CHALLENGES OF URBAN FOREST PARK RESTORATION ON POST-CLOSURE LANDFILL: PERCEPTION AND FUTURE ENGAGEMENT FROM THE LOCAL COMMUNITIES

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อินทัน พรันซิสชา ฟิตรี : ความท้าทายของการพัฒนาสวนป่าในเมืองบนหลุมฝังกลบที่ปิดดำเนินการ: มุมมองและการมีส่วนร่วมจากชุมชนท้องถิ่น. (CHALLENGES OF URBAN FOREST PARK RESTORATION ON POST-CLOSURE LANDFILL: PERCEPTION AND FUTURE ENGAGEMENT FROM THE LOCAL COMMUNITIES) อ.ที่ปรึกษาหลัก : กัลยา สุนทรวงศ์สกุล

ความท้าทายของการฟื้นฟูสวนป่าในเมืองบนหลุมฝังกลบที่ปิดดำเนินการ: มุมมองและการมีส่วนร่วมจากชุมชนท้องถิ่น

การพัฒนาสวนป่าในเมือง ถือเป็นเครื่องมือที่ใช้ในการวางแผนการพัฒนาที่เหมาะสมสำหรับการแก้ปัญหาที่เป็นผลกระทบจากการเปลี่ยนแปลงกลายเป็นเมือง เช่น ปัญหามลภาวะและเกาะความร้อนในเมือง ซึ่งปัจจัยสำคัญในการพัฒนาสวนป่าในเขตเมืองได้ที่สำคัญ คือ การมุมมองรับรู้ระดับบุคคล ในการสร้างบริการจากป่านิเวศด้วยการพัฒนาสวนป่าในเมืองที่สามารถตอบสนองความต้องการของชุมชนและเพิ่มการรับรู้ผ่านการเปลี่ยนแปลงการใช้ประโยชน์ที่ดิน รวมถึงการได้คุณภาพชีวิตที่ดีในเมือง งานวิจัยชิ้นนี้จึงต้องการศึกษากรอบการพัฒนาในการพัฒนาการฟื้นฟูสวนป่าในเมืองบนหลุมฝังกลบที่ปิดดำเนินการ จากมุมมองและการมีส่วนร่วมจากชุมชนในพื้นที่ การเก็บข้อมูลดำเนินการโดยการสังเกตที่ภาคสนามและการเก็บข้อมูลจากการทำแบบสอบถามจำนวน 168 คน โดยคัดเลือกผู้มีส่วนได้ส่วนเสียจากชุมชน 5 แห่งที่ตั้งห่างจากจุดที่มีการพัฒนาสวนป่าในเมืองออกไปในระยะ 50 เมตรถึง1,000 เมตร นอกจากนี้ยังเก็บข้อมูลการสัมภาษณ์เชิงลึกกับผู้มีส่วนได้ส่วนเสียหลัก 15 คน ซึ่งได้รับผลกระทบจากพัฒนาโครงการฟื้นฟูระบบนิเวศน์ของที่ฝังกลบอ่อนนุชหลังการปิด โดยมีบทบาทและความรับผิดชอบทางสังคม ได้แก่ หัวหน้าหมู่บ้านทั้งอดีตและปัจจุบัน เจ้าหน้าที่เขตประเวศ องค์กรที่ไม่ใช่รัฐบาล และรัฐวิสาหกิจ การศึกษาในระยะแรกต่อการมุมมองรับรู้ของชุมชนต่อผลกระทบทางลบและทางบวกจากการฟื้นฟูระบบนิเวศบนพื้นที่หลุมฝังกลบอ่อนนุช ครอบคลุมประเด็นเศรษฐกิจสังคมและสิ่งแวดล้อม และพบว่าความต้องการส่วนทางสังคมที่สำคัญคือผลกระทบทางลบและทางบวกที่จะเกิดที่เป็นข้อกังวลจากมุมมองชุมชนมีนัยสำคัญด้านเศรษฐกิจสังคม ได้แก่ อาชีพ และรายได้ ซึ่งเป็นปัจจัยสำคัญที่ท้าทายการพัฒนาโครงการที่ต้องการให้เกิดกระบวนการร่วมมือและการมีส่วนร่วมอย่างต่อเนื่อง ซึ่งจากการศึกษาพบว่ามี 6 ขั้นตอนที่ต้องบูรณาการ ปัจจัยด้านสิทธิความเป็นเจ้าของ และความตระหนักรู้ เพื่อพัฒนาความต่อเนื่องในการมีส่วนร่วมของชุมชนในท้องถิ่น โดยขั้นตอนที่พบ มีดังนี้ (1) การตั้งเป้าหมายบริการด้านสิ่งแวดล้อม และความเป็นอยู่ที่ดี (2) การประเมินความต้องการของชุมชนที่ได้เรียนรู้รูปแบบสวนป่าในเมือง (3) การประเมินสภาพปัจจุบันด้านสิ่งแวดล้อมและเศรษฐกิจและสังคมที่เปราะบาง (4) การระบุความท้าทาย เช่น สิทธิความเป็นเจ้าของ และความตระหนักรู้ (5) การสร้างการข้อมูลสำหรับการปรับปรุง และ (6) การประเมินข้อมูลที่ได้รับสำหรับการปรับปรุงและสร้างเป้าหมายใหม่ ประโยชน์ของการนำประเด็นท้าทายเข้าไปในขั้นตอนต่างๆ

สาขาวิชา	สิ่งแวดล้อม การพัฒนาและความยั่งยืน	ลายมือชื่อนิสิต ....
ปีการศึกษา	2564	ลายมือชื่อ อ.ที่ปรึกษาหลัก ....

Intan Pransischa Fitri : CHALLENGES OF URBAN FOREST PARK RESTORATION ON POST-CLOSURE LANDFILL: PERCEPTION AND FUTURE ENGAGEMENT FROM THE LOCAL COMMUNITIES. Advisor: KALLAYA SUNTORNVONGSAGUL

Urban forest park development is considered a promising planning tool in tackling some of the problems associated with urbanisation, such as pollution and urban heat island effects. Individual perceptions are pivotal in the urban forest park development. Their significant factors were aimed to address the community's needs and increase the recognition through the disruptive change of land function and urban living toward urban forest park development. The framework of local community engagement in urban forest park development was proposed. Field observation and questionnaires survey of 168 respondents were selected from five villages located 50 meters-1000 meters radius from the site. In-depth interviews were conducted with 15 key stakeholders who had roles and responsibilities involving the project of ecological restoration on the On-Nut post-closure landfill. The former and current village chiefs, Prawet district government, non-government organizations, and a state enterprise were collected. Referring to the urban forest development on the post-closure landfill, the perception of communities through their needs was significantly found both negative and positive impacts. The study assessed the local needs which were socioeconomic, and environmental quality affected by the urban ecological restoration. Only occupation, and income were significant adverse impacts caused by the urban forest development. To develop the urban forest on the landfill, the study showed project framework development process should the concerns on sources of incomes interrupted by the project replacement. Moreover, the study referring to the concerns to develop the pre-construction of project, the well-being focussing on local occupation and incomes should be included in the target setting. Challenges of sense of ownership and local community awareness on the Green Bangkok 2030 were stated by stakeholder; therefore, they should be integrated into the key steps of engagement framework development. The study found that there were six steps based on the community perception on the urban forest development: (1) well-being and environment service goals, (2) assessing the community needs leaned from other urban forest models, (3) assessing existing conditions, not only the environmental quality, but also vulnerable socioenconomic aspects, (4) addressing the challenges such as the ownership and awareness, (5) generating the feedbacks, and (6) evaluating the obtained feedbacks and setting new goals. The benefits of these steps can lead to the implementation of engagement of sustainable development.

Field of Study:	Environment, Development and Sustainability	Student's Signature ....
Academic Year:	2021	Advisor's Signature ....

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LIST OF ABBREVIATIONS AND ACRONYMS

ADB	Asia Development Bank
AHP	Anal
BMA	Bangkok Metropolitan Administration
ES	Ecosystem Services
FAO	Food and Agriculture Organization
HDI	Human Development Index
MCDA	Multi Criteria Decision Analyst
MEA	Millennium Environmental Assessment
PCD	Pollution Control Department
SDGs	Sustainable Development Goals
UGS	Urban Green Space
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change

CHAPTER I
INTRODUCTION

1.1. Rationale Study

Community participation is the pivotal element in urban green space development, implying that community participation and engagement can lead to long-term sustainability. Nonetheless, the urban green area development does not always create a positive side for society. Therefore, it is necessary to consider the development of urban green space development that has a major impact on local community engagement. Nowadays, in the new era of urban project development is on the local community views and perception to response the construction activities particularly the community perception in the urban green space development.

In the part of urban development, the create the urban green space is the necessary part to boost the Human Development Index (HDI) due to urban green space infrastructure development has an impact of social economy and ecology to generate the urban people well-being. Yet the challenges of this development is the changing of local comunity, whereas it obviously can be seen at the vulnerable communities in the urban, they are frequently excluded from the decision-making process in urban green space development, particularly in the ecological restoration in the urban area (Brodowicz; Carpini et al., 2004). The perception is the result of the response of local community senses which would drive the active participation if the local comunity had the positive perception value.

In addition, the perception of local community could address the community engagement in project planning procedures. Public engagement on urban development appears to be interpreted in several ways, it is because diverse viewpoints on the community engagement could explain the variance in perceptions of community participation. The interconnection and link of perception and engagement could be the power tools to create the project sustainability. Therefore, the local community needs to express themselves by evaluating the perception. Because of perception is a key component of "bottom-up" planning strategy. Ensuring the local community perception and creating the engagement should be the important part of the urban green space development specially at the ecological restoration project.

Community engagement is widely viewed as a key component of the planning process since engagement is the merging aspect of participation and perception. Its use helps develop and progress democracy, particularly aggregative democracy (Rowe & Frewer, 2005). The fundamental of the engagement is the community participation is regarded as one of the foundations for good governance. It helps to improve the accountability, transparency and ensure sustainability of construction initiatives integrating people in development activities. For about the last twenty years, the scheme of participation has been widely implemented in the discourse of development.

Engagement of the local community in the urban green areas is necessary needed. Urban green spaces are regarded as one of the most important elements in city development, which the local communities should support. These issues were also highlighted on the announcement of the United Nations Sustainable Development Goals in September 2015 and the Habitat III New Urban Agenda in 2016 as the inclusive concept of development. In the agenda 21 has been set the goals of bringing citizens closer or accessible to the area and services they use, including the public hearing in governance, planning, design. Management, monitoring processes adds to the complexity. Linking from civic involvement in the early planning stages for green spaces (Loures & Crawford, 2008; Molin & van den Bosch, 2014; Van Empel, 2008). In the several developing countries such as Indonesia, Malaysia, and Singapore attempt to increase community engagement in urban green space development to improve sustainable achievement (Ali et al., 2021; Malek et al., 2015; Setiowati et al., 2020).

Over the last two decades, there has been a paradigm shift from a rationalist approach to urban planning, in which the decision-making process is primarily controlled by a few technocrats, experts, or government officials, to a more participatory approach, in which a wide range of stakeholders, including local people, were involved. According to UN Habitat (2010), this type of participatory planning moves away from planning for the people and planning with them. Agenda 21, a major blueprint that emerged from the United Nations Conference on Environment and Development in 1992, emphasized active participation of local communities as critical to achieving sustainable development because it allows local planning

authorities to develop strong policies that reflect local people's views and effectively address a wide range of social, economic, and environmental problems (United Nations, 1992). World Health Organization (WHO) mentioned the green infrastructure includes urban green spaces. It is a key component of a city's public open spaces and common services, and it can create a healthy environment for all residents. Therefore, it is crucial to ensure that public green areas are accessible to all local community groups and ensure the local community participation in the planning, design and maintenance of urban green spaces is important to assure that local needs are met (Bianconi et al., 2018; Miller et al., 2015).

Similarly, Thailand also has the Green Bangkok 2030 Project, which is an initiative that aims to completely green Bangkok's public spaces and set long-term action goals until 2030. One ongoing project is reconstructing the On Nut Ecological Forest Park at the post-closure landfill at Prawet District, Phase 1, area 18 Rai. Landfill restoration is one way to achieve sustainable development goals, making cities and human settlements inclusive, safe, resilient, and sustainable. It is also the essential point to achieve SDG 11 and SDG 15 in the big city and the added value for local community engagement. The establishment of policy and management strategies and the involvement of local people and managers are required to protect green areas in accessible urban sites (McPhearson et al., 2015).

One of Green Bangkok 2030 is to increase community participation in urban green space development. Nonetheless, the On Nut Ecological Forest Park process possibly faces challenges from using closed landfills as a forest park, especially community perception and participation in all project stages. The land-used transformation and infrastructure changes during forest park construction and operation would change the perception of nearby communities and related stakeholders from the different knowledge on ecological production, which would generate various benefits. In other words, related stakeholders should consider the levels of communication and information dissemination depending on the complicated level of technical information management, which various factors affect the local perception and changing behaviour on the change land function, information of complicated contamination prevention from the restored landfill, and the city

pollution. Consequently, educating the people about project development is a crucial phase of the first step for all public engagement programs.

Having a complete understanding of the public's perceptions of urban green space might ramifications urban planning and design. To provide good design recommendations, it's necessary first to understand what kind of green space may be built, who requires or would utilize such a space, and when the area would be used. In addition, A link between urban forest parks, public participation, and sustainability has also been discovered in the previous study (Chakraborty et al., 2020; Cleary et al., 2019; Colding et al., 2013; Erdkamp, 2020; Wu et al., 2020). Individuals and communities are more likely to support management initiatives that enhance urban green space. Besides, Pauleit et al. (2019) proposed context-sensitive urban green space construction that respects the diversity of citizens' desires and practices regarding urban green spaces. This knowledge will aid urban planners and politicians in maximizing the benefits of urban forest park development that are most valued by the public and contribute to creating cities that reflect their citizens' aspirations. This research aims to assess local people's perception of urban forest park development. It's also vital to investigate the local community's views on this landfill transformation. More extensive information of an individual's actual exposure to landfill area needed for the decision-maker and greater knowledge of the community's experience will help any proposed evidence-based local needs.

It raises questions about the management of green spaces, especially in terms of urban forest park development is how local people are involved in the management process. However, in-depth studies on assessing residents' perception of urban forest park development within a management context are minimal. Thus, to fill this research gap, the present study aims to understand how On-Nuch disposal plant residents perceive the importance of urban forest park development, how this perception varies depending on residents' background. Thus, it is necessary to evaluate the stakeholder understanding of these complex subjects. Determination of factors that support the project participation needs to identify the strategic engagement framework in the early phases of development urban forest park restoration on the post-closure landfill area.

1.2. Research Question

Increased community engagement is required to promote community perception in a single project. It could be the difference between an initial phase of urban forest park development, successful post-closure landfill rehabilitation and a failure. The government should encourage local communities participation because the local communities have a greater understanding of the situation near the landfill. The urban ecological restoration could address the changing of local community perception and behaviour. As a result, the following questions of this study will be focus on:

1. What significant factors influence community perception in post-closure landfill restoration plans in on-nut areas?
2. How is the future engagement framework to increase community engagement based on existing perception of sustainable ecological landfill restoration in the project area?

1.3. Research Objectives

Urban community limits connection to environment and can expansion the exposure to certain environmental damages, such as air, water, and noise pollution, especially for local community who live in the post-closure landfill area. However, It is feasible to identify the knowledge and understanding of urban forest park benefits for receivers, assessing the benefits of urban forest park development in other issues that should be questioned to the local community, all the responses and answers by the local community should be the aspect in creating the sustainable ecological restoration in the urban. This study provides the local knowledge and response of the post-closure landfill transformation. And as result, the following goals are the focus of this research:

1. To determine the significant factors to address the community's needs and increase the recognition through the disruptive change of land function and urban living toward forest park development.
2. To formulate the framework of local community engagement in the initial phase of the urban forest park development.

1.4. Expected Outcomes

Efforts to change the community perception and increase local communities' participation are disseminating the information, providing knowledge and education, and providing empowerment activities based on landfill restoration output. Therefore, the expected results of this study are:

1. The list and data of significant factors that influence community perception to participate in ecological restoration around landfill areas.
2. The expected engagement activities which could tackle the gap and the challenges of different local community perception.
3. Conceptual model of the strategic concept of continuous community engagement in post-closure landfill improvement programs.

1.5. Scope of The Study

This study will concentrate on the five towns within a 50-meter, 200-meter, 400-meter, 600-meter, 800-meter, and 1000-meter radius of the On-Nut landfill zones, as documented by the researcher earlier. These communities contribute to eco-restoration projects and the community perspective on ecosystem benefits that come from eco-restoration. Furthermore, community participation in the planning and monitoring stages of forest park development is referred to as public participation. The researcher will use a structured questionnaire and a purposeful random sample strategy to collect data for this study. In addition, all stakeholders involved in the research topic will be interviewed in-depth. Purposive sampling and multi-stage random sampling will identify selected key informants. this study requires demographic information from the respondents. Environmental data, such as images or other documents, will be used to back up evidence of the environment's impact on the landfill area's quality of life.

To close the gap revealed by this study, both quantitative and qualitative investigation approaches will be used. After that, descriptive statistical analysis and descriptive analysis will examine the results. All validated data show a complex network of components and their roles in developing a participatory strategy. The findings of the analysis and discussion and the participatory approach mechanism will

be presented to the following stakeholders: local communities, local governmental agencies, and educational institutions, as a recommendation for developing a community capacity-building program or a similar project at the landfill restoration site.

1.6. Expected Result

The output of this research is the engagement framework that can be applied for the local community's engagement in the initial and construction phase of urban forest park development not only at On-Nuch ecological urban forest development but also at all urban green space development. The outcome of this study is that the local communities understand, realize, and know about the benefit of ecosystem services from the urban forest park construction and contribute and participate in the project process. The findings of this research will benefit future research projects.

1.7. Significance of Study

The study's significance stemmed from the disclosure of factors and relationships in the participants. The perception, acceptance, knowledge, participation, and activities of the local communities toward establishing a sustainable urban forest park at the On-Nut post-closure dump area can be determined using the Participation criteria. It can serve as an example of a community participation framework that can adapt to environmental changes while addressing social issues. The significant factor of community in the On-Nut post-closure dump region had changed that reflection.

CHAPTER II
LITERATURE REVIEW

A literature review outlines and analyses related literature to provide insights into a study (McMillan & Schumacher, 2010). In corroboration of this view, Johnson and Christensen see a literature review as an explanation of the theoretical underpinnings of the study related to the current topic (Johnson & Christensen, 2019). In this chapter II, the writer will link the concept of community perception theory and the concept of community engagement to find the kinds of solutions to achieve sustainable urban development in the initial stage of landfill restoration. Starting from the sustainable urban development, stakeholder mapping, landfill ecological restoration, community perception and engagement theory.

2.1. Research Terminology

2.1.1. Community Perception

The process by which each individual selects organizes, and evaluates sensory stimulations from the external environment to provide meaningful experiences for him or herself (Adler & Gundersen, 2001)

2.1.2. Community Engagement

Community engagement in research is a process of inclusive participation that supports mutual respect of values, strategies, and actions for the authentic partnership of people affiliated with or self-identified by geographic proximity, special interest, or similar situations to address issues affecting the well-being of the community of focus(Fawcett et al., 1995; Jones & Wells, 2007; Minkler & Wallerstein, 2011; Moini et al., 2005).

2.1.3. Stakeholder

A stakeholder is any group of people organized who share a common interest or stake in a particular issue or system (Grimble & Wellard, 1997)

2.1.4. Post Closure Landfill Restoration

Restoration. The process returns a landfill site to a condition suitable for its after-use. Restoration includes design, initial landscaping works, soil spreading, and after care

2.1.5. Urban forest park

Urban forest park on this study refers to the combination of the urban forest and urban park, which has the tree, and public facilities (Singh et al., 2018)

2.1.6. Urban Forest Park Ecosystem Services

Urban forests provide multiple ecological, social, and economic benefits through ecosystem services. Ecosystem services are defined as benefits that humans obtain from ecosystem functions or as direct and indirect contributions from ecosystems to the well-being of humans (Assessment, 2005; Sukhdev et al., 2010).

2.2. On-Nuch Disposal Plant During Operation

The Pollution Control Department (PCD) forecasts average solid waste in Thailand to increase from 40,662 tonnes per day in 2008 to 42,900 in 2023. More than 50% of waste heads to landfills and has done so for more than four decades. As well as On-Nut Disposal Plant, more than 30 years ago operated to collect Municipal Solid Waste in Bangkok. On-Nut station is located approximately 20 kilometres to the east of the city centre. It covers 93.28 hectares of a residential area, which the Thai government owns. Apart from being a transfer station, this site also houses two hospital waste incinerators (Krungthep Thanakom Co., Ltd, with 30 tons/day), a composting plant (capacity 1000t/d), and a night soil treatment plant. Other wastes that cannot be disposed of in this site are transferred to a landfill in Panomsarakham by Pairojsompong, while hazardous waste is transferred to an incinerator in Samut Prakarn by Akkhie Prakarn Public Co., Ltd, the BMA reported that of the MSW collected in Bangkok 10% was composted in On-Nut.(Chiemchaisri et al., 2007; Sukholthaman & Sharp, 2016; SUN, 2017).

Secondary materials	Revenue unit (Baht/tonne)	Percent of material types
Paper	*5,926*	*100%*
Cardboard	4,850	58.2%
Newspaper	5,300	9.2%
Office (printed) paper	8,000	32.7%
Glass	*1,047*	*100%*
Flint cullet	1,400	20.6
Amber cullet	950	20.6
Green cullet	950	20.6
Mixed cullet	950	38.1
Plastic	*777*	*100%*
LDPE	600	24.2%
HDPE	1,600	18.8%
PET	1,000	22.8%
Mixed plastic	300	34.2%
Light beverage carton (LBC)	3,000	N/A
Steel	*16,824*	-
Compost	*1,000*	-

N/A: Not applicable

Figure 1 Solid waste management of On-Nuch Disposal Plant during the operation

Compost product obtained from On Nut composting facility, Bangkok, Thailand; paper derived from Thai consumption ratio (TPIA, 2006); glass and plastic modified from den Boer et al. (2005) with an omitted contaminant. According to the observation, the operation of the on-nut landfill has been halted for more than 20 years (Community and Local Staff interview,2021). On-Nut Disposal Plant empirical data is sufficient. As a result, the researcher should collect data on the current situation to focus on the post-closure challenges and conditions.

2.3. Post-Closure Landfill Ecological Restoration and On-Nuch Study Case

The post-closure landfills are susceptible to open burning and exposed to scavengers, and disease vectors, landfills, and dumpsites degrade the environment. Typically, dumpsites are poorly located and run by inexperienced personnel. The dumpsites pose a range of significant environmental dangers and consequences. The leachate produced by garbage decomposition contaminates surface and groundwater sources, rendering them unsafe for human consumption (Saxena & Bhardwaj, 2003). Open burning, fire hazards, and explosions pollute the air and contribute to greenhouse gas emissions (methane and carbon dioxide). Rushbrook et al., 1999.

Landfills are of interest due to their size and potential for redevelopment. Once closed, many landfills have been transformed into recycling centers, parks, recreational areas, and other land use. Instead of leaving a landfill site derelict and underutilized with no economic value, cities and municipalities can redevelop a site and create a community asset. According to Aplet (1977), creating parks and recreational spaces is popular land use for closed landfills. Examples include golf courses, parks, playgrounds, baseball diamonds, soccer fields, and rugby fields. Green spaces are popular end land uses for three distinct reasons. Firstly, the Ministry of the Environment (MOE) recommends "that uses on lands previously used for waste disposal be limited to open-air activities associated with parks, recreation and open spaces, crop farming and similar uses for which the landfill end-use is specifically designed" (Ontario, "Operational Guidance" 2)

Dumpsite rehabilitation projects are initiated due to one of the following reasons:

1. Presence of marketable material in the dumpsite that can be excavated for sale or use.
2. Reduction in the closure and post-operation monitoring costs of the site.
3. Stipulated requirement by the owner/regulator of the landfill to close and rehabilitate the site; and
4. The presence of toxic wastes within the dump site poses public health risks.

- **Dumpsite Rehabilitation Case Studies**

Landfill reclamation and rehabilitation have been employed as a tool for sustainable landfilling for the past 50 years worldwide. Landfill mining is the term for this practice. It's the process of digging materials from active or closed solid waste dumps and separating them for recycling, processing, or other uses. In Tel Aviv, Israel, in 1953, the first landfill mining operation was reported, and it was utilized to recover soil fractions that helped enhance the soil quality in orchards (Shual and Hillel, 1958; Savage et al., 1993). It was then used to obtain fuel for incineration and energy recovery in the United States of America (USA) (USEPA, 1997; Hogland, 1996, Cossu et al., 1996, Hogland et al., 1996). Other pilot studies from England, Italy, Sweden, Germany (Cossu et al., 1995; Hogland et al., 1995), China, and India

(Joseph et al., 2003). The table below lists papers relating to landfill restoration studies. Most landfill restoration studies focus on the process of change, biodiversity improvement, and design, with few papers addressing community perception and participation. As a result, this research will focus on the community through landfill restoration in the initial phase, with the possibility of obtaining community engagement in the future to establish a sustainable urban forest park.

Table 1 The previous study about landfill rehabilitation

No	Author/ years	Title
1	Anna artuso, elena cossu, liang he and qirui she (2020)	Rehabilitation of landfills. New functions and new shapes for the landfill of Guiyang, China
2	Andrzej długoński (2018)	Recreational development of old landfill: the case study of górka Rogowska landfill in łódź city, Poland
3	Wolfram hoefer, frank gallagher, theresa hyslop, tyler j. Wibbelt, beth ravit (2017)	Unique landfill restoration designs increase opportunities to create urban open space
4	Wong, j. T.-f., chen, x.-w., mo, w.-y., man, y.-b., ng, c. W.-w., & wong, m.-h. (2015).	Restoration of plant and animal communities in a sanitary landfill: a 10-year case study in hong kong
5	Giuseppe camerini and riccardo groppali (2014)	Landfill restoration and biodiversity: a case of study in northern Italy

On the other hand, there are many landfill restoration pilot projects in many places throughout the world, and several countries have experienced environmental, economic, and social improvements because of the reconstruction:

Table 2 Landfill ecological restoration benefit at other countries

Wuhan - Jinkou landfill restoration which restored more than 52 hectares	**Compared to traditional restoration methods, the project saved CNY829 million by employing aerobic ecological restoration. Health By restoring the waste site, more than 100,000 individuals who live near the landfill would breathe cleaner air. Social The new ecological park enhances Wuhan residents' quality of life while also promoting economic and social development in the surrounding area.**
Durban - Buffers' landfill closed-loop system	The benefits of the project include stronger community engagement and social capital (as the surrounding community is earning a living and improving their economic situation), environmental benefits (through the reintroduction of coastal forests, which would otherwise be under threat from farming), and economic development (energy use and sale, local jobs). The project has already been replicated in Durban's other landfills.
Seoul- Nanjido garbage dumpsite restoration	Plant and animal habitats have been improved. The Seoul city government manages the ecological park as a conservation area where animals and plants are preserved. The park's connectivity to the Han River,

	Bulgwancheon Stream, Hongjecheon Stream, and Hyangdongcheon Stream, which operate as eco-corridors, is responsible for the rapid increase in flora and animals. In 2010, the park was awarded the United Nations Habitat Special Award. This award recognises individuals, institutes, and businesses for their outstanding contributions to sustainable urban development.
Taiwan - Shanshuilu Eco Park	The benefits of this project included reversing the negative effects of the old landfill's filth, mess, and unpleasant stench, increasing the land's value, and improving the visible scenery. It rose to prominence as a brilliant example of landform rehabilitation and transformation. Various interactive facilities were constructed within the park through landfill rehabilitations and full utilization of natural and community environmental resources. It evolved into development with ecological vitalization, environmental preservation, recreational, and educational purposes. The recently constructed Shanshuilu Eco-Park has significantly improved the visual scenery and reconnected residents to their

	villages.
India- Eco Park Delhi's Okhla Landfill	Benefits to the environment: Reduced development strain on greenfield lands. Protection of the public's health and well-being. Groundwater, surface water, and air quality protection. Soil resource conservation and recycling. Benefits from the state. Improving the standard of living. The bad societal impression connected with them is removed by reviving the damaged neighborhoods. Fear of waste is lessened. Disseminating waste recycling information. Economic advantages. Increasing the value of a piece of land by repairing it. Increased use of current municipal services and reinvestment in them

2.4. Roles and Benefits of Transforming Landfills into Green Spaces

Urban parks and open spaces are critical for maintaining a high quality of life (De Ridder, 2004). Natural assets (e.g., urban parks and forests, green belts) and components (e.g., trees and water) in urban settings appear to improve quality of life in a variety of ways, according to empirical findings (Chiesura, 2004). Natural places provide social and psychological services, in addition to the apparent environmental benefits of air and water purification, wind and noise filtering, and microclimate stability (Chiesura, 2004; De Ridder, 2004). Nearby green areas offer city dwellers a variety of social and recreational possibilities, including the opportunity to meet new people, relieve stress, appreciate nature, exercise, and relax. The desire to live near urban green spaces has grown among city dwellers. People migrating to an urban area

have been studied for their 'willingness to pay.' According to one study, people are willing to spend a higher price for a residential residence near a high-quality park, green area, or open space (Hoffmann et al., 2012).

People who live closer to green spaces are thought to enjoy healthier and more meaningful lives, which is why they are ready to pay a higher rent or take out a more costly mortgage. According to Hoffman et al., "living near a green area provides various opportunities to contribute to one's health and well-being, as well as the ability to socialize" (Hoffmann et al., 2012). The importance of urban parks and green areas in balancing nature and the built environment is critical. People like to reside in communities with a high perceived quality of life, and businesses prefer to invest in them. People desire safe, culturally diverse neighbourhoods with activities for the entire family (Adams et al., 2010). As a result, parks and green spaces play an important part in a rising city's livability and sustainability, giving urban residents additional possibilities to enjoy a healthier and more active lifestyle. Green space has a favourable impact on human health and well-being. According to a study conducted in the Netherlands, having a view of a green space greatly speeds up the healing process for hospital patients (Cohen et al., 2007; Hoffmann et al., 2012). 'Public parks have a vital role to play in enabling physical exercise and contributing to a better lifestyle,' says Cohen, who agrees with Hoffman (De Ridder, 2004). Green space has been shown to improve human health and well-being (Cohen et al., 2007). However most urban brownfields sit dormant for lengthy periods with no clear purpose (Adams et al., 2001; De Sousa, 2003). This is due to various economic and environmental reasons that prevent or delay the rehabilitation process. It is critical for Bangkok cities to maintain their existing urban parks and green areas while also planning for expanding populations and changing urban dweller values. This section emphasizes the value of urban green spaces and how closed landfills can be suitable locations for new parks and recreational facilities.

The benefits of risk managing landfills can contribute to a city in three distinct ways:

- Restoring natural systems, reintroducing native ecosystems, increasing biodiversity, regenerating plants and trees, improving air quality, and

removing and managing dangerous chemicals are all examples of environmental benefits (De Ridder, 2004). The rehabilitation of a local landfill prevents hazardous material from flowing to neighbouring properties and transforms a once-undesirable site into a mixed-use property that serves both current and future social demands (Laing et al., 2006).

- Increased revenue to balance the costs of long-term waste care, new job possibilities, a larger tax base, and indirect economic advantages for the neighbouring areas are some of the economic benefits of redeveloping landfills (Tiesdell, 2008).

