by agriculture	a16	MARD
Gross domestic product at current prices by industry	a17	MOIT
Gross output agriculture (in current price) per capita	b16	MARD
Gross output of industry (in current price) per capita	b17	MOIT
Number of times of tourist visitors	b6	DCST

Note:

- a1, b1, a2, b2…: Numbering of KPIs
- GOPFP: General Office for Population and Family Planning
- MOC: Ministry of Construction
- MONRE: Ministry of Natural Resources and Environment
- MOT: Ministry of Transport
- MOET: Ministry of Education and Training
- MOH: Ministry of Health
- MARD: Ministry of Agriculture and Rural Development
- MOIT: Ministry of Industry and Trade
- HUPI: Hanoi Urban Planning Institute

- DLIS: Department of Labor, Invalids and Social affairs
- DCST: Department of Culture, Sports and Tourism
- DPA: Department of Planning and Architecture
- DOC: Department of Construction
- DONRE: Department of Natural Resource and Environment
- DOT: Department of Transportation
- NTSC: National Traffic Safety Committee
- EVN Hanoi: Electricity Vietnam Hanoi

To show the progress of one planning policy, we need the interaction among different actors, especially we have to indicate one actor who is mainly responsible for the whole process, including implementation of the policy and management of KPIs. If actors are in the familiar areas, it will be easy to build consensus among them. However, if actors are in wide areas, it will be much more challenged to interact them, especially the identification of an actor for main responsibility. Here, we show some expectations of the consensus among actors in managing some policies.

Table 5.4 Building consensus among actors in managing policy implementation

No.	Policy	Actors	Output-KPIs	Actors	Outcome-KPIs	Actors
1	Planning 5 satellite cities and development of 3 sub-urban centers around Hanoi center	MOC HUPI DPA	Population in R2, R3, R4, R5	GOPFP	Population in R1	GOPFP
	Main responsibility: MOC-HUPI					
2	Complete the ring roads IV, V	MOC MOT	Number of trips per day between different districts	MOT DOT	Travel time	MOT DOT
	Main responsibility: MOT					
3	Establishment of 3 industrial regions (7000 – 8000ha): the North, the South and the West	MOC MOIT	Gross domestic product at current prices by industry	MOIT	Gross output of industry per capita (at current prices)	MOIT
					Number of labors in industry	DLIS
	Main responsibility: MOC					

5.7. Current Availability and Management of Hanoi Urban Data

5.7.1. Current Hanoi Urban Data Availability for KPIs

There are several challenges of current availability and quality of Hanoi urban data because of the management issue and transparency of data in Vietnam. Generally, each KPI has to be managed by one data source as one organization. The Hanoi urban data utilized in this study were mostly gotten from Hanoi Statistics Office (HSO) who offers Hanoi data by districts, some from General Statistics Office of Vietnam (GSO), MOC, Person Trip (PT) Survey (2011) and other sources.

At present time, the available data for case of Hanoi can be roughly grouped into two types: (1) data from statistics, which annually collected by HSO, and (2) specific data which collected from other references.

Table 5.5 Hanoi urban data availability for KPIs

Types of KPI	Available unit	Available period	Data Items	Sources
Population	By district	Every year	Average population by district	Hanoi population and housing Census – HSO
Labor	By economic sector	Every year	Labors in Hanoi by sector	Hanoi labor and employment Census – HSO
Percentage of passengers using public transport	By district	Based on programs of urban development	Percentage of passengers using public transport	Person Trip (PT) Survey
Travel time	By district	Based on programs of urban development	Travel time simulation	Person Trip (PT) Survey
Fatalities and injures per year by accident	By city	Every month and year	Report of accident status	Traffic accident Survey Report – National Traffic Safety Committee

Air Quality Indicator (AQI)	By city	Every hour	Statistic of air pollution of cities in the world by hours	Observation of air quality by hours – US Embassy & Centre for Environmental Monitoring, General Environmental Department, MONRE (Aqicn.org)
Number of trips per day between different districts	By district	2011	Number of trips per day	Person Trip (PT) Survey
Total newly built area of residential housing	By city	Every year	Newly built area of residential housing in the year	Hanoi population and housing Census – HSO
Area for open and green space	By city	Every year	Open and green space	MOC
Number of colleges, universities and students	By city	Every year	Number of colleges, teachers and students in colleges and universities by management level	General Census on civil service – HSO
Number of health establishments, patient beds and health staffs	By city	Every year	Number of health establishments, patient beds, health staffs and contagious diseases	General Census on civil service – HSO
Average output of water per day	By city	Every year	Development of urban infrastructure	Observation of water output – Fresh Water & Environmental Sanitation Center, DONRE
Percentage of population in using fresh water	By city	Every year	Status of using fresh water	Census of population in using fresh water – HSO and DONRE
Average output of electricity per day	By city	Every year	Output of electricity status	Observation of electricity output – EVN Hanoi
Percentage of households are supplied by electricity	By city and district	Every year	Status of using electricity	Census of population in using electricity – HSO and EVN Hanoi

Gross domestic product at current prices (by agriculture, industry and service)	By economic sector	Every year	Gross domestic product at current prices by economic sector	Economic Census – HSO
Gross output of industry and agriculture (in current price) per capita	By city	Every year	Some main indicators per capita	Economic Census – HSO
Number of times of tourist visitors	By city	Every year	Activities of tourism in Hanoi (at annually 31st December)	Tourism Survey Report – DCST

Note:

- By city: data is available by the whole Hanoi city
- By district: data is available by 29 districts in Hanoi
- By sector: data is available by each sector. Ex: industrial sector, agricultural sector, service sector.

Table 5.6 KPIs correspond to Hanoi urban data in the base year 2011

No.	KPIs	Statistic 2011	Units	Data items	Source Items
b1	Population in R1	1.702,2	thous persons	Average population by district	HSY 2015
a1	Population in R2, R3, R4, R5	5.077,1	thous persons	Average population by district	HSY 2015
a2	Population in R2	1.585,6	thous persons	Average population by district	HSY 2015
a3	Population in R3	1.544,8	thous persons	Average population by district	HSY 2015
a4	Population in R3 and R4	3.004,5	thous persons	Average population by district	HSY 2015
a5	Population in R4	1.459,7	thous persons	Average population by district	HSY 2015
a6	Population in R5	487	thous persons	Average population by district	HSY 2015
b2	Labors in Industry	714.902	persons	Labors in Hanoi 2011	HSO website http://thongkehanoi.gov.vn

b3	Labors in Services	1.635.828	persons	Labors in Hanoi 2011	HSO website http://thongkehanoi.gov.vn
b4	Labors in Science and Education	237.541	persons	Labors in Hanoi 2011	HSO website http://thongkehanoi.gov.vn
a7	Number of trips between per day different districts	Depends on districts - zones	trips	Number of trips per day	PT Survey 2011
a8	Percentage of passengers using public transport	14	%	Percentage of passengers using public transport	PT Survey 2011
b7	Travel time	Depends on districts - zones	minutes	Travel time simulation	PT Survey 2011
b8	Number of fatalities and injures per year by accident	11.395 fatalities 48.734 injures	fatalities, injures	Report of accident status 2011	National Traffic Safety Committee
b9	Air Quality Indicator (AQI)	232	no unit	Statistic of air pollution of cities in the world by hours	http://vietnam.usembassy.gov/air_quality_monitor.html
a9	Gross domestic product at current prices by service	166.670	bill. VNdongs	Gross domestic product at current prices by economic sector	HSY 2015
b10	Number of labors in trade and service enterprises	833.637	persons	Labor of trade, hotel and restaurant, service enterprises in Hanoi by Vietnam standard industrial classification	HSY 2015
b11	Number of labors in private trade and services	333.506	persons	Number of establishments and labors in private trade and services by districts	HSY 2015
a10	Total newly built area of residential housing in the year	3.000.000	m2	Newly built area of residential housing in the year	HSY 2015
a11	Area for open and green space	Missing	m2	Open and green space	MOC

a12	Number of colleges and universities	80	schools	Number of colleges, teachers and students in colleges and universities by management level	HSY 2015
b5	Number of students	721.450	students	Number of colleges, teachers and students in colleges and universities by management level	HSY 2015
a13	Number of health establishments	638	establish-ments	Number of medical establishments, patient beds, health staffs and contagious diseases	HSY 2015
b12	Number of patient beds	15.695	beds	Number of medical establishments, patient beds, health staffs and contagious diseases	HSY 2015
b13	Number of health staffs	13.601	persons	Number of medical establishments, patient beds, health staffs and contagious diseases	HSY 2015
a14	Average output of water per day	750	thous m3/day	Development of urban infrastructure	HSY 2015
b14	Percentage of population in using fresh water	Missing	%	Status of using fresh water	Fresh Water & Environmental Sanitation Center, DONRE
a15	Average output of electricity per day	Missing	mwh/day	Output of electricity status	EVN Hanoi
b15	Percentage of households are supplied by electricity	Missing	%	Status of using electricity	HSO/EVN Hanoi
a16	Gross domestic product at current prices by agriculture	18.939	bill. VNdongs	Gross domestic product at current prices by economic sector	HSY 2015
b16	Gross output of agriculture per capita (at current price)	5,5	mill. VNdongs	Some main indicators per capita	HSY 2015

a17	Gross domestic product at current prices by industry	97.393	bill. VNdongs	Gross domestic product at current prices by economic sector	HSY 2015
b17	Gross output of industry per capita (at current prices)	53,2	mill. VNdongs	Some main indicators per capita	HSY 2015
b6	Number of times of tourist visitors to Hanoi's hotels	8.900	thous times	Activities of tourism in Hanoi (at annually 31st December)	HSY 2015

Note:

- a1, b1, a2, b2…: Numbering of KPIs
- HSY: Hanoi Statistical Yearbook

5.7.2. Management of Hanoi Urban Data

How KPIs system works to get progress for the Hanoi Master Plan? We need an information system to product data for estimating KPIs. The urban data belongs to many areas of development of Hanoi, such as demographic data (population and employment), transportation data (road network, personal trips…), land use data (production, resident…), etc. However, there are several challenges of current availability and quality of Hanoi urban data because of the management issue and transparency of data system in Vietnam. The Hanoi urban data utilized in this study are mostly from HSO, some from GSO, MOC, PT Survey (2011) and other sources.

The KPIs and data system for Hanoi master plan should be managed by an agent about urban planning and development under Hanoi's People Committee (HPC), such as Hanoi Urban Planning Institute (HUPI), who are taking responsibility of the master plan's adjustment and collecting data for Hanoi.

