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Article

Unveiling the Depths: Unravelling Stakeholder Values in the Landscape of Bangkok's Urban Waterways

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Abstract: The city of Bangkok is built on an elaborate network of waterways shaped by its historical settlement process, underscoring the profound bond between humans and the natural landscape. In light of Bangkok's rapid urban transformation and its status as one of Southeast Asia's most vulnerable coastal metropolises, this paper seeks to explore the intricacies of Bangkok's waterway landscape by examining how stakeholders address its value. This research draws insights from qualitative data collection involving government agencies, experts, practitioners, NGOs, and residents from three distinct waterway communities. The paper identifies distinct value categories within Bangkok's waterways, classified as diminishing, absent, and evolving values. These values reflect the complex landscape surrounding the waterways and their relationship with flood management and heritage preservation. The study underscores the limitations of the values expressed by government agencies and in policy documents while highlighting the potential contributions of other stakeholders in enhancing waterway management. This evidence emphasises the necessity of multi-stakeholder involvement and the application of values in decisions when developing urban resilient alternatives to the 'business-as-usual' model prevalent in Bangkok.

Keywords: landscape value; cultural landscape; stakeholders; flood management; heritage preservation; urban waterways; Bangkok; Thailand

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1. Introduction

1.1. Valued Landscape and Pressure in Bangkok's Waterways

The waterway holds significance in Southeast Asia in terms of the ecosystem [1], floodplain resources [2], and in determining the form of vernacular settlements [3]. Earlier settlers of Bangkok (or Rattanakosin) reclaimed the floodplain area in the lower Chaophraya Delta in ancient times (1470–1767) by excavating the minor waterways, Lamrang or Lamkradong, before Rattanakosin was established [4]. Bangkok developed through local agricultural patterns [5–7], as water benefited the plantation areas naturally in the flood seasons [8,9]. Early documentation records the major waterways, known as Khlong or canals, which served the purposes of defence, city expansion, transportation, irrigation, and trade (1782–1866) [10,11]. Public governance responded to these waterways, including the Canal Premium Act (1870), the Marine Department (1897), the Canal Department (1902) [12], and the Irrigation Department (1914) [13]. This time period determined the values formed around specific human interactions with natural resources [14] in the form and practices of individuals and groups, as both humans and landscapes, i.e., as cultural landscapes [15–17] (Figure 1).

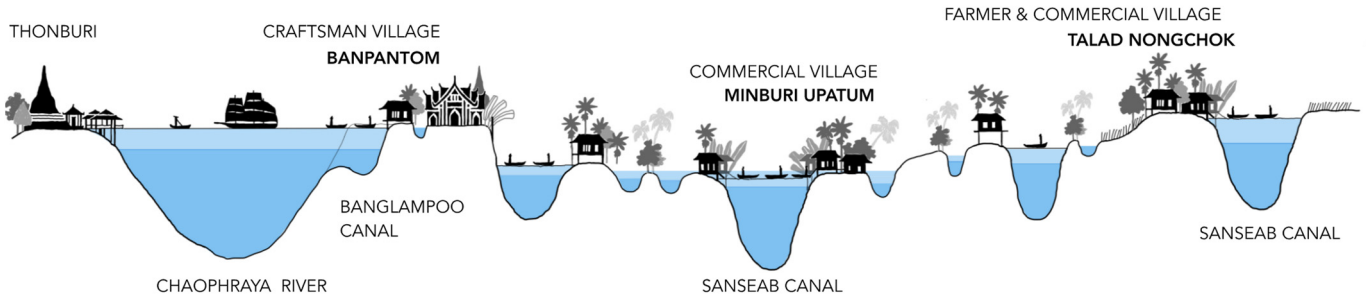

Figure 1. The historical water city of Eastern Bangkok (1782–1860).

There was a major shift from the water base to the street base (1860s–1940s) when roadways and bridges were constructed for vehicles [10,11]. This coincided with numerous irrigation projects initiated for large-scale food production [13], causing the installation of division structures such as watergates, which later hindered boat transportation [11]. As the settlements densified, waterways began to shallow [10,17]; their maintenance shifted from dredging to filling, with excavation stopping in 1915 [10] (Figure 2). The Public Cleaning Department (1974) managed the remaining waterways until the Drainage and Sewerage Department, DSD (1977), took over under the 1985 Bangkok Metropolitan Administration, BMA [18]. Wastewater treatments began in 1994, improving in 2014 and 2020 [19], though water quality is still poor [20]. Public boat transit resumed in 1990 (Sanseab Canal), 2004 (the river), and 2020 (Padungkrungkaseam Canal), with other routes being started but not sustained. The Town Planning Department, TPD, produced the Bangkok Comprehensive Plans (1992, 1999, 2006, 2013, and 2020s), after the drafting versions in 1960 and 1971 [21], without any reference to the waterways [22].

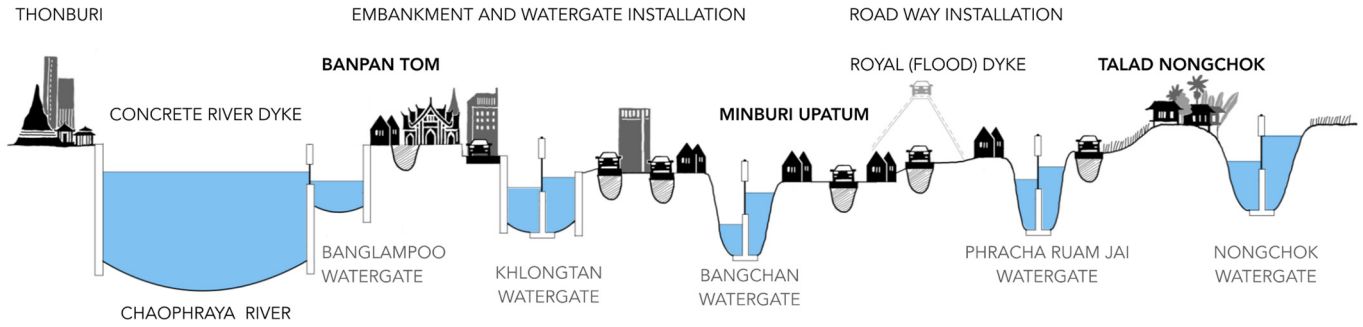

Figure 2. Eastern Bangkok during modernisation (1860s–1940s).