- Improved quality of life in neighbourhoods (people can live closer to work and recreational places), 13 eliminations of dangers to human health and safety, and possibilities for social contacts among neighbours and coworkers are some of the social benefits of converting landfills to green spaces (Environment & Economy, 2003). Many brownfields have the potential for urban rehabilitation to help achieve critical social and environmental goals while also generating financial benefits on public investments (McCarthy, 2002). Landfills are several types of brownfields with enormous redevelopment potential, resulting in environmentally, socially, and economically viable communities for present and future generations.

2.5. Community Perception, Engagement, and Sustainability

The brain's conscious reception, selection, processing, and interpretation of information through all senses is perception. What is perceived is also described using perception (Broadbent, 2013). In the sociological study, the terms "community perception" and "satisfaction" are frequently used to describe subjective social variables. The act of pleasure or the state of being pleased; gratification of desire; contentment in possession and delight; the serenity of mind resulting from compliance with one's desires or needs are all examples of satisfaction (Chesoh, 2010; Hassenzahl, 2018).

Participation is a process, not a commodity, that involves a variety of stakeholders who determine how and what services are offered. Participatory

partnerships are voluntary, and their success is contingent on stakeholders believing that the process benefits them (Schubeler & Bank, 1996). As a result, community members must be free to express their own opinions and convictions to address their neighborhood's specific situations and issues. It must be focused on promoting human development rather than boosting income, riches, or economic expansion. Lane & McDonald, 2005; Schübeler et al., 1996) argue that participation should be considered when making decisions, implementing, and maintaining programs, and evaluating successes and failures.

By incorporating society, urban green space planners will better understand people's needs and perceptions of urban green space, creating suitable urban green space provisions. In some circumstances, society may participate in creating and managing urban green spaces. The plan became more solid and effective because of the collective awareness created by public participation in the planning process (Keser & Gökmen, 2017). Various inputs from various perspectives will enhance the quality of urban green space. Furthermore, societal participation will foster a sense of ownership over urban green space. Based on the American experience, the more public participation in urban green space development and administration, the stronger their sense of ownership and belonging, and the more their motivation to nurture urban green spaces (Erickson, 2004). Positive cognitive pictures give them a sense of belonging and a willingness to care for urban green spaces. People will appreciate and care for a neighborhood with meaning for them, provides public access, and encourage use and engagement (Abu-Ghazzeh, 1996).

Community involvement ensures that the public is involved in a project's planning and decision-making processes. What is constructed and planned around them reflects their values, needs, and desires (Gibson, 2010; Wates, 2014). Environmental conditions as a space for human contact with other living and non-living organisms is one of the development potentials that must be considered. In urban park development, community participation entails equipping people with the knowledge, skills, and attitudes necessary to identify their environmental values and goals and act accordingly, based on the best available information about options and consequences (Cleveland & Cleveland, 2018). According to the opinion,

environmental citizenship entails equipping people with the knowledge, skills, and attitudes they need to identify their ecological values and aims and act according to their best understanding of options and consequences. The fast shift in people's behavior has drawbacks in each scenario, and community engagement activities can take longer in some cases (Dobson, 2007).

In contrast to communities being only consulted and enjoying project benefits, community engagement always influences the direction and implementation of community development projects. Participation must be more than a policy statement (Lane, 1997; Wheeler et al., 2007). The conditions for fostering public participation and engagement are to (1) promote the project agent's advantage image, (2) provide information to the public beginning with the project's preparation phase, and (3) encourage participation at every stage of the project to foster a sense of belonging through collaborative efforts (Bureekul, 2007; Rojanamon et al., 2012). As a result, the growth of community engagement shows that local communities ' participation in selecting, developing, planning, and implementing programs or projects would color their endeavor with local views, attitudes, and patterns of thought, as well as their values and knowledge.

This research assumes that all stakeholders have total flexibility, ability, and willingness to participate in the project's first stages. This project will examine individual characteristics (gender, education, social position, family income and asset, information access, awareness of public interest, satisfaction with development program, and community perception and engagement in this project) will be examined.

2.6. Stakeholder Engagement Toward Sustainable Green Space Development

When establishing the strategy, it is critical to recognize the spatial potentials and difficulties of urban green spaces in a city and the community's needs, values, and priorities. The Urban Green Space Strategy will provide possibilities to bring together many different features and perspectives for improving the city's quality of life. Furthermore, improvements may be made in securing the collaboration of various

stakeholders and raising public knowledge about the several significant issues that must be addressed. People should be encouraged to recognize and sign up' for the reality that green space opportunities are tied to the public good and that they require public support, if not participation, to grow and administer properly.

Governments are primarily responsible for developing and managing green spaces in metropolitan areas. There is a growing perception that the government is no longer the sole agent in the construction and administration of green spaces. "The state is an important driver of progress, but it is not the sole one." (Keser & Gökmen, 2017; Elahi, 2009; Jain & Jain, 2013; Elahi, 2009). To increase the quality of urban green spaces, a comparative study of the creation and maintenance of green spaces in 26 European cities proposes that "a collaborative and cooperative relationship among local authorities, local business, and voluntary groups should be developed" (Baycan-Levent & Nijkamp, 2004).

The function of stakeholders in the company's environment cannot be isolated from the involvement of diverse parties in a development program. According to (Aras & Crowther, 2008), stakeholders have a vested interest in the organization/success. Companies can be impacted by the organization's or company's activity. His article also stated that managing stakeholder relationships would be challenging if the organization did not measure what stakeholders should take. As a result, organizations should determine what their stakeholders are like and maintain ties based on their characteristics and interests.

The stakeholder theory's primary concept is that the better the corporate relationship between stakeholders and the firm, the better the company's business will be, and vice versa, especially if the relationship between stakeholders and the company is bad. This is due to the company's dependency on its stakeholders, either directly or indirectly. Trust, respect, and cooperation are the foundations of strong stakeholder relationships. A community development program, for example, must be tailored to the character of the community and its surroundings.

To determine the role of each stakeholder, all actors or groups that impact and are affected by a program's policies, choices, and activities, a stakeholder analysis is required. In this study, the role of each stakeholder has a significant impact on the success of the urban forest development program and the likelihood of stakeholder conflicts in the field.

2.7. Urban Forest Park Benefits and Drawbacks.

Approximately half of the world's population now lives in cities, with industrialized countries accounting for 76 percent and developing countries accounting for 40 percent. By 2030, 60 percent of the world's population is predicted to reside in cities, with developing countries accounting for most of the additional urban growth (United Nations, 2005). Urban planning that prioritizes environmental quality and human health could mitigate the impact of city life on the Asian population's physical and mental health. Because most Asian cities are tight and have the world's highest population densities (Wendell Cox Consultancy, 2006), it is critical to prepare for the coexistence of greenery and built-up fabric. Greening Asian cities could help achieve sustainable and healthy city goals that will benefit tens of millions of people. Their expansion provides an opportunity for environmentally sustainable planning and development.

Figure 2 Urban green space distribution in ASEAN countries.

City planning must be restructured. By designing annual public and private planting plans with a 5-year rolling horizon, the spirit and purpose of urban green space might be transformed into action plans (Jim, 1999). The diagram above depicts the urban green space standard for each ASEAN country. Each country is attempting to raise the number of green spaces per person, such as Thailand in 2030 having to increase the number of green spaces per person by around ten sqm/person. Creating urban green spaces, such as parks, urban forest parks, and other green spaces in the city, aims to improve environmental services in the urban region. According to Constanza et al. (1998), urban forest parks can assist the ecosystem by providing environmental services. This hypothesis was then modified by De Groot et al. (2002) into 23 categories of ecosystem services. Meanwhile, the Millennium Environmental Assessment (MEA) divides the relationship between ecosystem services and human life into four divisions and 23 classes:

- Foodstuffs, clean water, fiber, fuel, other primary materials, genetic materials, medicinal and biochemical materials, and ornamental species are short supply.

- (7) Air quality regulation, (8) Climate regulation, 9) Disturbance prevention, 10) Water regulation, (11) Waste treatment, (12) Soil protection, (13) Pollination, (14) Biological regulation, and (15) Soil formation are all regulated.

- (16) Aesthetics, (17) Recreation, (18) Inspiration, (19) Cultural legacy and identity, (20) Spiritual and religion, and (21) Education is some of the aspects of culture.

- Supporters: (22) habitat and reproduction protection, (23) germplasm protection

Table 3 The urban green space impact

Economy	Sociocultural	Environment
POSITIVE IMPACTS	POSITIVE IMPACTS	POSITIVE
• Demonstrated a high ratio of added value (no or le ss input of raw materials), promised high-profit creation (less input of capital), brought in money through attracting foreign tourists (Ko &Hong, 2 004)	• Changes in the composition of residents, occupation, sense of value, traditional way of life, and consumption patterns (Pearce, 1981)	• Improve the air and water quality.
	• Improving the quality of education, contributing to international peace, overthrowing social, racial, and religious barriers, understanding the native culture, adopting new ideas, conserving traditional culture, and exchanging different cultures	• Reduce the odor in the surrounding environment
• Created opportunities for employment and spending by tourists created an income of the residents who spending activity, in turn, vitalized the local economy (Ko &Hong,		• Improve organic land matter
		• Provide the habitat for promoting biodiversity
		NEGATIVE IMPACTS (Ko & Hong, 2004; Oh, 2003)

2004)	(Yamashita, 1997; Ko & Hong, 2004)	
NEGATIVE IMPACTS		• Bird migration and wild animal
• The problem of opportunity cost, the leakage of profits created by the tourism industry to the outside, the employment issue of low-quality positions for locals, the rise in living costs and land price, the change in the local economic structure, and the use of excessive energy (Ko &Hong, 2004)	NEGATIVE IMPACTS (Oh, 2003) • Difficult to be generalized, but increase in crime, thieves, vandalism, addiction to drugs and alcohol, smuggling, and prostitution • Aroused the feeling of self-contempt and loss of self a mong local	• Pollution; changes in soil quality, plant population, and ecosystem; environmental degradation; changes in topography; and destruction of rare plant and animal species.
• Hindered the formation of an independent local ec onomic structure (Ko &Hong, 2004)	• Moral laxity and an increase in crime with the openin g of adult entertainment businesses • Abandonment of agriculture (souvenir shops, cafes, and restaurants with a quick return of cash)	• Damage the infrastructure around the area by the root and litter.

According to the pre-research observation, the On-Nuch post-closure landfill area will also provide the benefit and the drawback for the community and environment.

Table 4 The Impact of development urban forest park at On-Nuch

Impacts	Positive	Negative
Physical	Increase the esthetic and original view value of the environment	Patch or jogging track could add the density and pressure on land, this urban forest park development close to the airport, about 12Km from Suvarnabhumi airport high and the giant tree should appropriately select, so could affect the flight system. (impact of the airport EIA)
Biological	Improve the area biodiversity	Increase the litter of the tree.
Ecological	Create microclimate, provide the habitat for increasing the biodiversity	-
Health	Improve the air quality in the surrounding area.	-
Social	Improve the phycology and the interaction of community (improve the communication way of the local community)	Increase the criminality in society.
Economy	Improve the business and improve the income of the	Unemployment could increase the cause of the

	local community.	landfill being reconstructed.

2.8. Urban Forest Park Development to Achieve the SDGs

The high population coupe with mobility in urban areas is the leading cause of civilization stress. Ulrich, 1991 that if individuals are stressed, doing activities in the natural environment or interacting with the natural environment will reduce stress or restorative effects, while many urban environments will inhibit healing due to pressure from the surrounding area (Ulrich et al., 1991). City green open space meets natural and human systems in an urban environment. The importance of urban green space play, especially in the neighborhood, has been proven in several studies (Wood, 2003)

Urban forest park encourages interaction between resident communities and the natural environment. Greenspace also provides social and environmental services that contribute to the quality of life in the city. The effect (health improvement) cannot always be attributed to the availability or amount of green space. Notice that green space availability in a site may be a proxy for socio-economic factors, explaining green space's supposed health impacts (Maas et al., 2006). Bangkok, a city with a high enough density, is one of the countries with the least green space among major cities in Asia. Thus, the Bangkok Metropolitan Administration (THE BMA) plans to add green space for Bangkok residents from 6.14 square meters (m2) per person to 6.38 m2. It is not easy because green space is not a leading strategic national urban planning (Thaiutsa et al., 2008).

Figure 3 Benefit of on nut disposal plant ecological restoration planning

       The figure shows the benefit of urban forest park development. Based on the On-Nut Disposal, there are three aspects of landfill redevelopment: environmental, social, and economic benefits.

Environmental benefits:

- Reduction of development pressure on green fields sites
- Protection of public health and safety
- Protection of groundwater resources, surface water, and air
- Protection and recycling of soil resources

Social benefits

- Improving the quality of daily life
- Elimination of the negative social impression associated with the affected communities by revitalizing them.
- Reduction of the fear of garbage
- Spreading the knowledge of waste recycling

Economic benefits

- Increasing land value by improving degraded property
- Increased utilization of and reinvestment in existing municipal services

The key to long-term development is balancing using natural resources for socioeconomic development and protecting ecosystem services critical to everyone's well-being and livelihood (Falkenmark, 2017). There is no set method for establishing this equilibrium. Understanding how ecosystem services contribute to livelihoods and who benefits and loses from development interventions is critical. The suggested Sustainable Development Goals can be directly influenced by ecological restoration (SDGs). On-nut restoration planning, when combined with a sufficiency economic concept, can achieve several important goals, as illustrated in the table below:

Table 5 Links urban forest through SDGs

Sustainable Development Goal	target	Role of urban Forest	On-Nuch Action Planning
1 NO POVERTY	1.5	Urban forests create employment, provide a resource for entrepreneurs, reduce the cost of urban infrastructure, provide ecosystem services for all citizens, improve the living environment, and increase property values, ultimately boosting local green economies	Community around possible to create the business around the urban forest park: Selling fruit, selling their homemade product

2 ZERO HUNGER	2.1 2.2 2.3 2.4	Urban forests are direct food sources (e.g., fruits, seeds, leaves, mushrooms, berries, bark extracts, saps and roots, herbs, wild meat, and edible insects). Indirectly, they support healthy eating by providing affordable woodfuel, high-quality water, and improved soil for sustainable agricultural production	Planting various trees will create a habitat for plants and reduce the odour in the environment. reduce the soil degradation would help the community to the home plantation
3 GOOD HEALTH AND WELL-BEING	3.4 3.9	Forests and other green spaces in and around cities provide ideal settings for many outdoor recreation and relaxation activities, thereby contributing to the prevention and treatment of non-communicable diseases and mental health maintenance. Urban forests filter and efficiently remove pollutants and particulates, which also helps reduce the incidence of non-communicable diseases	Providing the exercise facilities like a jogging track will help the community improve their habit. By improving the air quality, humans on this site will not experience lousy air quality.
6 CLEAN WATER AND SANITATION	6.3 6.6	Urban forests are efficient regulators of urban hydrological cycles. They filter drinking water by reducing biological and chemical pollutants, reducing the risk of floods and erosion, and reducing water losses by minimizing microclimatic extremes through evapotranspiration	The tree root and grass on the forest park will reduce the rain-off and keep the good under-land water.

		processes	
7 AFFORDABLE AND CLEAN ENERGY	7.1	The sustainable management of urban forests can produce renewable energy for urban communities. it is a vital function for billions of urban and peri-urban dwellers worldwide, particularly in lower-income countries, where woodfuel is often the most affordable and sometimes only available source of energy	Planting the tree will produce oxygen and reduce the odour in the environment.
8 DECENT WORK AND ECONOMIC GROWTH	8.4 8.9	Investments in urban forests and other green infrastructure add significantly to green economic growth by providing an attractive environment for tourism and business, improving home values and rental rates, creating job opportunities, providing materials for housing, and generating savings in the costs associated with energy and the maintenance of human health	Increase the income of the local communities by providing the community capacity building
11 SUSTAINABLE CITIES AND COMMUNITIES	11	Well-designed and managed urban forests contribute to cities' environmental sustainability, economic viability, and liveability. They help mitigate climate change and natural disasters, reduce energy	Forest and plants were planted has multi-function as the habitat for the animal, as the temporary habitat for animal's migration, create a good

		costs, poverty and malnutrition, and provide ecosystem services and public benefits	environment
13 CLIMATE ACTION	13.1 13.2 13.3	Trees and forests in and around cities contribute to climate-change mitigation directly by sequestering carbon and reducing greenhouse gas emissions and indirectly by saving energy, reducing the urban heat island effect, and mitigating flooding	implementing integrated policies and plans towards inclusion, resource efficiency, mitigation and adaptation to climate change, resilience to disasters, and development and implementation, in line with the Sendai Framework for Disaster Risk Reduction 2015-2030, holistic disaster risk management.
15 LIFE ON LAND	15.2 15.3 15.4	Urban forests help create and enhance habitats, constitute a pool of biodiversity, significantly improve soil quality, and contribute to land restoration	Increase the biodiversity in the urban area, provide ecosystem services, and decrease the degradation as well as the environmental damage

Add smart consumption to achieve the 2030 and 2050 urban areas: effective consumption to mitigate climate change and social changing (human rights, environment service sharing, policy, and implementation).

2.9. Analyst Hierarchy Process to Find the Significant Factor

Multi-criteria Decision Analysis (MCDA) is a retrieval analysis that results in several decision criteria. Researchers in economics and retrieval decisions found

flaws in a neoclassical understanding of decision-making and location in the early 1970s, and the approach was born (Carver, 1991). MCDA is a strategy for supporting decision-making in problems with many criteria and options that uses a systematic quantitative approach. Its goal is to assist decision-makers (Decision Maker / DM) in making more consistent judgments by considering significant objective and subjective aspects, particularly user requirements. MCDA is a collection of methodologies that allow individuals or groups to rank, choose, and compare diverse options (e.g., products, technologies, policies) by explicitly accounting for many factors (Belton and Stewart, 2002). According to (Wang et al., 2009), MCDA is a type of integrated sustainability evaluation, an operational evaluation, and a decision-making support technique that may be used to solve complicated challenges.

MCDA includes a variety of approaches, including SMART, Swing, AHP, ANP, WSP, WSM, TOPSIS, ELECTRE, PPROMETHEE, and many more. MCDA is applied in a variety of multi-discipline evaluation challenges, including technology selection in energy exploration (Khorasaninejad et al., 2016), land use (Lami & Abastante, 2014), sustainable development (Grady et al., 2015), agriculture (Wijenayake et al., 2016), and many others.

In this study, MCDA would adhere to the criteria set forth by the Asia Development Bank (ADB) in its Initial Environmental Examination of Solid Waste Management Improvement Project in 2009. The project description criteria can be identified in three steps. The table below shows the current state of the post-closure landfill area, as well as a list of urban forest development projects:

Table 6 Criteria related to sustainable urban forest park development

Phase of		Available status	Explanation
Pre-Construction	Preparation of Conceptual Study	Available	Preparation conducted by the BMA, which collaborate with other stakeholders

			like PTT, Big Tree, WePark, and University
	Site Selection and Allocation	Available	THE BMA has been selected a location of about 8 Hectars to develop an urban forest park.
	Preparation of Development Plans	Available	The BMA and PTT cooperate to design and prepare the plan
	Conduct of Environmental Assessments and preparation of the IEE	Unavailable	Insufficient Budget and time allocation (recommendation: should conduct)
	Securing the necessary permits and clearances	Unclear	The BMA is the authority of the land. Therefore, permits are not necessary. Nonetheless, the BMA does not promote the plan to the community. Recommendation: the BMA should

			inform the local communities plan because mostly the community work depends on this landfill area.
Construction Phase	Site preparation and Construction of Landfill		The landfill has closed since more than 15 years ago.
	Construction of the Administrative Building and operations Buildings		There is a building office as the centre of the administrative, operational building
	Land preparation include land levelling, construction of access and internal roads, drainage facilities, and other horizontal earthworks		

The overarching goal for criteria, sub-criteria, and options are all part of this structure. The AHP MCDA methodology will be used in this study, and it has an

advantage over other multi-criteria decision support methods in that it incorporates intuitive knowledge decision-makers into analytical conclusions (Saaty, 2000). The goal of AHP is to figure out how decisions are made and what factors influence them. One must be familiar with the subject of decisions to use AHP. Experts in the field must determine what factors influence judgments. The structure problems and the weighting of various problems are divided into two sections in AHP. First, the decision-maker must break down decisions into easier-to-understand hierarchical sub-problems.

CHAPTER III
RESEARCH METHODOLOGY

The urban forest park improves the local community's ecology, economy, and social influence. Environmental degradation, air pollution, and water contamination as landfill area repercussions could be rectified by ecological restoration during the landfill's post-closure development into an urban forest par. Shifting the land function would address the local community's changing participation. It encourages public participation in the design and operation of urban forest parks. To understand the main variables affecting community participation and the community engagement framework, it is necessary first to understand the community's perception and then initiate engagement.

3.1. Conceptual Research Framework

This study aims to identify the most important factors impacting community participation and provide a framework for the local community's interaction in the early stages of urban forest development and landfill operation at On-Nut. The community in the On-Nut post-closure dump region can evaluate the benefits and functions of urban forest parks using this approach.

To support the research findings, including the elements impacting involvement, literature on community engagement was evaluated, including sustainable green space and resource development, stakeholder interaction, and decision-making tools. Other relevant data from local government agencies and the national government will be collected and evaluated to understand better the development of urban forest parks concerning community knowledge, capacity, and land-use changes.

The process of knowledge transfer between urban populations and green space development is facilitated by community engagement. Engagement motivates participants to share their perspectives and experiences, adding depth to the evaluation and encouraging biodiversity in the urban environment. Roundtable conversations, rapid social problem and existing assessments, and assessing community needs and perceptions are popular tools used to analyse critical elements and the community engagement process. Stakeholder identification would lead to valuable responsibilities

and roles in constructing an urban forest park. The trust and sense of belonging would be created by identifying the project design based on community needs and perceptions. The key factors discovered would help with decision-making in developing a long-term community participation framework. This study's conceptual framework depicts the overall community engagement framework and its strategic components. The study's conceptual framework was divided into three components. It consisted of

The environmental impact of an urban forest park was studied in three ways: physical, biological, and social.

The conditions of the post-closure landfill site are defined using MCDA and analytic hierarchy process (AHP) approaches and a process of involvement bridging across factors and a community empowerment framework. The effects of complicated community participation during constructing an urban forest park, where environmental circumstances alter community awareness and participation. As a result, observation, snowball and in-depth interviews, questionnaires, and field surveys will be used to collect baseline studies of engagement and other available data related to urban forest park development, such as socioeconomic status.

1) demographic information on respondents, 2) perception, acceptability, and awareness of the urban forest park development, 3) major determinants in community participation, and 4) community engagement and perception are among the study's goal information or datasets. Field observations, questionnaire surveys, and in-depth interviews were used to collect primary data, while secondary data was gathered by studying academic journals, government records and reports, and published materials.

RESEARCH FRAMEWORK

Community engagement for sustainable unban forest park development

Urban forest park environmental impact

Site description

Site Project Information **(physical/biological impact /social impact)**

Strategic community engagement scheme

Tools of multicriteria of community participation management (MCDA): **(pre-construction, construction, operation)**

Community internal factor (gender, education, income, age, occupation)

Community perception

Community knowledge

Community acceptance

Community participaction

Stakeholder mapping

Significant internal factor

Significant factor of community participation

Quantitative analyst

Quantitative and qualitative analyst

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CHULALONGKORN UNIVERSITY

Significant factor categorized

Scoring of analytic hierarchy process (AHP)

Community preference and AHP comparison studies

significant factor of perception

Community engament framework

Figure 4 Research framework

This research begins with a primary study to assist the researcher in comprehending the current situation, policy, legislation, and community in the project's immediate vicinity. According to the project plan, the BMA launched the Green Bangkok 2030 Project to collaborate between public, commercial, and civil sectors armed with the capability and public consciousness to expand green areas in Bangkok. As a result, all indicated groups, including the community, were chosen at random to complete the questionnaires. Another group was key stakeholders with duties and responsibilities in the On-Nut post-closure landfill project's urban forest park. The BMA (Bangkok Metropolitan Administration) is in charge of green space development. Big Tree is an environmental volunteer and advocacy organization that collaborates with communities, government agencies, the commercial sector, and other civic organizations to raise public awareness and support initiatives that help conserve public green spaces in Bangkok and beyond. We Park is a project that aims to turn vacant lots into green public areas. The Thai Health Promotion Foundation is assisting us. The private sector is referred to as PTT.

All the stakeholders mentioned above will be purposefully chosen to be interviewed. The questionnaire survey and in-depth interviews were analysed using descriptive statistics and event analysis. The community participation variables were prioritized based on their percentages from the highest to the lowest influenced level. Finally, they were used to construct a community involvement framework to develop a sustainable urban forest park.

3.2.Study Area

Post-closure On-nut landfill area located at Soi Onnut 86, On-Nut Garbage Disposal Plant on-nut Rd. (soi Sukhumvit 77), Prawet, Prawet, Bangkok 10250. The urban forest planning on-nut landfill area covers an area of 8 Hectares. On the other hand, this location has one other active landfill with about 4,690 tonnes/day. The eco-urban forest would be developed in the ex-landfill area, closed to operation more than 15 years ago.

The On-Nut landfill location is near Bangkok's city centre, about 46 km and only 12 km from Suvarnabhumi airport. Simultaneously, the population in this district reaches 172,761 people with an area of 52,490km, then about 5,021 people live 1 km from the On-Nut Garbage Disposal Plant. Therefore, this study would find many social factors such as diversifying resident socio-economic condition, factory, company, and stakeholder.

On the observation stage and initial interview with the local THE BMA   and prewet district staff, at least three community lives depend on the On-Nut area as the scavenger or the BMA local staff. Those communities stayed on the site of the On-Nut landfill area. According to Thailand EIA, the direct beneficiary community that receives the impact optimally is the community that stayed about 1 km from the project area. Therefore, this research will be conducted at a district around 1 km from the On Nut (ONEP, 2016).

The pre-observation defines the total population in this selected site. About 5021 people lived in the area cover about 5 *Village* (village). In addition, THE BMA mentioned the target of this project is the people can access within 400 meters. Accordingly, the selected research site is also based on the accessibility of the community, and 1 km is appropriate for the local communities to walk to the site.
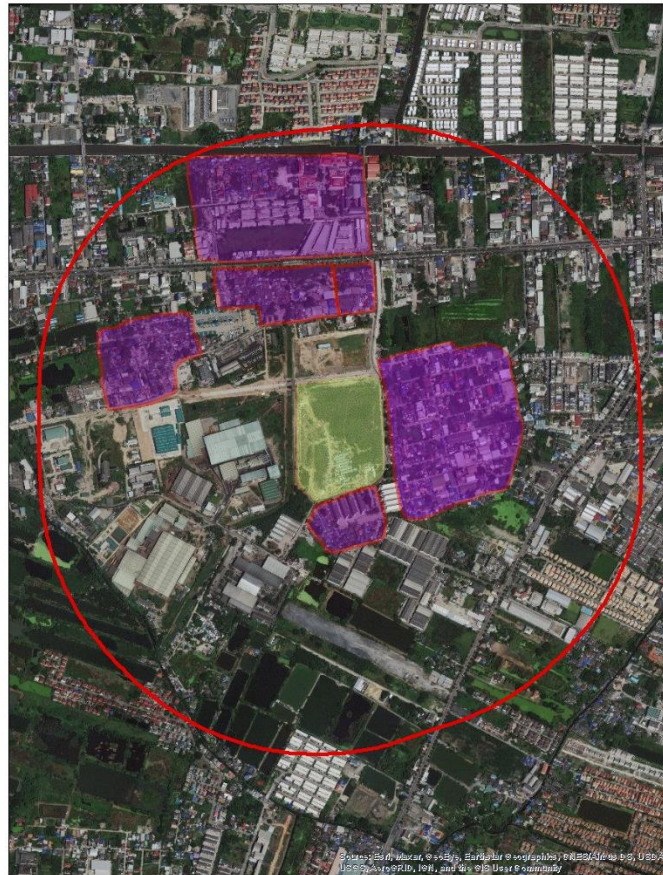
Figure 5 Research site area radius 1km from the landfill restoration planning

3.3. Research Design

The research design was based on observation and initial coordination with the BMA. The study used primary and secondary data to obtain information about the community's condition and urban forest park planning responses. The data were collected by field observation, in-depth interviews, and questionnaires. The field survey was implemented several times between October 2020 to January 2021 to meet the key stakeholders in the study area and observe the local people's livelihood and behaviour. The stakeholders were appointed in advance to ask for their merciful assistance, available time, and convenient location to introduce the research purposes and benefits to the developer (the BMA).

The complete data collection and questionnaire survey will be implemented between July to August 2021. The questionnaires were designed in three parts, including 1) demographic information, 2) community's lifestyle, perception, awareness, knowledge, participation, and support of this project, 3) Community need

and problem. The in-depth interview would be conducted with crucial respondents with roles and responsibilities in the urban forest park development at the On-Nut post-closure landfill area. Other supporting discussions is also driven by the local prewet district government, the private sector, and other experts on the urban forest project.

In the premilery data collection study, the field survey was implemented several times between October 2020 and January 2021 to meet the key stakeholders in the study area and observe the local people's livelihood and behaviour. The stakeholders were appointed in advance to ask for their merciful assistance, available time, and convenient location to introduce the research purposes and benefits to the developer (the BMA). The questionnaires will be designed in three parts, including 1) demographic information, 2) health condition and lifestyle behaviour, 3) community's perception, acceptance, knowledge, participation, and support of this project. The in-depth interview was conducted with key respondents with roles and responsibilities involved in urban forest park development at the On-Nuch post-closure landfill area. Other support interviews were also driven by the local prewet district government, the private sector, and other experts on the urban forest project.

DATA COLLECTION STEP AND ANALYST

Steps of research methods

Roles and responsibilities at On-Nuch Project

- Purposive samping
  - Current and former village chiefs
  - Local Prawet governmental agencies
  - PPT staff and leader of Departement
  - WePark and BigTree

- Purposive random sampling
  - Community at 5 zone

Stakheholder coordination and determination

Data Collection

Primary data
- Demographic information of respondents
- Factors and lifestyle behavior
- Perception, knowledge, and acceptance, Participation

- Field observation
- Questionnaire survey
- In-depth interview

Secondary data:
- Urban forest park benefit (Ecosystem services)
- Internation participatory aprroach framework

- literature review

Data Analyst

Descriptive statistical analysis

1. Enter quantitative data into SPSS and Microsoft Excel
2. Coding and calculating data based on percentage from the highest to lowest influenced level
3. Conduct t test to verify an influence of demographics

Data Summary and AHP Analyst

1. Summarize the significant factors
2. Identify the problem and keyword by AHP

Analytic Hierarchy Process (AHP) and Community Preference

1. Problem identification and solving problem design
2. Design the hirarcy structur by scoring
3. Evaluating, calcuating, analyst, and testing the consistancy of hirarcy

Community engagement framework

3.4. Data Collection

This research starts with the On-Nut Closured Landfill area's pre-research to make it easy to design and determine the proper tool and materials used as research targets and baseline data collection. Field observation and questionnaires survey with dichotomous questions, checkboxes, and a Likert scale, roleplay or focus group discussion will be used to collect the study datasets, as shown in table below. This pre-research was conducted within more than three months. It was conducted to ensure that the questionnaires were clear to stakeholders and covered all the exciting topics. Furthermore, it determined effectiveness and searched for the weakness of questions for improvement. A technique of memo and voice recording was used throughout the questionnaire survey and field observation.