5.8. Conclusion

This chapter has illustrated the application of the M&E system we proposed in chapter 4 for the Hanoi Capital Construction Master Plan to 2030 and vision to 2050.

The analysis of Hanoi master plan has been corresponded to the functions and steps of the M&E system we established before. As results, KPIs in the Hanoi master plan have been selected, operated to Hanoi urban data, then benchmark to the target values for gap analysis. For KPIs development, the Hanoi urban data have been identified by sources, items and units, and the base data for 2011. The role of different stakeholders from national to local levels in management of KPIs system is also identified. The possible outcomes when applying the M&E system is to improve the plan and help local authority improve their policies to achieve final goals. In general, the M&E system can be considered a significant management system for the large-scale Hanoi master plan, especially in the conditions as slow progress of implementation and lack of concrete tool for management.

For synchronous and effective management of planning implementation, we expect to establish an organization to take responsibility for the full M&E system and run PDCA cycle periodically. It will work under the guidance of HPC. The members of this organization should be people who worked on the development of the master plan first hand including leader, experts, scientists from different agencies, investors and enterprises. For effective activities, the organization should connect frequently to the urban data management organization and engage stakeholders in different agencies during the planning process.

In chapter 6, the detailed process of KPIs calculation and Gap Analysis with CUE model in Hanoi master plan will be presented, in order to show the key importance step of the M&E system for an urban plan.

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CHAPTER 6

KPIS CALCULATION AND GAP ANALYSIS WITH CUE MODEL – THE CASE OF HANOI MASTER PLAN

6.1. Introduction

As can be seen from the previous chapters, the development of KPIs will control goals/objectives of an urban master plan, in which it can help decision-makers in monitoring and evaluating the urban planning process to get final goals. Therefore, calculation of KPIs and doing gap analysis during the planning process are very important, especially for a large-scale project with wide range of policies as the Hanoi master plan.

Chapter 6 gives a detailed process of KPIs calculation and gap analysis with Computable Urban Economic (CUE) model, application for the case of Hanoi master plan. Section 6.2 introduces modeling for KPIs calculation with CUE as one of powerful models. Section 6.3 introduces input, output, operation flow and limitation of CUE model in calculation. Section 6.4 presents Hanoi urban data for KPIs calculation by CUE model, including: demographic, land use and transportation data. Section 6.5 presents the detailed process of KPIs calculation and gap analysis with CUE model applied for the case of Hanoi master plan, focus on one specific outcome as "decrease growth rate of population in city center". As a result, this process will estimate the planning policies' effects, in order to improve the decision-making for Hanoi master plan. Section 6.6 concludes main findings in chapter 6.

6.2. Modeling for KPIs Calculation

In the implementation scheme of an urban plan, it is extremely necessary to forecast the future status of many development issues. Forecasting the future should be supported by theories. In the system of KPIs, each KPI must be observable and measurable, so it can be predicted by a target benchmark value in future. There, calculation of KPIs is important, however, it is not a simple issue. Indeed, some KPIs cannot be calculated directly from urban data because it has to be synthetized by several variables (ex, average of travel time between different centers). In addition, some KPIs can interact to other KPIs and cause ineffectiveness of policies. For instance, in dealing with traffic congestion, the policies of opening more roads may be ineffective because people use more private vehicles. Therefore, we need a powerful tool for calculating KPIs.

There are several theories can be utilized to predict future by calculating KPIs, in order to evaluate wide range policies in socio-economic condition, land use, transportation, architecture, industry, agriculture, service, tourism, etc. In this research, we are going to present the calculation process of the polulation-KPI. There are several theories for population estimation, so as calculating the polulation-KPI have been used, as below:

- *Regional Model Life Tables:* Coale and Demeny (1966) provided Model Tables for which the terminal open-ended age group is 80 years and life expectancies that ended at age 77.5. This works well for populations with high mortality, but not well for populations with low mortality. The Tables presented in this study are in two principal forms: model life tables and model stable populations.
- *Estimating County Population by Age, Sex and Race:* Brown and Scardamalia (1991) reviewed a methodology used by the U.S. Census Bureau to prepare national estimates of county population by age, sex, and race. They then evaluate its applicability to preparing state estimates of county population, using data for New York State.
- *Demographic Models:* Coale and Trussell (1996) examined two classical Demographic Models – conventional life tables and stable populations – and a modern generalization of stable population theory and discuss mathematical models of conception and birth. The authors examine the use of demographic models in forecasting future mortality, nuptiality, and fertility and in population

projection. They conclude with observations about the purposes and uses of demographic models.

- *Master Address File to Estimate the Population for Small Areas* (Becker, 1999): The author starts by observing that the Census Bureau has moved from population-based methods to housing unit methods for purposes of estimating sub-county population because population-based methods have suffered from seriously inadequate data sources and high levels of geocoding error. Housing units, already located on the ground, provide a better data set with little geocoding error. However, the author points out that housing-based methods are flawed as well. The author examines the use of the Master Address File to provide housing required for the housing unit method of population estimation and discusses issues that need to be resolved before it can be used as a source of population estimates.

From theories, concrete tools for KPIs calculation will be supported. Among tools for KPIs calculation, Computable Urban Economic (CUE) model is a powerful tool which has been using widely for evaluating many policies in Japan cities and other developed countries. CUE model is developed consistent with *microeconomic theory* and welfare measurement in traditional cost benefit analysis. In Japan, the urban models that can be seen as a member of CUE model family have been developed and applied since late 1980, and then generalized as unified form for wide application for urban policy evaluation. CUE model has been referenced in some papers as a useful tool for policy evaluation (Yamasaki *et al*, 2007; Nguyen, Trong Hiep, 2014; Zhang, R *et al*, 2016 & 2017). This model has been introduced in chapter 2 by literature review and chapter 5 by utilization as a tool for evaluation in the M&E system.

CUE model can work with transportation, land use and socio-economic issues. Actually, CUE model is possible to give us final results of policies in details zone by zone and also output a set of variables describing an urban plan by working with transport models consistent with microeconomic theory. The set of output variables outputted from CUE simulation can be interpreted as KPIs by the 3 aspects. First, they are logically related to objectives defined or transformed from urban master plan; second, they can represent the efficiency and effectiveness of urban sub systems performance; and third, they are interacted each other. Therefore, evidently, the CUE model absolutely can be used as a

KPI calculation. In this research, for calculating the population-KPI, CUE model can output the distribution of labors by zones, from that can we can calculate population by zones.

As can be seen from the figure 6.1, KPIs calculation to predict the target value in future is an important process with CUE model as a tool and urban data system. From its result, the gap analysis can be carried out.

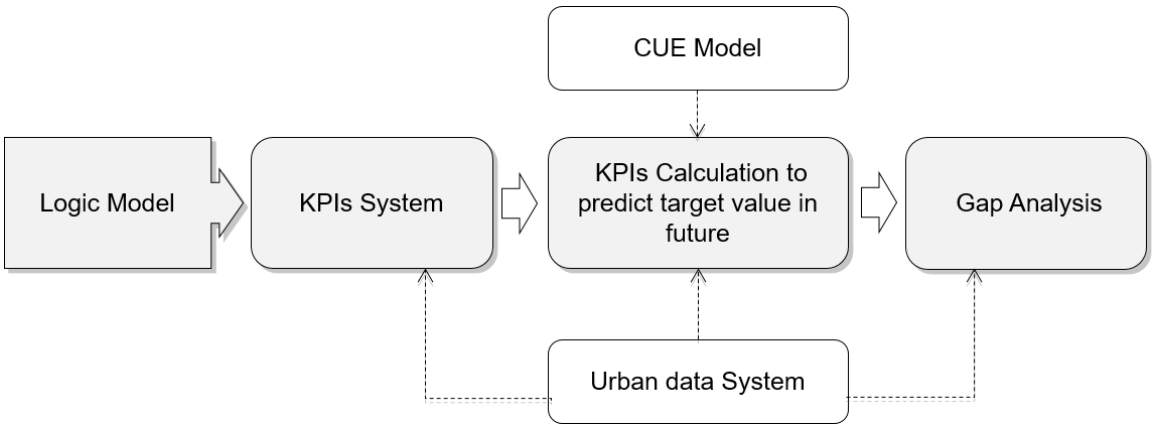

Figure 6.1 KPIs Calculation

6.3. CUE Model Input, Output and Operation flow

6.3.1. CUE model Input, Output

Here are the types of urban data need to be used for CUE modeling. In general, include followings:

- Land use data: land used for concrete purposes of urban development (housing, production…); land regulation; land use plan; land price, land tax, rental.
- Transportation data: person trip data (traffic counting, vehicle ownership, trip length, travel behavior); transportation infrastructure (road network, rail network, railway, bus stations, airport…); urban traffic policies (public transport fares, gasoline price, parking cost, congestion pricing policies).
- Socio-economic data – Demographic data: Spatial distribution of population and labor; Structure of population (growth rate, population structure, household structure, workforce by sectors).
- Regional account (GRP per capita, residential income, price index, gasoline price).