During city modernisation (1860s–1940s), with the force of economic booms (1980s) and the expansion of the city (1960s–2020s), the overall role of Bangkok's waterways for communities changed into a neglected element with poor cultural functions [11,20,23], with encroachment issues [24], heritage degradation [24–26], and shifts in social structures [16]. Moreover, this widespread urban development has wrought profound environmental damage [27,28], including effluents polluting water bodies and widespread culverting and abandonment in some places, effectively acting as a sewage channel across Bangkok's waterways [12,29]. The waterway landscape has therefore changed significantly over time (Figure 3). This paper explores how different stakeholders have changed the values they attribute to Bangkok Urban Waterways (BUWs) and their management as assets of heritage and flood control.

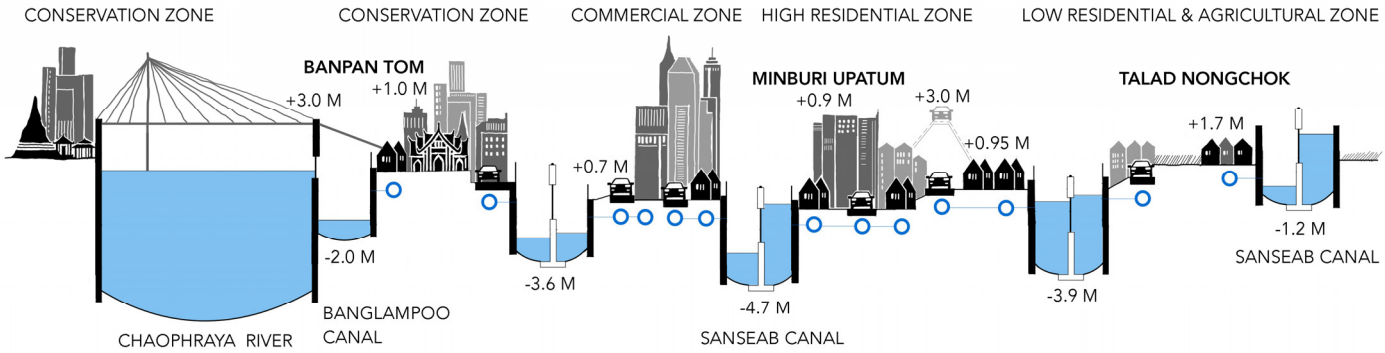

Figure 3. Eastern Bangkok during urbanisation and today (1950s–2020s).

1.2. Management Action and Waterway Values: Heritage Preservation and Flood Control

The existing literature shows that management can affect values directly and indirectly, sometimes resulting in the erosion of landscape values, as people no longer perceive the environment's worth [30]. Dempsey et al.'s studies indicated how rivers in Madurai and Ahmedabad, India, have lost cultural significance due to development and poor management, resulting in poor water quality and disincentivised use [31]. For example, cultural ties with the Sabarmati River were entirely severed for some Hindu temples, which lost all direct physical and visual access to the river [32]. Comparable outcomes are observed in related heritage preservation and flood control projects in Bangkok.

For heritage preservation, the Fine Arts Department, FAD (1912), known for its emphasis on ancient monument conservation [17], designated the waterways as within the conservation zone for protection in 1976. This conservation zone, or Old Town Bangkok, has been regulated by conservation policies [33], known as the Rattanakosin Plan (1982, 1994, 1997, 2017, and 2020), overseen by the Office of National Environmental Policy and Planning, ONEP [34], and with the BMA as the land owner [35,36]. Askew's studies indicated that Bangkok's conservation policies demonstrate the value increase in protection elements, illustrating the challenge of policy direction that considers only the royal and elite lineages, with the decline of the local identity exhibited through the Banglampoo District [37–39]. Sirisrisak (2009) found that cultural rights were declining through conservation policies, as traditional communities were forced to relocate as the areas were turned into formal spaces, i.e., public parks [35,40]. Aruninta (2009) studied the Pom Mahakan Fort community along the canal, which faced the challenge of relocation after the area was turned into a park to promote tourist attraction and orderliness [41]. Issarathumnoon (2016) revealed that conservation policies rarely incorporate existing residents [42]. Tantinipankul (2012) studied the Bangkoknoi and Bangkokyai Canals, finding that the different local communities often encountered difficulties in engaging with government agencies [24].

For flood control action, the flood events of 1982 and 1995 to 2011 led to the elevation of roadways (King Dike) and the Chao Phraya River dike to a height of 2.5–3.0 m above sea level to prevent water overflow, along with the extended dikes surrounding Bangkok [43] (Figure 3). The BUWs (1165 canals with a length of 2284 km) have been treated as drainage and sewage channels through dredging work, which aimed to keep the depth at 3.00–6.00 m so to drain the water during heavy rains, with the support of structured measures like watergates and pumps [43,44]. Numerous studies regarding flood controls in Bangkok and Central Thailand have found that these structured solutions have led to negative impacts on the locals. Ratanawaraha (2016) highlighted the limitations of the dams and dikes, and the lack of flexible mitigation options, which revealed the inadequate flood management [22]. Jular (2017) discussed the decision to redirect the floodwater after dike breaches in the 2011 flood, which faced strong resistance from local residents [45]. Marks' studies indicated that the government's decision to prioritise the protection of economic value in specific regions of Bangkok by adopting measures like floodwalls, the elevation of roadways [46], or

sandbag walls resulted in significant floods to vulnerable communities [47] and influenced social inequality [48].

Academic studies in Thailand have also suggested addressing flood events through concepts like 'liquid perception' [49], 'amphibian identity' [25], and 'building open ground' [17], recognising the cultural landscape's significance. These recommendations stem from international interest in the Sustainable Development Goals (SDGs) and urban resilience [50], e.g., Nature-Based Solutions (NBSs) [51]. These international frameworks have been implemented around the world, e.g., in the UK and The Netherlands [52], but not in Thailand.

While recent studies concerning heritage preservation and flood events demonstrate the status quo of management, it is important to ascertain what values the institutions hold when making decisions. This paper presents the manifestation of the ongoing management actions and illustrates how they differ from academic viewpoints by focusing on the landscape value of the BUWs.

1.3. Local Influence on Management

The local communities are the 'users' of the landscape who possess extensive knowledge about a site's history, the integration of spaces in the area, and the potential future uses [53]. Ideally, the consideration of locals in terms of management can be seen through the notion of 'community-based conservation', which gives the prioritisation to local knowledge. For instance, in the Solomon Islands, residents play a crucial role in shaping choices and empowering community decisions in their ecologically complex setting [54]. This approach requires support by various stakeholders engaging in the landscape, recognising and accounting for multiple scales, particularly the smallest scale of local communities [55]. While involving only policymakers or professionals alone can offer valuable insights into a place's functionality, relying solely on their expertise may result in limited perspectives and often neglects scale-related challenges [54,55]. In this way, involving the real users of landscapes, i.e., the locals, is essential to gathering the necessary insights and ensuring that any environmental enhancements align with their requirements and efficiently achieve the intended goals [53], reflecting problem-centric processes [56].