The data used in this study are primary data and secondary data in the beginning stages. The in-depth interview will be conducted to get comprehensive information from related stakeholders on Bangkok's urban forest or green space development. The representative review data will be selected using a purposive sampling method. According to (Becker et al., 2012), purposive sampling is a non-probability form of sampling that aims to sample the cases or participants strategically and relevant to the research questions that are being posed. One of the advantages of this method is as a tool to identify the typical case sampling were defined as sampling a case because it exemplifies a dimension of interest.

- Demographic information of respondents

Respondents' demographic information, including gender, age, birthplace, occupation, education, income, and stayed duration, were collected by questionnaire survey with dichotomous questions and multiple choices. They were gathered to examine their influence on factors in participation.

- Significant Factors and urban forest park engagement

Questionnaires collected significant participation factors with dichotomous questions, multiple choices, and a liker scale. Important factors are also collected through various sources of information, such as journals, textbooks, reports, and news. The field observation, literature review on criteria, and principles of urban forest parks were also applied to compare the results collected from field observation and questionnaires for an analyst.

Table 7 Key-informant and respondents of the research.

Stakeholders	Sample sizes for the study
1. **Village chiefs**	Five persons
2. **Local governmental organizations (Prawet District Government).** • The community development department of Prawet district. • The education department of Prawet district. • The environment and community health department. • Cleaning and park services department.	4 persons
3. **Bangkok Metropolitan Administration** • Chief Park • Chief Park of part 1 • Leader the BMA at On-Nut	Three people
4. **Private Sector (PTT)**	Four persons
5. **Social enterprise and NGO** • We Parks • Big Tree • Pa-Thai	3 people

Table 8 Dataset information and expected outcomes

Datasets	Details	Data Collection tools	Expected Result
Site Description	Site observation	ArgisMap	**Expected design benefits of the initial concept of urban forest planning.** - Site Description and Update - Urban forest park development based on Community preference
Demographic information of respondents	• Gender • Age • Education • Income • Occupation • Stayed duration	Questionnaires with dichotomous questions and multiple choices	**Community Participation Development to the optimized urban park benefit.** - Community demographic condition - Significant Factor of Participation - Community Perception and behaviour toward the sustainable urban forest park development
Factor and Participation Indicator	- Internal and external factor (Social Class) - Environment aspect - local wisdom	- Literature review - Field observation - Questionnaires with dichotomous questions	- The significant factor affecting the community knowledge of urban park benefits.

Topic	Methods	Expected outcomes
- laws and regulation	and checkboxes - In-depth interview	- Change of people perception and community preference regarding various information transfer methodologies. - Unexpected factors affect the community perceptions. - The effective communication and dissemination of information.
Urban forest park participation, perception and knowledge	Perception and problem identification	- Desk study - Field observation - Questionnaires with dichotomous questions and - checkboxes - In-depth interview - Focus Group Discussion / roleplay	**The framework of Community Engagement** - The positive and negative impact of the urban forest park development - Multicriteria Decision analyst toward the practical urban park benefit for the community. - Sequential testing for community perception. - Community engagement framework for sustainable urban park

development.

3.5. Sampling Method

Bernard 2002 mentioned data gathering is crucial in research. It is meant to contribute to a better understanding of a theoretical framework. It then becomes imperative that selecting the manner of obtaining data and from whom the data will be acquired be done with sound judgment, especially since no analysis can make up for improperly collected data (Bernard, 2002). This study's populations were all heads of families in the 1000 meters (1km) from landfill area, where the total population around radius about 5021 population with a total of household is 857 of five *villages*/village:

Table 9 Infographics of villages (village).

Infographic of villages						
No	name in Thai	Name of community	total of population		total houses	Distance from On-Nut
			Male	Female		
1	ชุมชนเกาะมุสลิม	Gor Muslim	122	120	76	200 meters
2	ชุมชนสามัคคีธรรม	Saamakkeetam	254	266	157	200 meters
3	ชุมชนเทพรักษา	Thep raksa	284	296	202	400 meters
4	ชุมชนแฟลต 86 อาคารสงเคราะห์ออนนุช 86	Songkhro Building On-Nut 86	318	342	280	600 meters
5	ชุมชนร่วมใจพัฒนา	Ruamjai Pattana	267	246	142	800 meters
6	ชุมชนกระทุ่มเสือปลา	Kratumsuepla	1171	1335	264	1000 meter

Figure 7 Distribution of sample area

       The researcher used the Slovin formula to calculate the total of the sample. Based on the slovin formula from 857 households, the number of the household was 173 household:

$n = \frac{N}{1+Ne^2}$, where: n = Number of samples,

$$N = \text{Total population}$$

$$e = \text{Error tolerance.}$$

The number of 146 households would increase the proportional sample by using a proportionate stratified random sampling. A calculation formula was shown as follows:

$$ni = \frac{n \; x \; Ni}{n}$$
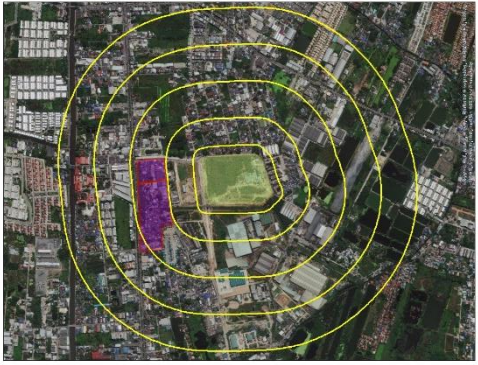
Where ni = Sample sizes of the household of each village
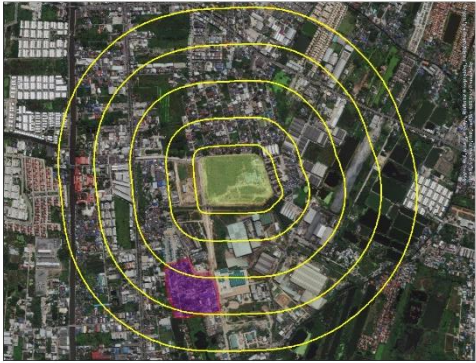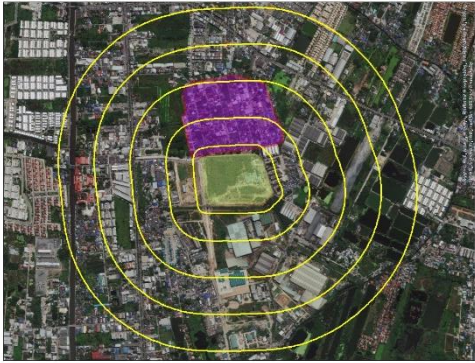
                n = Total sample size
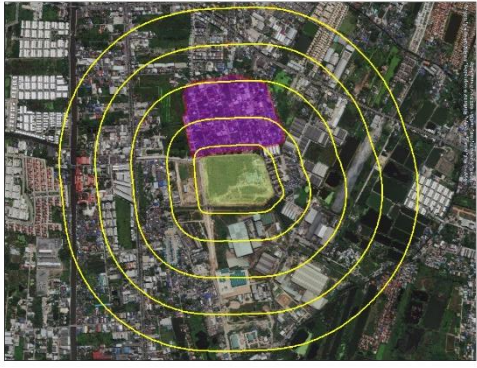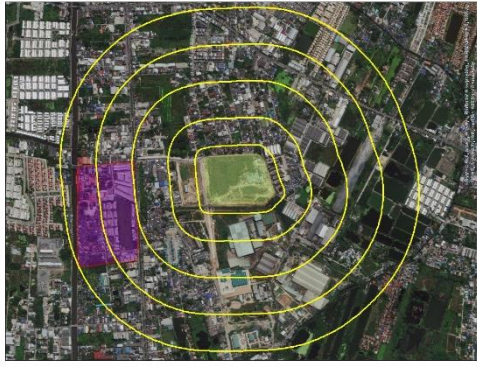
                Ni = Numbers of the household of each village

                N = Total numbers of households

Table 10 The sample sizes of households of each village.

No	Name of the village in Thai	Name	Distance	Calculated sample sizes	Village Map
1	ชุมชนเสามัคคีธรรม	Saamakkeetam and muslim	200 meters	28	

52

2	ชุมชนเทพรักษา	Thep raksa	400 meters	26	
3	ชุมชนแฟลต 86 อาคารสงเคราะห์อ่อนนุช 86	Songkhro Building 86 On-Nut 86	600 meters	36	

4	ชุมชนร่วมใจพัฒนา	Ruamjai Pattana	800 meters	35	
5	ชุมชนกระทุ่มเสือปลา	Kratumsuepla	1000 meter	38	

Data research probably would be taken during covid-19, to minimize the bias the risk of covid-19 the data collection will occur in many ways and strategies such as:

- Online Interview
- Using the social media application (line, WhatsApp)
- Virtual call

Apart from relevant stakeholders will select by purposive sampling to determine differences in perceptions, knowledge, interest, and especially regarding the position and role of the community in the landfill ecological restoration activities.

3.6. Data Analysing

A qualitative approach is research and understanding based on a methodology investigating a social phenomenon and human problem. In this method, the researcher creates a picture complex, scrutinizes words, detailed reports of the respondents' views, and studies natural situations (Creswell, 1998). The descriptive method in this research would conduct both descriptive qualitative and quantitative methods. This technique aims to create a systematic, factual, and accurate description of the facts, properties, and relationships between the phenomena under study. Qualitative descriptive analysis is a descriptive analysis of qualitative data, while quantitative descriptive research is a descriptive analysis of quantitative data using the tabulation method. This study employs the Analytical Hierarchy Process (AHP) technique since there are various alternatives for using the area. Thomas L. Saaty invented the AHP decision-making technique. Thomas L. Saaty defined AHP as decision-making approaches generated from conditions with various criteria and choices. The AHP model hierarchical order of decision-making objectives, criteria and alternatives simplifies the decision-making process decision due to the variety of decision-making backgrounds and the number of options selected.

Table 11 AHP score value

Intensity Interest	Definition
1	Equally Important Preferred
2	Equally to Moderately Important Preferred
3	Moderately Important Preferred

4	Moderately to Strongly Important Preferred
5	Strongly Important Preferred
6	Strongly to Very Strongly Important Preferred
7	Very Strongly Important Preferred
8	Very Strongly to Extremely Important Preferred
9	Extremely Important Preferred

Thomas L. Saaty based his findings on more research. It also lays out the processes for making well-organized decisions with AHP, including creating a hierarchy based on goals, criteria, and the alternatives to be chosen to identify the goals/goals of decision making. Create a pairwise comparison matrix, then weigh priorities at the appropriate level using the priority gained from pairwise comparisons. Thomas L. Saaty gives a numerical scale that indicates comparison to create a comparison. This number indicates how important or dominant one element is compared to other elements. The table below shows an interest comparison scale: According to Thomas L. Saaty, a multi-criteria decision-making approach (MCDA) is used to form the AHP hierarchy. A method based on mathematics The priority level of the criterion is compared to the level of relevance, which refers to the scale of interest, after which the problems are structured as a hierarchy. The AHP approach produced the following alternative selection framework.
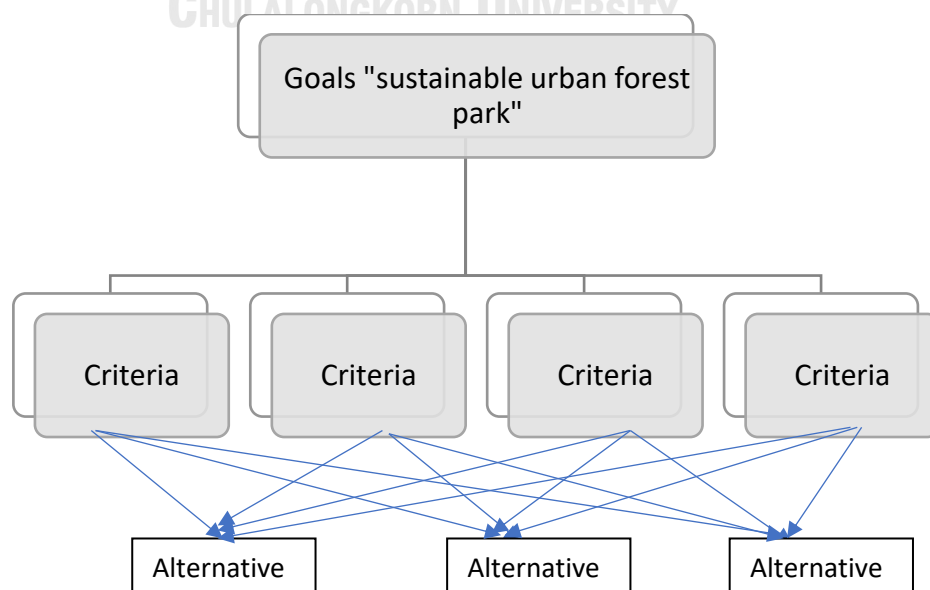
Figure 8 AHP criteria hierarchy process

Figure above shows that goal is at the top of the hierarchy, level 2 is second, and alternative hierarchy is at the bottom as the item to be chosen based on multi-criteria conditions. So, as Thomas L. Saaty said in [21], the process of making decisions has changed from decisions based on words to decisions based on figures. The Analytic Hierarchy Process (AHP) provides an objective mathematical model that can be utilized to make decisions, according to Thomas L. Saaty [22]. Essentially, AHP works by establishing priorities for alternatives as well as the criteria that are used to evaluate them. Typically, the criteria are separated by a measuring scale, making it impossible to combine them directly. To create a hierarchy, first lower the priority to criteria, then lower the priority again to alternative performance on each criterion. This priority is lowered due to a paired evaluation that uses an assessment ratio or scale to determine the level of relevance to the user or users. Finally, process weighting and addition are employed to determine the overall priority of options regarding their contribution to the goal. With AHP, a multidimensional scaling problem becomes a one-dimensional scaling problem. AHP's pillars are as follows:

1) Ratio scale, proportionality, and a normalized ratio scale
2) The pairwise comparison that is reciprocal
3) The eigenvalues of the principal vectors' truth sensitivity
4) Homogeneity and grouping are two terms that come to mind while discussing homogeneity.
5) Dependencies and feedback are synthesized flexibly.
6) Ranking Group evaluation and preparation

Study of literature

1. Conduct a literature study on previous research that has a similar theme

2. Formulate Supporting Criteria in the development of urban forest/landfill ecological restoration

3. Determine Alternative - according to the on-nuch area

Data collection

1. Conducting interviews with expert respondents

2. Provide questionnaires for expert respondents.

Determination of Research Methods

1. Using AHP as a mixed qualitative and quantitative research method

2. Using Expert Choice as a tool.

Building an Analytics Hierarchy

1. Defining the Hierarchical Structure of the Problem

2. Weighing Criteria at Each Hierarchical Level

3. Calculating Criteria Weighting

4. Testing the Consistency Level of Criteria Weighting.

5. Calculating Alternative Weighting

6, Displays the selected Alternative Order

Figure 9 process of AHP analytical process

3.7. Limitation

Several challenges were found while implementing the pre-research observation. It took a long time to collect the data from questionnaires for data collection. The study conducted questionnaires with the local communities who work during the daytime and had a limited period to fill the questionnaires; therefore, it was challenging to meet them to gather the questionnaires. Regarding the dialogue with the local BMA staff, the research team should consider the social problem on this site, like drug abuse and criminality. The interview team must describe the urban forest due to the urban forest park development being never promoted to the local community. Based on the observation, the local communities lack information about the restoration and the urban forest park benefit.

CHAPTER IV

RESULT AND DISCUSSION

Perception studies of the local communities were applied during the initial phase of urban forest park development to create future engagement through the bottom-up stakeholder principle. On this post-closure landfill ecological restoration development, several factors were specific to the community perception, such as social cultural, economic conditions, experience, and understanding. The significant factor which affects the community perception will use to design the engagement framework.

The study results revealed the five main parts based on components involving the engagement framework. They included as follow:
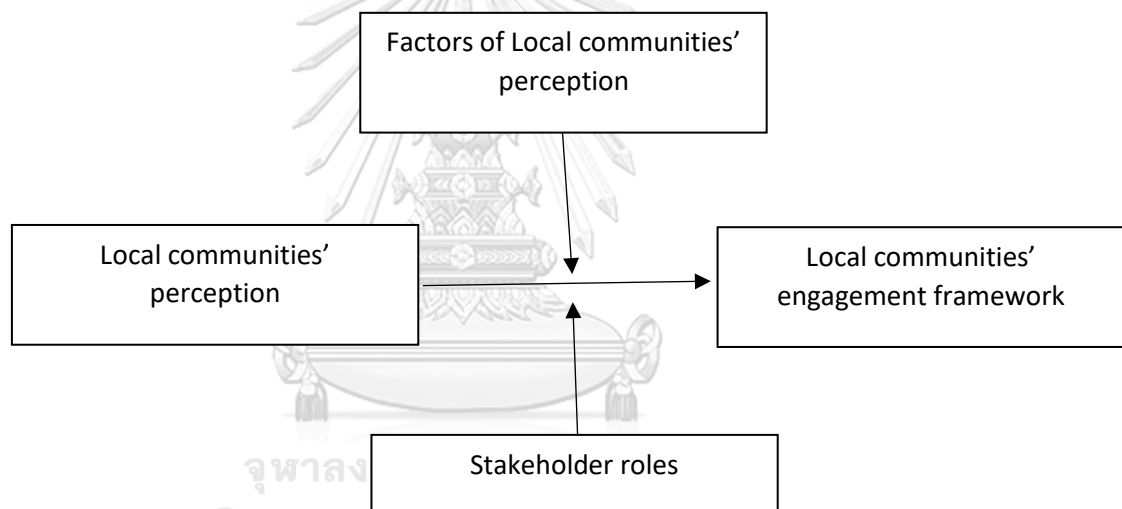
Figure 10 Discussion and result mind-mapping

1. The existing condition of landfill ecological restoration site area and the existing demographic information of 5 studied sites.
2. Significant factors and the challenges of local communities' perception.
3. Stakeholder roles identification.
4. Significant criteria of engagement framework
5. Engagement Framework

The research data was collected by field observation, questionnaire survey, document reviews, and in-depth interview which were analyzed by descriptive analyst and statistical analysis including percentage and chi-square test, ANOVA-test, and

correlation test to support the statistic analyst the expert interview would evaluate the significant factor of the local community's perception. The existing condition of the post-closure landfill area is used to analyse local communities' interaction with the project area. The interview and questionnaire were used to identify the major factors which affected the local community's perception in the initial phase of urban forest park development, which the factors variable would lead to the sustainable engagement

The selected factor would assist in finding the challenges and relationships among the external variable of public concerns on experiences, health issues, environmental problems, and economic impacts. Moreover, the stakeholder roles identification would emphasise the authority and interest of each stakeholder where it could generate the collaboration concept to support the strategic engagement framework to support the sustainable urban forest park development of the ecological restoration project.

4.1. Existing Factors Influencing Local Communities Perception

4.1.1. On-Nut Disposal Plant Area and Operation

The post-closure landfill at On-nuch is the part of the On-nuch disposal plant area located at Prawet district, about 24 km from Bangkok, and it is about 12 km from Suvarnabhumi Airport. The landfill site was closed more than 30 years ago. According to the interview, the manager has no adequate information about the landfill site. There is no data related to the date and exact year when this landfill started to close. Yet, this disposal plant area still has an ongoing operation that focuses on managing the solid waste and recycling the plant litter to be decomposed as organic matter. The picture below shows the active operation process of the disposal plant process at the On-Nuch area.

Figure 11 The Operation process at On-Nuch disposal plant

Nowadays, the landfill area was closed, yet the garbage truck still crosses the road on the post-closure landfill area. Since this landfill area is close, the operator or manager conducted minimal treatment. Due to this area being the study site of ecological landfill restoration in Bangkok, the manager mentioned the treatment that gives to this site, such as watering and plantation the *Leguminosae species*. Therefore, the ecological condition surrounding the landfill seems like the second succession phase, which is indicated by the Leguminosae species and wild grass growing in that area, as shown in Figure 12.

Figure 12 Existing ecological condition at On-Nuch Disposal Area in 2021

During the data collection, this research also attempts to collect the hydrological conditions related to water sources used for watering the landfill site and the water used by residents in an area. Both water supply comes from the government water supply. The local communities and managers of the post-closure landfill explained the canal water of this area was contaminated from the landfill site, and it could not be used for watering and the local household.

Figure 13 Contaminated water canal nearby the local community's houses

The environmental issues become the major concern of the local community, the bad odour, water contamination, and air pollution generated from the disposal plant operation and the existing lactase from the landfill site still can be felt by the local community, especially for the community who has the house nearby the canal, the map illustration below.
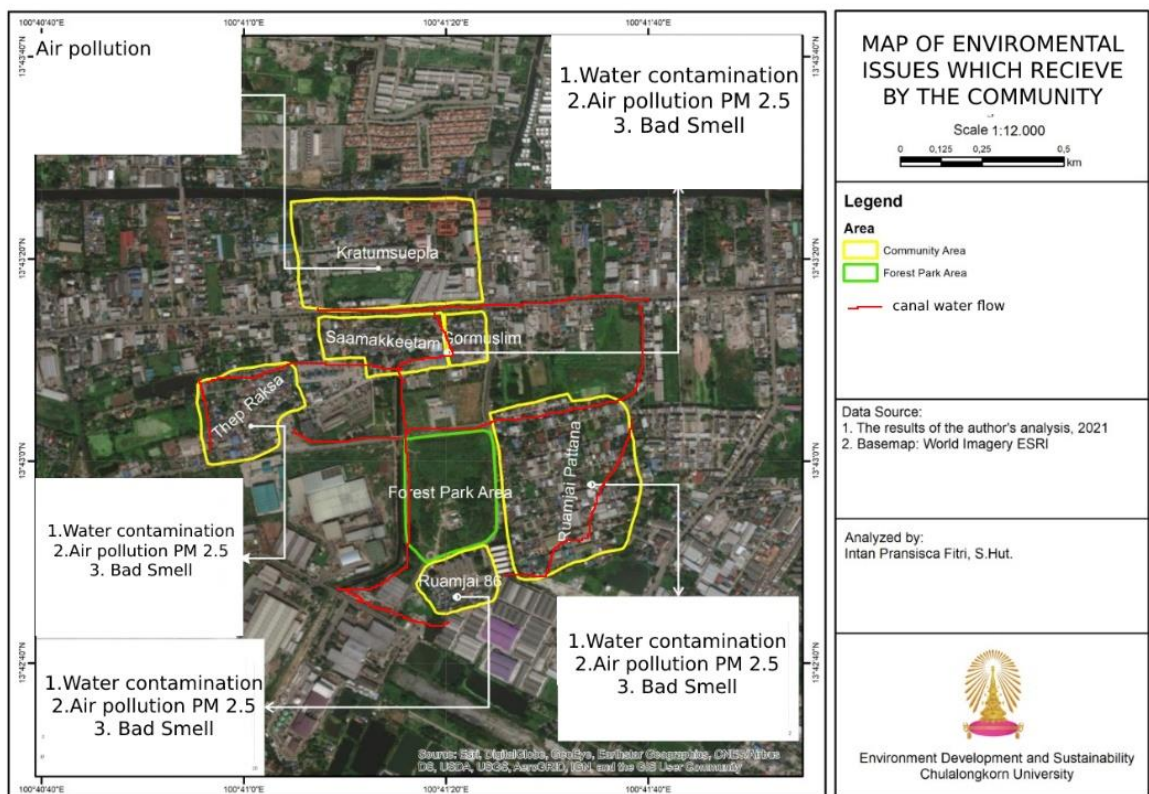
Figure 14 Map of the environmental problem received by communities

4.1.2. Existing livelihood status and demographic information

This Prawet District comprises 45 or villages, which only 5 exist nearby to On-Nut Post closure landfill area, including 1) Thep Raksa 2) Ruamjai Pattana & Ko Yao 3) Kratumsuepla 4) Ruamjai 86 5) Gor Muslim and Saamakkeetam. In this part, each Village (village) will display the data result. Whereas the age classified by the World Health Organization officially changed the age criteria in 2015. Before the age of 44, a person is considered youthful. According to the new age classification, youthful people are between the ages of 25 and 44, middle people are between 44 and 60, older people are between 60 and 75, senile people are between 75 and 90, and long-lived people are over 90. This international standard is created without considering the objective regularities of development, physiology and psychology throughout a person's entire life, including rapid growth in childhood, smooth development in adulthood, and the progressive ageing of the human body. Each village will be explained followed by this data:

The local communities at Ruamjai Pattana and Ko Yao consist of two villages/villages, where the Ruamjai Pattana is the community close to the landfill area. Hence, according to the Prawet District government, the local communities who stay at this location have no legal status because local communities build the houses on the government land. Therefore, the community has an agreement with the local government. The local communities should get ready to move whenever the government starts the project. According to data collection, more than 20% of community graduates from elementary school run their businesses by selling second-hand products or opening small shops at their own houses. The major occupation of these local communities in this area is the freelancer. Their income of about 3,000-10,000 THB/Month. (Detail information is provided in the diagram below)
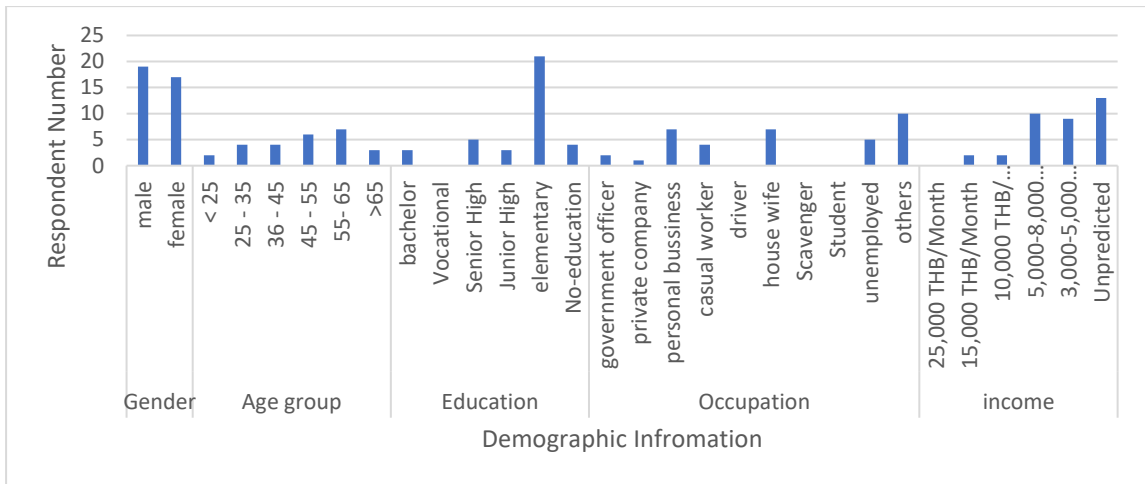
Figure 15 Demographic respondent of Ruamjai Pattana & ko yao

Thep Raksa village consists of 202 houses on the population. Theb Raksa village is one of a village that rejected the ecological restoration project and has no adequate information from the local community, this community is not open to the newcomer or unordinary people, and the Prawet district government was also warning the enumerator during the data collection due to this one of red zone in this area. Regarding occupation and economic livelihood, more than 50% of local communities work on this landfill and disposal plant area. It can be said that the interaction between the community and the landfill area is closest rather than other communities. Like another village the community here mostly hold elementary education background. They run their own business by selling and filter the garbage as the main job. the average or monthly income 3,000-8,000THB/Month.
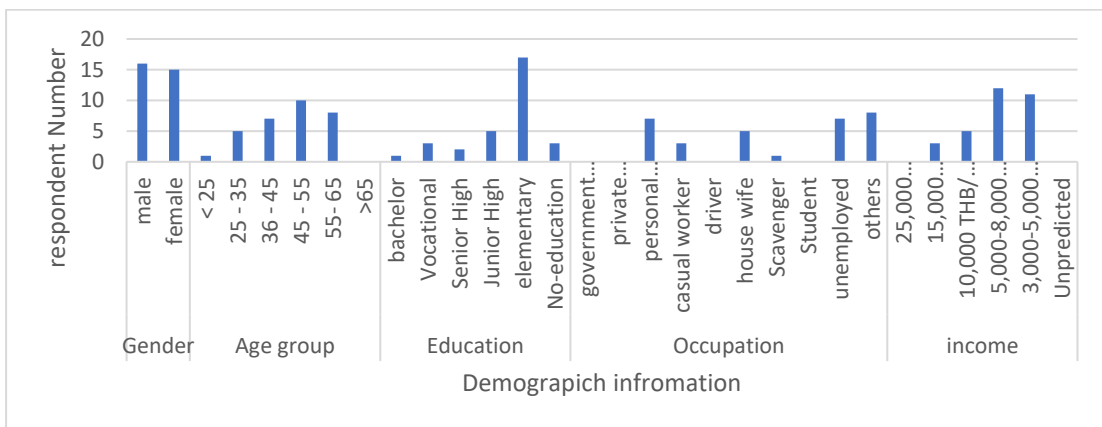
Figure 16 Demographic respondents of Thep raksa village

Gor Muslim and Samakeetam are two of Villages separated by a small river, these two villages as well as small as the Thep Raksa, especially for Gor Muslims not more than 100 households in this Village, Samakeetam and Gor Muslim dominated by a woman who also work to support their livelihood, major of local communities as well run their business by selling the food, fruit, and second-hand product, more than 50% civil hold the elementary school certificate. Gor Muslim and Samakeetam receive the bad effect of the landfill operation because the small river and canal flows through this village, especially during the rainy season. Detail information is provided in the digraph below
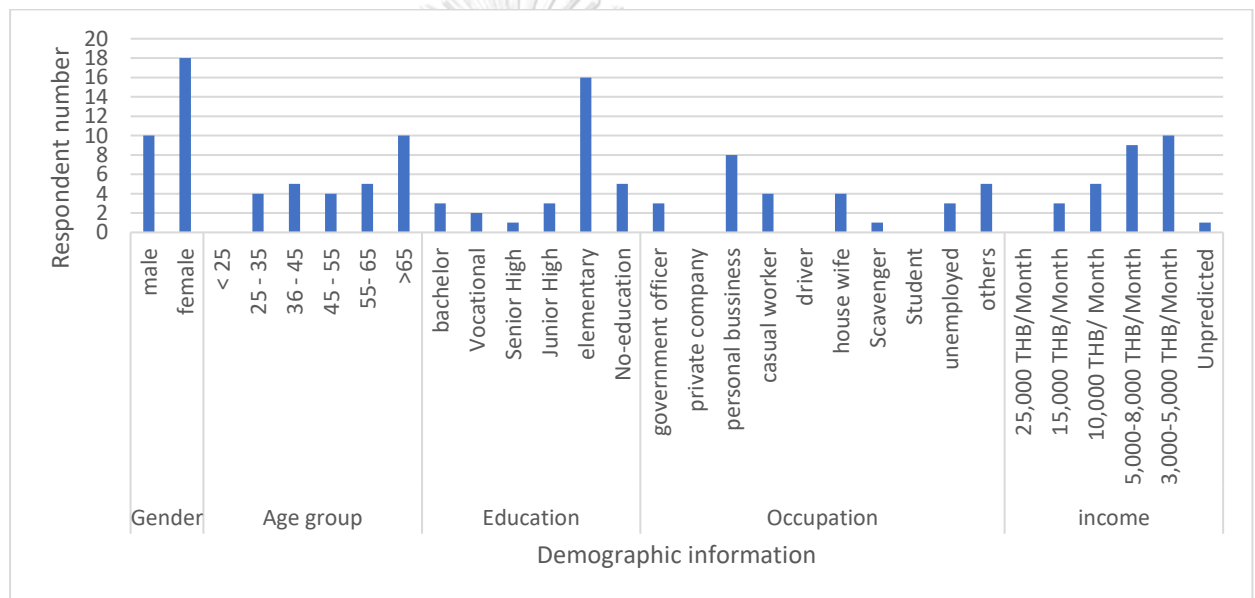
Figure 17 Demographic respondents of Gor Muslim and Samakkeetam

Kratumsuepla village consist of high-density population in this research site, more than 50% local communities work depend on their own business, this community has the high income compare to other villages it may cause the community it's not working depended on the landfill area, the interaction between the community and the landfill is not the direct relation rather than other Village, as well as the education background and occupation this community has the high variety of educational background and occupation. The Kratumsuepla village and landfill site is about a 1km radius. Islam/Moslem is the major religion in this area. Compared to other communities. This community is the most educated community rather than other communities. There are many respondents who hold a bachelor's degree certificates.