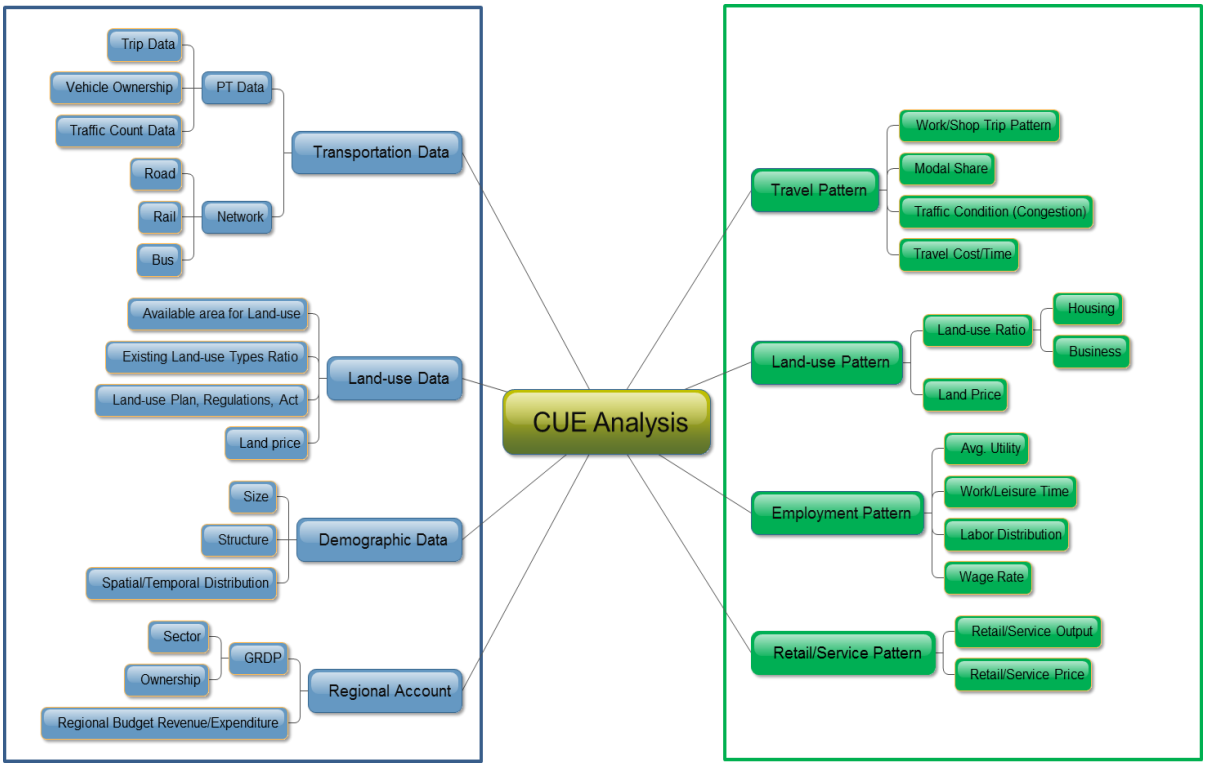

Figure 6.2 CUE Model Input, Output

Figure 6.2 presents the urban data need to serve for CUE Modeling. In order to operate the current version of CUE, input data set should be prepared in the following table:

Table 6.1 Input data set for CUE model

No.	Data Set Item	Description	Note
1	**Socio-economic**		
	Population	Total	Total population living in study area
		Spatial Distribution	Total individuals living among zones
		Structure	Characteristics of population (sex, age, growth rate, urban/rural...)
	Labor	Total	Number of labor working in study area
		Spatial Distribution	Number of labor living/working among zones
		Structure	Characteristics of workforce (sex, age, skill, working sector)

	Regional Account	GRP/GRP per capita	
2	**Land-use**		
	Total Control	Surface area	Area defined by zonal boundary
		Total land area for development	Land use for all development purposes, including land for national security, defense, and preservation area
		Unused land area	Unused or preserved for future development
	Land-use by purpose	Land area for residential housing	Land area for housing development
		Land area for urban socioeconomic activities	Land area for office, commercial, public service, manufacturing, agriculture
3	**Transportation**		
	Travel Pattern	ODs matrices by purpose/mode	Travel demand by purpose, by mode
	Generalized Travel Cost	Average travel cost/time	Travel distance, travel speed, transit fare, fuel price, parking cost, vehicle ownership, transit accessibility
	Transport Infrastructure Network	Road, UMRT	Location, Geometric Dimension, Operation Rule, Capacity

In urban planning and development management issue, from input data, CUE will run based on general equilibrium under the price mechanism between land, labor, transport and commodity markets, to get output, as shown in figure 6.3.

Under a general equilibrium framework, the considered sub-urban systems will be interacted each other through socioeconomic and spatial mechanisms. The set output variables represent the real urban economy such as spatial distribution of household, workers; the distribution of land use for residential, commercial, manufacturing…, land price; and aggregated also utility of civilian living in study zone. It is clearly that the variables are expected KPIs which representing for physical operational state of urban area.

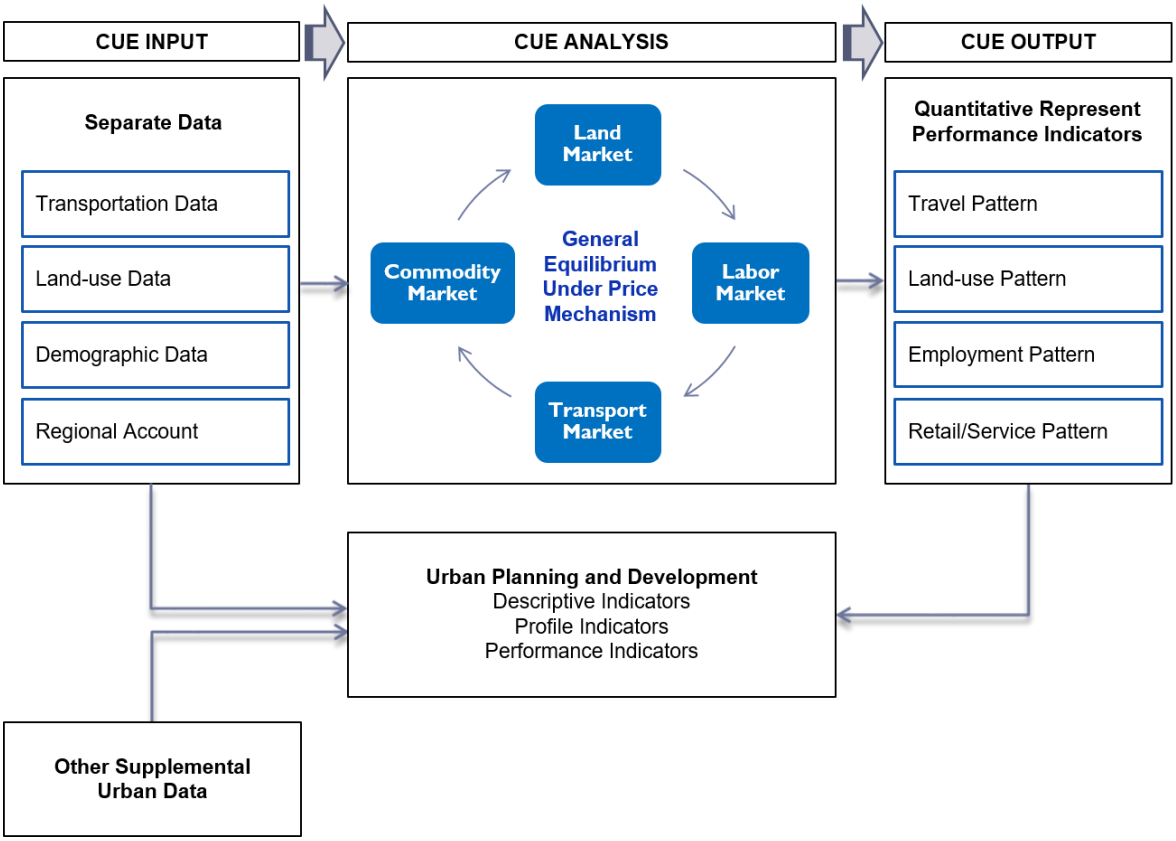

Figure 6.3 CUE model structure

6.3.2. Operation Flow of CUE Model

The operation flow of CUE model in practice has shown in figure 6.4. In general, it consists of 5 steps:

Data preparation:

The purpose of this step is to formulate a data set for computer simulation, consistent with zone system from related available urban data. The data will be prepared for representing urban states by development milestone (time or policy introduction). The data would be prepared for:

- Base case: represent or base time;
- Check/Evaluation time: the urban variables at new state (variables with changes).

The data will be created should be:

- In comply with assumption and/or definition of model variables;

- Reflect zone's characteristics related to defined variables;
- In accordance with the format of computer program.

Model setting:

In this step, the parameters of CUE sub models will be estimated or defined based on the urban data. Usually, it including:

- Socio-economic parameters: consumption shares in utility function; and input factor share of production functions
- Transportation: modal split, assignment models

The model then can be calibrated to adjust the model parameters so that variables outputted from simulation close to the model can reflect the tendency or close to current urban state.

Simulation:

In simulation step, we can get the Benchmark CUE Model, which can be used for analysis and evaluation missions.

Exogenous variables and/or parameters should be changed and/or adjusted in accordance with evaluated policies of development scenarios.

Result analysis:

In this step, the simulation result will be analyzed in order to visualize and prepare proposals supporting for planners/decision-makers. This issue will be shown in details by gap analysis process in the next section.

Decision making:

In this step, the policies will be revised, improved or changed based on the result of gap analysis. This issue will be monitored and evaluated by PDCA cycle.

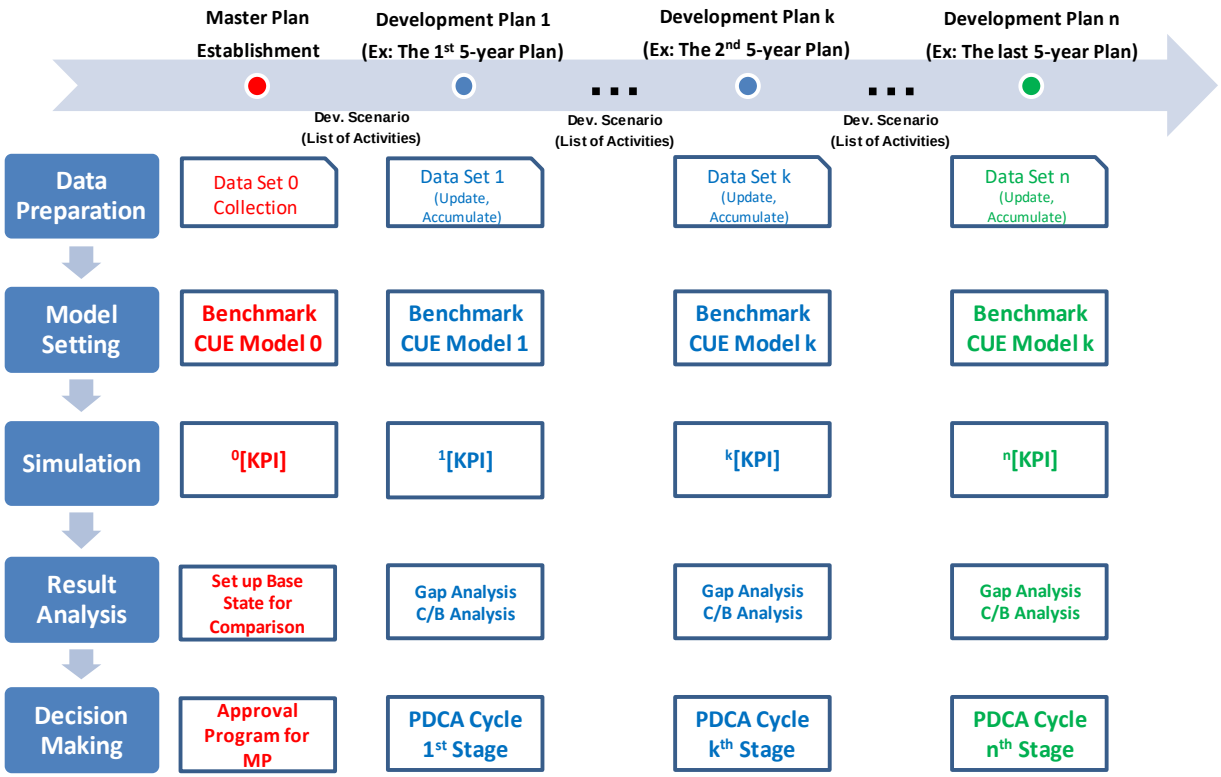

Figure 6.4 The Operation Flow of CUE model for KPI calculation and PDCA Management

In the case of Hanoi master plan, CUE model will help us to produce final results and detailed by zones and regions. The model works based on the urban data, to bring out different patterns in different perspectives. During model analysis, the land use and trips will keep changing until the land market, labor market, transport market and commodity market in each zone reaches equilibrium. Accordingly, applying CUE model will make this system work well for measuring the planning progress while operating CUE model with Hanoi urban data system.