The fusion of local and scientific knowledge is of particular importance and represents one of the benefits of involving multiple stakeholders in tackling environmental issues [57]. Combining scientific and local knowledge is generally a challenging business. Many scientists and government officials exhibit a certain scepticism about local knowledge, especially when it is tacit or unwritten, as it can be challenging to articulate and convey [54,58]. Additionally, when indigenous groups are involved, local knowledge often stems from a distinct worldview compared to Western science, leading to variations in starting points, assumptions, and rules [59].

Studies of flood management in Thailand have concluded that a community-driven approach is needed to tackle urban resilience, and have called for inclusivity to play a significant role with the support of government agencies [45,60,61]. For example, one study indicates that, while the government often relies on technological solutions and wealth-generating policies, the residents consider a broader range of adaptation options, incorporating socio-cultural factors [62]. Involving communities in local planning through adopting area-based strategies is also recommended [63–65]. Similarly, scholars investigating heritage preservation in Thailand agree on the need to enhance local involvement [40,41], address traditional communities [24,36,66], and acknowledge the social value, recognising the cultural landscape [67]. This calls for a further investigation and empirical evidence to demonstrate the contribution of the locals. This paper explores the values held by the residents of the BUW landscape compared to other stakeholders and their implications for waterway management.

2. Materials and Methods

2.1. Case Study Approach and the Three Study Site Contexts

This study takes a loose case study approach [68,69] to the BUWs as a whole, focusing on three waterway communities in Bangkok so to capture the various [70] land covers, management actions, waterway roles, and edges in this context. Policy analysis [71] around conservation, flood prevention, and urban development was conducted, investigating the valued landscapes manifest in policy rhetoric. Historical maps, archival study [72], and map analysis [73] were processed to explore and select three study sites.

Banpantom was once an artisan village (1884) [74], settling near the Banglampoo Canal, a defensive moat (1782) [75]. The village was surrounded by many waterways and orchards [76,77], with a mix of nearby markets, sawmills, and shipyards. The villagers were made up of government officers and craftsmen serving the palace [74,78]. Banpantom underwent changes as a result of street-based development (1939), when crafting creased (1962), and intensive urbanisation [74]. The community is within the conservation boundaries [33] and has become a major tourist attraction (1990s) (Figure 4). The Banglampoo Canal water quality has improved since 2006, and the canal has been managed to ensure that it does not flood [43,44,79]. Government initiatives include the Banglampoo Cultural Heritage Corridor (2016) [80] and the Khlong Robkrung Redevelopment Project (2017) [81].

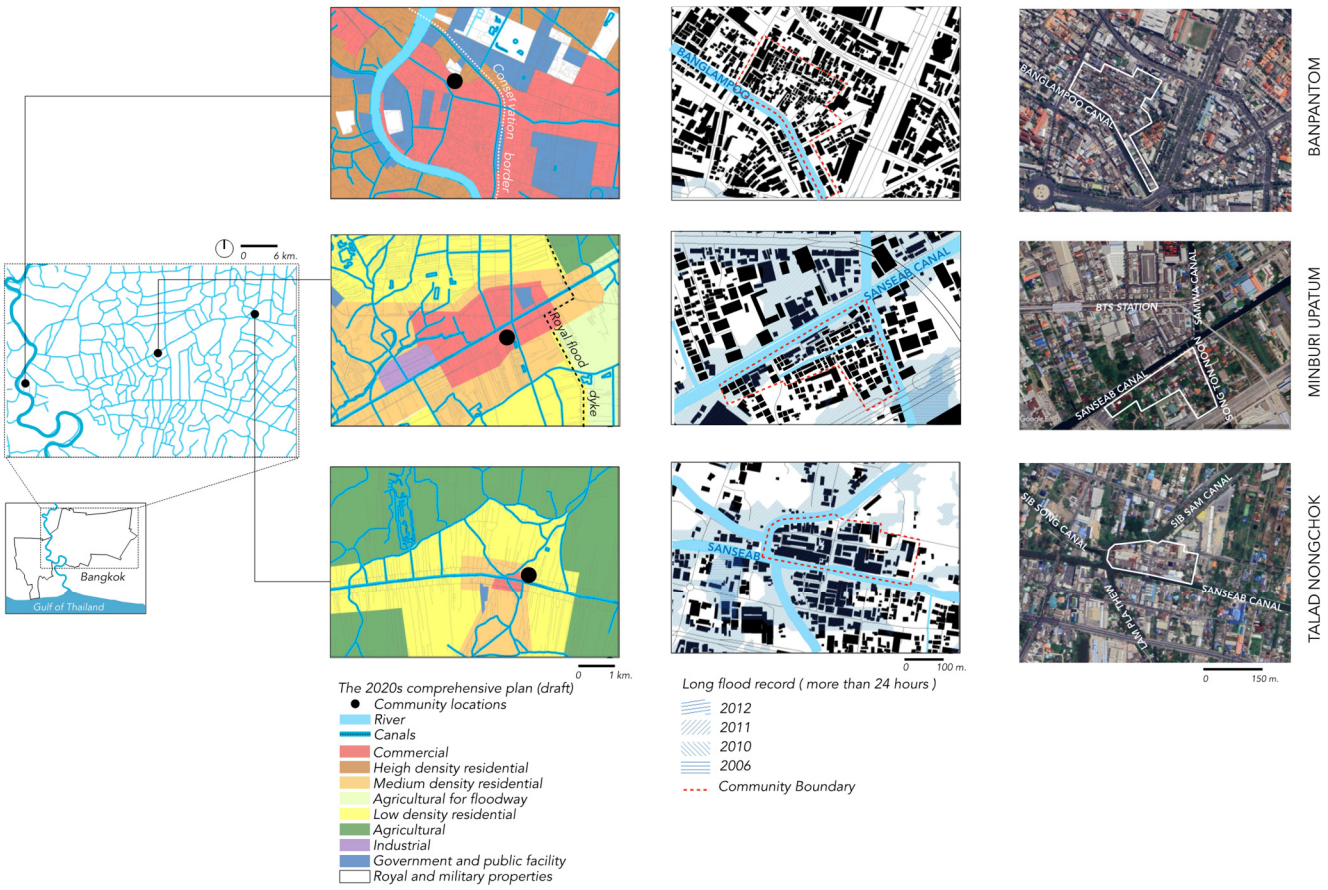

Figure 4. The three study sites: Banpantom, Minburi Upatum, and Talad Nongchok.