Even though most of the local community's graduate from elementary school, their occupation is not dependent on the landfill area. They mostly sell the food, fruit, and as the commute service (grab driver). The illustration below mentions the demographic of the respondent at Kratumsupela village.
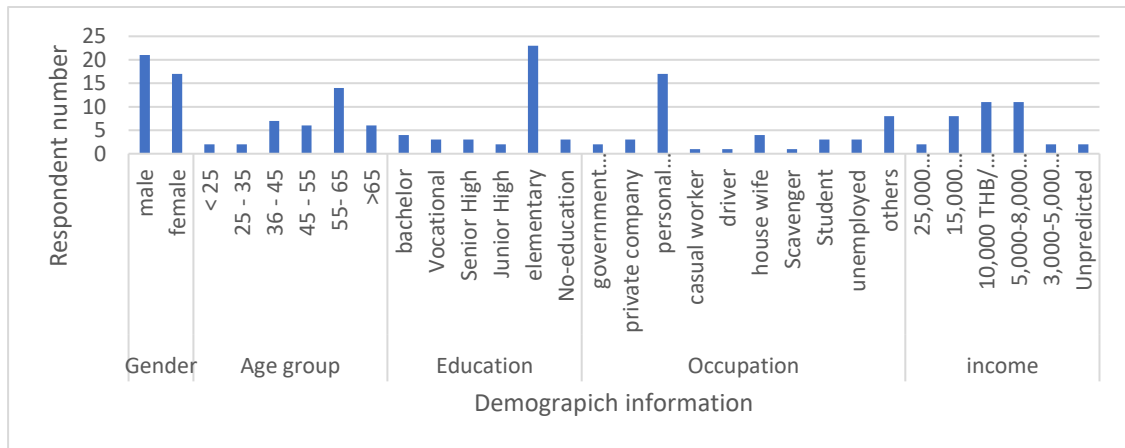
Figure 18 Demographic respondents of Kratumsuepla

Ruamjai 86 is the local communities that work under the BMA. The BMA provides them the apartment to stay, and mostly, this local community works to help THE manage the solid w. The local communities mostly have the monthly payment from the government about 15,000 TBH/month. Local communities in this village mention that they were the outsourcing the BMA   staff, they work as the garbage truck driver, the people who work to sort the solid waste. The complete infographic of the community is provided in figure 19. according to all the respondents of this data collection, the children used to go to school close to their village.
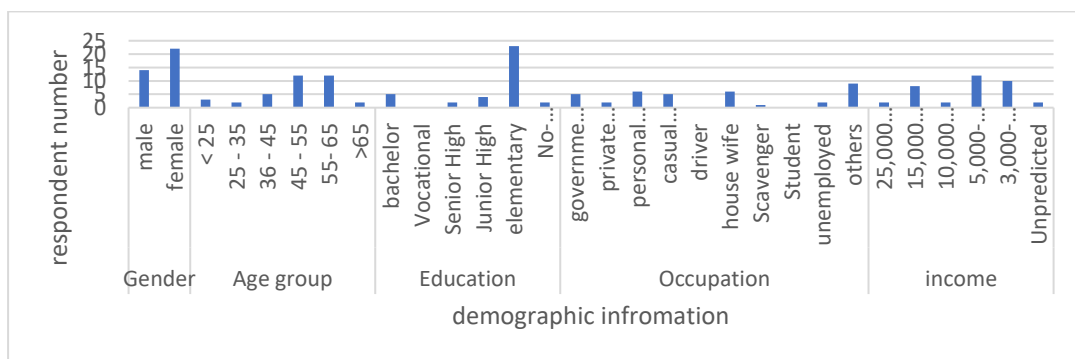
Figure 19 Demographic respondents of Ruamjai 86 village

According to the observation, interview, and statistic result analyst, the community's characteristics had no differences. Therefore, the general information of this data respondent would be shown on the other part of this thesis to make the significant factor analyst effective and accurate. The illustration below can provide you with the link to each village. The factor of this similar character might be because of the history of the local community. This community has come since this landfill opened and operated, according to the background history. The community came to this landfill area and tried to get more income for their life, and now they stay here during their lifetime, with the occupation and behavior. Most local communities understand all the social and ecological conditions in this area because of their intense interaction with the landfill site. Since the landfill closed, the local communities never came to this site.

The local people who live nearby the post-closure landfill can conveniently access the post-closure landfill area as well as at other developing countries such as Indonesia and Malaysia Mapa, M. T., Powell, J. C., Asis, A. H. B., Sakke, N., & Gulasan, A. (2019). The local communities find their local livelihood by filtering/sorting the garbage and working as recycle staff. Since this landfill area operation stopped, the community tried to adapt by adjusting their interaction with the landfill site, changing the behavior, yet without changing any livelihood and ecosystem at the post-closure landfill area.

The selected village have similar characteristic of houses (semi-permanent houses). The local communities build their houses using the wood and the raw material from solid waste materials such as plastic, banner, and others.

Figure 20 Housing surrounding on-nut disposal plant area

According to the primary information which has collected in 2021 from the Civil Registration Section of the Prawet District, it shows that there are around 4,967 persons with 2,362 males and 2,605 females in the surrounding research area, which mention in this table below:

Table 12 Number of households at five villages On-Nut Post Closure Area

Info Graphic of Villages						
No	name in Thai	Name of community	total of population		total houses	Distance from On-Nuch
			Male	Female		
1	ชุมชนเกาะมุสลิม	Gor Muslim	122	120	76	200 meters
2	ชุมชนสามัคคีธรรม	Saamakkeetam	254	266	157	200 meters
3	ชุมชนเทพรักษา	Thep raksa	284	296	202	400 meters
4	ชุมชนแฟลต 86 อาคารสงเคราะห์อ่อนนุช 86	Songkhro Building On-Nut 86	318	342	280	600 meters
5	ชุมชนร่วมใจพัฒนา	Ruamjai Pattana	267	246	142	800 meters
6	ชุมชนกระทุ่มเสือปลา	Kratumsuepla	1171	1335	264	1000 meter

Sources: Civil Registration Section of the Prawet District 2021

Sustainable development goals (SDGs) emphasize creating the well human being for society, a sustainable environment, and achieving economic improvement. Human or local communities as the key actor of the sustainable which plays many roles as the planner, designer, developer, controller, and beneficiaries should consider all aspects. Overexploitation affects the ecology, damages the environment, creates pollution, and decreases the human development index (HDI). In the big city where more than 50% of human life occurred the environmental degradation. Bangkok is

trying to improve the environment quality by creating a green space area. Reconstructing the landfill area is one way to generate this sustainable urban development, yet the challenges come from the community's diversity around the dumpsite. The HDI value could also depend on the time duration of community stay in one area. As well as the ecological restoration project of Green Bangkok 2030, the BMA mentioned the local communities of this area would be the direct receiver of the project's benefit. The BMA wishes that this project could help the community to improve their income and livelihood, help the national plan to achieve SDGs, and increase the number of HDI of Thailand.

According to the questionnaire, almost more than 72% community had stayed in this area for more than 20 years, and 14% had stayed over 15 years (see figure; 23). This data proved the experience and the knowledge of the community understanding related to the information at On-Nut landfill site, for instance, they could mention the problem of the environment site, they could explain the source of bad smell, they also could explain the detail of weather condition and impact for their environment. According to the other studies about community behavior, 20 years is more than enough for someone who knows and understands the environment (Akerlof, G., & Yellen, J. L. 1994). From the interview, the local communities mentioned about their lifestyle rarely changed since this on-nut landfill closed. However, this stays duration drives the local communities to feel comfortable with their area. The local communities said they feel this area is their own, which means that the sense of belonging of this site has been existing, and it would help the local manager encourage the participation of local communities in this project.
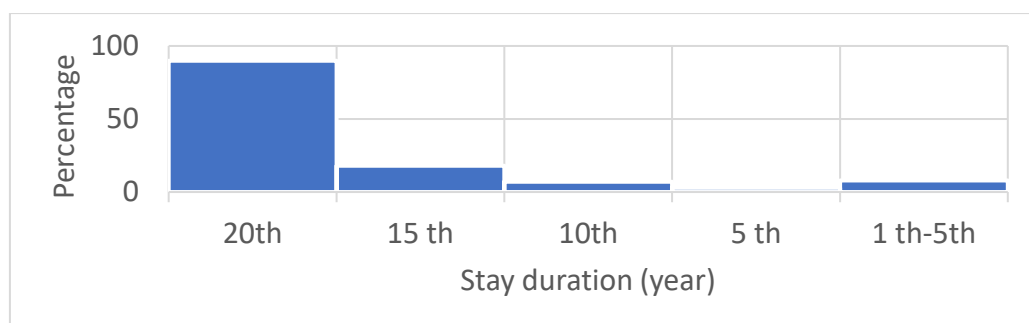
Figure 21 Local people stay duration data

Besides, in figure 24, more than 98% of communities were asked about "do you have a plan to move from this area" answered "NO," the bad

experience about the environmental degradation did not make the local communities move from their area. The convinience and confortable reason it and most respondents said that they are growing and spend all their time in this area since they were child-married and had the grand child, and another reason is because of the job and source of income comes from their occupation as the scavenger, and they do not have any planning to find another job.
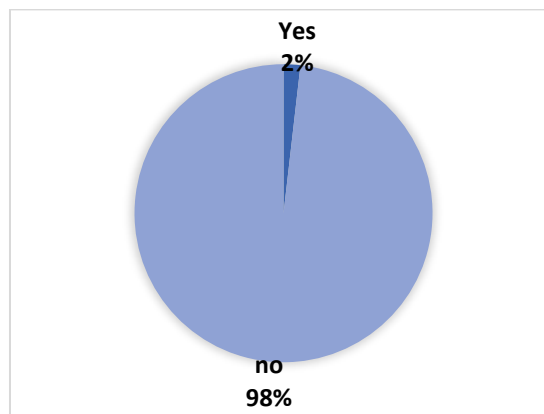
Figure 22 Planning to move out site the On-Nut area's data.

The merge of the data collection result showed that each village has a different community background. Based on all the data collection, the local communities who live close to the area of the On-Nut disposal plant <800 meters are mostly working as a scavenger, or the BMA   Outsourcing staff or retire from the BMA   and their educational background mostly elementary school.

The merge of respondent data from 5 villages which consist of 196 respondents has about 47% were male, and 53% were female, then the aged classification about 48% of the respondents was elder >65 years old, 22% were middle elders 45 - 55, and 17% middle-aged adult (36 –45). More than half of the respondents, or 59%, graduated elementary education when categorized by education. At the same time, the proportion of respondents with no education and the junior school education were equally 10%. Only 9% of the respondents graduated with a high vocational education/diploma, a bachelor's degree, and higher. The major occupation of this correspondence is running the private business about 27%, and only about 1% respondence is the driver, whereas 24% still working as the freelancer. Otherwise, about 12% of respondence are unemployed. When categorized by the income per month, one-third of the respondents, or 33%, earned 5,000- 10,000 baht

per month. Meanwhile, 23% earned about 15,000 baht per month. Only 5% of people earn an income of about 3,000-5,000 baht per month. A summary of demographic information of the respondent is shown in the table below.

Table 13 Demographic information of 169 respondent from five villages

Demographic Information of Respondents	N	%
Gender		
Male	80	47%
Female	89	53%
Age groups		
Adolescents < 17	8	5%
Young adults (25–35)	17	10%
Middle-aged adult (36 –45)	28	17%
Middle Elders45 – 55	38	22%
Elders >65	46	27%
Did not identify their age	21	12%
Education		
Bachelor	16	9%
Vocational	8	5%
Senior High	13	8%
Junior High	17	10%
Elementary	100	59%
No-education	17	10%
Occupation		
government officer	12	7%
private company	6	4%
personal business	45	27%
casual worker	17	10%
driver	1	1%
housewife	26	15%
Scavenger	4	2%
Student	3	2%

unemployed	20	12%
others	40	24%
Income		
25,000 THB/Month	13	8%
15,000 THB/Month	39	23%
10,000 THB/ Month	36	21%
5,000-8,000 THB/Month	55	33%
3,000-5,000 THB/Month	9	5%
Unpredicted	13	8%

Quality demographic information, including gender, age, occupation, income, and education level obtained, will be analysed more closely to identify the significant factors influencing local perception, knowledge, acceptance, awareness, and participation for the future engagement process.

4.1.3. Local community structure

According to the leader of the village interview, the urban people in the On-Nut area generally can take care of themselves without any dependence on others. The interactions among local people occur based on interest factors than personal factors. There have been no social changes since the landfill closed. The local community attempted to adapt to the change by looking for another source of income and occupation.

According to data collection, the classification of urban people in this study emphasizes people's occupation, income, and impact/ risk of this project, the local community at 1 km from On- Nuch ecological restoration project has the similar characteristic compared to other urban people this community is one of vulnerable community which had no exact monthly income, hold the low education background; elementary school, has the semi-permanent houses which build by wood and bricks, has the high risk on the landfill site as well as the primary impact receiver, this table shown the characteristic of the local community in the post-closure landfill area:

Table 14 On-Nuch people characteristic

Indicator/ variable	Explanation
Income	Income range 5,000- 15,000 THB
Occupation	Food Seller, Scavenger, Second-hand seller
Population density	Less than 2,000 people
Social Structure / Social Status	Lead by one leader
Houses	Semi-permanent (from wood and bricks)
Land legality	Had the land certificate/ had the agreement with the local authority
Risk	High risk to the project
Impact	Direct receiver

At 1 km from the post-closure landfill area, the local community had a valid organizational structure. A leader leads this village to manage the village and control the social situation in this area. This community leader has the authority to find the conflict resolution and handle the other social issues. In addition, this leader has the right to communicate directly to the Prawet district government. This illustration below shows the social structure of the local community at the On-Nuch post-closure landfill site.
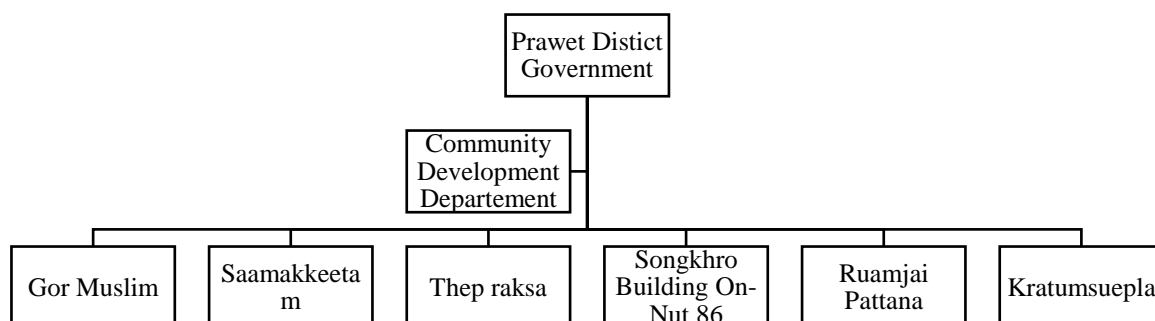
Figure 23 Village management structure

4.2. Key factor influencing the local perception

In part of this study, individual characteristics were established to evaluate the major factors that influence community perception. However, the demands and perceptions of urban forest park development differ in those needs are also impacted by habits, health difficulties, sensory dimensions, and perceived attributes. This explains why perceptions of greenspaces, particularly the design of urban forest parks, are a concerning topic in the study of environmental psychology, which investigates people's sensuous experiences (Grahn & Stigsdotter, 2010; Peschardt & Stigsdotter, 2013; Qiu & Nielsen, 2015).

The statistic analyst tools have evaluated the demographic feature in this area for finding the significant factor of local communities' perception in the initial phase of an urban forest park at the post-closure landfill area, which can influence the future engagement process. In making the effective significant factor, the expert interview will confirm the statistic analyst. All the dependent variables were regressed on respondents' age, gender, education level, main occupation, income, acceptance, and local community knowledge. Perception towards local communities' participation in this urban forest park development will be mentioned independent variables, are regressed on perception towards the sustainable urban park. The significant factor mentioned by the expert during the interview has a similar approach with the statistic analyst: education, income, and occupation.

4.2.1 Effect of age on the local community's perception

According to the statistical analyses, age had no significant effect on the perception, this linear with the expert analyst which mentions that any aged would have the same perception of this urban forest park development The chi-square analysis results show that the sig value of community is greater than 0.05 (Asymp Sig> 0.05). At this research, any age varieties have a similar perception which agrees and support the urban forest park project. This might also be supported by the other evidence/factor of the community experiences (over 20 years) and activities. The monotone activities or daily activities of local communities affect the high level of enthusiasm and expectation. The local communities and experts mention if the urban forest park would execute the activities in this area in any distinguished age of this research, such as meditation, jogging, running, recreation. The local community,

particularly respondents aged 50, stated that having a green space or urban park surrounding their area would open access for them. Local communities said the nearby green park is Rama IX Park, yet it is difficult to get to Rama IX Park by walking or taking public transportation. Citizens between the ages of 20 and 30 share this sentiment and prefer to spend their time in the green space. If there is an urban forest park in the On-Nut region, the local district administration mentions that this park can be used by students who live near the On-Nut landfill. It can be concluded that any aged would positively perceive this urban forest park development.

4.2.2 Effect of gender on the local community's perception

Gender is one of the indicator tools to calculate perception's level. A gender composition of respondents was forty-seven male (47%) and fifty-three female (53%) (N = 169). The chi-square analysis results show that the sig value of community is greater than 0.05 (Asymp Sig> 0.05), indicating that there is no correlation (non-significance) between the type of factor respondent's gender and the perception of urban forest park development at On-Nut post-closure landfill area or that gender does not affect the perception of this planning. This is in line with Priego's 2008 study findings, which found that gender has no impact on the public's perception of Perception and value of nature in urban landscapes: a comparative comparison of cities in Germany, Chile, and Spain (Priego et al., 2008).

The main factor of this insignificant factor of gender between men and women in this study is the family/social roles and responsibilities related to the landfill's post-closure use. Men and women have the same access to this post-closure landfill site. On the other hand, the data collection found that men and women have distinct knowledge and opinions on the aspect of the activities of urban forest parks. Women are more likely than men to consider the ecological services aspect. In contrast, men prefer a higher value on activities that improve their quality of life, such as exercises and workouts. It is also highlighted by Browne 2002 which mentioned that the distinct vision was impacted by their positions, influenced by culture, social norms, and societal ideals (Browne, 2002; Carvajal et al., 2013; Medard et al., 2002; Myers, 2010).

During the interview, the men and women have different tasks and responsibilities at the On-Nut Disposal Plant area; in some households, mostly women

work as food sellers or at the recycling center. The males had a vital role at work as the head of the household. By the expert's interview, gender was not the expert's concern because the expert believes that all the gender would receive similar benefits and access to this urban forest park. According to the interview of the local community, both men and women stated this project could bring many benefits for their neighborhoods: provide exercise, improve the air quality, and bring social benefit for them.

4.2.3 Education effect on the local community's perception

The statistical data analyst shows no significant differences between perception and education background in this study. The local communities in five villages believe that have had many trees will improve the quality of the environment. Even though the community mostly graduates at the elementary school, they have a good perception of ecosystem services because of the experience and awareness to plant their plantation in their neighborhood.

The chi-square analysis results show that the sig value of community education background is greater than 0.05 (Asymp Sig> 0.05). It indicated no correlation (non-significance) between the educational background and urban forest park development perception at the On-Nut post-closure landfill area. The respondents' experience and green space knowledge affected their perceptions of urban forest park development planning. It can be seen clearly during the interview that the community could explain and imagine the benefit of the urban forest park. Respondents also have a good perception of the tree plantation. The local communities believe that trees should bring them the benefit not only ecological benefits but also an economic benefit.

The expert interview analyst found that the BMA mentions that local communities' education background will be another challenge for making the community understand and participate in this project. On the other side, it contradicted the Prawet district government, which mentions that education is not a concerning issue of the local community because the local community has a good perception of urban forest parks and the plantation program. The major issues of the local community were criminality. Community leaders also mention that all the community members have the local communities' positive action and activities, as

seen in their initiatives such as planting trees in the neighborhood. The picture below shows the local community gardening in their neighborhoods. It is giving the aesthetic benefit of their neighborhood.

Figure 24 Planting tree action and environment awareness of local community

4.2.4 Effect of income and occupation on the local community perception

Urban green space can aid in the prevention of harmful health consequences associated with climate change and urbanization. However, the data shows that socioeconomic variables such as home income and neighborhood impoverishment have the greatest impact. Socio-economic confounders mostly address variables of social status that include the education of survey participants or households, followed by income or employment status. From this finding, the significant factors of occupation and income, which correlate with the local community perception, according to the statistical analyst, the spearman rank correlation value is 0.267 with a correlation probability value [sig. (2-tailed)] of 0.007. Stating that there is a relationship between income and urban forest development plans and the Anova test of income and community perception from the analysis results, the calculated F is 0.528, which means that there is a significant relationship between income and occupation to the perception.

Regarding the results of questionnaire data processing, it is known that 7% of respondents have a low level of perception, 27% of respondents have a moderate level of perception, and 76% of respondents have a high level of perception. Thus, the dominance of the level of public perception is largely at medium and high levels. After further identification, it turns out that the village that is 50 meters-400 meters away is a village where the community depends on the landfill area. A lot of anxiety will arise if this development plan is implemented. Especially the villagers of Theb Raksa and Ruamjai Pattana. Almost 60% of people depend on the landfill area as secondhand sellers or work from recycling waste in the on-nut area.

This was previously explained by the heads of 5 villages that the community had adapted to environmental changes in the On-Nut area. Changes in the land use of residence areas require residents to adapt to the new environment, including adaptation to the livelihood changes. The land ecosystem that will transform into an urban forest park will not immediately allow them to utilize the new resource directly. The high interest of the community to be able to open a business after the development of the urban forest will not be as easy as what the community expects because of the lack of knowledge about what potential can be developed apart from trading, lack of expertise, and lack of capital to process these new resources. The business expansion also needs coordination and collaboration with the BMA, and it should be synchronized with the design of the urban forest park.

The BMA has predicted the economic benefit that the local community will receive, and the PTT also mentions that this urban forest park should allow and give access to the local community to expand their business and improve livelihood. The local management organization should make strict regulations to prevent the inequality of these issues.

Figure 25 home business of the local community in the site area

The ordinary occupation of the respondent's work is divided by permanent and non-permanent. Permanent jobs are traders, and non-permanent jobs are labor in out-sourcing of the BMA employment construction and handicrafts or this study case area the local community mention as a freelance. In this local case, there is no difference between woman and man, the woman mostly collects and selects the solid garbage, and several women work as the seller, which is dependent on landfill area. In the interview process, the local community only worried about their income, but they will support the urban forest park development because they believe this urban green space will bring benefits for their life such as improving the air quality. The local community hopes this project could also provide a chance for expanding the business opportunity for them, such as selling the fruit, clothes, or any vegetables.

4.2.5 The effect of ecosystem services benefit, health issues

The statistical analysis between the ecosystem services benefits, communities experience, and local knowledge, and the perception have positive relationship in the urban forest park development and respondents' perception generated by personal experiences. According to the data collection, the local community were sophisticated suffering from negative impact the landfill area such as the noise, odour, air pollution, and water contamination. This condition creates the local community's desire to have better environment quality in the surrounding area.

In addition, the head of the education department at Prawet district mentioned the purpose of urban forest park in this area could be utilized for student learning about ecosystem and science. Creating a good environment for the local community could be the added value to support the urban forest park development. It will improve the local community's perception of the environment's appearance or

condition. During data collection, more than 70% of respondents gave a significant positive response to this development plan, but the major issue of this development is the dissemination of information regarding urban forest development. The local community mentioned they never get the information. They only know from the construction closing process of landfill side, without any information related to the next phase of construction, since this landfill closed, the BMA regulated the prohibition access to enter the landfill area.

Five community leaders explained that the landfill's closure resulted in the struggle and challenge for the community to meet their needs. Therefore, the local community has the strong adaptability to fulfil their basic need, and now they are surviving and finding the comfort zone to deal with the challenges and problems. Even though the local community has met their livelihood, the community leader mentions that ecological restoration is mandatory because it still struggles and faces environmental degradation and pollution. They expected the urban forest park development to be carried out to encourage improvements in living standards. The community leaders emphasize that they are ready to participate in any phase of the development process if the BMA needs assistance.

Meanwhile, data analysis on the respondent's perception of the green Bangkok 2030 Project to redevelop the On-Nut Disposal Plant showed a high approval percentage, exceeding 72.23%. This perception is consistent with the high acceptance rate given by the level of approval for the redevelopment of the post-closure landfill site as an urban forest park. From this analysis, it could be concluded that the Bangkok people consent to redevelop the post-closure landfill as proposed by the Bangkok Metropolitan Administration. The local community also expected the benefit of this urban forest park development for their lives, such as improving air quality.

- **Benefits and acceptance provided by urban forest park development**

According to the question on the questionnaire, " what do you think this project (urban forest park development) serves residents with natural and social-ecological services benefits and drawbacks? About 95% and 92% agree that this project could improve the air quality and decrease the odour in their environment, and only 2% that "green space and wetland greatly improve water quality or sanitary." It is due to the residents using the government water supply and never experience the

irritation from contaminated water. Hence, about 68% of the community concern about the natural spaces are important habitats for biodiversity, according to 4.92 percent of respondents, who are more concerned with reducing noise and mitigating urban heat effects than with habitats.
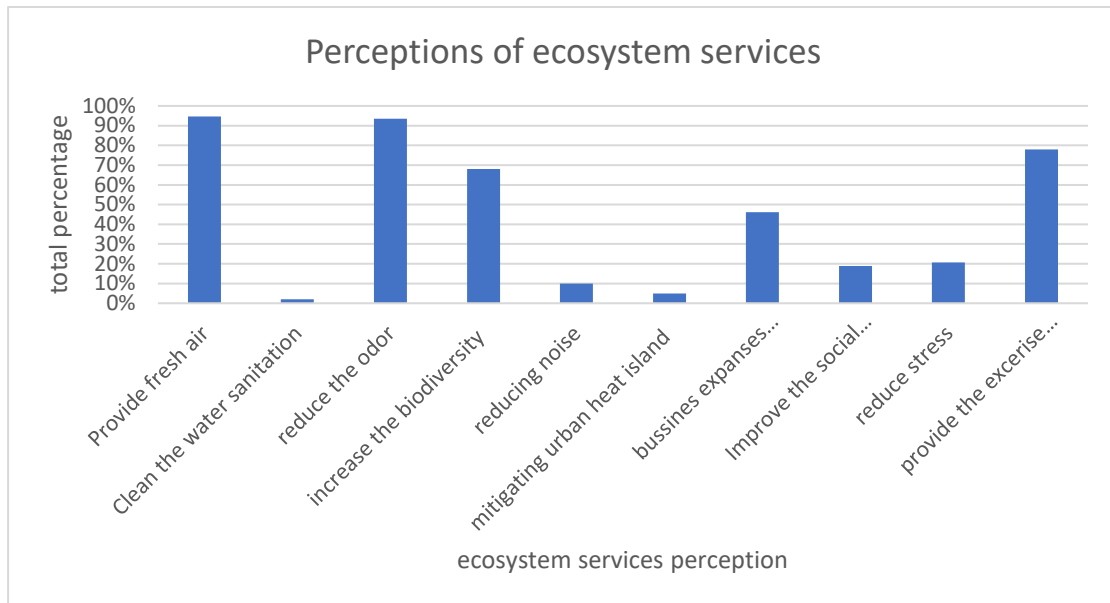
Figure 26 Perceptions of ecological services of green open spaces

Changes strongly influence residents' perceptions of ecological services in landfill area purposes. Those who have seen a significant benefit in an urban forest park or urban parks such as Lumpini Park or Rama IX Park are more likely to agree with natural space than those who have not, followed by those who have experienced a significant interaction or activities in green space. Urban forest park planning in the post-closure landfill area assists residents on a social level by encouraging health and offering a relaxing environment. They also have an impact on residential property values. Resident's value the benefits to expanse the business the greatest, with 46 percent strongly agreeing and 19 percent slightly agreeing to the improve social interaction, and 21% reducing the stress level. About 78% of those who took part of provide the exercise benefit it. It shows that, regardless of how often or for what purpose they visit will visit this urban forest park area once it's done, respondents appreciate the importance of green open space for their health in an urban setting.

The urban forest park planning, especially this project, serves as a location for everyday leisure and recreation that enhances people's daily life, according to 72 percent of respondents and 2 percent of those who disagree, and about 8% neutral.

This project's effects on real estate value received lower approval than the other three criteria, with 5 percent of respondents strongly disapproving, implying that other factors are more essential. Community shows the rejection caused by the concern about their livelihood and income, commonly from the landfill area.
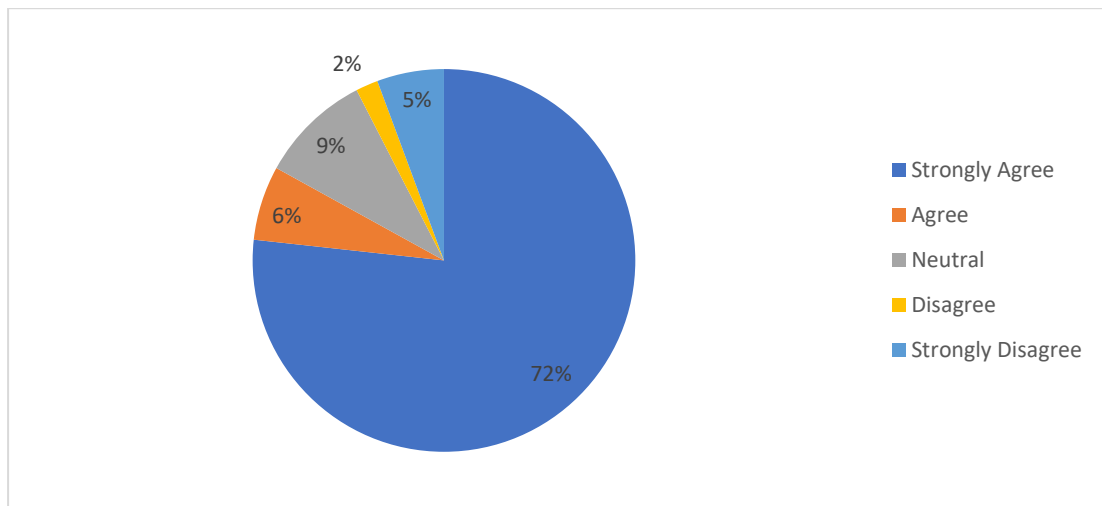
Figure 27 Acceptance of the post-closure landfill transformation.

The local community's rejection comes from the local community who has anxiety about their livelihood. The community worries about income and occupation, negatively impacting their family. This community work as a scavenger or second-hand seller.