6.3.3. Limitation of CUE model

Beside many benefits of CUE model in calculating KPIs, there is still some limitation of the model to cause the result which is not as expected. The limitation caused from some reasons below:

- Urban data is CUE input. Because CUE model has to set the interaction between diverse data in different aspects (socio-economic data, land use data, transportation

data), the result can be impacted. Moreover, the availability and quality of urban data are very important to effect to the result of CUE calculation.

- The operation of CUE model is explicit. Therefore, the model calibration is difficult and wastes time, money and manpower.
- CUE is a dynamic model because its variables can change by time, and, it has to interact with different aspects. Therefore, it is difficult to give accurate result in each aspect.

6.4. Hanoi urban data for CUE calculation

6.4.1. Demographic data

The demographic data of Hanoi is available by every year and offered by HSO, as shown in table 6.2.

Table 6.2 Demographic data (HSO)

Data	Available unit	Available period	Data Items	Sources
Population: Total population in Hanoi Population in R1 Population in R2 Population in R3 Population in R4 Population in R5	By district	Every year	Average population by district	HSO
Labor	By economic sector	Every year	Labors in Hanoi by sector	HSO

6.4.2. Land use data

Table 6.3 gives the detailed information about land use data in Hanoi master plan. In which the land use categories are defined by urban function area in National Technical Regulation on Regional and Urban Planning and Rural Residential Planning (QCVN 01:2014/BXD). The type of land use categories is used for urban land use planning. The type of land use data is collected from Master Plan, in terms of map. The format is CAD files.

Table 6. 3 Land use data (HSO and Hanoi master plan (MOC)

No.	Land-use by Categories in Urban Planning	Existence (2011)	Plan	Type	Format
1	Public, complex land (service, trade, office, living)	O	O	Map	CAD, GIS
2	Health care Land	O	O	Map	CAD, GIS
3	Existing civil land	X	O	Map	CAD, GIS
4	Urbanized village land	X	O	Map	CAD, GIS
5	Outskirt, suburb village land	O	O	Map	CAD, GIS
6	New living unit land	X	O	Map	CAD, GIS
7	Ancient quarters	O	O	Map	CAD, GIS
8	Old quarters	O	O	Map	CAD, GIS
9	Relics land	O	O	Map	CAD, GIS
10	Training and education unit land (universities, college, vocational training schools)	O	O	Map	CAD, GIS
11	Army, national defense security land	O	O	Map	CAD, GIS
12	Tree, park, entertainment land	O	O	Map	CAD, GIS
13	Sport and gyms land	O	O	Map	CAD, GIS
14	Isolated, protective plant land	O	O	Map	CAD, GIS
15	Project land within green belt, green corridor	O	O	Map	CAD, GIS
16	Agriculture Land	O	O	Map	CAD, GIS
17	Water front	O	O	Map	CAD, GIS
18	Industry - hi tech Land	O	O	Map	CAD, GIS
19	Tourism Land	O	O	Map	CAD, GIS

20	Forestry Land	O	O	Map	CAD, GIS
21	Cemetery Land	O	O	Map	CAD, GIS
22	Infrastructure headwork Land	O	O	Map	CAD, GIS
23	Other Land	O	X	Map	CAD, GIS

Note: O: Availability; X: Missing; The Land-use data in terms of GIS format is created based on CAD data by NKU-CUE program.

6.4.3. Transportation data

Transportation network:

The transportation network in Hanoi is referenced in the PT Survey (TEDI, 2011) shows in detail the road network in Hanoi and OD information (Original and Destination of trips) by districts, as shown in figure 6.5 and 6.6.

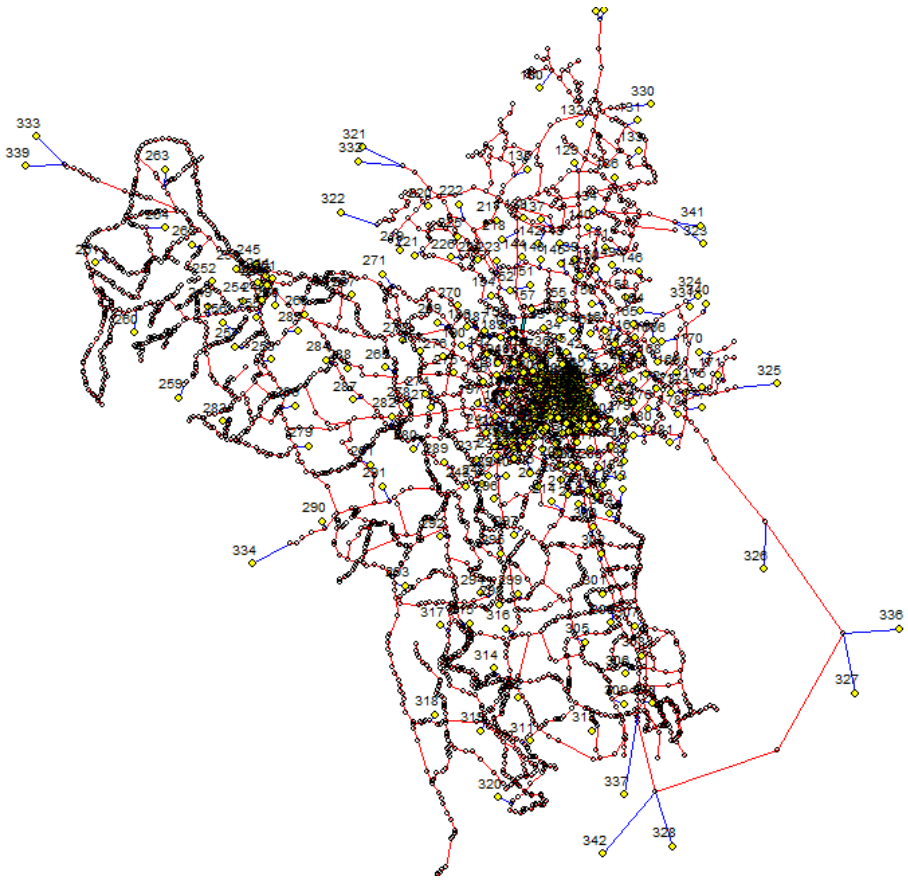

Figure 6.5 Hanoi road network 2011

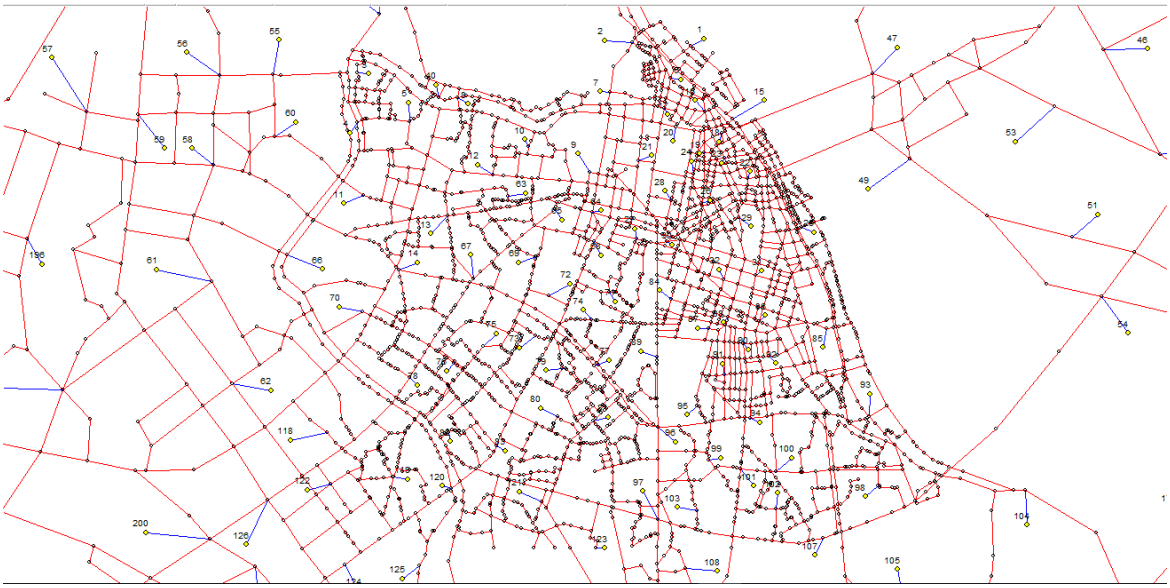

Figure 6.6 Hanoi road network 2011 – Central area

Traffic data:

From the road network and OD information, PT Survey (TEDI, 2011) with JICA STRADA has simulated in detail the number of trips between different districts based on travel time, distance and speed of each trip. The traffic data is the original data which is referenced in PT Survey (TEDI, 2011). All of the results of PT survey were compiled in a STRADA form as a scientific base for the transport planning.

6.5. KPIs Calculation and Gap Analysis – The case of Hanoi master plan

6.5.1. Framework for KPIs Calculation and Gap Analysis

As mentioned in chapter 4, KPIs Calculation and Gap analysis are the key function of the M&E system, so it is the most important step when applying the system to an urban plan. This section presents a brief summary of establishing the gap analysis framework based on case development analysis. This framework includes:

- Observation of the plan' goals to consider the possibility to achieve goal;
- Observation of the reality by years for comparison;

- Case setting for consideration, analysis, evaluation of the effect of different planning policies:

- Establishment of the case 00 – without any policies, as a base case for analyzing gap;
- Establishment of the optional targets based on the implementation of different policies (case 01, case 02, case 03,…).