Minburi Upatum used to be a commerce node (1911), with fruitful market activity (1937–1957) alongside the Sanseab Canal (1837), which was excavated for city expansion and later used to support irrigation and transportation [11,82]. The Minburi Area was surrounded by villages and paddy fields [83], with many rice mills [84]. Commerce ended in 1987 after the decrease in water transportation (1915–1950s) [10]. The recent high-density residential Minburi District was built at the edge and inside of the flood barrier (Figure 4). The Sanseab Canal was embanked in 2008 and was finished around Minburi Upatum

in 2017. Government initiatives include the Minburi Redevelopment Plans (1997, 2014, and 2020) [82,84,85], the Reclamation of Sanseab Canal (2021) [86,87], and extended water transportation plans (2019) [82,88].

Talad Nongchok has been a market since 1917 [89,90] at the confluence of waterways (Figure 4), including the Sanseab Canal [90]. The village was once a significant node for commerce and transportation; however, this was later barred with the construction of irrigated watergates (1904–1910) [10,11], resulting in its diminished significance (1986). Talad Nongchok has been relegated to the outskirts of Bangkok among the paddy fields. Town plans and the flood barrier (1985) have divided the areas identified as Nongchok to be the agricultural zone [91]; however, the Nongchok Area has transformed into housing estates [90] from the city expansion pressure (2000s). Government initiatives include the Nongchok Redevelopment Plans (1997 and 2014) [92,93] and the eastern flood dike (2017–2020) [79,94].

2.2. Qualitative Research Design

This research focuses on three components, landscapes, users, and management organisations [95], across different sectors and scales [96,97] to understand the complex connections between human-modified landscapes and relevant stakeholders [57,98]. The study aligns with the theory of social constructionism [99], which emphasises how shared meanings and beliefs are collectively created and maintained. Therefore, borrowing an ethnographic approach [100] through this stakeholder-led research provides rich qualitative data in understanding the attitudes, values, and perceptions around the BUWs.

The data collection used go-along interviews [101] with residents from three communities (RE), who are the users of the landscape. This outdoor-based site method [102] captured a sense of connection in the place of study as the researcher and residents walked and talked together [103]. These interviewees were largely middle-aged, around 45–50 years old, engaging in conversations to capture historical insights into policy implementation and the perception of the role of landscape value [104] through their local knowledge [54,58]. Semi-structured interviews [105] were conducted with government agencies (GA), experts and practitioners (EP), and international agencies or NGOs (IA) as management organisations. The study explored the institutions' sphere of influence around heritage conservation, flood prevention, and urban development.

A temporal framework [106] was used to help shape the questions (Table S1). Questions were asked about the changes in the BUWs, peoples' connections with the waterways, and the situations around ongoing projects. Later, perspectives on management alternatives or an ideal vision for the BUWs in the future were captured. These future visions help demonstrate how value is embedded in stakeholders' perceptions towards the BUWs.

Ethical approval was granted by the Department of Landscape Architecture Research Ethics Committee, University of Sheffield. A total of 29 individuals were interviewed between November 2021 and July 2022 (RE, n = 10; GA, n = 7; EP, n = 10; IA, n = 2; see Table A1). The study applied a thematic analysis [107,108], via Nvivo 14 Software [109], through an abductive strategy [110] to analyse the interview data. Policy analysis was also conducted alongside the interview data analysis.

3. Findings: Landscape Values of Waterways and Management Alternatives

3.1. Stakeholders and Landscape Value of Bangkok's Urban Waterways

The different values held by the interviewees of the BUWs were demonstrated (Table S2), and three types were clustered (Table 1). Firstly, (1) Diminishing values, food production values and transportation values, were described as they declined over time. The GA/EP/IA described a major waterway, Khlong, as a massive irrigation channel for food production (GA-01/03/06, EP-01/04/07) and public water transportation (GA02/04/05/07, IA-08, EP-01/03/05/07), reflecting what was conveyed in policy documents. The RE considered minor waterways, Ramrang, as local irrigation channels for gardens and community farms (Figure 5B) (RE-05/08/09/10), including local transportation over a shorter distance (RE-

05/06/07). The RE were the sole stakeholder identifying the daily consumption value (RE-08/09/10): "*We utilised both the Phrapa [waterwork] and water from the Sanseab Canal. . . washing dishes, watering plants [..] After the embankment construction, access to the canal was blocked and we had to pay more for water services (RE-08)*".

(**A**) (**B**) (**C**)

Figure 5. Pumps at the watergate in Sanseab Canal (**A**); edible plantation (**B**); renovation of the embankment by historical material in Banglampoo Canal (**C**).

Table 1. Landscape value held about the BUWs in the data analysis.

		Government Agencies (GA)	Residents (RE)	Experts, International Agencies (EP/IA)	Policy Documents *
(1) Diminishing values	Food production value	/	/	/	/
	Daily consumption value		/		
	Transportation value	/	/	/	/
(2) Absent values	Ecological/biodiversity value		/	/	/
	Livelihood value		/	/	
	Favourable settlements value		/	/	
(3) Evolving values	Day-to-day cultural value (historical)		/	/	
	Preservation value (modified)	/	/	/	/
	Local recreation value (historical)		/		
	Urban public space value (modified)	/	/	/	/
	Natural inundation value (historical)		/	/	
	Flood prevention value (modified)	/	/	/	/

* Document analysis (Table A2).

Secondly, (2) Absent values, the values in history that are now absent in the present day, were expressed by the EP/IA/RE, including ecological values (RE-02/03/08/09/10, EP-02/06/07/09/10), livelihood values (RE-01/02/03/04/06/07/08/09/10, IA-08/09), and favourable settlement values (RE-01/02/04/07/09/10, EP-03/08/09/10). The RE described the historic values as follows: "*. . .the Banglampoo Canal once bordered the soil bank, adorned with plantations like the Crok Tree [Lampoo] and Indian Oak. [. . .] Numerous trees lined the canal, particularly near its mouth where it joined the river, inspiring the name Banglampoo (RE-03)*". "*We crafted the decorated tray along the BannLor Canal—the crafting process needed to be located near the water resource (RE-01)*". The GA interviewees did not recognise these three values, while the ONWR's policy [86,111] mentioned the BUWs' ecological value.