- **The local community perception of the active participation**

Landfills are frequently found around urban areas, where most of the infrastructure is concentrated. Green space area amenities are needed for public enjoyment, workouts, passive recreation, or simply enjoying the fresh air to release all of one's intentions. According to various studies, this demand (green park/urban forest) arises in areas around urban areas to establish eco-restoration in the waste area. Management necessitates increased community participation and empowerment. Community involvement is critical in this situation because it entails individuals' active participation in the drafting of collective agreements and participation in activities. The resulting cooperative agreement represents their crucial awareness and duty as part of the community empowerment process.

The data in the figure shows that community involvement in urban forest park development based on the willingness intensity of participation in 5 Villages

(79.00%) in general, at the figure 9 the detail of the comparation participation at each Village followed by the Kratumsuepla 77%, Ruamjai Pattana 72%, Songkhro Building On-Nut 67%, Samakkeetam 62%, Gor Muslim 54%. However, the Thep Raksa only 3% willing to participate. The majority community in this area is scavengers who strongly depend on the landfill area.
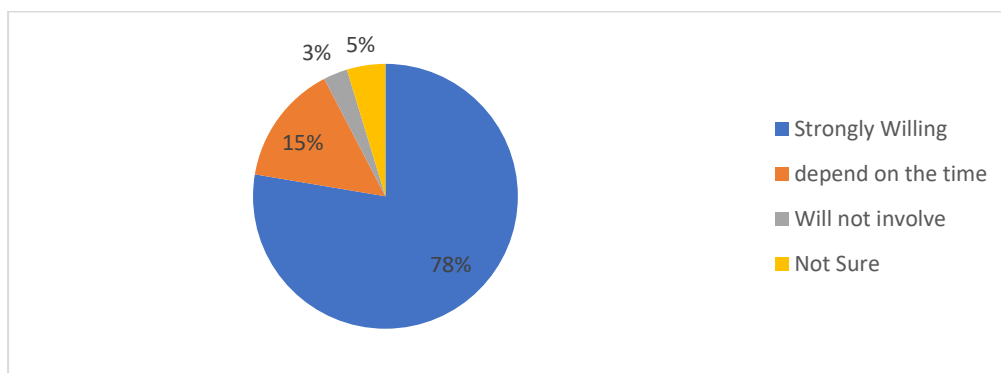
Figure 28 The willingness of local community participation

As a result of a data analyst, the distribution of willingness participation can help the government, or the developer design the participation implementation approach. From this diagram below, Thep Raksa community shows the lowest value of local community willingness participation less than 10%, and more than 74% of the local community would not be able to participate in this project because of the personal reason such as: have no time, not interest to involve, and the main reason is because the community in this area is not agree with this project plan.
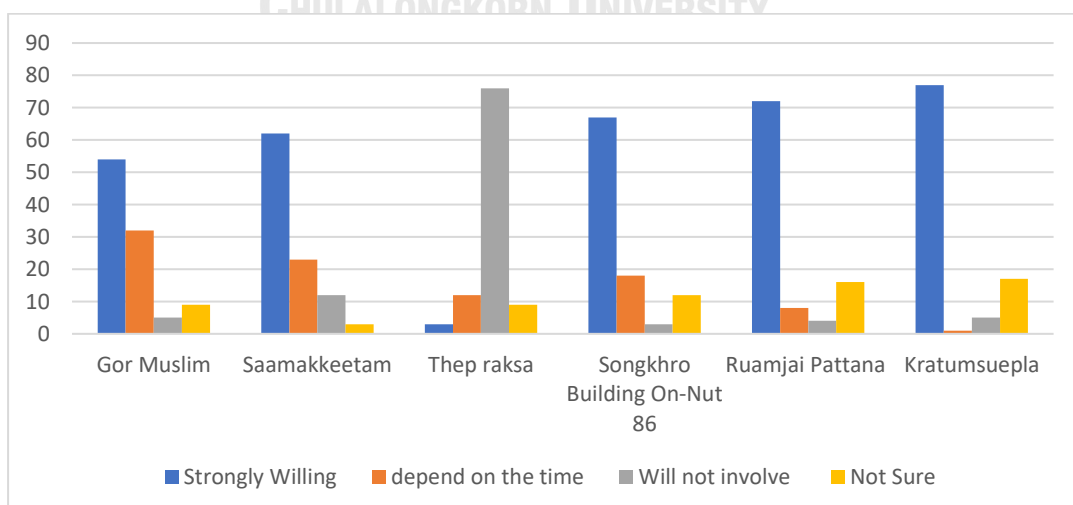
Figure 29 Willingness participation value at each study case area

- **The current health condition toward the community perception**

Theoretically, the effect of exposure to gases resulting from waste decomposition on humans depends on several factors, including the length of time a person is in the exposure environment, how often a person is exposed, the amount of gas concentration, and a person's resistance to exposure. Health is H_2S and NH_3. The effects of these gases at low concentrations cause headaches or dizziness, feeling sluggish, loss of appetite, dryness of the nose, throat, and chest, coughing, skin stinging, and even have an acidic effect on tissues. The body especially is ammonia gas. At lower concentrations, ammonia increases the "irritation" because ammonia is very soluble in water. The wet body surfaces in contact with ammonia will be irritated or burn with severity determined by the alkalinity of the ammonia itself. The body parts most likely to be in contact and impact are the respiratory tract organs, eyes, skin, mouth, and respiratory tract. Therefore, this research also collected data regarding the community's health.

Community within the surrounding post-closure landfill area ranks bad odors produced by the landfill as the main issue of people concern about 93%. Water contamination is also the one concern issue (81%). In addition, the respondent emphasized the effect of the landfill becoming worse in the rain season. While public health and safety risks are less important due to the survey results, the community has no experience of disease issues (no skin irritation, breath problem, and digestion illness).

Figure 30 Water contamination surrounding the local community's area

The data collection was conducted in the summer season; hence, the water contamination could not be seen clearly, but the local communities mention the small canal should generate a bad smell in the rain season. Sometimes, it is disturbed their activities. One respondent mentioned that before the landfill operation, they used to

play and swim in this small river, but since the landfill operated, the water started to contaminate.

Table 15 Respondent's perceptions analysis

Respondent's perceptions analysis	
Data / Respondent	Perception (%)
Issues of post-closure landfill sites	
Bad odors produced by the post-closure landfill	93
Rubble and soil subsidence on the ex-landfill sites and surrounding area	73
Water pollution caused by leachate	81
Health and safety risks to the people around the surrounding area	48
Health issues	
Healthy Life behavior	
- Take a shower min. two times	98
- Wear mask at working place	78
- Do exercise or workout at least 2times	45
Cough	2
Respiratory Tract Problem	1
Digestive Tract Problem	1
Dermatology Diseases/ Skin Disease	3

The highlight of this priority indicated that Bangkok People agreed with the Bangkok Metropolitan Administration (the BMA) to prioritise ecological landfill restoration as an urban forest park. Yet, it should provide exercise space and other facilitation like parking area, small market. However, the percentage of disapproval that exceeds the perception of "strongly disagree" with the value of 7% among respondents in this area is cause for concern that the redevelopment of post-closure landfill as urban forest park might impact their income and livelihood scavengers. They consider social problems like drugs abuse and high social gapping.

4.3 Benefits and Drawbacks of Urban Forest Park

UN Recently announced Sustainable Development Goals including a city-specific goal to make cities safe, livable and sustainable (Goal 11)" Regarding UN report, 2016. One of the dimensions for this aim is straightly related to the UGS provision: Until 2030, create access to green and public spaces safely with accessibility for all people, especially for older people, children, disabilities, and women globally (Kendal, Lee, Ramalho, Bowen, & Bush, 2016).

The existing issues and challenges had founded during the data collection process. Regarding the social occupation or employment status, the main occupations of local people at surrounding 1 km from this project area are the PPT staff who work as the outsourcing staff which is responsible for operating the waste management equipment, or they run their own business as the retail or reseller the secondhand product which had selected from the waste-collecting center, many of them as well work as a scavenger (Prawet District Staff, 2020). Each occupation possessed different knowledge related to the utilization of post-closure landfill areas. The local staff had the vision of the operation process and the ecosystem services discovery. The main livelihood has relied on post-closure landfill areas. However, some of them think that by having and developing the urban forest park in this landfill area, they could create many recreational activities such as jogging, selling vegetables/fruits, making the environment better, and decreasing pollution, hence this also could cope the social issues. On the other hand, about 45% of the local community thought this urban forest park would decline their income in providing services for food consumption by affecting their occupation opportunities. The different views of the local community will be resumed in the two main drawbacks and benefits, such as the socio-economic and environmental impact.

A long time ago, the post-closure landfill area was utilized as an open space area for the community to earn money for their life. Now, the community is prohibited from giving or treating this area. The operator manager applied the protection and conservation treatment by watering the area and tried to increase the *Leguminosae* plant in this surrounding area to reduce the land contamination and increase the organic matter on the land. In this study case at least, two major problems should be tackled by the developer. These main issues should be coped with the

related stakeholders in this project, such as social economy issues, educational and vacancy opportunities of the BMA employment vulnerable People in this community.

- **Social-economy impact of the urban forest park development**
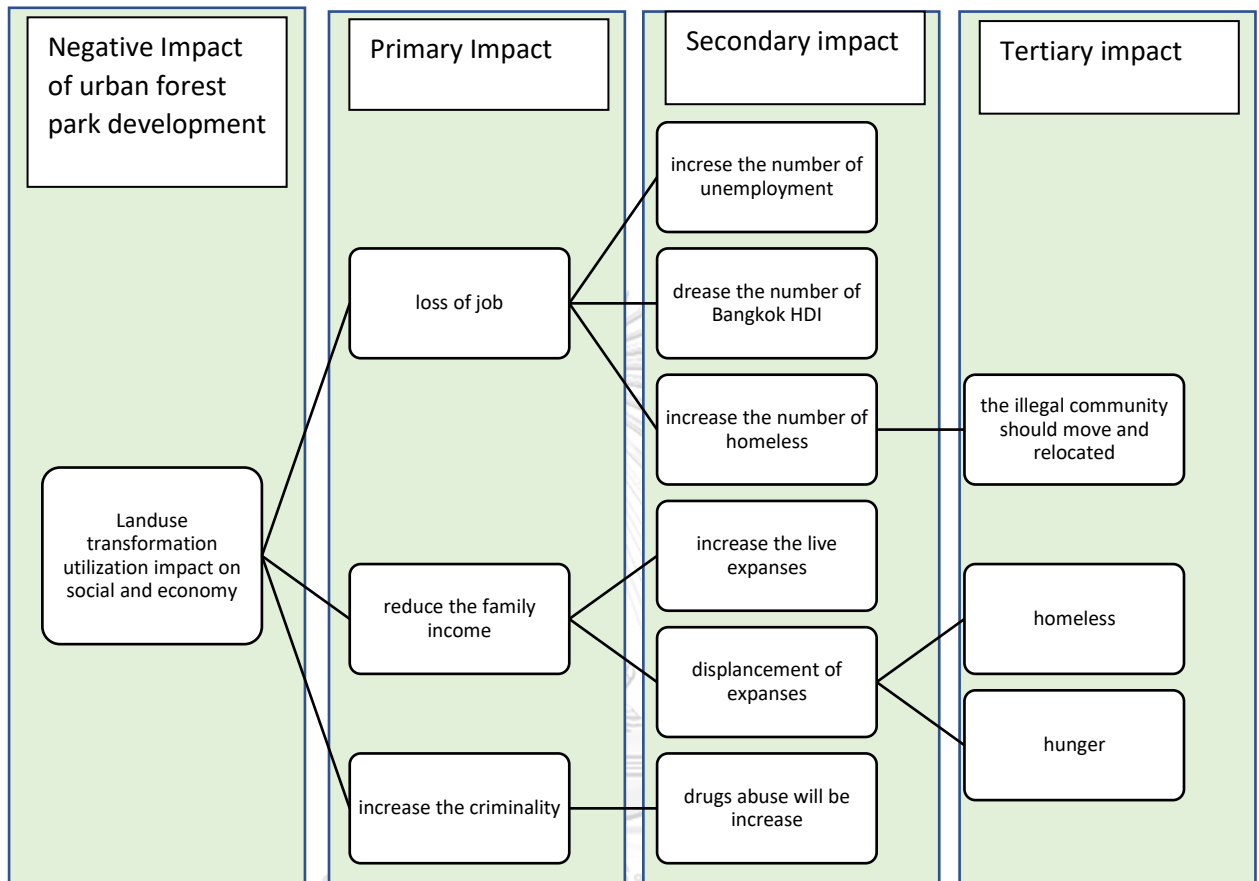
Figure 31 Diagram tree of urban forest park social economy impact

This diagram tree shows this project's negative snow impact prediction regarding the local interview. At least there are three primary impact predictions that the local community will receive: losing the job, reducing the income value, and increasing criminality. These three primary negative effects would drive to secondary impact such as increase the number of unemployment, displacement of expanses. Moreover, it will address the homeless and hungry.

According to the head of the community development department at Prawet District, the local communities at Ruamjai Pattana (about 50 meters from the project area) are unregistered citizens because they built the home on government land. However, these local communities should anticipate any project that authorities would develop. The primary effect of this project can be unemployment should be the red

line of the developer and local community because almost more than 50% community work on this waste management.

Figure 32 The home business of local communities

The picture shows the process of garbage transport by the local communities as their main livelihood. This project also could drive a positive impact for the local community, follow as this diagram below: The diagram provided the positive impact prediction such as increasing the income, improving the communication and engagement between stakeholders, and improving the health condition. Local communities and the BMA have the same prediction revealed this project possible to change local communities to sell their product.
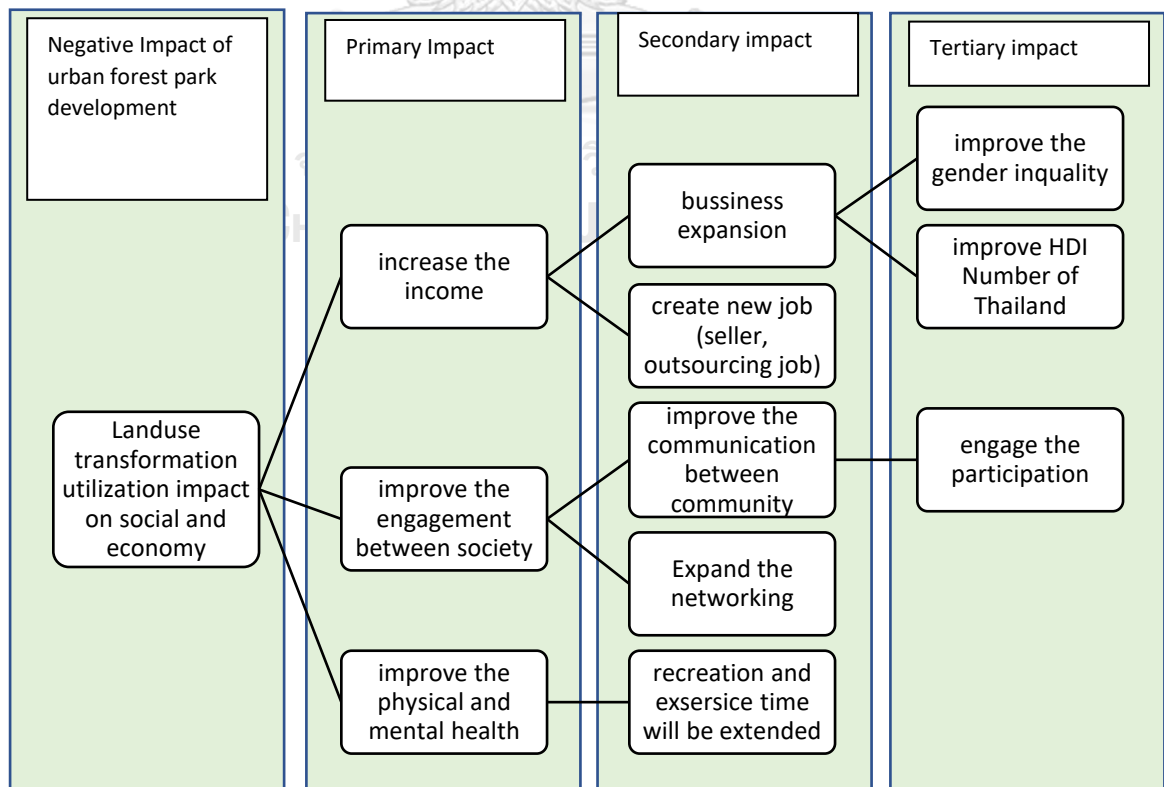
Figure 33 Diagram tree of social-economy positive impact

According to the interview, the BMA and the leader of local communities had been identifying the social issues, which should be considered during the urban forest park process. This is also emphasized by the local district government officer, especially the community development division. The major social issues in the on-nut area include drug abuse, illegal people, and criminality. In addition, the local communities that stay more than 500 meters from the pilot project area also mention their security when the construction is done. Social issues in this surrounding area are mainly caused by many unemployed people living near the on-nut (50 meters – 200 meter), which the BMA and local government officials also a highlight. About 12% of unemployment in this research area comes from the *Gor Muslim, ruamjai 86 and Ruamjai Patanna Village.* Muslim Gor Village leader explained this drug abuse and social issues had conducted since the On-Nut operation a long time ago. Therefore, He requested that the BMA have participatory monitoring involving the local community.

Even though urban forest park benefits cities and the people who live nearby, access to them and the benefits they provide are not uniformly distributed. Furthermore, the development of these places could have unintended consequences for individual urban districts. Minorities and those from lower socioeconomic backgrounds have the least access to green spaces and are disproportionately affected by their construction, making it an issue of environmental justice.

According to a case study in Atlanta, Georgia, socioeconomically disadvantaged persons were denied access to the city's green spaces (Dai, 2011). Even in the city, people with greater money could drive to a public green space or pay for membership to a private one, such as a golf club, highlighting the wealth disparity. According to the conclusions of another study of park distribution in the Los Angeles area, as an example, there is an inequitable allocation of the park that disproportionately hurts poor persons (Sister et al., 2010).

On the ecological restoration at On-Nuch disposal area. The BMA and local government should anticipate the high retail costs of properties near parks. Other factors such as the lack of private backyards or access to unsafe parks contributed to this. Because several studies showed the residential housing expenses concerning

green space, the closer a residence was to a public green space, the higher the cost would be in most cases.

In addition, this urban forest park development is necessary to improve the security and self-convenience should get intention from the developer for ensuring the sustainable urban forest park in this area. This research then proposed several policies. First, green open space must be accessible to every citizen with security guarantees. The positive role of this space can be reduced if it is not supported by adequate security, including biological security such as maintaining cleanliness so that it remains accessible during the COVID-19 pandemic. The security will guarantee the visitor can be saved during the activities. In much research, the safety and comfortable feeling could indicate the sustainable urban forest park area.

- **Education and vacancy opportunities for vulnerable people**

Respondents in this study expected to perceive green features as helpful to enhancing work environments. Stakeholders in On-Nuch who were involved in urban green space planning, maintenance, and conservation perceived green spaces as potential places for educational activities where, for example, people could receive training on agroforestry practices, gardening, entrepreneurship, or learn about the environmental issues. The community capacity building was the success story of Malawi and Romania in terms of urban forest park development, which provides training for the local community surrounding urban green space (Gavrilidis et al., 2020).

The BMA stated that urban forest park provides vital services for the welfare of urban dwellers. They offer various benefits, which support our physical, psychological, and social health. Thus, it plays a significant role in creating socio-environmental conditions that increase human health and wellbeing. This ecological restoration project should provide opportunities for attracting development, creating jobs, and increasing property values.

Based on the explanation from the head of the education department in the Prawet district, if the project of ecological landfill area is built with the concept of an environmentally approach, it will drive the conscious and the integrates of the environment, natural resources, where it can ensure the ability, welfare, and quality of life of present and future generations.

- **Ecology impact of Urban Forest Park and another green area**

According to the research questionnaire, this development can help to break down social barriers in cities and bring people closer together, improve communication, improve the social life, highlighting the reason why respondence said it could be improving the social life of the community interaction in this project because of the size of this project only 8 hectares. The community explains it will not happen if the urban forest park is large like King Rama IX Park. The On-Nuch project can be accessed by walk. It can address the local community to have the interaction each other. By this explanation demonstrates how the many benefits of green space in every city will be distributed differently depending on the number and size of green spaces, as well as which groups live in the closest households, and illustrates how the many benefits of green space in every city will be distributed differently depending on the number and size of green spaces, as well as which groups live in the closest households.

According to an expert interview, urban forest park development at On-Nuch can serve as a habitat for various types of wildlife with high biodiversity. It is a place of protection and nutrition for several animals, especially birds, small mammals, and insects. This project can create a natural environment, and plant diversity can create local ecosystems that provide places and food for birds and other animals.

The Big Tree added the composition of vegetation with various strata in the urban environment would add to the value of the city's beauty. The shape of the canopy that varies with the appropriate placement (spatial arrangement) will give the impression of its beauty. The tree canopy also gives a soft impression to buildings in urban areas that tend to be rigid. A study conducted on the existence of green open space on the aesthetic value is that people are willing to pay for the existence of green open space because it provides a sense of beauty and comfort.

The PTT restoration project leader mentioned other benefits of this urban forest park. Green open space can be built to manage the urban environment to lower the temperature during the day and vice versa at night. It can be warmer because the tree canopy can withstand radiation from the earth. The amount of reflected solar

radiation in a forest is strongly influenced by the wavelength, type of plant, age, the plant's position, sun's rays, weather conditions, and latitude. The air temperature in forested areas is more comfortable than in areas not overgrown by plants. In addition to temperature, another microclimate element regulated by green open spaces is humidity. Trees can provide coolness to hot city areas (heat islands) due to the reflection of the sun's heat coming from buildings and steel. This area will produce air temperatures 3-10 degrees higher than rural areas. Planting trees in an area will reduce the atmospheric temperature in the hot area
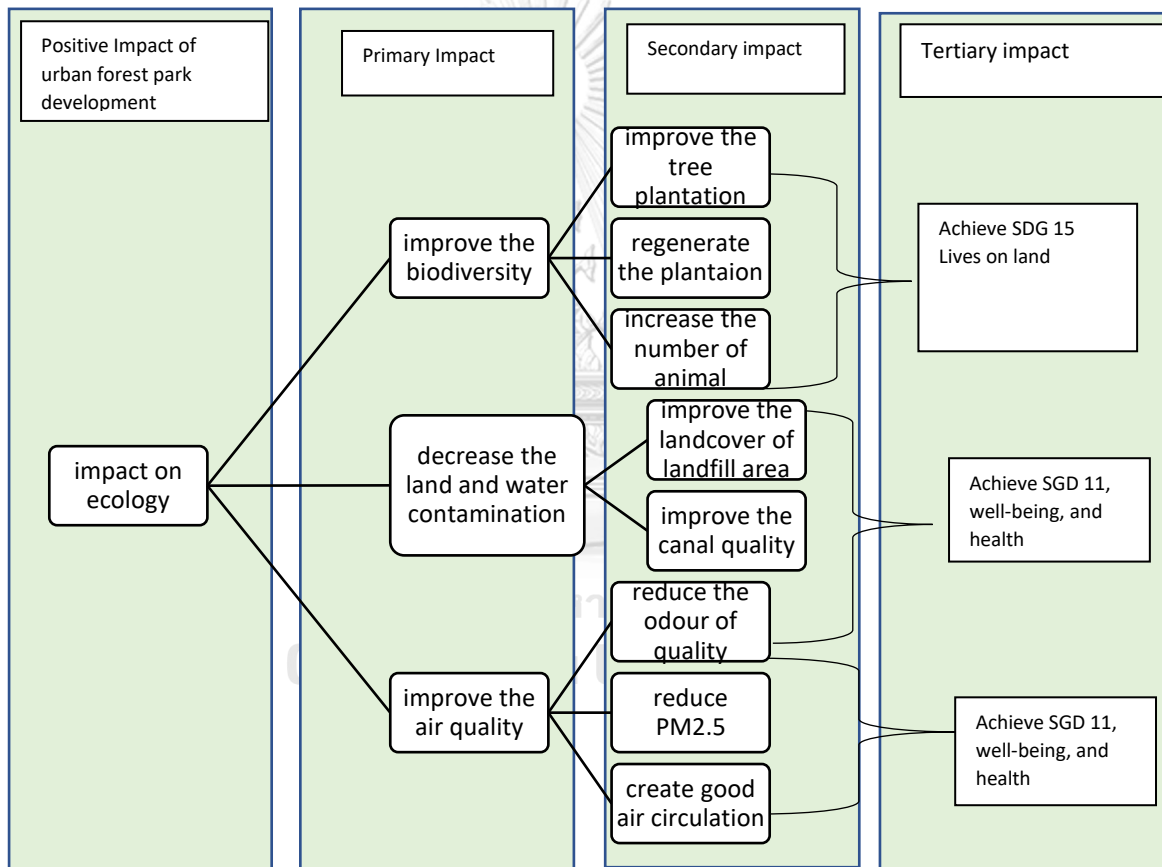
Figure 34 The positive impact of urban forest park development

All the development activity, wherever and whenever, will have an impact. The impact is a change that occurs because of an activity that can be natural, whether chemical, physical, or biological. In the case of urban forest park development at On-Nuch post-closure landfill area, this development's negative environmental effect can also happen. According to the expert interview, the negative impact can be observed during and after the development of urban forest parks, such as the wildlife attack, noise disruption, and water contamination.

Bird migration is another disadvantage that should be considered. Thousands of wild bird's roam throughout bird migration season. Creating new habitats will allow numerous birds to migrate in the On-Nuch area, along with other species, including snakes, lizards, and monitor lizards. The presence of thousands of migrating birds, on the other hand, poses a significantly greater risk to the safety of not only flights but also local communities.

Respondents were also questioned about any negative experiences while visiting other open areas. More than 70% of them stated that they had no negative experiences participating in other urban forest parks activities. A person's perception of the quality of green open space is influenced by their objectives when visiting the region. People are more interested in getting specific benefits from features that satisfy their needs. Those who come to stroll or appreciate nature, for example, are more likely to notice if there isn't enough green space. Those who prefer to walk can tell when walking pathways are limited, whereas those who prefer to ride bicycles can see cycling trails. It also reveals that respondents, regardless of the reason for their visit to the green open space, are more likely to perceive a lack of exercise facilities. The illustration below provides the primary, secondary negative impact of the urban forest park development at On-Nuch area.
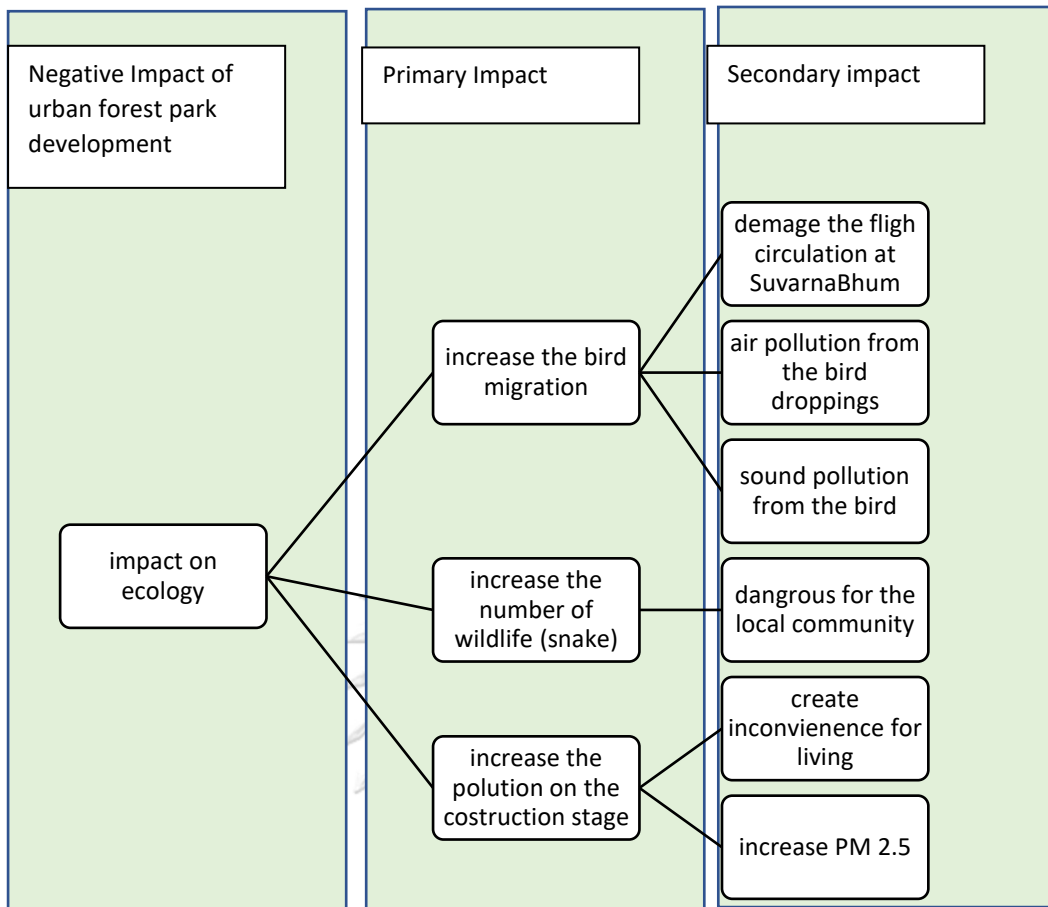
Figure 35 Negative impact of urban forest park development

This table reveals the impact of the urban development prediction according to the interview and conclusion of the discussion and questionnaire. The respondents mention this could be the long-and short impact, as well as it would drive to positive and negative effects for the economy, social and ecology (Table 25)

Table 16 Adhoc- impact of urban forest park area transformation

area / Impact	No Effect	Positive Effect	Negative Effect	Beneficial	Adverse	Problematic	Long-Term	Short Term	Reversible	Irreversible
Air quality		✕		✕			✕	✕		
water quality		✕					✕	✕		
soil improvement		✕		✕			✕	✕		

odor air		✕		✕		✕	✕	✕		
natural vegetation	✕	✕					✕			
wildlife		✕	✕		✕		✕		✕	✕
natural drainage		✕		✕			✕			
groundwater		✕		✕			✕			
noise from animal			✕		✕		✕	✕		
noise from the transportation			✕		✕		✕	✕		
visual disruption	✕	✕					✕			
health and safety	✕	✕		✕			✕			
economy value		✕	✕		✕	✕	✕			
social value				✕		✕	✕		✕	✕
public facilities	✕						✕			
recreation	✕			✕			✕			
visual aesthetic	✕	✕		✕			✕			

This highlights a feature that may have a big impact on access to green areas: the closer and easier these spaces are to be reached, the more expensive it is to live near them. Cleanup and converting locally undesired land use or brownfields to urban green areas improve nearby property values and create gentrification hotspots, putting pressure on minority and low-income populations. Green spaces benefit both the city that invests in them and the people who use them. However, it is vital to highlight the harm these places and unequal access may do to communities since they can prevent those who most need the benefits from getting them. Fortunately, this project will achieve a lofty goal of placing all citizens within a 10-minute walk of an urban forest park. As a result, no matter where you are in the city, you can find a green space of varying quality. An open area/ urban forest park is essential when creating future-proof cities. However, it is critical to identify the deficiencies in current green spaces that cities like Bangkok are striving to address to make the benefits of these spaces accessible to all.