From those observations, the gap will be identified, analyzed and filled based on policy implementation. Firstly, we observe the gap between reality and optional targets. Secondly, we have to find the reason why that gap happens. Thirdly, we consider how to fill that gap by revising, adding or changing policies.

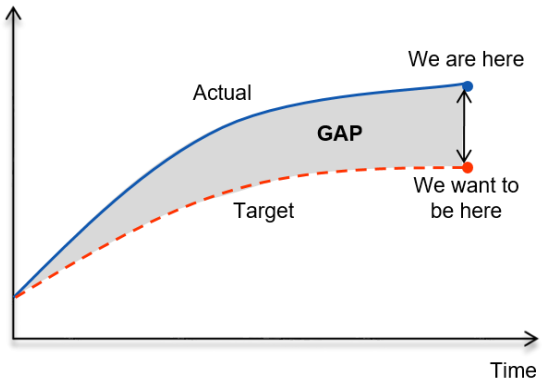

Figure 6.7 Gap analysis

To calculate the optional cases, CUE model is used, in order to estimate the policy's effects. The next sections will illustrate a full process of KPIs calculation and gap analysis with CUE model for the case of Hanoi master plan, focus on one specific outcome as "decrease growth rate of population in city center".

6.5.2. KPIs Calculation with CUE model

In this section, we present KPIs calculation with CUE model for the case of Hanoi master plan. The most intensive and challenged outcome of Hanoi master plan is reducing high pressure for city center. Therefore, we are going to measure this outcome by KPIs calculation and gap analysis, in order to show the effect of the M&E system proposed.

As can be seen from table 6.4, the Logic model analyses how to get the outcome "Decrease growth rate of population in city center" by a logic way, and how to measure it

by the outcome-KPI as “Population in R1”. To support this outcome, 7 policies are given in the Hanoi master plan.

Table 6.4 List of policies are measured by KPI “Population in R1”

No.	Input	Output	Output-KPIs	Outcome	Outcome-KPI
1	Planning 5 satellite cities and development of 3 sub-urban centers around Hanoi center	Increase migration from city center to satellite cities and sub-urban centers	Population in R2, R3, R4, R5	Decrease growth rate of population in city center	Population in R1
2	Planning the UMRT system combines with other public transport systems to make an efficient interconnected network	Increase users of public transport	Percentage of passengers using public transport		
3	Planning the BRT system	Increase users of public transport	Percentage of passengers using public transport		
4	Planning and improving new towns in districts surrounding city center and 3 sub-urban centers and 5 satellite cities	Increase housing floor area	Total newly built area of residential housing in the year		
5	Moving residents from the city center to new towns in sub-urban centers and satellite cities	Increase migration from city center to sub-urban centers and satellite cities	Population in R2, R3, R4, R5		
6	Building new clusters for universities in Hoa Lac, Son Tay, Xuan Mai, Phu Xuyen – Phu Minh, Chuc Son, Soc Son	Increase areas and space for colleges and universities	Number of colleges and universities		
7	Construction of new general medical clusters in Hoa Lac, Soc Son and Thuong Tin – Phu Xuyen	Increase space for hospitals and cliniques	Number of medical establishments		

Among them, the first four policies (as shown in table 6.4) are considerably the most impact to the population growth rate in city center. The reasons include: they are large-scale policies that can influent to the whole city development; and, they have been implementing by steps since 2011. In addition, these four policies are possible to be evaluated by CUE model because they relate to CUE inputs as population, employment, transportation and land use. Therefore, in practical point of view, it is very necessary to monitor and evaluate these four policies.

However, up to now, there are only two lines of UMRT named 2A, 3A and 3 sub-urban centers have been implementing and expect potentials. The BRT system is in testing process and facing some problems. So in this case, CUE model is used to estimate the effect of UMRT lines 2A, 3A and 3 sub-urban centers by calculating the KPI "population in R1".

Firstly, we have to prepare the data input for CUE model the from HSO and the Person Trip survey (PT survey – TEDI, 2011) including demographic data, homestead land and production land distributed within 29 zones, travel time, travel demand between 29 zones, and transportation network.

From demographic data (HSO), we predict the total labor from total population of Hanoi in the future year observed. In order to achieve that, we use the formula for predicting population based on the average growth rate by years of the city (GOPFP, 2011), as below:

$$P_t = P_0 * (1 + r)^t$$

In which: P_t: the population of the future year

P_0: the population of the current year

r: average growth rate (%)

t: period from current to future year (year)

From population we can predict the labor (homezone) based on the ratio between population and labor of the city. In the case of Hanoi city, this ratio is approximately 2.

Application of above formula for predicting population in Hanoi in 2020, and demographic data from HSO, we get the result below:

$$P_{2020} = P_{2015} * (1 + 0{,}022)^5$$

$$P_{2020} = 7390{,}9 * (1 + 0{,}022)^5 = 8240{,}5 \text{ (thous persons)}$$

In which: P_{2020}: the population of Hanoi in 2020

P_{2015}: the population of Hanoi in 2015 (thous persons)

0,022: average growth rate of Hanoi from 2010 to 2015 (%)

5: number of years from 2015 to 2020

The population in Hanoi in 2020 is predicted as 8240,5 thousand persons. From this, the total labor (homezone) of Hanoi is simulated as below:

$$\text{Labor}_{\text{homezone}} = P_{2020} / 2 = 8240{,}5 / 2 = 4120 \text{ (thous persons)}$$

Secondly, the process of CUE calculation is carried out. Figure 6.8 shows the process of CUE calculation to distribute labors (workplace and homezone) by zones and regions. From homezone labors, we predict population in each region of Hanoi.

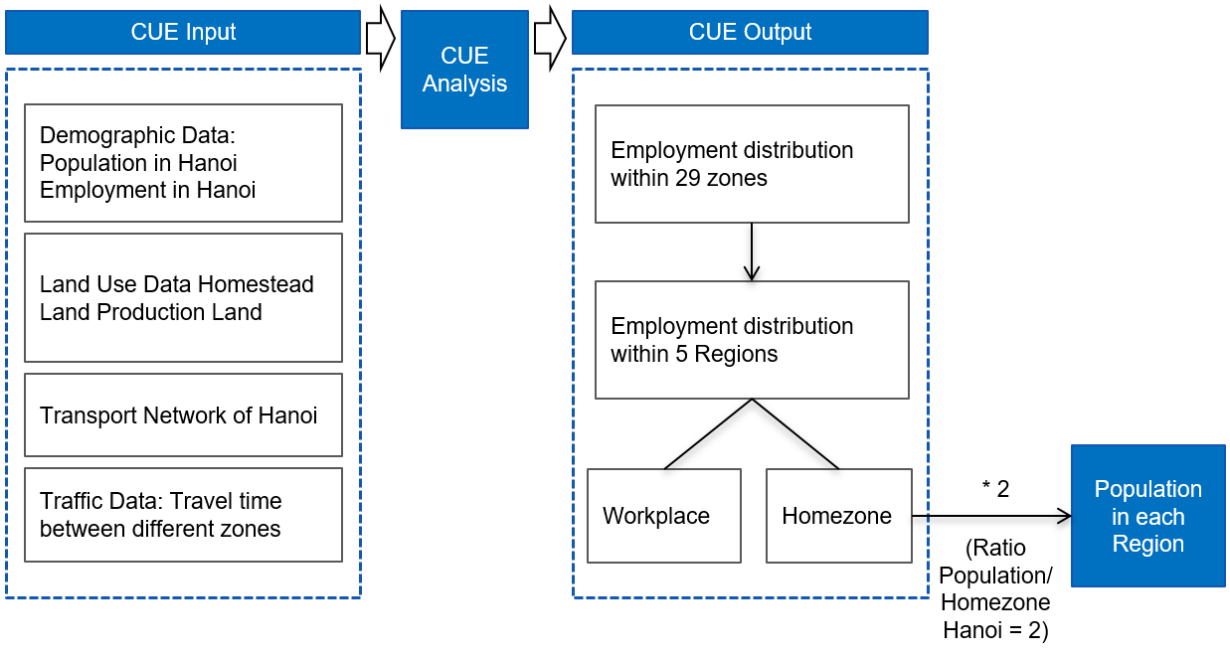

Figure 6.8 CUE calculation process

The detailed result of CUE calculation for case 00 (without policies), case 01 (2A, 3 sub-centers) and case 02 (2A, 3A, 3 sub-centers) is shown in the table 6.5. From homezone labor in R1, we calculate the population in R1 with 3 cases, as shown in the table 6.6.

Table 6.5 Distribution of labors by 5 regions (person)

Region	Case 00 (without policies)		Case 01 (2A, 3 sub-centers)		Case 02 (2A, 3A, 3 sub-centers)	
	Workplace	Homezone	Workplace	Homezone	Workplace	Homezone
R1	984,977	953,593	955,036	908,721	925,124	873,120
R2	676,602	689,261	676,571	699,221	686,400	709,006
R3	1,097,588	1,107,584	1,107,547	1,122,519	1,117,869	1,127,645
R4	952,214	953,641	962,247	963,643	972,119	973,466
R5	408,619	415,921	418,599	425,896	418,488	436,763
Total	4,120,000	4,120,000	4,120,000	4,120,000	4,120,000	4,120,000

Table 6.6 Homezone labors and Population in R1 (person)

	Case 00 (without policies)	Case 01 (2A, 3 sub-centers)	Case 02 (2A, 3A, 3 sub-centers)
Homezone labor	953,593	908,721	873,120
Population	1,907,186	1,817,442	1,746,240

6.5.3. Gap Analysis

To measure the outcome "Decrease the growth rate of population in city center", we have to analyze and fill the gap between actual and target value of population in R1. To identify the gap, all of the observations have to be considered, as below:

1) Observation from outcomes of Hanoi master plan (MOC, 2009): the population in R1 in 2020 and 2030 is assumed to be lower than in 2011 (as 1702,2 thousand persons – HSO). The reason is Hanoi master plan expects to reduce high pressure (high density and

congestion) in the city center by planning satellite cities and development of sub-urban centers, and planning a good transportation network which enhances public transport.

2) Observation from reality (actual) from 2011 to 2015 (HSO, 2015): population in R1 still increases dramatically from 1702,2 in 2011 to 1819,3 thousand persons in 2015, so it will be continuous to increase in 2020 without doing anything. The reason is the high congestion caused by high population density in the city center. High population density caused by many public works and spaces located in the city center (universities, hospitals, scientific offices, companies…), plus to a poor transport network and high rate of private vehicles.