For (3) Evolving values, certain values (historical) have evolved to become the values (modified) serving the city at the current time (Table 1). In day-to-day cultural values, the RE/EP/IA discussed daily routines and intangible memories (RE-02/08/09/10); no

evidence was mentioned by the GA. Preservation value was expressed as a means for the younger generation (RE-01/04), which the GA considered as forms of protection and benefiting tourism (GA-02/05/07), similar to the preservation policies. The EP/IA identified the BUWs' value for historical preservation (EP-03/04, IA-08): "*Humans created these waterways [including Banlampoo Canal] long ago. [. . .] The archaeological evidence found in these historical canals holds significant value, providing insights into the chronology of the area (IA-08)*" (Figure 5C).

Only the RE mentioned local recreational value (RE-01/02/03/04/07/08/10): "*Fifty years ago, the water level in the Banglampoo Canal was very high, almost reaching the houses' first floors. We could sit down and put our legs in the water. [...] The children used the waterways as their playgrounds (RE-02)*". Urban public space was valued by the GA/EP/IA as the means of public access and the potential to foster urban recreation (GA-02/04/05/06/07, EP-01/03/05, IA-08/09), as conveyed in the policy documents, while the RE considered this value in a particular area for the short-cut route, as examined in Minburi Upatum: "*I must note that most pedestrians [along Sanseab Canal] in this area are unproductive... Only pathways near the bridge that connect to parking lots* via *the main road are beneficial. People utilise this route to save time when accessing the BTS [skytrain] (RE-06)*".

The flood prevention value of the BUWs was addressed by the GA/EP/IA as free-flow drainage channels helping to divert water out of the city (GA-01 to 07, EP-01/04/05/07, IA-09): "*The BUW help a lot to [address] the flood issue. We use them to bypass water out of the urban area. But you need to understand the nature of the waterways in Bangkok which is flat. This means the water will flow slowly, not quickly. We really need to use the help from pumping and other structures (GA-04)*" (Figure 5A), which was similar as that addressed in the policy documents. The EP/IA/RE considered this value, also in regard to the BUWs, as a detention area, recognising the natural inundation value (EP-02/03/06/08/09/10, IA-08, RE-08/09/10). The RE in Talad Nongchok mentioned that their community remained unflooded during the city's 2011 flood: "*The water level in Sanseab Canal decreases quickly after almost reaching the floor (RE-08)*". Contributing factors included the plentiful spaces of green areas and many minor waterways that allowed the water to be contained rather than inundating the community (RE-08/09/10, EP-02/03).

3.2. Management Alternatives

The stakeholder recommendations (Table S4) were clustered into five alternative scenarios (Table S3) (Figure 6). Scenario I, enhance ongoing management (Figure 7), recommended by the GA/EP/IA/RE, considered boundary control at the BUW edge (GA-01/02/03/04), including relocation improvement (GA-05, IA-09, EP-01/05), increasing detention areas (IA-08/09, EP-02/04/08), improving the capacity of structural measures (GA-03/04, EP-04/07), improving the wastewater treatment (GA-01/02/06, IA-08/09, EP-01/04/06/07/08), and improving garbage collection (RE-02/05/08, GA-01/04/06, EP-05): "*The embankment increases BUW capacity, and we [GA] should make a greater depth. [. . .] The existing pipe diameter in the conservation zone [including Banpantom] is 40 cm. The pipes should change to be 60 cm (GA-04)*". Banglampoo Canal (BC) in Banpantom should remain strongly protected, and Sanseab Canal (SC) in Minburi Upatum and Talad Nongchok must keep its drainage role.

Scenario II, natural restoration (Figure 8), suggested by the EP/IA, highlights a focus on the understanding of the natural landscape of the BUWs as a network (EP-02/03/08/09/10), including recommendations for restoring the BUW bank and water flow (IA-08, EP-02/03/08/09/10): "*. . .waterway network can effectively mitigate flood impacts by providing widespread coverage. These BUW should be considered -critical infrastructure- as they play a vital role in helping the city cope with uncertain changes, such as flooding. It's essential to recognise that numerous small waterways feed into the main waterways, and ensuring the survival of this network relies on safeguarding these minor components (EP-02)*". The BC should be restored to connect the flow with the river. The SC in Minburi Upatum should reconnect with the minor waterways, and in Talad Nongchok, the SC should restore ecological integrity.

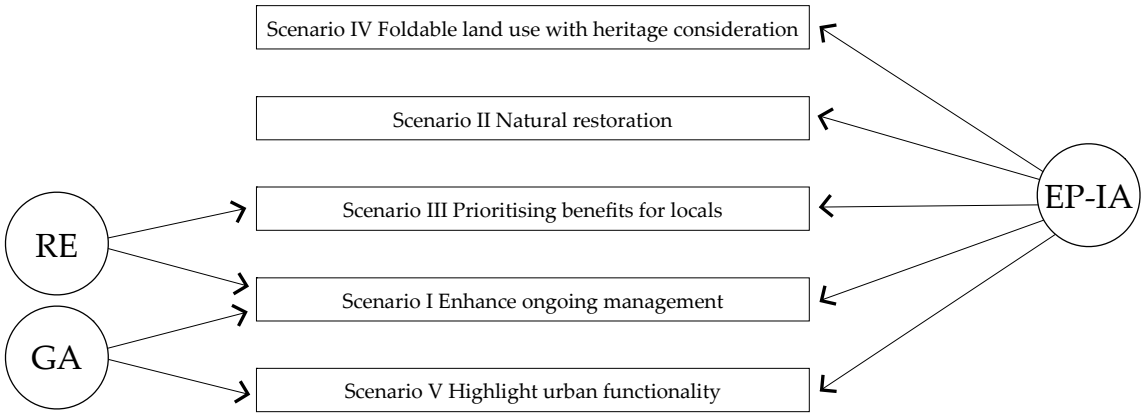

Figure 6. Alternative scenarios clustered from the stakeholders' recommendations.