4.4 Challenges and impacts of community perception to participation

In most sustainable cities, public engagement is the current practice of social integration. Public engagement is essential to improve the quality, legitimacy, and competency of environmental evaluations, urban planning decisions, and policymaking processes (Dietz & Stern, 2008; Gaventa & Barrett, 2012).

In this research, meaningful public participation highlights that sustainable development involves a process that allows people to take ownership of their ideas and initiatives to select solutions to local environmental challenges. Then, local community awareness is also the other challenges in this project since about more than 70% percent of the local community at Theb Raksa who would not be involved in this urban forest park development.

In this context, local community engagement refers to collective action to improve the quality of life. An empowered community can establish widespread support for environmental and development issues in their neighborhood by providing adequate knowledge that can influence local decision-making. Therefore, two major challenges: the sense of ownership and the environmental awareness, will explain in this section

- **The local community ownership senses**

One of the most significant aspects of community participation is the ability of the community to participate in most procedures. When the community is perceived as an equal participant in setting the scope and framework for monitoring, there is a greater sense of ownership over the issue. Maintaining a high level of community ownership is crucial to fulfilling urban forest park development's long-term sustainability goals.

According to this research, the urban forest park is the distance away from a park, and whether that distance affects use or benefits derived from the park to the local community. The local community agreed with this finding. But the relationship of distance to park use is important because these characteristics impact which neighborhoods are receiving benefits from a park and the local community sense of belonging. For example, this research found that distance is a factor mitigating the benefits derived from a recreation site for the community who live close to urban forest park they can say if it's possible to come every day because it or others found

that a view of an urban green area from one's home, in addition to visitation, is related to positive feelings about a self of belonging.

The idea of psychological ownership can be implemented into a local community's engagement framework to bridge the gap between the psychological argument of the actual problem and the symptom of diminishing public participation by understanding the routes of psychological ownership. In addition to a sense of ownership, a sense of community is another factor that might impact community motivation. In this context, a community is a collection of individuals who share resources and services and reside in the same area. The community is also seen as the most basic level of human organization, responsible for the physical and emotional traits that community members must deal with. This is demonstrated by the community's eagerness to participate in and contribute to solving a problem that benefits everyone. As a result, it's vital to investigate "community spirit" so that the public may learn more about its impact on the development of urban forest park participation and how to build community spirit in cases where its absence is a barrier to the park's long-term sustainability.

- **Environmental Awareness**

Perception of developer and the local community is different. To fill the gap of different of local community

The respondents were questioned about their awareness of the environment. They were concerned about the air pollution and the contaminated area since this urban park will be developed. The local communities are aware of the bad odor of the area since these issues affect their lives. In the rain season, the community tries to plant the tree in the surrounding area of their living to prevent the pollutant increased. Other awareness can be seen on the reuse and reduced implementation in this local community's area. The local communities also mention that they need more trees to improve the contaminated river. Hence, they also mention they never throw the rubbish on the landfill area since this area closed.
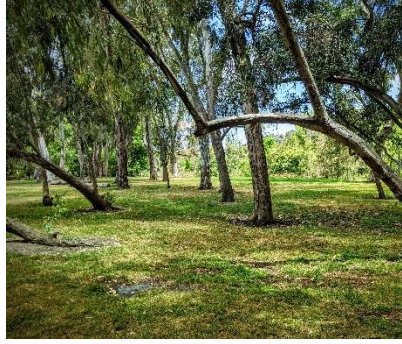
Figure 36 Community creation and 3R implementation

4.5 Community needs and urban forest park design

This research divided the project design according to three major designs, while during the interview, the local community got an explanation about the difference of this design by using this table:

Table 17 Green space design purposes at this research

Urban Forest	Urban Park	Urban forest park
Have more than 80% vegetation, have no exercise facilities	Have only about 50% vegetation with full of exercise facilities	Have more than 60% vegetation, provide several exercise facilities
Function: to improve the air quality, increase the biodiversity, focus in	Function: focus on the improving the social live, provide the recreation and	Function: not only focus of the enviornment recovery, this design

environment recovery.	support the public excersice facilities.	also focus on the improving the social live, provide the recreation and support the public excersice facilities.

The results show that, of those who used green spaces, 76.7% used them more than once a week. Walking and running were reported as the main activities in the urban forest park for about half of the respondents (89.6%), followed by recreation (8.9%), resting (1.5%), To determine the types of suitability for post-closure landfill redevelopment according to the community's point of view are taken as an indicator. The data obtained shows the priority of redevelopment types based on community needs preferences. The graphic below shows that the community prefers to have urban forest parks accessible by foot and have exercise facilities. About more than 132 communities (80%), about 26% prefer to have public parks.
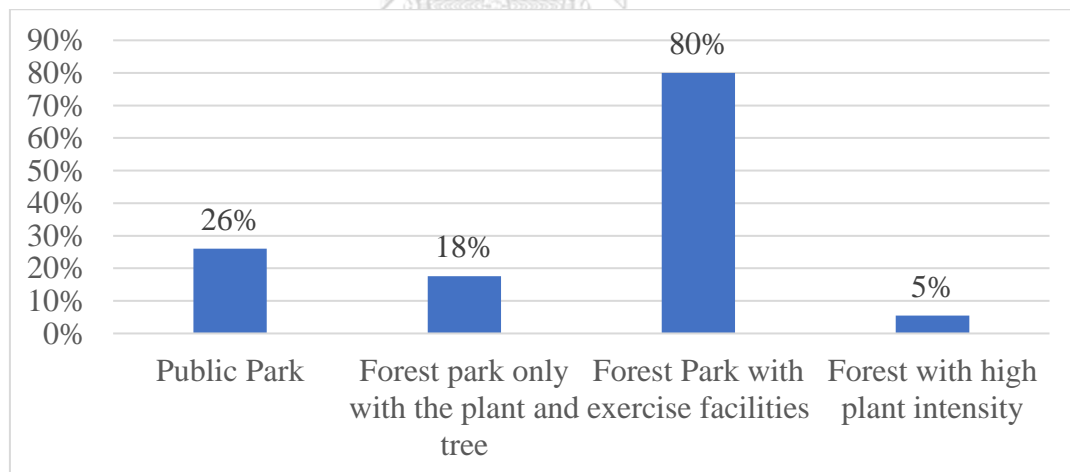
Figure 37 Community preference and needs

According to the interview, the community's major mention their desire to do some picnic and family activity at this park. Therefore, this urban forest park development design and planning must be including the with additional facilities, both in the form of protective plants and flowering, as well as in the form of completeness in the form of children's toys, seats, and arrangements that entice people to visit this urban forest park.

In this research, the local community stated that this urban forest park was supposed to serve an aesthetic purpose, according to the community. This function is to improve the comfort and beauty of the city environment on a micro-scale, such as a home page or a residential setting, and a macro scale, such as the entire urban landscape. Townspeople's creativity and productivity are boosted by capable. Playing, exercising, or other sociability activities, which establish a balance of physical and psychic life, can also be active or passive entertainment. Can create a pleasant mood and balance between various structures, road infrastructure with urban forest trees, city parks, parks agriculture and forestry city, park buildings, green lines, railroad tracks fire, and the blue path along the river. Associated with green infrastructure. Landscape design and planning for community parks have advanced significantly during the last decade. Urban forest parks are no longer merely a venue for energetic kids with playgrounds. As our cities get more crowded, the expert mentioned that parks are becoming the sole outdoor leisure space for residents to connect with nature. When balancing space limits and community requirements with a park's capital budget, innovative problem-solving is typically required.

Big Tree, the BMA, and We Park were interviewed about including a multigenerational and multipurpose component, which necessitated designing and planning spaces for people of various ages. We Park mentions the needs to reconcile the different demands of empty nesters looking for outdoor space to rest, young adults looking to play evening kickball, teenagers looking to hang out with friends, and young children looking to run around play. They haven't decided on the concept or design for the on-Nut area, but they believe the design team considered everything, including plenty of seating options, covered spots, observation gardens, open spaces favorable to informal games, and a playground. Landscape architects and planners are also considering our four-legged companions when developing today's parks, according to the BMA.

In the same side, the community emphasized in the creating the opportunity to expand their business, the local community worried about this urban forest park can cover the economic issues. The local community mentioned that this project should have the small market to provide the access of local community to sell their product, since more than 60% local community is the second-hand and food seller. This

argument similar to the WePark and the BMA which mention that this ecological restoration able to provide the economy benefit for the surrounding local community in this area. The PTT mentioned, the local community participation could be increase if this project able to address the economic problem and improve the income value, it should give the sense of ownership for local community to involve in protecting and monitoring this urban forest park development.

Finally, this urban forest park development able to meet the local community needs such as provide the vegetation to improve the air quality, provide the exercise facilities to create healthy lifestyle, increase the income value by providing the small market.

4.6 Responsibilities clarification of institutions according to participation
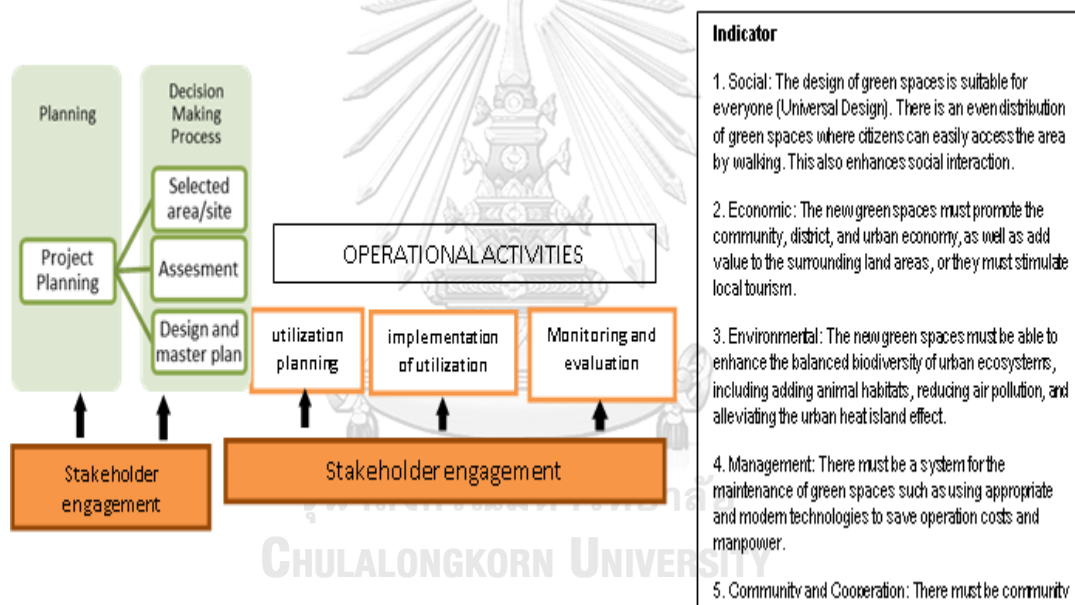
Figure 38 Green Bangkok 2030 operational process in increasing green space area

A stakeholder is a group or individual defined by their impact and potential conflicts of interest. At least seven stakeholders could impact the sustainable forest park at the On-Nut post-closure waste area, according to the stakeholder analyst's findings, whose roles and interests are detailed in the table below.
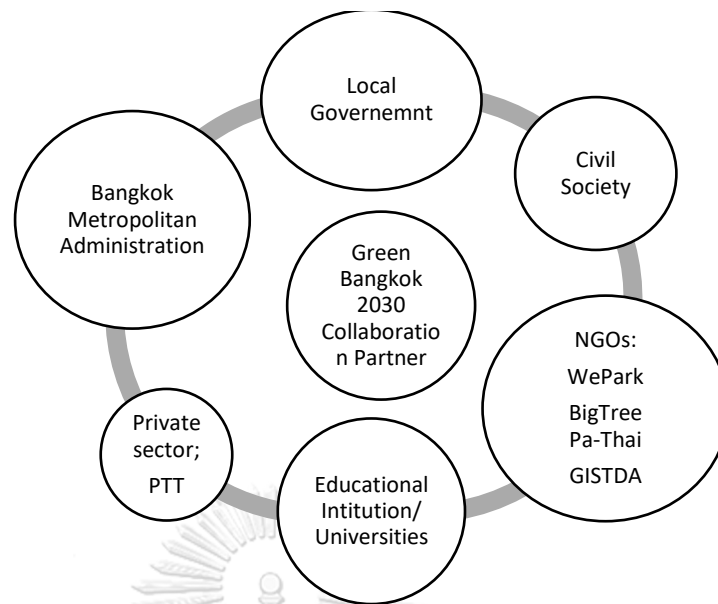
Figure 39 Stakeholder identification scheme toward Green Bangkok 2030

Urban forests, known as "Pracharat forests for the well-being of the Thai people," are designed to strengthen the ecological system and enable locals to utilize the green space according to the area's conditions. It includes exercise, relaxation, and learning. In 2018, over 300,000 Rai of green space within and around cities will be available to the public. Massive urban development in Bangkok provides an enormous opportunity to increase urban green areas by developing the unused spaces scattered throughout Bangkok. The new or free land belongs to the government (the BMA), and private agencies could redevelop urban green space spaces. Indeed, the space includes vacant public spaces, areas under the expressways, space between buildings, footpaths, land alongside the canals, etc. The Green Bangkok 2030 Project on 15th December 2019 by the BMA to collaborate between public, private, and civil sectors equipped with the capability and public mind to expand green spaces in Bangkok.

Green Bangkok 2030 has initiated collaborative work with stakeholders PTT Public Company Limited, Thai Association of Landscape Architects, Big Trees Project, We! Park Project, and Thailand Urban Tree Network.

The illustration above shows the interlinking of each stakeholder to work collaboratively to support the green Bangkok 2030 to achieve the goals: (1) Increasing the ratio of green spaces to 10 square meters per person. (2) Increasing public green spaces that people can access within 400 meters or 5 minutes by walking at no less than 50% of Bangkok's total area. (3) Increasing urban tree canopy per urban area to

30% of Bangkok's total area. As landowners, Green Bangkok 2030 opens the collaboration partnership for citizens or the private sector to increase green spaces in their communities or areas. The diagram below shows how the engagement process is critical to support green Bangkok 2030 in the development process.

Table 18 Stakeholder engagement and responsibility

Stakeholder involvement status	Influence	Responsibility	contribution	Strategy for engaging the stakeholder
Park chief	High (as the head of the park at the BMA under the chief of the BMA)	Control the budgeting, manage the park policy and build the networking	Can manage and supervise the project, Possible to postpone	Round table discussion, Policy discussion. Information and feedback meetings every six month
Chief park of part 1	High (under the supervise of the park chief)	Take care of park monitoring and control the administration, design the park policy, and consider the park management in Bangkok.	Can consider the park that proper to used as a park and the design of the park. Possible to postpone	Table discussion, Policy discussion. Information and feedback meetings monthly
Leader the BMA at On-Nuch	Medium		Not possible to change the regulation or implementation.	

Stakeholder involvement status	Influence	Responsibility	contribution	Strategy for engaging the stakeholder
BigTree	Medium	Look after the tree and conserve old-big trees in the park	Not possible to change the regulation or implementation, Help the old tree data, and help to design the urban forest park	
We Parks	Medium	Design the park landscape, and possibly invite the local people to participate	Not possible to change the regulation or implementation, but can recommend the park design	Create the activities with the community and collect the community's perception about the design of urban forest parks.
Kratumsuepla	Low	As the local actor, this stakeholder contributes to disseminating the information and updating the community	Working as the partnership college to help the developer solve the problem on the field site.	Engagement on a survey of project location, invite on the site working, give the

Stakeholder involvement status	Influence	Responsibility	contribution	Strategy for engaging the stakeholder
		condition.	Making complaints about the quality of service after the reports	responsibility to distribute the project information
Gor Muslim	Low	As the local actor, this stakeholder contributes to disseminating the information and updating the community condition.	Working as the partnership college to help the developer solve the problem on the field site. Making complaints about the quality of service after the reports	Engagement on a survey of project location, invite on the site working, give the responsibility to distribute the project information
Thep raksa	Low	As the local actor, this stakeholder contributes to disseminating the information and updating the community condition.	Working as the partnership college to help the developer solve the problem on field site. Making complaints	Engagement on survey of project location, invite on the site working, give the responsibility to distribute

Stakeholder involvement status	Influence	Responsibility	contribution	Strategy for engaging the stakeholder
			about quality of service after the reports	the project information
Saamakkeetam	Low	As the local actor, this stakeholder contributes to disseminating the information and updating the community condition.	Working as the partnership college to help the developer solve the problem on the field site. Making complaints about the quality of service after the reports	Engagement on a survey of project location, invite on the site working, give the responsibility to distribute the project information
Songkhro Building On-Nut 86	Low	As the local actor, this stakeholder contributes to disseminating the information and updating the community condition.	Working as the partnership college to help the developer solve the problem on the field site. Making complaints about the quality of service after the	Engagement on a survey of project location, invite on the site working, give the responsibility to distribute the project information

Stakeholder involvement status	Influence	Responsibility	contribution	Strategy for engaging the stakeholder
			reports	
Prawet district department	Since the project is located on the BMA land, the prewet district officer or stakeholder could not involve and support the on-nuch project, but the Prewet district could work together and disseminate the information about the park and give the information to the local community about this urban forest park planning.			

On this table, the stakeholder is identified as two characteristic direct and indirect stakeholders, where the direct stakeholder is the stakeholder that directly affects the project development likely the initiate the project, landowner, decision-maker, policy, and regulation implementor. These stakeholders, such as Bangkok Metropolitan Administration and PTT, according to interview PTT has a direct impact on this project implementation due to the responsibility and the interest of PTT to achieve the green Bangkok 2030.

An indirect stakeholder is a stakeholder who has no power and has low interest in this project. Such as the Prawet District Government, which has other responsibilities to look after the urban forest park in On-Nut areas, other stakeholders such as university/ researcher, We Park, Big Tree would be able to give the other view/idea yet have no power to manage and control the area. As well as the community, the community has high interest and needs in this project. The community has no power to control the project.

4.6.1 Stakeholder role and responsibility mapping

Stakeholders are defined as parties who can influence or be influenced (received the impact) by decisions made (Freeman, 1984), or as a person, organization, or institution who has attention and can influence the result of an activity (Greetings and Noguchi, 2006 and Bisjoe, 2010). As a result, stakeholders can be defined as individuals or groups who can influence and impact decision-making and the achievement of an activity's goal. Townsley (1998) divides stakeholders into

two categories based on their relationship to a decision or activity: primary and secondary stakeholder's secondary stakeholders. A primary stakeholder is a party with a direct interest in a resource, such as a source of income or someone directly affected by exploitation. Yang, et al., (2010) referred to these stakeholders as critical stakeholders. Secondary stakeholders have a direct or indirect interest in the resource or rely on some of the wealth or revenue created by the resource.

Based on the classification of stakeholders as stated by Townsley (1998), the primary stakeholder is Bangkok Metropolitan Administration (the BMA) as the leader in organizing and managing the landfill restoration program at the On-Nut Disposal Plant. As the owner, the BMA staff assisted in implementing an urban forest park in the On-Nut area. Those staffs are responsible for providing reports and are accountable for the ecological restoration program. The environmental restoration plan that the BMA will carry out requires work functions from government agencies, private parties, NGOs, and other academics in supporting the implementation of urban park forest management.

According to the graphic, the BMA as the owner or project implementation and the key of the urban forest park project at post-closure landfill area has strong interest and power. This interest is because of the target of green Bangkok 2030 and the national strategic plan, which mentions the increasing green space area in Bangkok to create a better quality of life and improve the air pollution in the Bangkok area. The BMA is divided into two categories on this project at the national level and the site area. Based on the authority level, all the social enterprises/NGOs had not enough power to give the intervention of urban forest park project, yet they have the high-interest value to show the intents of participation.
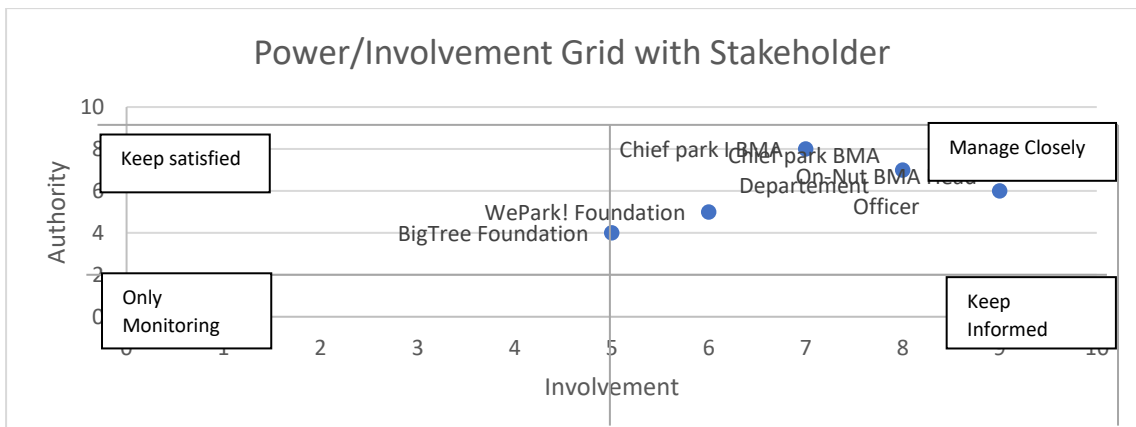
Figure 40 Power and Interest of direct stakeholder (National Government).

While indirect stakeholder in this research is the local government at prewet district, the respondent of key actor mentions about in this project. The local government cannot decide the project implementation because the responsible working area is different. The task, response, and working area structure have been divided by the national and country policy. But the local government will support and help the BMA and national stakeholders to develop this urban forest park by helping to disseminate the information and providing the information which needs to create a sustainable urban forest park in this area.
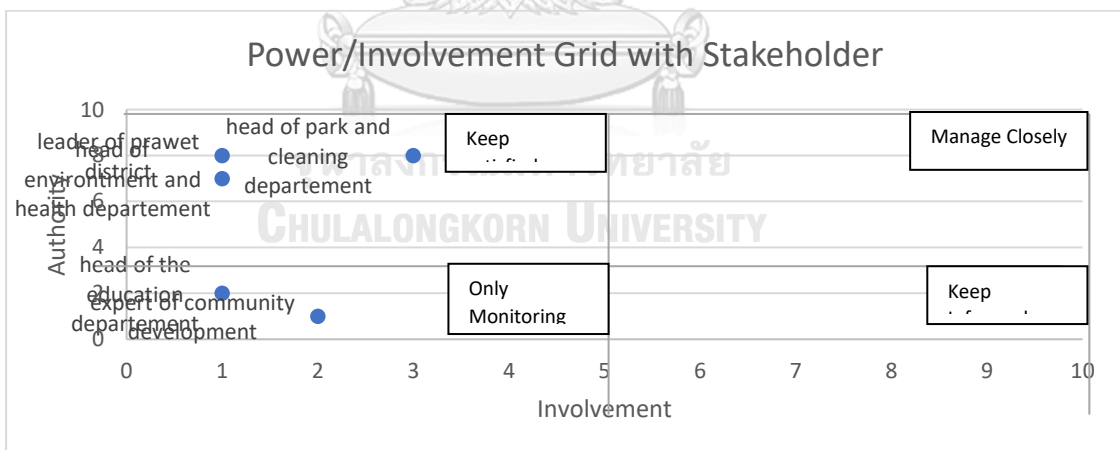
Figure 41 Power and Interest of direct stakeholder (local government)

4.6.2 Stakeholder collaboration to develop the community engagement

The importance of collaboration among many parties in the administration of urban forest parks to boost the efficacy of establishing synergies for improvement, particularly in landfill restoration. Economic advancement can empower communities as equal participants if the community knows the position and potential of their place.

Encourage research institutions/universities, social businesses, non-governmental organizations, private firms, and donors to take on the issues of urban forest park management in a collaborative manner. In partnership with these institutions, increasing the capacity of urban forest park management resources can be advantageous, as can encouraging grants from the public. This study aims to present a complete and accurate description of the partnership model stakeholders ecological landfill restoration in the initial phase, based on this explanation.

The diagram below explained the link of stakeholder collaboration in the ecological restoration process during the initial phase and implementation phase, the importance of community assessment will be the starter point of the community engagement to ensure the community needs and the project design able to fill the gap.
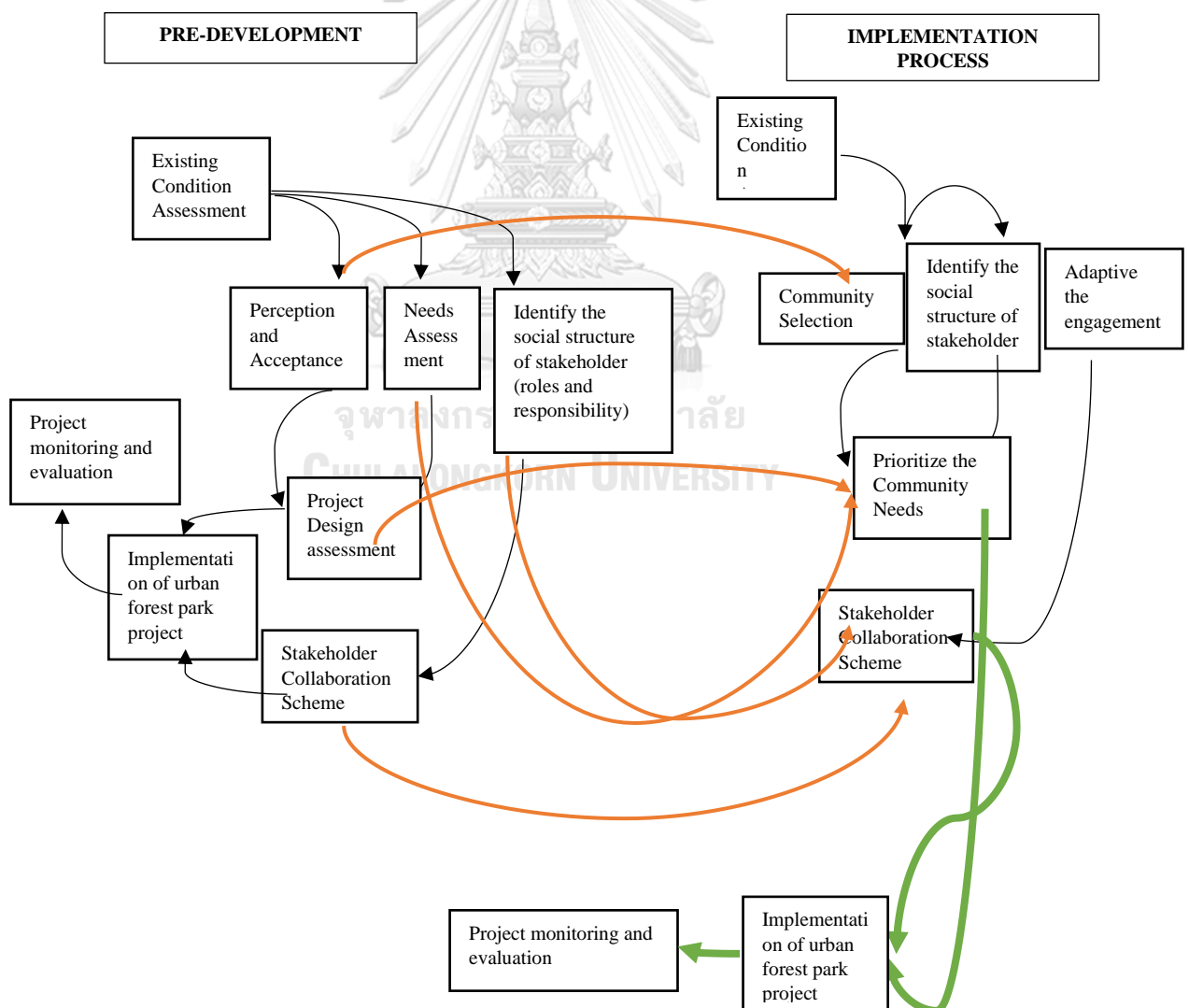
Figure 42 Scheme of perception, stakeholder interest and engagement process

The stakeholder theory's primary concept is that the better the corporate relationship between stakeholders and the firm, the better the company's business will be, and vice versa, especially if the relationship between stakeholders and the company is bad. It's due to the company's dependency on its stakeholders, either directly or indirectly. Trust, respect, and cooperation are the foundations of strong stakeholder relationships. A community development program, for example, must be tailored to the character of the community and its surroundings.

Table 19 Selective collaboration elements

Indicator	In-depth interview result
Motivation is the process that initiates and encourages actors to collaborate. The challenges of urban forest park development force the collaboration used to solve the development problem and gain legitimacy for stakeholder position or responsibility and an imbalance of resources, which indicates that collaboration actors are needed for all stakeholders. Motivation in this study refers to an aspect that encourages actors to collaborate.	All stakeholders have the same motivation and mission to improve the environmental quality in Bangkok Area
Interdependency is a stakeholder interrelation, which is beneficial and exists as a foundation for collaboration because it indicates the work cannot be done by themselves. Dependence is authoritative on the commitment of the actors. Interdependency in this study refers to how actors depend on other actors to achieve post-closure landfill ecological restoration goals.	Each stakeholder has the responsibility and roles. The responsibility encourages the stakeholder to work harmonize and synergy to obtain the benefit of each interest

Internal trust or legitimacy is defined as acknowledging all parties that the related actor can be trusted and credible in response to their duties and roles within the collaboration framework. Internal legitimacy is pivotal because it is an element to form a shared commitment. Trust in this study refers to the individual's belief in other actors accomplishing their roles and responsibilities within the collaboration.	Legitimacy is the high value to work collaboratively among the stakeholders.
Leadership is the role of the leader during the collaboration process. The initiation of collaboration that builds trust between actors facilitates dialogue and explores common goals. Leadership in this study refers to how actors who could initiate collaboration can facilitate collaboration goals.	The stakeholder is dependent on the BMA regulation and the discussion of round table and coordination
Common goals result from unifying goals, solving the problems together, and minimizing the misunderstandings between stakeholders. The common goals in this study refer to the common goals to be achieved by all collaboration actors in managing the initial phase of post-closure landfill ecological restoration.	The same mission and goals to create the better condition for the Bangkok people

Commitment is a pledge reflected in the responsibility for responsible actions in the collaboration framework. Commitment in this study refers to the consistency of the actors in contributing to the collaboration process.	The commitment of stakeholders to achieve the goals
Participation is the involvement of actors in collaboration. Participation in this research refers to each actor's contribution in collaboration to green open space.	All related stakeholder tents to have active participation.
Transparency in collaboration is used as an institutional design to strengthen legitimacy and build public trust. Transparency in this research refers to mutual openness in every stage of the urban green space management activity.	The transparency of the budget still needs to be explained.

- **Existing Collaboration Condition**

The stakeholder collaboration model in the management of landfill ecological restoration is based on considering each stakeholder's roles, duties, responsibilities, and capacities. Bangkok Metropolitan Administration (the BMA) as the leader in organizing and managing the landfill restoration program at the On-Nut Disposal Plant. The environmental restoration plan that the BMA will carry out requires work functions from government agencies, private parties, NGOs, and other academics in supporting the implementation of urban park forest management.

The BMA establishes coordination and cooperation with PTT in supporting financial support and analyst design in determining the suitability of the urban forest in question. PTT is a private sector that actively participates in climate change mitigation and supports green development activities in collaboration with several experts and networking to support green areas in Thailand. PTT can also be used as a partner to develop the surrounding community's economy by providing training programs and workshops. Another support is needed from the NGOs sector: Big Tree

is an environmental volunteer and advocacy group that works with communities, government agencies, and the private sector, and other civic groups to promote awareness and activities that help preserve public green spaces in Bangkok and beyond. Hence, Big-Tree can increase community awareness through community development activities carried out by Big-Tree. Besides that, Big-Tree can support tree species inventory and determine plant suitability following development goals.