3) Observation from CUE calculation for 2020: The result consists of 3 optional cases:

- Case 00 (without policies): population in R1 still increases to 1907,2 thousand persons in 2020 but more slowly than actual observation. The gap between case 00 and reality is because of the limitation of CUE model in distribution of labors by different zones, and the quality of Hanoi urban data. Therefore, it effects to the population inflow in R1 which is lower than reality.
- Case 01 (with UMRT 2A and development of 3 sub-urban centers): population in R1 still increase but more slowly than the case 00 (to 1817,4 thousand persons in 2020). The case 01 shows the effect of migration from the city center to sub-urban centers in preventing congestion; and the operation of UMRT 2A (as expected in 2017) in reducing travel congestion and effect to household's choice of living.
- Case 02 (with UMRT 2A, 3A and development of 3 sub-urban centers): population in R1 still increase but more slowly than the case 01, in other word, there is small distinction between 2011 and 2020 (1702,2 compares to 1746,2 thousand persons). The case 02 shows the effect of migration from the city center to sub-urban centers in preventing congestion; and the operation of UMRT 2A, 3A in reducing travel congestion and effect to household's choice of living.

From all of the above observations, it can be seen that the description from Hanoi master plan seems to be unreal until this time because the mid-target year 2020 is closed to 2017 while the population in R1 still increases dramatically. In reality, the implementation progress of planning policies has been taken more slowly than the expectation in Hanoi

master plan (including UMRT network, sub-urban centers and satellite cities). Therefore, the more reasonable and convincing prediction of population in R1 can be seen from CUE calculation with the comparison between case 00, case 01 and case 02 as above.

After observation, we can identify the gap of population growth in R1 between reality and optional cases, analyze the causes and fill that gap. In general, the process of gap analysis shows whether UMRT network and sub-urban centers work effectively to help the city center in reducing pressure.

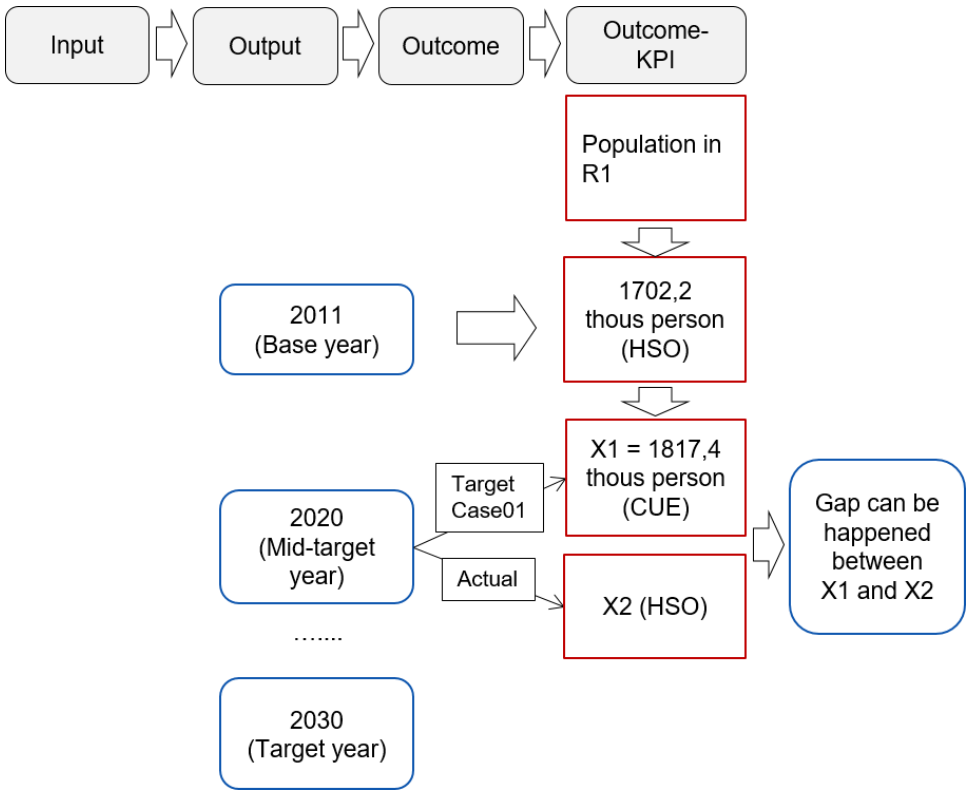

Figure 6.9 Identification of gap in population growth in R1

Figure 6.9 shows how to identify the gap with outcome-KPI as population in R1. The timeline has set up with three important years: 2011 (the year of master plan establishment) as the base year, 2020 as the mid-target year and 2030 as the target year. We take an illustration for analyzing gap with the case 01. In 2011, the population in R1 is 1.702,2 thousand persons (HSO, 2015). For 2020, CUE model estimates the population in R1 as X1 (as 1817,4 thousand persons) based on the effect of UMRT 2A and 3 sub-urban centers. In reality 2020, Hanoi urban data will provide us a real figure of population in R1 as X2. As a result, in 2020, the gap can be happened between X1 and X2.

Table 6.7 Actual and target population in R1 (persons) (HSO 2015 and CUE calculation)

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Actual (HSO)	1,702,200	1,741,500	1,772,000	1,796,000	1,819,300					
Case 00 (without policies)	1,702,200									1,907,186
Case 01 (2A, 3 sub-centers)	1,702,200									1,817,442
Case 02 (2A, 3A, 3 sub-centers)	1,702,200									1,746,200

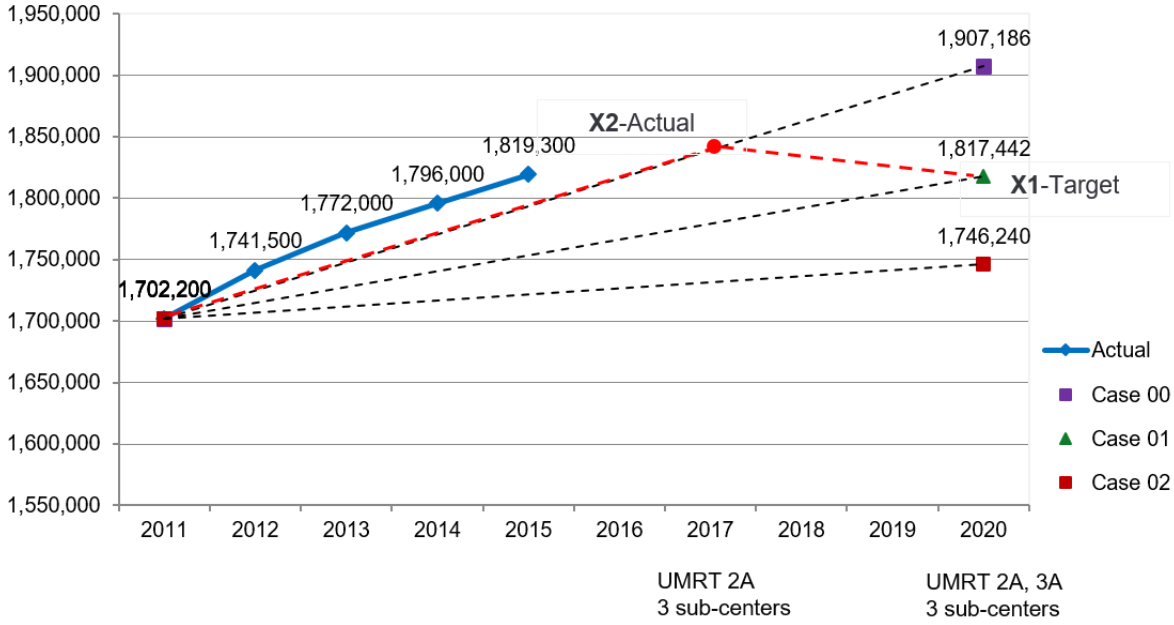

Figure 6.10 Comparison of Actual and Target population in R1 (persons)

As can be seen in figure 6.10, to check the gap between X1 and X2, we observe the development of the blue line (as actual population) and the hidden red line (as target population in case 01) until 2020. If X2 is approximately X1, the policies work effectively. If X2 is bigger than X1, population in R1 still increase at a more rapid pace than expected, the policies have some problems need to be improved. For example, let's assume what might be happened when the UMRT 2A is operated. In this case, the UMRT 2A may face difficulty to attract users because of the high price ticket, or inconvenient accessibility, or

low speed, or low quality of train and railway, etc. On the other hand, the development sub-urban centers are in slow progress. As results, those policies cannot encourage migration from the city center to sub-urban centers. Therefore, it is necessary to propose solutions based on the problems identified, to improve the UMRT 2A and 3 sub-urban centers.

From the gap analysis process, it can be seen that when we impact a policy, the population in R1 is trended to decrease in growth rate. From 2011 – 2015 and 2015 – 2017, there are no policies are updated, so population in R1 will be continuous to increase. As planned, in 2017, the operation of UMRT 2A can effect to the population growth rate by which population in R1 starts to decrease gradually until 1817,4 thousand persons in 2020. In 2020, if the operation of UMRT 3A and development of 3 sub-urban centers are possible, the population growth rate can be decreased one more time, by which population in R1 will be 1746,2 thousand persons in 2020. In general, from 2017 to 2020, the situation can be change year by year and we need to observe the implementation of planning policies and their effects. So up to this moment, it is difficult to predict the exact number of the population in R1.

At the end of Hanoi master plan in 2030, all policies are assumed to complete. Among them, policies effect directly to population development and migration consist of UMRT network (8 lines), BRT network, ring road network, sub-urban development (3 sub-centers) and satellite city planning (5 satellite cities). The completion and operation of these policies will illustrate whether a gap happen between the target and actual value of population in R1.