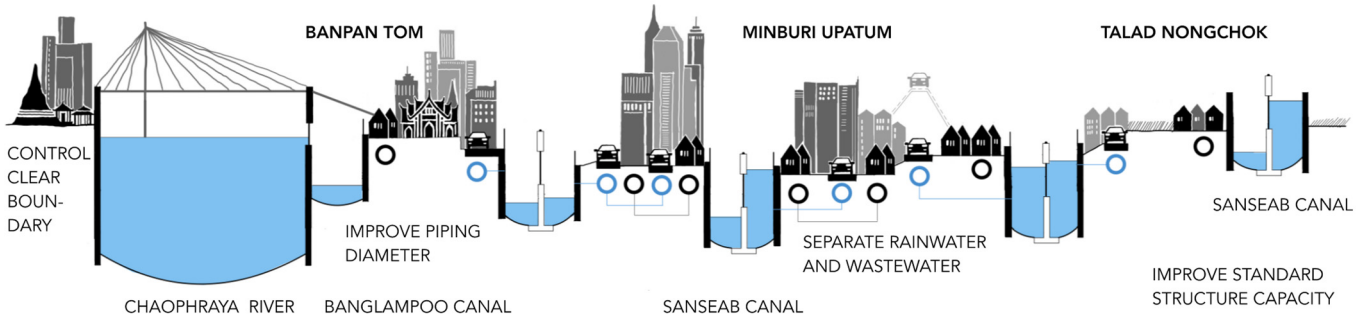

Figure 7. Eastern Bangkok with three waterway communities representing the "enhance ongoing management" scenario.

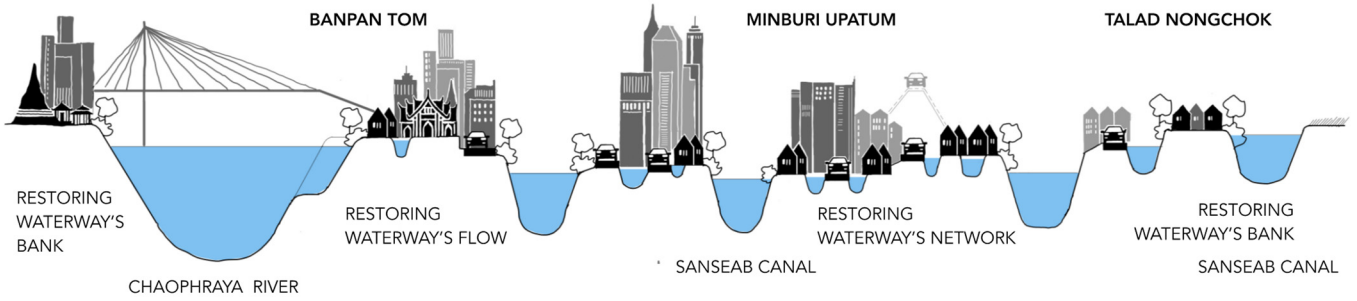

Figure 8. Eastern Bangkok with three waterway communities representing the "natural restoration" scenario.

Scenario III, prioritising benefits for locals (Figure 9), recommended by the RE/EP/IA, highlights a focus on granting the permission to inhabit and earn a livelihood (IA-09, RE-01 to 10), enabling access for routine consumption (RE-05/07/08/09/10), equilibrating the operation of watergates (RE-05/06/07/08/10, EP-01/05), and providing safety and security (RE-01/02/04/06/07). The RE from Minburi Upatum said the following: *"Despite the presence of the embankment, some of us continue to use local boats because many houses along the canal have private piers. We believe that creating more access points to the [Sanseab] canal could benefit us, such as providing fishing terraces, piers for children to swim, and spots for Loykratong celebrations (RE-05)"*. The BC and SC should prioritise the benefits for local communities.

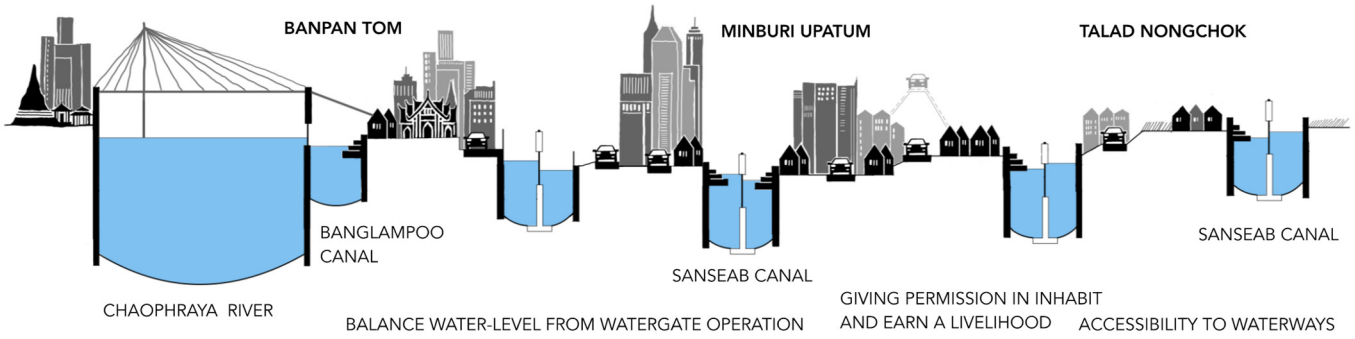

Figure 9. Eastern Bangkok with three waterway communities representing the "prioritising benefits for locals" scenario.

Scenario IV, floodable land use with heritage consideration (Figure 10), recommended by the EP/IA, addresses floodable areas at the waterway edge (IA-08, EP-03/09) and considers community identity (IA-09, EP-03/08/09/10): "*I recommend that the GA team should revise the land use plan to incorporate multiple layers, not just floodways. Preservation plan should not be limited by the current conservation boundary [. . .] During the dry season, urban amenities such as pathways along the Sanseab Canal might be repurposed temporarily. During the flood season, the area could accommodate increased water retention (EP-09)*". The BC's width historically could hold more water, and the SC in Minburi and Talad Nongchok should consider flexible land use and heritage values.