Meanwhile, We Park is a project to develop empty spaces into green public spaces. Under the support of the Thai Health Promotion Foundation, we park has many programs to help communities around green areas to contribute and participate in green area development. At the same time, the university contributes to the concept of development in terms of architecture, handling soil contamination, and assessing the landfill area to be restored.

- **Motivating and challenging factors in collaborative stakeholder related efforts to implement ecological restoration planning**

The driving factors for collaboration that can make collaboration work well are that the existing networked structure is transparent with the BMA being the leading sector and there is no hierarchical level between collaboration members, all of whom have the same position and the network is horizontal; each stakeholder shows a reasonably high commitment to a common purpose by carrying out collaborative activities based on their respective responsibilities and carry out innovations in the preparation process for the development of urban park forest areas.

Furthermore, distributive accountability/responsibility in collaboration is clear by carrying out the process discussion and coordination in the decision-making process; and information sharing between stakeholders who are well implemented by exchanging information between the stakeholders involved by asking directly to the stakeholders who provide the information or data with each stakeholder is quite good.

The human Resources capacity from each stakeholder is also not optimal in implementation. In addition to Human Resources, Financial Resources owned by each stakeholder are also limited in number. Coupled with concern with the COVID-19 pandemic, many budget allocations were diverted to handle pandemic cases.
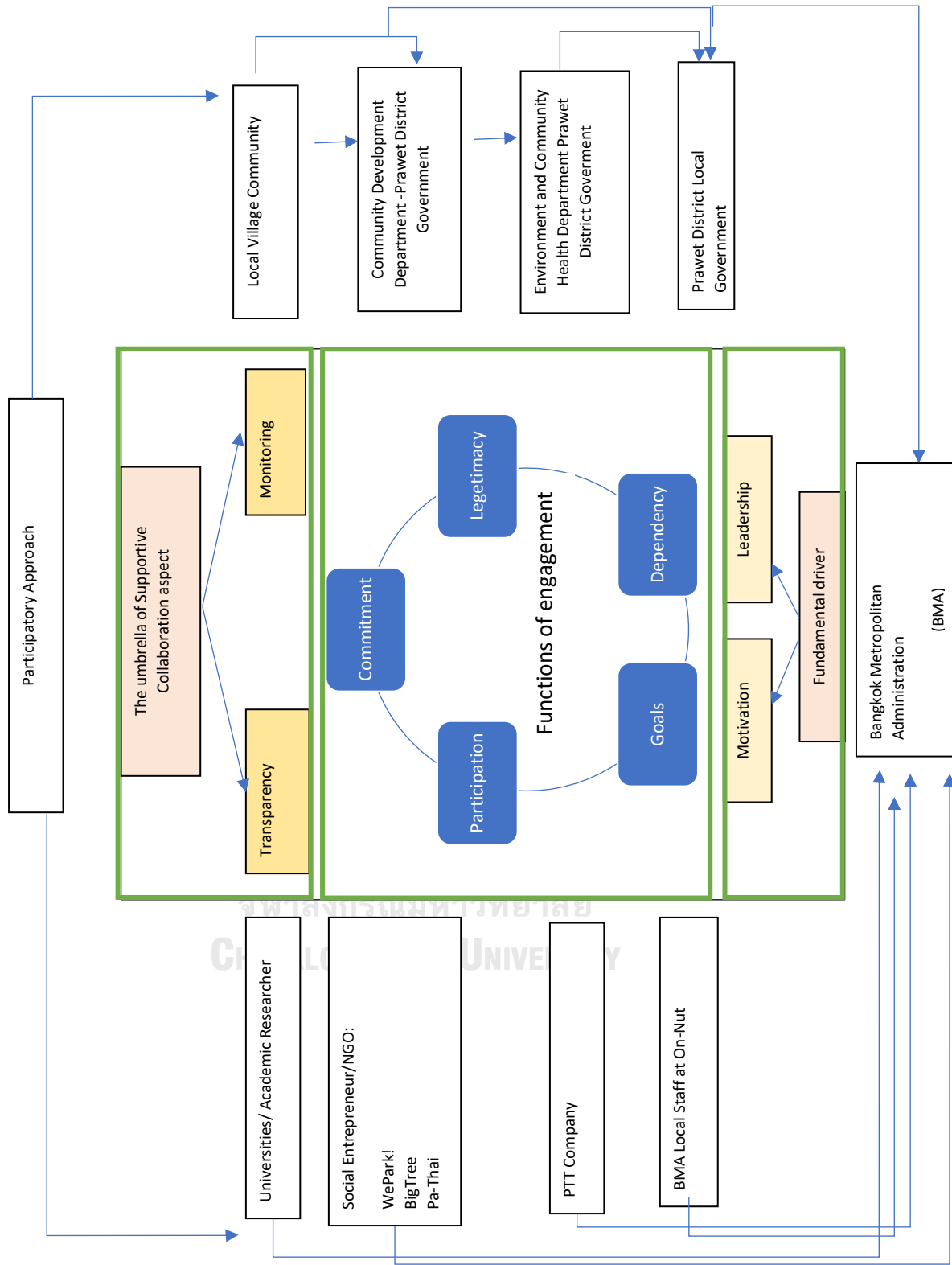
Figure 43 Multi-Stakeholder collaboration identification

Motivation and leadership as the fundamental element of collaboration in urban forest park development, the similar encouraging motivation seen as the existence of goals, reasons, and specific benefits that underlie actor involvement in the management of Green Bangkok 2030, all the stakeholder attempt to create the excellent environment condition and improve the human well-being for Bangkok people. Achieving internal objectives and the benefits derived will positively impact each actor for the institution and the ecological restoration project. Collaboration motivation will affect participation and will automatically strengthen collaboration actor commitment. Motivation is also related closely related to the interdependence of other actors. Some collaboration actors depend on the existence of other actors, were without collaboration actors. Likewise, the BMA should highlight the challenges of this dependency aspect. The mutual relationship dependence between stakeholders will lead to an agreement between actors to fulfill other interests and needs.

Leadership is in this collaborative process as the starting inclusive point to initiate the collaboration. In this case, the role of the coordinator. The BMA, as the focal point of leadership, creates the images of dependency of another stakeholder, not only because of the power of the BMA but also because of the BMA as the owner of many open green spaces in urban areas. The BMA has an essential value in forming collaborations, especially with non-parties governments. Leaders in collaboration are also needed to facilitate dialogue between actors in achieving agreement to solve the problem. Nonetheless, the role of the leader is to facilitate dialogue between collaboration actors yet fully maximized.

Following the fundamental aspect of collaboration; motivation and leadership. The collaboration process includes the other elements that show on the inter-relation cycles; goal, participation, commitment to the process, and internal trust/legitimacy. The correlation of all the aspects of the cycles cannot be separated from the other collaboration elements. The shared goal of the collaborative actors is to achieve the successful development of an urban forest park. This common goal is realized through actions agreed upon by all collaborating actors as a form of joint management. It refers to the participation of each actor. In achieving the goal, participatory supervision is also needed between actors to ensure that each actor performs their responsibilities and roles in collaborative participation.

Participation would create a commitment to the process. Commitment is necessary to ensure the achievement of the target of the collaboration. Each actor's legitimacy/trust will make the partnership process or joint actions program smoothly in urban forest park management. The emergence of trust between collaboration actors begins with assessing and monitoring each other on the performance of different actors in the direction of ecological restoration planning. As a core element of collaboration, trust must be supported by transparency between collaborating actors. Shared goals, participation, commitment, and trust must be backed by relationships to reach agreements in management actions Green Bangkok 2030.

The long-term stakeholder collaboration must also be seen from the internal relationship between collaboration actors. The presence sees the internal connection of transparency and oversight between actors. Supervision attempts to ensure that existing problems are quickly resolved, and that each actor contributes according to his capacity. Management of the ecological restoration plan that other actor will carry out will strengthen internal trust in collaboration. Likewise, transparency will make it easier for actors to supervise the implementation plan and enhance their confidence. Transparency is the ease of collaboration actors obtaining everything related to the Green Bangkok 2030 project and the On-Nut Ecological program. However, this transparency and monitoring are not very prominent in collaboration. This is because the absence of collaboration guidelines causes what information needs to be shared between parties and the monitoring procedures tend to be unclear, as well as the monitoring and supervision in the landfill restoration implementation plan are still not optimal, caused by the un-optimal role of the BMA as a collaboration leader in facilitating dialogue between actors.

4.7 Significant criteria of local communities' engagement

The Analytic Hierarchy Process (AHP) is a measuring theory used to determine the ratio scale from both discrete and continuous pairwise comparisons. The AHP system employs a hierarchical approach to represent difficult multi-factor or multi-criteria issues. The aim is at the top of the hierarchy, followed by the factor level, criteria, sub-criteria, and so on until the last level of options. A difficult problem can be stated in detail via hierarchical determination. The group is then grouped into a

hierarchical structure to make the problem appear more organized and systematic. There are numerous ways to use an urban forest park development plant with AHP. Several criteria were constructed based on the results of various related research searches, as well as the results of expert interviews, to produce the most acceptable urban forest park development plan model for adaption on On-Nuch Disposal Plant Area, resulting in the following criteria for the aim of:
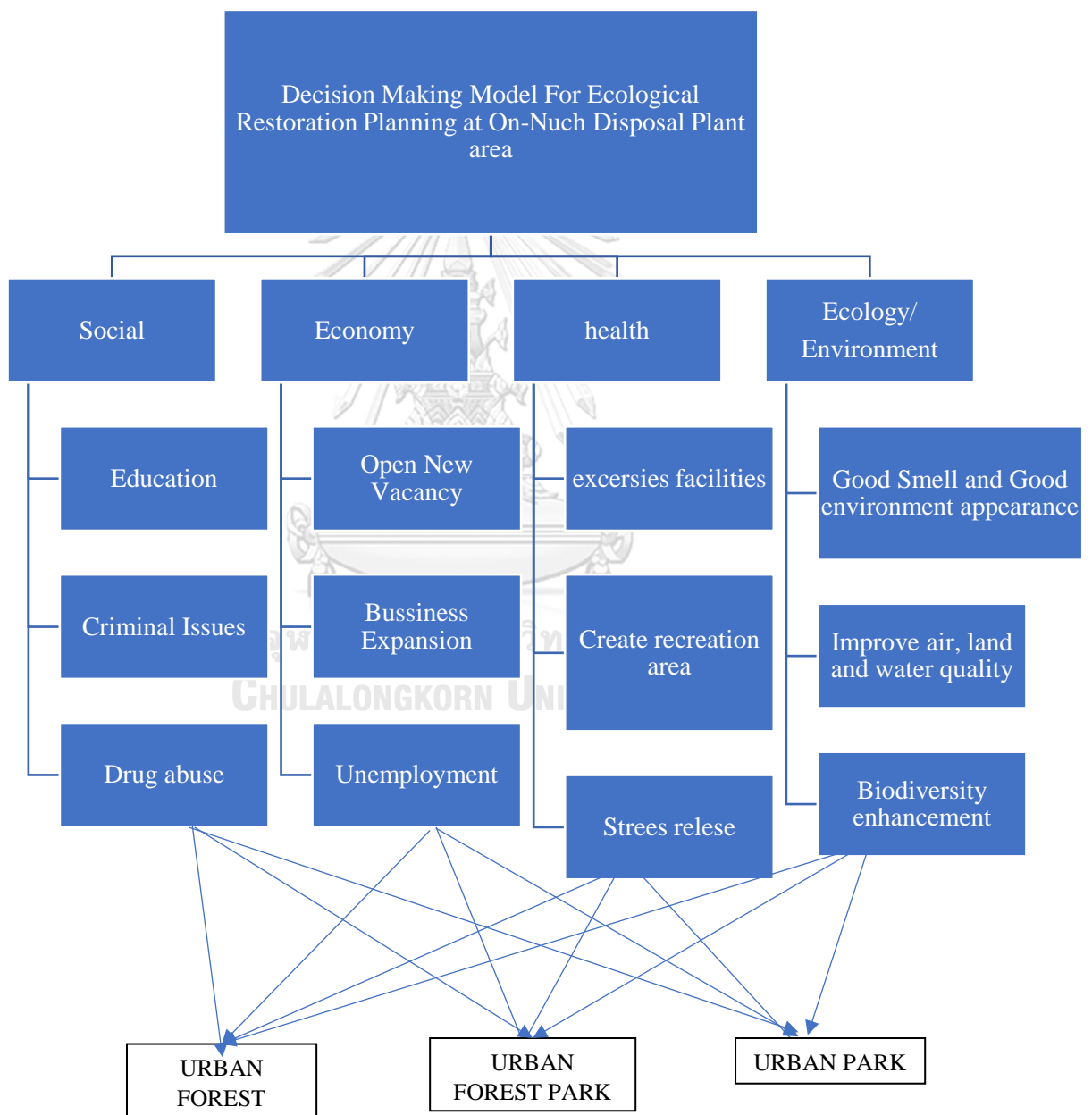
Figure 44 AHP analyst criteria

Decision-making model for ecological restoration at On-Nuch Disposal Plant area. Has several Criteria and sub-criteria:

1) Social, with sub-main criteria: education, criminal issues, drug abuses issues

2) Economic Impact: create the vacancy, open new business sector, unemployment

3) Health sector: exercise facilities, Create recreation area stress and mental health improvement

4) Environment issues: Good Smell and Good environment appearance, Improve air, land, and water quality, Biodiversity enhancement

While the alternatives that will be selected are: Urban Forest, urban forest park, urban park, after the objectives, criteria, and several existing alternatives are arranged hierarchically according to the AHP technique, the assessment of experts/expert respondents is then processed with the steps in AHP. The software used to speed up data processing is expert choice 2000 software. Following are the results of data processing compiled following the framework alternative selection.
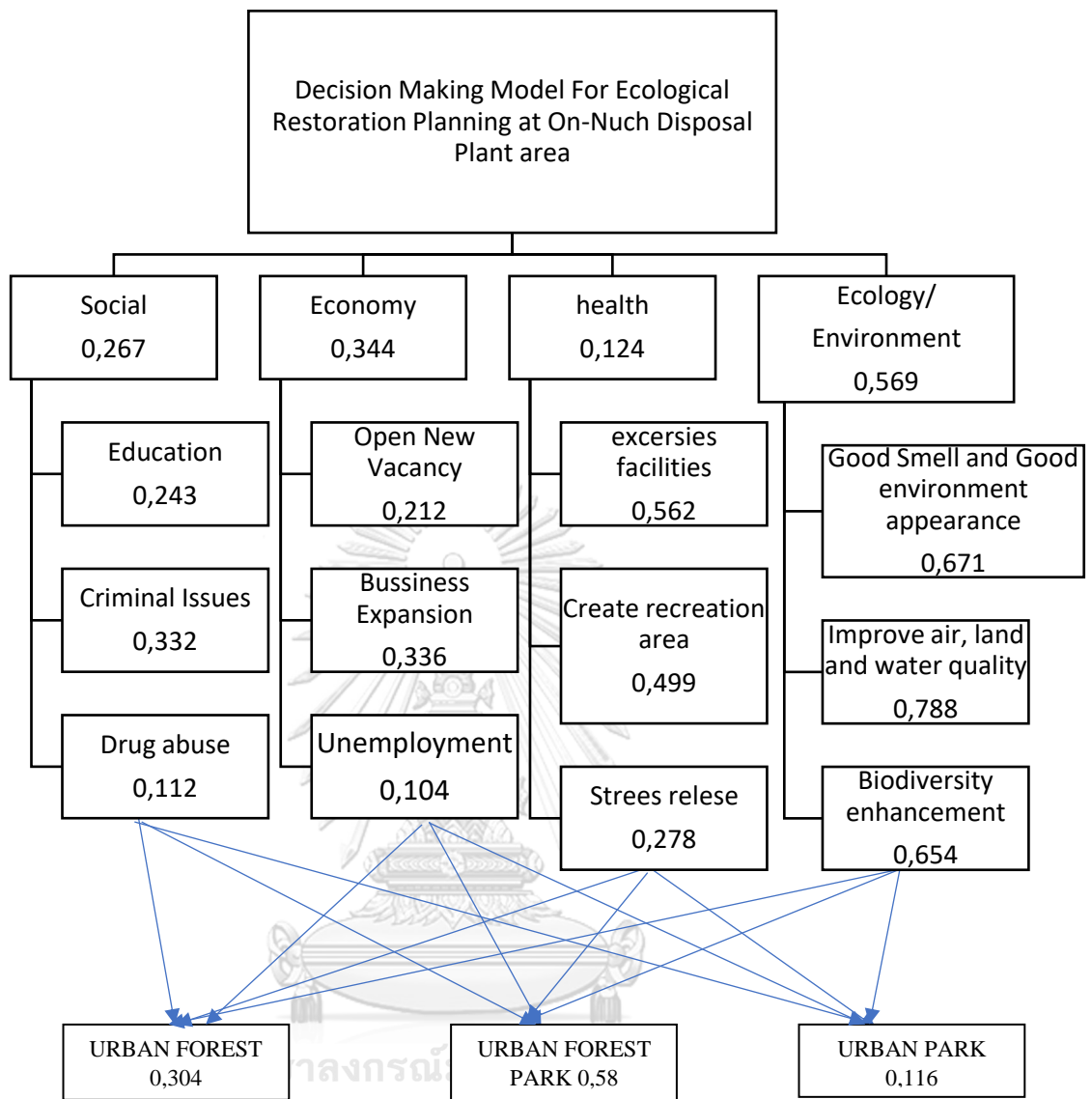
Figure 45 Value of Criteria Scoring

The figure shows a hierarchy of objectives, criteria, and the alternatives available for the purpose. Solutions: The result is the output of the data processing process from expert respondents calculated with the Expert Choice 2000 software.
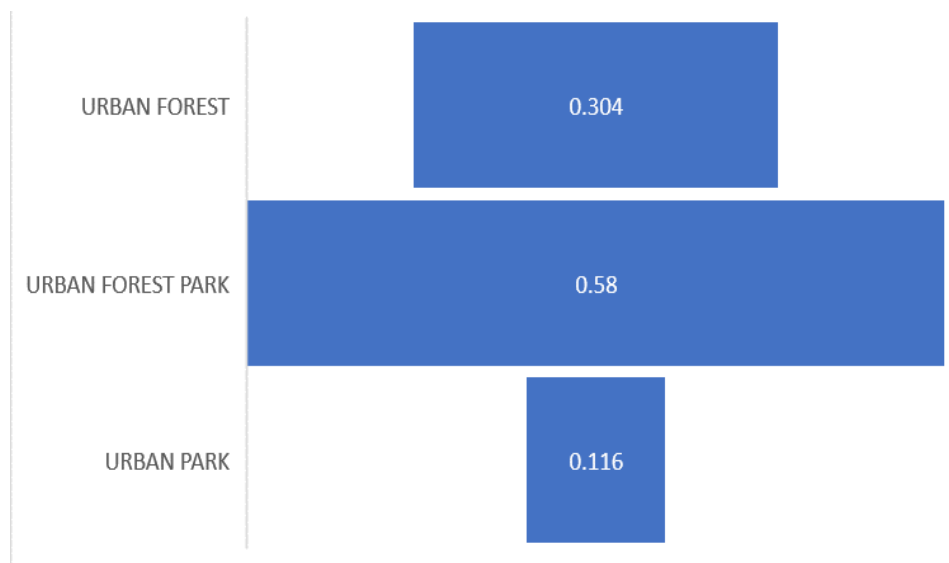
Figure 46 The respondent preferences by criteria result analyst

The figure above shows that the most weighted alternative is urban forest park development, with 58 percent, and the second most weighted alternative is urban forest, with 30.4%. The last, with 11,6 percent, is the urban forest.

- Strategic Priority for Urban Forest Development Based on Stakeholder Participation expectation

On one level, below shows the criteria to consider in achieving this goal: Social, economic, ecological, and health issues. The lowest level consists of various final actions or plans alternative that can positively or negatively affect the achievement of the main objectives through its effect on various criteria between the two levels (positive and negative). The alternative in determining urban forest development strategy is (1) improve the environmental degradation, (2) achieve green Bangkok 2030 target, (3) improve the local participation, and (4) dissemination from the government

- Relative Importance based on Government Ratings

Comparison results pair between strategies that considered in determining development strategy priorities urban forest park development by the community participation according to government by determining strategic priority achieve the green Bangkok 2030 with a weighted value (0.476), improve the environment

degradation (0.322), improve the socio-economy and local participation takes third priority with weight value 0,276 dissemination from the government with value 0,128. As for the order of priority Urban Park Forest development strategy at On-Nut Disposal Plant, post-closure landfill area according to the government can see in the table below.

Table 20 Priority Hierarchy according to government

No	Priority Hierarchy	Value
1	achieve green Bangkok 2030 target	0,476
2	improve the environment degradation	0,322
3	improve the socio-economy and local participation	0,276
4	dissemination from the government	0,128

- Relative Importance based on local communities Ratings

Rate comparison rating relative importance according to local communities comparison results pair between strategies that considered in determining development strategy priorities, as a result of hierarchy at Interest for strategy determination according to public rate comparison rating Relative Importance according to strategic priorities of the community by the participation prediction with a weighted value improve the environmental degradation with a weighted value (0.492), improve the environment degradation (0.394), Achieve the Green Bangkok 2030 takes third priority with weight value 0,152 dissemination from the government with value 0,110

Table 21 Priority Hierarchy according to local community

No	Priority Hierarchy	Value
1	improve the environment degradation	**0,492**
2	improve the socio-economy and local participation	0,394
3	achieve green Bangkok 2030 target	0,152
4	dissemination from the government	0,110

As most of the respondent occupation on this research is a businessman and key stakeholder such as PTT in the business sector, it's necessary to highlight the perception of the important points from the businessmen side. The results of pairwise comparisons between the strategies considered in determining the priority of development strategies of an urban forest park at On-Nuch area by the participation of the parties according to the perpetrator business by setting priorities the main socialization strategy of government with a weighted value (0.302), improve the environment degradation second priority with weight value (0.244), improve the socio-economy and local participation the third priority with a weighted value (0.238), thus achieve green Bangkok 2030 target (0,173). As for the order of priority, Urban Forest development strategy according to business actors can be seen in the table below

Table 22 Priority Hierarchy according to Businessman

No	Priority Hierarchy	Value
1	dissemination from the government	0,302
2	improve the environment degradation	0,244
3	improve the socio-economy and local participation	0,238
4	achieve green Bangkok 2030 target	0,173

- **Priority Development Strategy urban forest park development Based on multi-stakeholder participation**

From the calculations that carried out, it is known that the alternative the most important strategy or most important in development or urban forest park at On-Nuch disposal plant area is improving the environment quality by 0.353 or 35.3% later improve the social-economy and local participation of 0.302 or 30.2%, dissemination information from the government of 0.267 or 26.7% and the last one is to achieve the green Bangkok 2030 by 0.18 or 18%. As for the order of priority urban forest park development strategy based on participation, the multi-stakeholder can be seen in the table below.

Participation of the community in urban forest park development makes a good contribution to sustainable urban forest park management, especially in improving urban forest park function and benefit. In the development, increasing urban forest function is a strategy for the benefit of many parties by inviting the public as a participating actor to maintain and protect the urban forest park. Government plays a greater role in building facilities and infrastructure besides socialization of government policies through the provision of information so that the beneficiary parties from the urban forest get information clearly about the policies and how to implement according to Green Bangkok 2030 and the City Planning Department Bangkok Metropolitan Administration (The Bangkok Comprehensive Plan 2013 (B.E.2556) concerning urban development including the open green space area. The BMA Head of the park department explained that influential government socialization to community participation is strongly needed. The role of local government in fostering self-reliance and participation in community and giving counseling, providing information, and pioneering grant.

Table 23 The compilation of AHP score from all stakeholders

No	Priority Hierarchy	Government	Community	Businessmen
1	Dissemination from the government	0,128	0,110	0,302
2	improve the environment degradation	0.322	0,492	0,244
3	improve the socio-economy and local participation	0,276	0,394	0,238
4	achieve green Bangkok 2030 target	0,476	0,152	0,173

This result can generate the priority issues and the priority concern of multi-stakeholder, which could be the tool of the BMA to decide and consider the value of urban forest park development purposes. The Green Bangkok 2030 is the lowest

aspect of this development due to the dissemination of green Bangkok as inaccessible for local communities. The BMA reveals if this project has not been formally promoted at the On-Nut area.

4.8 Recommendation on engagement framework

The Development of engagement Framework requires the significant components which are identified to develop the conceptual framework for sustainable cities and communities' empowerment through the implementation of urban forest park development such as (a) social mapping of the community, (b) community needs and preferences, (c) and stakeholder power and interest. The critical focus relies on recognizing that the conformation and implementation of participation and engagement is a participatory process where communities and government agencies are the main actors, and the researchers catalyze their interactions. The success of this strategy largely depends on dialogue, the interaction between the different participants involved, and consensus on matters of public interest. In this sense, a conceptual framework is proposed to lay out the mechanisms that acknowledge the necessity to build trust between people. The conceptual framework of local communities' engagement at Urban Forest Park Development at On-Nut Disposal Plant intends to support four pillars, namely:

1. The development of social mapping to collect and socialize proper understanding of local communities' personalities and interests,
2. The communication or coordination design among stakeholders.
3. The act to sustain the development program by assessing the current policies related to the subject and development objective.

The social environment in which people live and lifestyle and behavior can affect incidence in the population (IOM, 1988). The population can achieve long-term improvement when people are involved in the community and work together to produce change (Hanson, 1988-1989). To produce change itself is not require only the awareness of each individual but also must build relationships and approaches in a community. The relationship will generate a community engagement in influencing a social life problem. So, community involvement engagement) is a collaborative process with or through a group of people who have a close relationship geographic

area, special interest, or situation similar to solve problems that affect the well-being of people (CDC, 1997).

Table 24 Level of acceptance and approval of the landfill restoration.

Acceptance to the green Bangkok 2030 Project for on-nut ecological restoration development	
Agree	94.33%
Not agree	15,67%
Level of approval for the redevelopment of the post-closure landfill site as an urban forest park	
Strongly Agree	46%
Agree	34%
Not Sure	6%
Not Agree	4%
Strongly Agree	10%

- **Social function mapping of the Community**

Motives are handled from an individual perspective, encompassing their personality and concern for environmental issues and livelihood concerns. In the technique described here, motives are used as a reflective way to build community participation criteria, where motivations are handled from an individual perspective, encompassing their personality and concern for environmental issues and livelihood concerns. Its purpose is to define local knowledge so that a social network for environmental transformation can be built tailored to the community's context and needs. Because diverse groups are residing illegally or by arrangement with the local government, and their monthly income is often less than 8,000 THB, the local population in the On Nut area has been classed as a vulnerable group. Arias et al. see community vulnerability as a reflecting pathway into catastrophe prevention, employing social cartography to assess local vulnerability. In the context of this conceptual framework, social cartography or social mapping is required to collaboratively analyze and explore elective community-based surveillance through the discovery of community motivations. The needs to develop linkages between local communities, in this view, informs the course of social mapping. The community can contribute significant information to a more comprehensive understanding of social

motivations, which can help develop monitoring strategies and determine particular criteria for community-based monitoring based on community preferences. The latter is crucial for instilling a greater sense of ownership among network participants. As a result, the community's motivation, which comprises a sense of ownership, community, and environmental awareness, is the first part of this conceptual framework.

- Community needs and the capacity building

According to the Centers for Disease Control and Prevention [CDC], 1997, p 9, at the first edition, community engagement is a process of collaboration with and through groups of people affiliated with geographical proximity, special interests, or similar situations to address problems affecting people's well-being, where that influence is a strong factor in realizing environmental and behavioural changes that will improve public health and its outcomes.

As stated in section 4.4 of this chapter, the local communities may require an urban forest park or another type of green space due to concerns about environmental degradation and human well-being in the area. According to the interview, the local communities require a capacity-building program to assist the BMA in managing this area to develop a sustainable urban forest park. Observations and interviews with several respondents revealed that various issues needed to be investigated to increase the community's capability in the five community groups: In terms of policy, there are two challenges in and around On-Nuch that are related to community empowerment: (a) people who still wish to work from waste management results. Nonetheless, some people want to start a business, for example, selling products in the urban forest park; (b) community dependence on government programs; unfortunately, according to data analysts, community initiative and innovation are low, and as a result, society becomes passive and non-independent, particularly in the participation process.

At On-Nuch, there is a problem with community empowerment: (a) community information accessibility to urban forest development plans, resulting in marginalization, apathy, and a lack of understanding of the benefits of urban forest development. Fortunately, each town has distinct institutions that should make disseminating the advantages of the urban forest initiative quite simple. If the

information on development project plans is not distributed, enthusiasm and community involvement in creating a sustainable urban forest park will dwindle.

There are three challenges associated with community empowerment when it comes to environmental damage: (a) Despite the fact that the waste region has been rebuilt for more than 15 years, air pollution is still relatively high due to the presence of multiple operational factories. (b) A lack of understanding of the benefits of ecosystem services leads to a decline in community wellbeing. Data and information gathered in the field show that people are more likely to pursue a profession such as garbage collection because it pays well, and (c) the community around On-Nuch is less interested in environmental conservation management because they have other activities that pay better. Due to a lack of community participation in environmental conservation.

In terms of human resources, two challenges must be addressed to empower the community within and surrounding the forest: (a) According to the results of the interviews, the community or village in this area has existed for more than 20 years, and they believe that neither the local government nor the BMA has come to see the hamlet's state. This demonstrates that government officials can assist the population in and around On-Nuch is severely deficient, causing problems. In whatever development program is available, skewed, and distorted information is disseminated to the community. b) Abilities Human resources in the management of urban forest parks are still rated as inadequate. The absence of community information, aid facilities, training, counseling, and activities offered by the government and other stakeholders who can support the sustainability of urban forest management are the causes of underutilized human resources. Some of the issues that develop as a result of insufficient human resource capacity include the risk of miscommunication and disinformation, the inability to accept aspirations/suggestions, and poor supervision, to name a few.

In terms of socio-economic empowerment, there is an issue in and around the project location, namely: (a) The interview results show that the community in 5 villages currently has a moderate income and tends to feel comfortable with waste management work. Hence, the people in the area feel threatened if the area is built as

an urban forest. Still, on the other hand, many people have a low economy and hope to develop their businesses and have a thriving community.

4.8.1 Participatory conceptual model

Although in principle, the participatory approach in environmental and social management is the same. However, because the environment and society are very broad and varied, this document is written needs to be limited to the design of participatory approaches to environmental management and strategies social in the urban forest park sector only so that it is more focused and will have a positive correlation with activities that are being carried out by this project.

In this context, the authors suggest the initiation of the involvement of local communities in urban forest development plans as planned by the government, but the community is also involved in the preparation of urban forest management plans, at least in the context of a public hearing. For this reason, it is necessary to develop a framework for community participation that is based on the awareness that: vulnerable groups need special attention and different support to participate in sustainable urban development activities and receive benefits fairly and sustainably; and community empowerment sector interventions need to be responsive to the interests, capacities, and priorities of vulnerable groups to be identified through consultation. The BMA must have a Community Participation Framework to ensure that the group who are vulnerable, including but not limited to ethnic groups, will be informed about project opportunities, and are consulted on their activities before implementation, and receive project benefits that are culturally appropriate and inclusive of gender and generational perspective. The community participation framework will also ensure that vulnerable groups will be informed of the potential negative consequences of a transfer of land use rights and other potential negative impacts of the project.