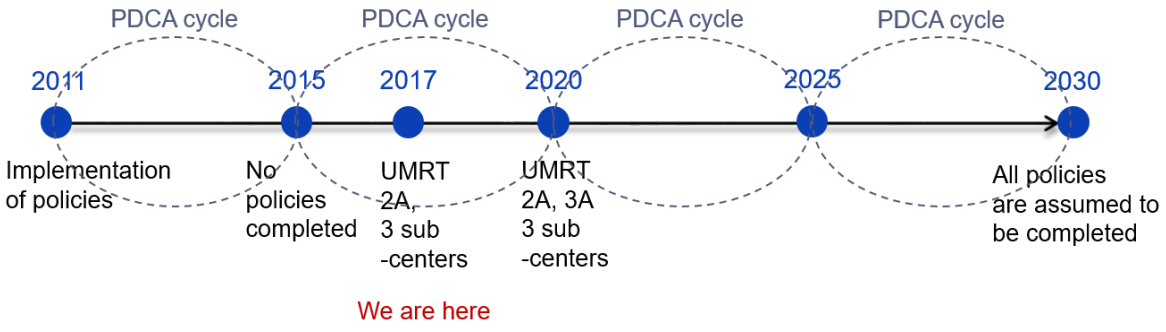

Figure 6.11 Timeline of policies' implementation

Following the timeline in figure 6.11, all of the policies from Hanoi master plan have been implementing since 2011 and assumed to be completed in 2030. The first process of gap analysis starts from the base year 2011 to 2015, the second from 2015 to the mid-target year 2020. The continuous processes will be taken from 2020 to 2025, then 2025 to 2030 as the final year of Hanoi master plan, when all of planning policies are assumed to be completed and achieve the target values. These periodical processes need to be monitored and evaluated by PDCA cycle. Therefore, the implementation of PDCA cycle in the M&E system is very significant when go back to revise and improve planning policies.

Overall, what we understand from the result of gap analysis process? It can be seen that when we impact a policy, the gap tends to be smaller, or in other word, the positive policy' effect can help to fill the gap. So gap analysis helps us to clarify the effect of each planning policy in which we can revise and improve it until we get outcomes.

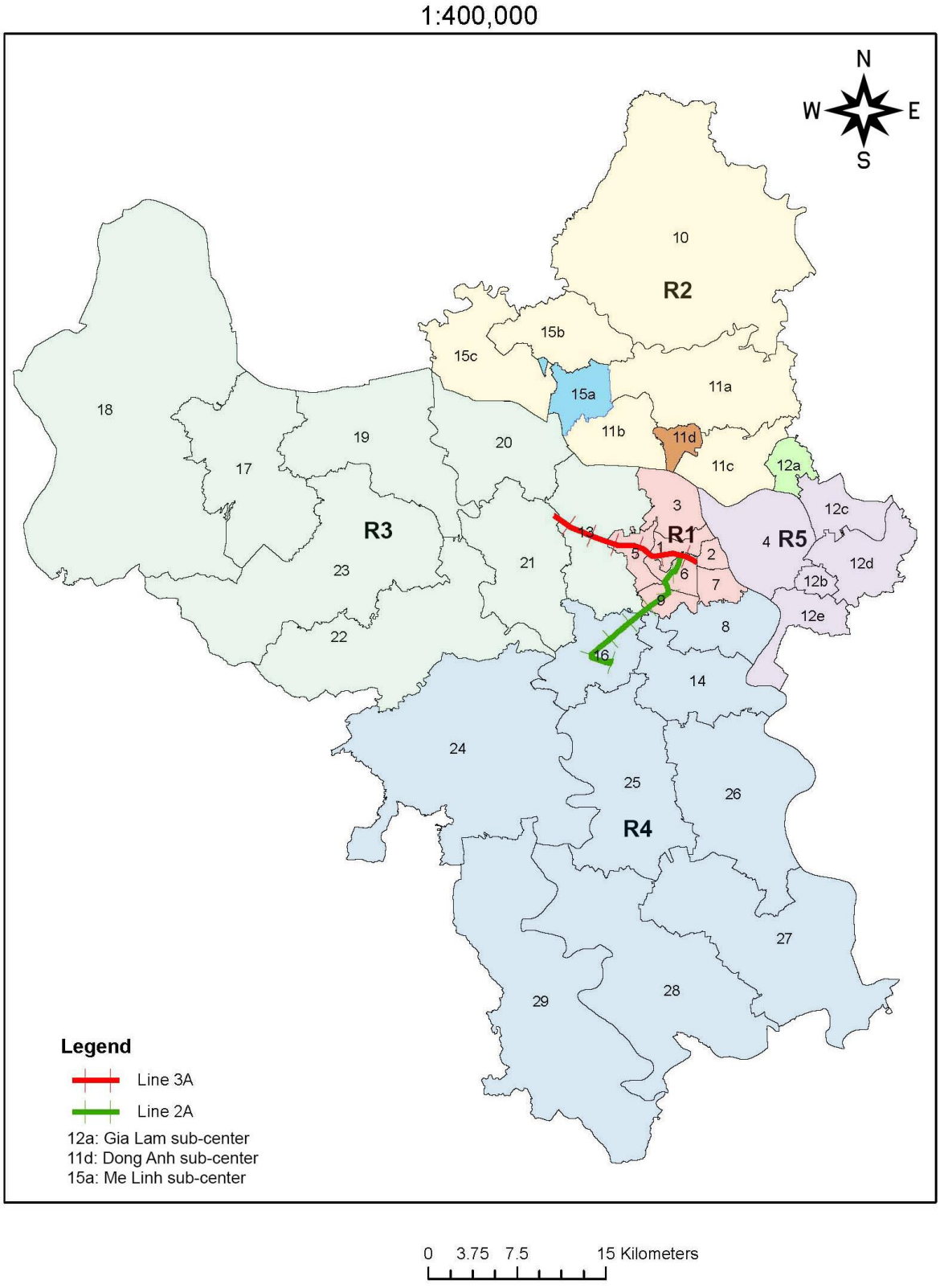

Figure 6.12 Position of UMRT 2A, 3A and 3 sub-urban centers

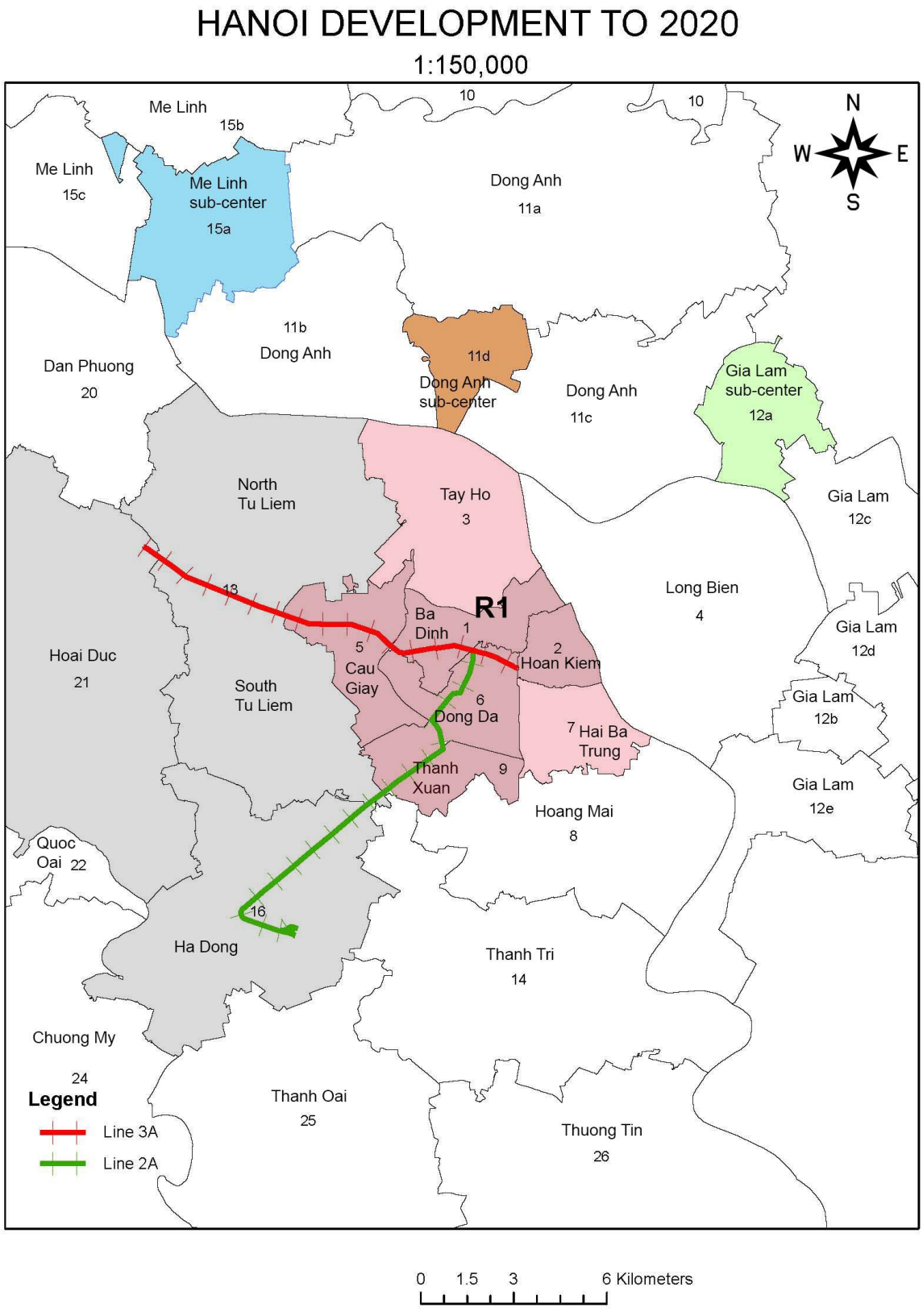

Figure 6.13 Impacted domain of UMRT 2A, 3A (by districts)