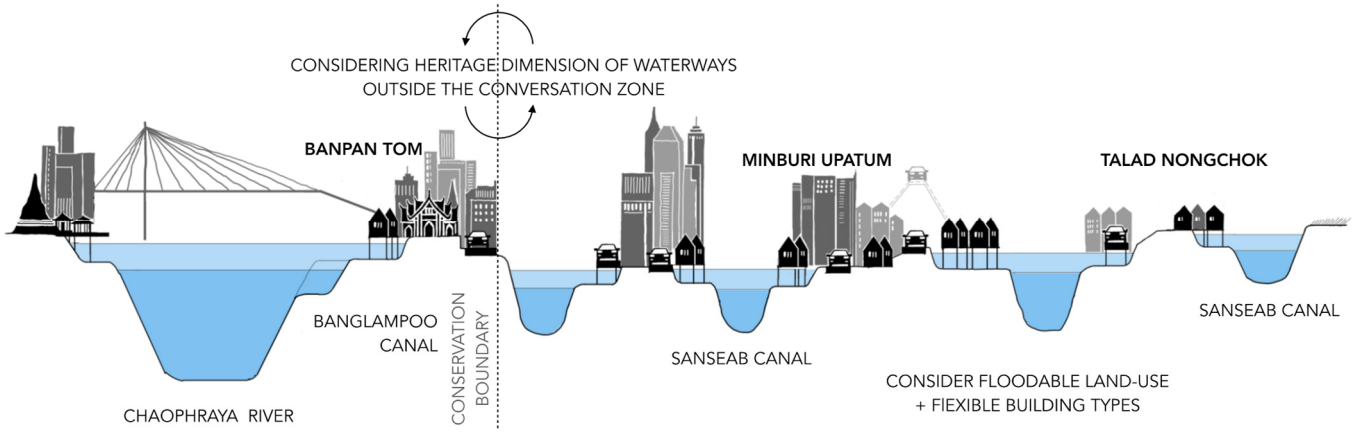

Figure 10. Eastern Bangkok with three waterway communities representing the "floodable land use with heritage consideration" scenario.

Scenario V, highlight urban functionality (Figure 11), recommended by the GA/EP/IA, included an emphasis on public water transportation (IA-08, EP-01/04/05/07, GA-01/05/06), providing recreational public access to the BUW-adjacent area (GA-01/02/05/06/07, EP-01/05), and involving investors and developers (GA-01/06): "*The Sanseab Canal can be developed to be used as the public area or green space. However, the water authority needs to adjust or change the structure of the current embankment. [. . .] I think the main problem of the canals as urban patterns is that the approach should be improved for more access by people to use as public spaces rather embankments (GA-02)*". The BC should function as public transportation, while the SC in Minburi Upatum should serve the urban role of the TOD, and the SC in Talad Nongchok should return full rights to the government.

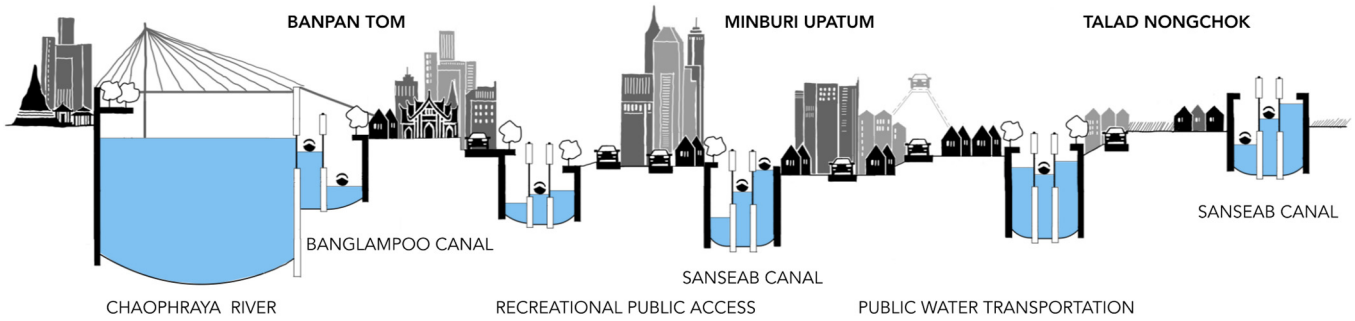

Figure 11. Eastern Bangkok with three waterway communities representing the "highlight urban functionality" scenario.

4. Discussion

4.1. Revealing the Need for Collaborative Stakeholders and Multi-Values

From the findings, it becomes apparent that none of the GA fully recognised the values of the waterways, identified as absent values and evolving values (historical), nor did they acknowledge them in policy documents. For example, water management agencies and water management policies did not take into account the values inherent in daily consumption, which is why the considerations relating to accessibility were typically absent from their embankment design standards, as observed across all three communities. While the ONWR's documents addressed the ecological value, their action plans have not echoed the significance of ecology or biodiversity. On the contrary, the RE/EP/IA reflected more diverse values, including those described as absent and diminished, such as day-to-day cultural values and ecological values. This indicates that there are certain limitations to the values raised when considering management that are not as diverse as they could be (Figure 12).

The findings illustrate that the RE was the sole stakeholder, highlighting a full range of landscape values for the waterways (Figure 12). The RE acknowledged the importance of both small and major waterways, whereas the GA made no mention of minor waterways whatsoever. This echoes the historical analysis. While the public entities focused on the major canals, the RE addressed the values of the waterways in the way of living with nature [14,15] and recognising its ecosystem service [1]. The findings echo how the RE can possess extensive information about their neighbourhood's history [53], indicating that this deep understanding of values can contribute to an inclusive approach in management. These are related to community-based conservation [54,55].

The RE have a strong potential to contribute to BUW management practices. This aligns with the literature [55,56]. The findings recommend a community-based approach, which is crucial for project proposals [54,58], and provide concrete evidence to support the literature on Thailand's flood management [45,63] and heritage preservation [40,41] regarding the urgent need for local involvement. The RE play a vital role in maintaining (diminishing value), restoring (absent value), and sustaining (evolving value) the BUW landscape.

The findings show that the RE recommended the fulfilment of basic needs for all residents, granting permission for ownership and livelihood. The EP/IA suggested solutions that included the natural significance or cultural significance (separately). While the EP/IA provided recommendations toward various alternatives compared to the RE (Figure 6), the RE addressed more diverse values compared to the EP/IA (Figure 12). This indicates the need for all of them to be involved in the management, i.e., the decision-making process. The EP/IA could play a facilitation role in fostering solutions, and the RE could help to initiate the proposals and drive the implementation. The RE's input, i.e., local knowledge, should be integrated with scientific knowledge from the experts [56], the EP/IA. This aligns with the bridging of knowledge [59] and the call in the SDGs and NBS recommendations for

multi-stakeholder involvement [51,52], which can avoid adopting one singular perspective within an intricate landscape system.