Several community groups felt this project would intimidate their income source based on the research. Consequently, the writer would recommend it. The principles that must be upheld in the process of involving the community in the project are:

1. The community must participate in the project at every stage (planning, implementation, and monitoring).

2. Community representatives and members of village representatives as well as relevant stakeholder's others at the village level should be able to participate in the decision-making process in the field; (at least the public hearing)

3. Every community member has the same opportunity to access all livelihood activities.

Local communities participate in planning, implementation, monitoring, and evaluation project to enable the project to achieve its objectives, sustainable and equitable urban forest park management, which will ensure the welfare of the local community. The stages when the community can participate are as follows:

- Stage 1: Select communities and villages to participate. At least five communities close to the landfill area from this research have distinguished character. For instance, we have to select an imam and the leader of villages to participate in the Muslim community.

- And doing some social-economy survey, where on the first chapter of this report, the writer has reported the community's social–economy condition.

- Stage 2: Community awareness and ecosystem services assessment. The BMA team had to meet with the community living in the surrounding villages project area. The first meeting should convey goals and targets project, benefits, and potential risks faced. This stage is very important to attract the attention of community members and provide them with information about the project to be accepted and supported by community members. The BMA team should consult with society and community groups without neglecting the poor, women, and indigenous peoples.

- Stage 3: Participatory Project Design Planning. a) Mapping problems and alternative solutions Local people participate in identifying the problems they face (for example, in livelihoods, air pollution, water contamination), determining alternative solutions, understanding the benefits and risks of each alternative, and designing the project. Certainty/commitment to participate The Project Team must ensure that all members of the community \ get equal and equal opportunities to participate in the Project.

- Stage 4: Project Implementation consists of two-stage a) Participatory mapping of rights and access to urban forests The Project team should

facilitate the identification of rights and access to the urban forest and the physical boundaries and access allowed. The results of this identification include system security, access time. b) Capacity building of the community the capacity of local communities must be built through training, facilitation, and providing access and opportunities for the community to participate in, productive economic endeavours.

4.8.2 Sustainable engagement future of project development

This research identified that local community engagement cannot be achieved without considering the many national, state, and local political, social, and economic interests. As a result, there are tensions between many parties and agencies that might influence the success or failure of any collaboration. Despite these obstacles, this study proposes a path ahead that combines the relative strengths of various stakeholders to achieve a common goal, despite the diversity of political opinions and interests. In achieving the local community participation, the developer should understand the local community participation level and the action to increase the local community participation. The table below provides the opportunities to community participate in Green Bangkok 2030 according to interview result:

Table 25 Strategic plan and action to increase community participation

Project name	Examples of project	Key stakeholder groups & roles	Participation level	Examples of engagement activities
Green Bangkok 2030	Parks and Open Space Master Plan at On-Nuch Disposal Plant	• Residents • Business owners • Council • Community members	• Involve • Consult • Empower	• Workshops • Open houses • Stakeholder meeting • Neighborhoods Working Group • Surveys • Public Hearings

According to the research process, the writer would suggest the national government. When new initiatives are being planned or changed to plans, policies,

programs, and services are explored. It is necessary to hear from individuals who may be affected. It was also like to hear from people who are passionate about the topics working on and have prior experience in them. Some of the day-to-day operational choices essential to keep the city functioning efficiently may not involve engagement with the community. It will keep individuals on board for these kinds of ventures. Many of the City's projects fall into these categories.

Hearing a variety of opinions and experiences is beneficial to us. Informed about the work that is being done, when it will be finished, and what type of disruptions might be expected. In Bangkok City, as the PPT mentions, PTT wants to provide far more opportunities for people to engage in and contribute to decisions that affect Bangkok People than are legally required. The City consults with the public on various issues, including the yearly City budget, neighborhood planning, park upgrades, public space adjustments, and transportation. We discuss what to do (important aspects and design), such as which features to add to a new park or where traffic improvements are needed. When we have the opportunity, we collaborate with the most affected stakeholders on the how (scheduling, etc.) and do our best to accommodate ideal times to complete necessary tasks.

In-depth interviews, observation, and pre-research analyst resulted from assessing what changes are being explored, what decisions have been taken, and the sort of project is the first step in evaluating chances for individuals to engage and contribute to decisions. Following identifying the potential for feedback, a six-step process is used to create a customized engagement approach. According to the PPT restoration leader, the community's expectations for meaningful engagement were that it should: • Improve the City's relationship with the community and its understanding of the community.

- Increase community understanding and informed dialogue.

- As a result, the developer would be able to make smarter decisions.

- Increase community acceptability and respect for decision-making procedures and outcomes.

•   Create a sense of belonging, connection, and ownership

The diagram below showed the recommendation step to engage the local community step by step during the initial phase, this step adjusted by the community condition, existing of environment and social issues, the community role authority, and roles. The six steps are create the engagement strategy and the project goal, Create the engagement strategy and the project goal, Create the engagement strategy and the project goal, Share the experience and success story by community perception assessment, Raise the awareness, Asses the existing connection and the community needs, Generate the feedback and enhance the participation.

Identify Issue / Project / Proposal

Urban forest park development

CONSIDER

Will the community be impacted? Does the project meet with any of the stipulations for engagement?

YES

NO

THINK AND CONSIDER AGAIN

- Do you think the community would be interested in the decision or project?
- Is the decision or project likely to receive negative feedback once implemented?
- Will the decision or project attract negative media attention?
- Are you sure you have considered...

PLAN

Meet with the other related stakeholders and agency to discuss planning and implementation of the engagement initiative

PLAN

Design the Stakeholder Engagement Plan with following things

- Draft Outline Purpose
- Determining Negotiables / Non-negotiables
- Stakeholder Mapping
- Identifying Key Questions & Key Messages
- Setting Timeframes
- Identifying the appropriate level of Engagement
- Determining appropriate methodology
- Activity Planning (Actions, Roles, Responsibilities)
- Risk Assessment and Reporting / Reviewing

DO

Implement the engagement actions outlined in the 'Activity Plan' section of the Stakeholder Engagement Plan.

REVIEW

Evaluate the success of the engagement against the objectives detailed in the Stakeholder Engagement Plan. Then, Consider the number of responses, the quality of responses and the extent to which all target groups have participated. Ask – what worked well, what didn't work well?

Participation activities:
- capacity building (training, workshop)
- meetings, FGD, public hearing
- negotiation

Stakeholder:
- Bangkok Metropolitan Administration
- Social Entrepreneur/NGO
- Private company
- Researcher
- Local district government
- Local community

Create the engagement strategy and the project goal

Share the experience and success story by community perception assessment

Raise the awareness

Asses the existing connection and the community need

Generate the feedback and enhance the participation

Evaluate and control the project evaluation

STEP ONE: CREATE THE STRATEGY

BMA explained the City's Engagement Team works collaboratively with the lead agency (BMA)and, in this research found, that members of the public services and industries like PTT, NGOs; PaThai, WePark, BigTree to create an engagement strategy that includes the following elements:

* Goal setting: What information do we need from the community to help us make decisions?
* Public commitment: What level (or levels) of public participation will be employed in making decisions? How the way civil participate
* Budget and schedule: What are the project's estimated completion date? What resources are available to put the engagement strategy into action?

STEP TWO TELL THE SUCCESS STORY

People must understand what the Bangkok government is attempting to achieve, why it is doing so, and how they can engage to contribute relevant input. Each project's information that helps to 'convey the tale' will be made clear and accessible. This question and the story telling process should rebound the time "history/past and the existing condition" for example followed by this question:

* How Did We End Up Here?
* What is the outcome of the decision?
* When did you make your decision?
* Who made the decision in the first place?
* What data was used to make the decision?
* How involved was the community in the decision-making process?

STEP THREE TELL THE SUCCESS STORY

Receiving feedback requires effective communication and promotion of input opportunities. All communication options will be specified in the engagement plan to ensure that a wide audience is reached.

STEP FOUR CONNECT TO THE EXISTING CONDITION

This is when the public gets involved. The questions are straightforward, the information is straightforward, and the following steps are properly outlined.

STEP FIVE GENERATES THE FEEDBACK

Reporting out is necessary to ensure that everyone who participated in the engagement process is aware of how their feedback was used and Council's final decision. To guarantee that all feedback was captured, we will share what we heard at each event with participants.

STEP SIX EVALUATE

All the stakeholders should respect the time and opinions of the community to assist BMA and other stakeholder in making well-informed choices that reflect community needs, beliefs, and vision for their neighborhoods and city. Debriefing and assessing is a crucial step in ensuring the success of future engagement efforts. After the public engagement period has ended, the interdepartmental staff team debriefs to assess how successfully the objectives were accomplished, to analyze community feedback, and to share experiences and recommendations for future processes. The community will be invited to participate in the debriefing or provide comments on the process whenever possible. Sharing information and allowing all voices in the room to be heard is key to successful public engagement, as is ensuring that all feedback will be considered before a decision is made. I hope BMA want community members to feel that their voice was heard that their contribution was valued, that they understand how input was utilized to inform recommendations.

The following factors will be utilized as Key Performance Indicators to aid in evaluation:

- The Engagement Framework will be evaluated on a yearly basis to ensure that it is still relevant and successful.
- Meetings with the interdepartmental staff team will be held once the engagement window closes

THE FOLLOWING FLOWCHART SIMPLIFIES THE BANGKOK PEOPLE ENGAGEMENT PROCESS.

Identify Issue / Project / Proposal

Urban forest park development

CONSIDER
Will the community be impacted? Does the project meet with any of the stipulations for engagement?

NO

CONDITION
Community needs the chances to increase the income and have the sustain occupation.

PLAN
Meet with the other related stakeholders and agency to discuss planning and implementation of the engagement initiative

THINK AND CONSIDER AGAIN
- Do you think the community would be interested in the decision or project?
- Is the decision or project likely to receive negative feedback once implemented?
- Will the decision or project attract negative media attention?
- Are you sure you have considered all the stakeholders?

CONDITION
Community needs the dissemination information to support the urban forest development.

PLAN
Design the Stakeholder Engagement Plan with following things
- Draft Outline Purpose
- Determining Negotiables / Non-negotiables
- Stakeholder Mapping
- Identifying Key Questions & Key Messages
- Setting Timeframes
- Identifying the appropriate level of Engagement
- Determining appropriate methodology
- Activity Planning (Actions, Roles, Responsibilities)

CONDITION
Community needs to improve the environment condition and need to be involved.

DO
Implement the engagement actions outlined in the 'Activity Plan' section of the Stakeholder Engagement Plan.

REVIEW
Evaluate the success of the engagement against the objectives detailed in the Stakeholder Engagement Plan. Then, Consider the number of responses, the quality of responses and the extent to which all target groups have participated. Ask – what worked well, what didn't work well?
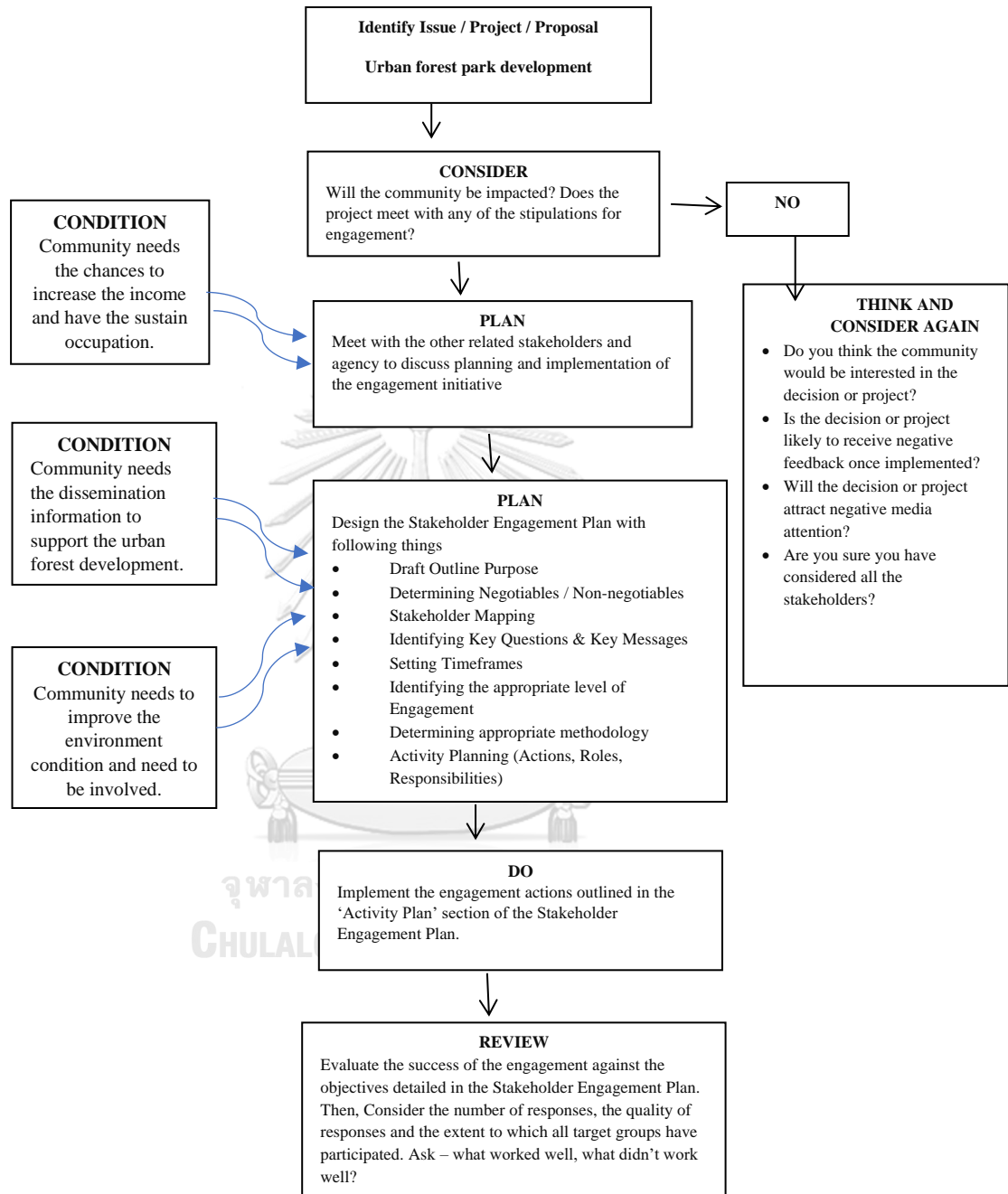
Figure 47 Framework of local engagement and needs

The public's opinion on urban forest park development varies. The existence of numerous factors influenced this. One of the factors is the interdependence of the economic, ecological, and social systems. 'Community engagement,' in its broadest sense, is the act of interacting with a community, regardless of whether the communication entity is an individual, a firm, or a government authority. In the construction business, community engagement usually refers to developers informing or advising local communities on the effects of a project on them or society. This is especially crucial for long-term infrastructure projects in which the impacted communities may have a strong interest. In these situations, getting out into the community and talking and listening to the people is one of the most critical things organizations can do to create and retain their reputations while ensuring the project's smooth progress.

Construction is by its very nature a disruptive process with the potential to have substantial consequences for communities if not handled properly. The local neighborhood may be subjected to rising temperatures, dust, and noise from the water supply during the construction phase. Contractors and consultants (architects, engineers, surveyors, subcontractors, etc.) should engage the community to ensure that construction impacts are minimized.
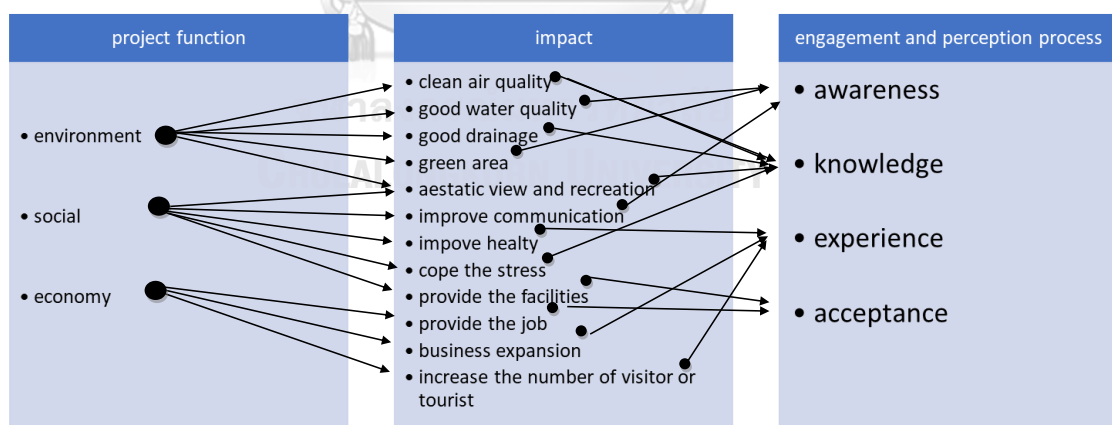
Figure 48 correlation of impact and engagement

According to the findings made during the interview process with WePark, Pathai, and Big Tree, recruiting a community is also critical. According to the findings from the interview process with WePark, Pathai, and Big Tree, it's also critical to recruiting a community-engaged building urban forest park area at on-nut to aid in the project's success. WePark and BigTree go above and above to support and

flourish with the local community. We can better comprehend people and their needs because of our local relationships, allowing us to develop programs that benefit everyone pilot project of urban forest park area at on-nut to aid in the project's success. WePark and BigTree go above and beyond to support and grow with the communities where they operate. We can better comprehend people and their needs because of our local relationships, allowing us to build programs that benefit everyone.

WePark mentions that community engagement develops true relationships. It's one thing to declare, "You can trust us and our project," and quite another to demonstrate why they should. People get to know you and your values when you're always a part of the community. They learn what you believe in and what motivates you. As you become more active, you develop long-term ties to help you implement your projects. It's even better if the community you hire to help you construct your product is just as enthusiastic as you are.

Another advantage of community involvement is civic engagement encourages improved communication; nevertheless, failing to reach out to vulnerable communities is a common blunder made during the process. Members of the community have a lot on their plates, including work and family obligations. As a result, the construction team oversees the community participation process as simple as possible; community members should not have to hunt for and decipher the fine text. Keep the community informed about timetables, milestones, and other important developments frequently. Ask the community for the best way to contact them, and then use those means. Some residents may prefer to receive updates via a neighborhood bulletin board, while others may receive them by email or text.

Furthermore, rather than a single developer or architect, communication should originate from a diverse group of stakeholders. Identify and collaborate with local community's organizations to spread the word about the project's major components. These organizations are familiar with their members and can assist in developing trust between developers, construction companies, and the neighborhood. Contractors must guarantee that community engagement is equitable while planning their next project. If done correctly, the initiative will benefit both the construction executives and the local community. in this study, the local communities mentioned

about they never had deep conversations or discussions with the government related to this project. It generated more than 90% of local communities did not know about this project. They expected if they will be involved in this construction process and could get access to help the BMA.

WePark mentioned the important thing about it: it is to engage early and often. It is also important to keep residents in the know as construction schedules move forward. Sharing the construction schedule and anticipated disruptions will help your team avoid costly delays while maintaining strong neighborhood relationships. This is also related to the constructor's gain from community engagement. During the construction phase, the developer will benefit from proactive, regular updates:

- Transform skeptics into helpful neighbors. When construction crews arrive in a community, many conjectures, and concerns from concerned neighbors are frequently discussed. These anxieties will be alleviated by clear communications about the project's benefits.

- Create a buzz and pique people's interest in leasing. To stimulate demand for residential and commercial spaces, provide lease information.

- Avoid any unnecessary pauses. Residents are less likely to submit a complaint if they know they can expect road and sidewalk closures, noise, and other disturbances. By including this information in updates, your team will be less likely to answer phone calls or respond to individual emails with complaints or inquiries.

- Make use of local expertise. Many plans have been decided, but there is still time to get community feedback on everything from which shop tenants to choose to engage community spaces before the opening. Their valuable local knowledge can assist the developer team in determining how to add value to the community best.

CHAPTER V
CONCLUSION AND RECOMMENDATION

This study was conducted to identify the perception, key factors, and future local engagement in the urban forest park development during the initiation stage to create a sustainable urban forest park utilization. The study concluded key findings, offered implications, and recommended future research.

5.1 Key factors in the community perception

Perception is how a person chooses, organizes, and interprets data to build a meaningful image. Perception is influenced by physical inputs and their relationship to the surrounding field and the individual's circumstances. Perception is how people organize and interpret their sensory input to make sense of their surroundings. However, what one perceives may differ significantly from actual reality. It is the process of selecting, receiving, organizing, and interpreting information from the outside environment to make it meaningful.

5.1.1 Existing environmental factor

During the initial stage, the perception of local communities is mainly influenced by environmental degradation caused by air pollution, water contamination, an odour of air quality, and high temperature. The major effect of this transformation that the local communities perceive is odor and air pollution, especially in the rainy seasons. Providing the tree and other vegetation would create the microclimate, improve biodiversity, provide ecosystem services.

5.1.2 Characteristic community factor

Local character or demographic factors played crucial roles in post-closure landfill rehabilitation. Gender, age, occupation, income, and education were used to categorize the social differences. Gender, age, educational background, according to the data analyst, have no bearing on how urban forest parks are seen, but income and occupation do. This is generated from the experience and personal view of the development of urban forest parks. In any age and gender, the local communities had similar desired activities such as doing exercise, jogging, recreation, and picnic.

Nonetheless. Income was the economic factor that influenced the perception of the local community. Their livelihood or income causes it comes from the landfill area. As well as the occupation since the community area is a scavenger. Their life depended on the landfill area. In this research, the health aspect is not a significant factor influencing the local community's perception. In the last 20 years ago, this community adapted to the degraded environment. According to the data, the community attempts to implement a healthy lifestyle. The community uses the water the government provides. The health concern only occurred in the rainy season because of the changing weather and bad odor.

Variable/ factor	Significant/ Not significant
Gender	Not significant, landfill restoration could provide benefits for all gender.
Age	Not significant, landfill restoration could provide activities that can be used for all ages.
Education	Their environmental treatment can prove that the local community has high environmental knowledge.
Income	Yes, income is a significant factor influencing the local community perception because income comes from the post-closure landfill area.
Occupation	Yes, occupation is a significant factor influencing the local community perception because community works depend on the post-closure landfill site.
Environment issues	Yes, the environmental issues engage the local community to have a better environment.
Ecosystem services benefit	Yes, the benefit from the ecosystem services able to support the local community livelihood and improve the quality of life
Health issues	Not, since the major community stayed about over 30 years, their adaptation has been adjusted to feel more comfortable, yet the local community still needs to be aware of the health issues.

5.1.3 Challenges of local communities' perception

Local people's sense of ownership was established inadvertently because of communal rights allocation, environmental problems in the post-closure landfill region, and local people's livelihood for more than 20 years. It encouraged residents to volunteer for landfill transformation because they knew that a recovered waste region would eventually provide them with ecological services, revenue, and a source of local employment. It meant that the common property right-induced sense of ownership generated both affective and material or utilitarian motivations for volunteering. The second external component is people's experience, which substantially impacts participants' opinions of everyday relaxation, health promotion, and community safety programs. Those who have experienced significant positive and negative changes want additional social–ecological services.

5.1.4 Community needs and preference

The community state that's residents who visit greenspaces can take advantage of a wide range of benefits. As well as the scholars and professionals are increasingly interested in learning about citizens' perceptions of and preferences for greenspaces, as well as what motivates them to attend. However, there has been no systematic strategy to employing preferences or perceptions in the literature, and both categories are used quite loosely. As a result, the goal of this research was to compile, synthesize, and summarize the current state of the community needs to be based on their perceptions.

The community prefers to have the urban forest park surrounding the On-Nuch area about more than Individual characteristics, the type of expected activities, and the expected design are usually determined by preferences for greenspaces development, in many studies whereas perceptions of urban forest parks are determined by individual characteristics, sensory dimensions and perceived qualities, and the characteristics of urban forest planning. As a result, urban forest park needs appear to be tied to the intended use expectation, while perceptions of urban forest or other greenspace are more linked to sensory experiences, live behavior, the experience of suffering from the pollutant environment. At the same time, needs are

more relevant for a new design or intervention for their future activities such as running, jogging, and better air quality. A more interdisciplinary approach is advocated, as is a simultaneous evaluation of people's wishes for future developments and perceptions of current planning. This will likely result in higher-quality urban forest park planning that reflects inhabitants' choices and requirements. The degree to which urban inhabitants can benefit from the environmental services of this project can be influenced by a greater knowledge of how they are viewed and used. As a result, this study's community needs, and preferences can be applied to future urban planning research and address issues related to urbanization and improving people's quality of life. According to the research the urban forest park design should meet the community needs and community desire. The local community suggest the urban forest park should support their local livelihood and support their income, this table shows the community condition, needs and design recommendation.

Community condition	needs	Suggestion
Low to middle income (5,000 – 8,0000 THB/Month)	The chances to increase the income.	Provide the market access to expand the business
Uncertain occupation/ freelancer/ small home seller	Have the permanent occupation	Expand the
Limited information and capacity	Have sufficient information and knowledge	Provide the workshop, training, FGD,
Have no access to urban green space area	Urban green space area	This project should be developed as soon as possible
High criminality and drug abuse	High security while using urban green space	Provide the participatory urban green space monitoring.

5.2 Stakeholder identification and collaboration

The On-Nut ecological restoration collaboration model involves the BMA (Bangkok Metropolitan Administration), Big Tree, government agencies, private sector, civic groups, We Park, PTT with different responsibilities. There are at least

ten elements that form collaborative stakeholders. Five elements are the core of collaboration so that these elements are needed or determine the implementation of the collaboration. Core Element landfill ecological restoration collaboration on Green Bangkok 2030 project is participation, motivation, shared goals, trust internal, and commitment to the process. At the same time, the other five elements are supporting elements of collaboration that include consensus, monitoring, transparency, interdependence, and leadership.

In the collaboration model, there is participation to achieve common goals. Participation collaborative actors encourage commitment and internal trust to make it easier to reach collective actors' in determining park management actions. The participation of each actor in park management is also influenced by motivation, interdependence, leadership, monitoring, and transparency. Barriers in the model collaboration are the absence of special provisions as guidelines for all actors. The roles, duties, and responsibilities of each actor, supervision procedures and targets to achieve collaboration tend to be unclear.

5.3 Priority decision priority toward the sustainable participation

Multi-criteria on this landfill ecological restoration are classified as social, with sub main criteria: education, criminal, and drug abuse. Economic Impact: create the vacancy, open new business sector, unemployment, Health sector: exercise facilities, create recreation area stress and mental health improvement, Environment issues: Good Smell and Good environment appearance, Improve air, land and water quality, Biodiversity enhancement. In addition, it's also categorized by a strategy of urban forest park development based on the participation of the parties according to the stakeholder participation get strategic priority urban development is (1) improve the environment degradation (0.353), (2) improve the socio-economy and local participation (0.302), (3) achieve green Bangkok 2030 target (0.267) and (4) dissemination from the government (0.18).

5.4 Community engagement framework

There is no one-size-fits-all approach to engaging with the local community. Identifying a goal/aim, assessing the existing condition of the inhabitants and city,

and acting on that knowledge to build the city's engagement plan are all part of community engagement. Seek input from the city's co-workers, stakeholders, authority, and others. Connect with academic institutions, civic groups, engaged locals, anyone ready to discuss community participation with this project, and even those scared to speak up.

The constraints in the local community engagement are that there are still gaps between several actors, which are generally related to knowledge, skills, limited human resources, and funding. So far, they have not found a solution because actors tend not to expose the problems that arise. There has never been a meeting involving all actors' collaboration, and the role of the BMA has not been maximized as a coordinator in facilitating dialogue between actors. There is no complaint mechanism either cause most people rarely criticize suggestions and opinions related to landfill area restoration plans. The local communities are too involved in urban forest development planning, so there is still a lack of community participation in development plans. Another obstacle is limited information or promotion of Green Bangkok 2030 activities, so the opportunity for multi-stakeholder collaboration is still lacking. It is a problem that arises from the development of landfills into urban forests because most people make a living from the landfill area, and social issues around the region have not been identified.

5.5 Recommendations for developer

Based on the conclusions above, it is necessary to put forward suggestions for government related to the results of this study, as follow:

1. To increase community participation in monitoring requires a commitment and coordination of solid support from the government, especially in program implementation and activities that support the achievement of the desired end goal "Green Bangkok 2030".
2. Improve the communication between the national government (the BMA) to the local communities and local government to ensure the information and collaboration work meets the interest and goals.

3. Applying a trust and loyalty of local people to encourage the local people's participation, adaptation by land use changing effect, and monitoring the security of Urban Forest Park at On-Nut post-closure landfill. Building trust between local people and governmental agencies by developing governmental officials' leadership characteristics.

4. Solving the problem of social, health, ecological, and economy should be done by solving the problem at the source through:

   - Increasing public knowledge and awareness of the benefit of this project,
   - improving community skills in efforts to overcome the monitoring and security standard,
   - Provide and improve facilities needed to maximize the urban forest park utility, as well as the development of suitable urban forest park.

5. Enhancing the local people's sense of ownership on this project allows them to make decisions, plan, and monitor. Thus, integrating the community needs and conditions by taking the major factors in the design and development process.

5.6 Recommendation on urban forest park design

The interview found for the park project development local community recommend the forest park at On-Nuch should consist of:

1. According to the local community interview, the community mention them prefer to have urban forest park which has the vegetations/ plant such as:

   - Trees: hardwood plants and grow upright, large with strong branching.
   - Grass: a type of idler plant, which is a precise plant above the ground.

2. According to the local community interview, the community mention them prefer to have urban forest park which has the facilities such as:

Purpose	Recommendation
Improve the health of the local community	Provide the exercise facilities such as the jogging track, yoga space
Improve the income and economy of the local community	Provide the market/ or the chance to expand the business

Improve the biodiversity and provide the ecosystem services	Planting the variety of tree species

5.7 Suggestions for further research

This research was conducted in the initial phase. Therefore, the suggestions can be submitted for other researchers to learn about community participation and engagement in the development or monitoring phases.

This checklist recommends questions to think about when planning community engagement. It is not necessarily that all elements will be appropriate for every engagement, but the checklist will provide a useful reflection tool to aid the planning of engagement activity. This checklist will be divided into two main sections: the developer management and the detail of community engagement.

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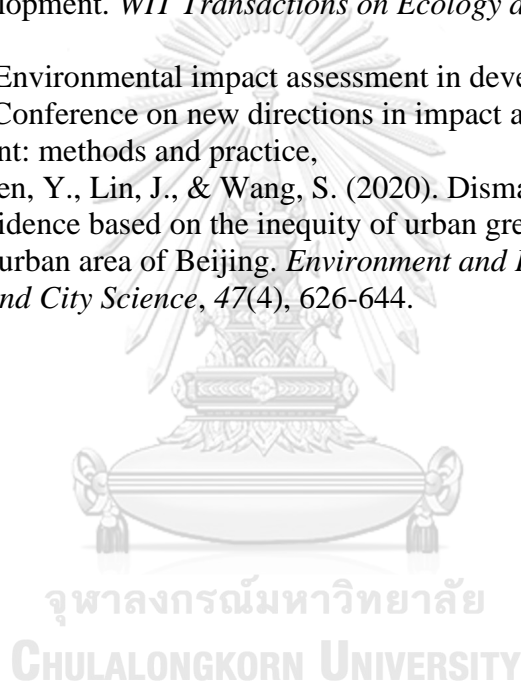CHULALONGKORN UNIVERSITY

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