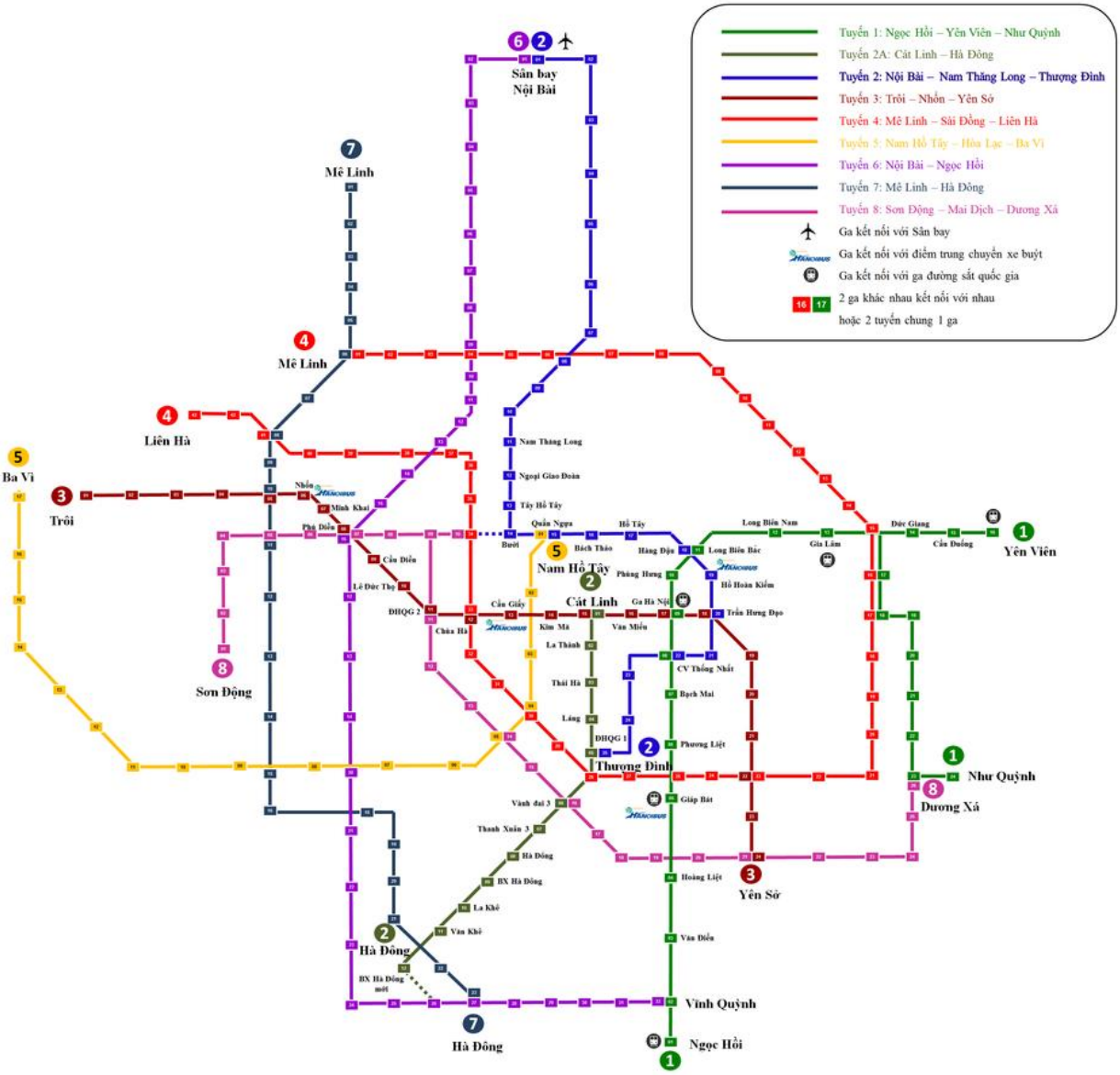

Figure 6.14 Hanoi UMRT Map (MOC, 2009)

6.5.4. Gaps in Hanoi master plan implementation

Generally, in the case of Hanoi urban development and Hanoi master plan, gaps are widely observed in practice in the issues below:

- The difference in population sizes in planning and reality in one observed time;
- Initial planning is not respected: planned infrastructure is not constructed accordingly (road routes for instance are not widen as planned…), lack of rooms for collecting water in new towns, constructional materials are not accurate as planned, buildings exceed their permitted heights;

- Late progress in many projects (UMRT lines, BRT, satellite cities…) because of some reasons as fund and site clearance;
- The derogation of investors: do not comply with their construction permits and allow illegal construction in reality;
- Urban sprawl: spontaneous urbanization (without infrastructure) takes place in agricultural land, natural or potentially flooded land (areas not suitable for construction) or around the peripheral industrial zone, peripheral suburban areas;
- Issues of conservation are not complied: Buildings with heritage value (ancient villas) are demolished.

Filling gaps is definitely not simple, especially for a large-scale and long-term urban plan as Hanoi master plan. During the implementation process of Hanoi master plan, gaps can be happened in wide areas and many agents have to take responsibility. For dealing with that, we need to find the suitable and useful tools to analyze gaps, problems as causes for gaps, in order to make adjustments for planning policies. This issue reminds one more times about gap analysis as the key function in the M&E system we established in chapter 4. The result from gap analysis will influence to the full system.

6.6. Conclusion

In this chapter, CUE model has proved to be a powerful tool for urban policy analysis and widely used in practice in Japan and other developed countries. Along with economic benefit CUE model can also a rich set of variables representing the real performance state of urban system. Therefore, it can be used to calculate KPIs in gap analysis process, in order to estimate planning policies' effects.

The process of gap analysis for the case of Hanoi master plan are clarified with general framework, KPIs calculation with CUE model and gap analysis. In general, the interpretation of the gap analysis result can be seen by observing the policies' effects to the population development in Hanoi urban center, how to decrease the population growth rate in Hanoi urban center and increase migration from the center to sub-urban centers, and how far is the policies' effects to Hanoi urban development. In addition, the chapter identifies gaps in wider areas in Hanoi master plan implementation and the necessary as well as challenges to do gap analysis in wide areas, as a key step of the M&E system.

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CHAPTER 7

CONCLUSION AND RECOMMENDATION

7.1. Conclusion

This research proposes a comprehensive M&E system for urban planning and development, focusing on the performance of urban master plans, utilizing the Logic model to develop KPIs, and Benchmarking for gap analysis under the PDCA management. To test the M&E system, the case of Hanoi Capital Construction Master Plan to 2030 and vision to 2050 has been illustrated, to show how the system work for an urban master plan's performance, from that possibly to reach higher performance in urban planning in general.

Chapter 1 introduced background of rapid urbanization and urbanization problems in Vietnam and Hanoi, problem statements that is necessary to build a M&E system in urban planning, and put forward to objectives, structure, methodology and expected contribution of the research.

Chapter 2 reviewed the literatures related to M&E in urban planning and development. Indeed, M&E system can be considered as a powerful key public management tool for urban planning. PDCA cycle is significant in managing the urban planning process, to ensure the plan, test and incorporate feedback before committed to implementation. The two more important issues in urban planning are engagement of stakeholders and data management have been investigated. From all points of view related to M&E for urban planning, the Logic model is considered a significant tool in telling the plan's

performance story by describing the logical linkages among project resources, activities, outputs and outcomes, and developing KPIs. The development and implementation of KPIs are essential to provide a basic set of criteria to evaluate existing cities and to measure the results of different urban planning projects. Benchmarking is one of the most appreciated methods to manage a city's performance, in which KPIs can serve as benchmark for evaluating city planning. Lastly, one of the tools for evaluation in urban planning mentioned is CUE model which is not only a powerful tool for urban analysis but also platform for discussion among urban stakeholders.

In chapter 3, many perspectives of Hanoi urban development and Hanoi master plan have been examined. The urbanization process of Hanoi is reviewed to identify the growth pattern of Hanoi over time. The investigation of 7 times Hanoi master plan shows that although many ideas for renovation have acknowledged and contributed to the city planning and development, some negative points still have to reviewed and solved in future. The newest construction master plan "The Hanoi Capital Construction Master Plan to 2030 and Vision to 2050" is considered the largest-scale plan and gives opportunity to Hanoi achieves the new vision. However, implementation of Hanoi master plan is not a simple issue and requires categorized forms of constraints including an effective management system. Therefore, it is necessary to build a concrete M&E system for Hanoi master plan to implement and accelerate the progress of planning and planning approvals in order to achieve its goals comprehensively.

Chapter 4 has shown the establishment of the M&E system for urban planning. To achieve a comprehensive and effective M&E system for urban planning, four functions have been identified as Quantitative management of policies' effects, PDCA cycle management of planning process, Engagement of Stakeholders, and Data management. In the M&E analysis, why and how to structure and combine different point of views and the way they work together in a system have been analyzed. In that, the Logic model is considered the main backbone of the M&E system to guide monitoring and evaluation in urban planning with several values. The M&E process has been built by 7 steps in order to implement an urban plan until it gets goals and objectives, test and incorporate feedback for its well performance. In this process, KPIs calculation and gap analysis are considered the key steps which influences directly to decision-making.

Chapter 5 has illustrated the application of the M&E system we proposed in chapter 4 for the Hanoi Capital Construction Master Plan to 2030 and vision to 2050. Accordingly, the analysis of Hanoi master plan has been corresponded to the functions and steps of the M&E system established before. As results, KPIs of Hanoi master plan have been selected, operated to Hanoi urban data, then benchmark to the target values for gap analysis. For KPIs development, the Hanoi urban data has been identified by sources, items and units, and base data for 2011. The role of different stakeholders from national to local levels in management of KPIs system is also identified. The possible outcomes when applying the M&E system is to improve the plan and help local authority improve their policies to achieve final goals. In general, the M&E system can be considered a significant management system for the large-scale Hanoi master plan, especially in the conditions as slow progress of implementation and lack of concrete tool for management.

Chapter 6 examined how CUE model can be used to calculate KPIs in gap analysis process, in order to estimate planning policies' effects. After that the full process of gap analysis for the case of Hanoi master plan are clarified with general framework, KPIs calculation with CUE model and gap analysis. In general, the interpretation of the gap analysis result can be seen by observing the effect of planning policies to the population development in Hanoi urban center, how to decrease the population growth rate in Hanoi urban center and increase migration from the center to sub-urban centers, and how far is the policy's effects to Hanoi urban development. In addition, the chapter identifies gaps in wider areas in Hanoi master plan implementation and the necessary as well as challenges to do gap analysis in wide areas, as a key step of the M&E system.

7.2. Recommendation

The issue of M&E systems for urban planning is not new, generally, to manage the planning process until we get goals/objectives. However, the way to structure functions of the M&E system by utilizing the Logic model, KPIs, Benchmarking and PDCA cycle has never been mentioned in previous researches. Generally, each of results has been analyzed, but still leave more to be investigated and answered. For the more precise assessment of the M&E system for urban planning and development, it is necessary to investigate in long period, with more contribution and feedback in both academic and practical perspectives.

For Hanoi and Vietnam urban planning and development, a concrete M&E system is very significant and necessary, in the context of rapid urbanization, poor management tool, lack of future prediction method and interaction between stakeholders. However, application of the M&E system for Vietnam and Hanoi is extremely not simple because of the political and socio-economic condition in the country. For the well operation of the M&E system in Hanoi, firstly, we expect to establish an organization to take responsibility for the whole M&E system. Secondly, we expect a concrete organization to be responsible for Hanoi urban data management, in order to assemble and operate the data system from different sources. Thirdly, we expect the effective engagement of stakeholders from different branches and levels in systemized management of KPIs for the Hanoi planning and development.