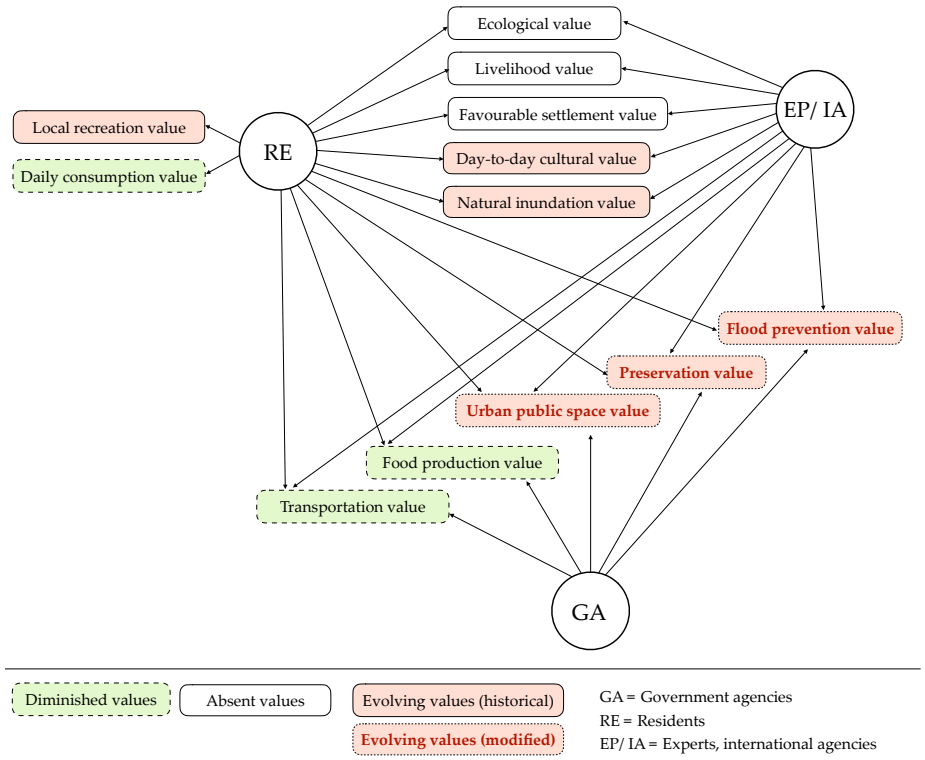

Figure 12. Stakeholders addressing values of the BUWs.

These findings provide evidence for the scenarios, which present the various values addressed in the stakeholders' recommendations (Table 2), representing value restoration fostering the relationship between humans and nature [53,112]. These findings confirm multi-stakeholder contribution. Many values were presented, but they were unrecognised by the GA and were not addressed in the policy documents. For example, absent values like the favourable settlement of the BUWs were expressed in a scenario concerning flexible land use [IV]. The diminishing daily consumption value was addressed in scenarios concerning benefits for locals [III] and heritage consideration [IV]. These two scenarios, [III/IV], also addressed the day-to-day cultural values, specifically the historical functions that have evolved over time. Similarly, the natural inundation, a historical value that has transformed, was expressed in a scenario of natural restoration [II]. This recognition, and having faith in the potential of landscapes, ultimately influences how the future of landscapes is envisioned [113]. Therefore, the RE/EP/IA can potentially contribute to BUW management practices in a more comprehensive manner than the GA alone by considering the diversity of values being held, the interpretation of those values, and the construction of alternatives.

However, the findings indicate a single level of expertise and certain values held that exemplify only specific areas of interest. Certain values were unique to specific scenarios, while many were missing. For instance, the ecological value was exclusive to the scenario of natural restoration [II], while this scenario did not account for values like daily consumption or livelihood values. While a scenario concerning floodable land use and heritage consideration [IV] showed the expression of various values, values like ecological, livelihood, and local recreation were not expressed. This indicates the need for further research investigating whether these values can be integrated or bridge the gaps in each other's expertise.

Table 2. Values expressed about the BUWs through five scenarios.

		Enhanced Ongoing Management	Natural Restoration	Prioritising Benefits for Locals	Floodable Land USE with Heritage Consideration	Highlight Urban Functionality
		[I]	[II]	[III]	[IV]	[V]
Diminishing values	Food production value			/	/	
	Daily consumption value			/	/	
	Transportation value				/	/
Absent values	Ecological value		/			
	Livelihood value			/		
	Favourable settlements value				/	
Evolving values	Day-to-day cultural value			/	/	
	Preservation value				/	
	Local recreation value			/		
	Urban public space value	/			/	/
	Natural inundation value		/		/	
	Flood prevention	/	/	/	/	/

"/" represents the values addressed.

4.2. Landscape Values Being Transformed and Forgotten

4.2.1. BUWs for Public Well-Being or Local Benefits

The re-evaluation of spaces in modern times as valuable public areas is fuelled by the rapid urbanisation of densely populated areas [52,53]. International initiatives underscore the benefits of public use and the creation of green spaces along waterways (e.g., the Amsterdam Canal Belt [114]). Regarding the BUWs, this shift is characterised by a move from localised recreational value for residents to a broader focus on urban public space value, i.e., the well-being of the people of Bangkok. The GA imagines these waterway-adjacent areas to function as public access pedestrian points, exemplified by the projects across three communities. These findings question the cityscape enhancement of urban public space along the BUWs while the local dimensions are ignored, given that residential areas have historically occupied the spaces along the waterways since the earliest settlements [4,115,116]. These findings lead to the initial recommendation that the consideration of the local dimension must be taken into account [56], bearing in mind that local benefits such as local recreational value must be addressed. Importantly, collaborative efforts should be adopted to avoid choosing between the BUWs serving wide public or local benefits; rather, both of them must be considered.

4.2.2. BUWs: Detention or Drainage

The findings demonstrate that the value of flood prevention has shifted from a once natural inundation to serving the urban city. It has given rise to distinct roles for the BUWs, including retaining water through detention, by providing space for water to accumulate as part of inundation, and free-flow drainage, which guides water out of the area. The findings indicate that a key factor shaping the present condition of structural measures in the BUWs is the GA's necessity to designate them as free-flowing drainage channels, implemented by the DSD to the BUWs, and the absence of a detention role in the flood prevention value. The historical development of water agencies in Bangkok indicates clear changes in priorities. The Canal Department prioritised transportation and excavation, while the Irrigation Department emphasised massive food production. The most recent Drainage

and Sewerage Department (DSD) focuses primarily on drainage. The empirical findings further show that the GA interviewees did not recognise the natural inundation value of the waterways. This lack of acknowledgement may be attributed to their insufficient understanding of the BUWs, which can serve as detention areas, as acknowledged by the EP/IA/RE, such as locals in Talad Nongchok, who described how they adapted well to major floods in Bangkok.

While the findings reveal the flood prevention value across all of the scenarios, they attributed a distinct role to the BUWs. Enhanced ongoing management [I] addressed the free-flow drainage, extensively controlling the BUWs, while scenarios like natural restoration [II] and floodable land use [IV] addressed the detention role of the BUWs, recognising the natural inundation value given to the flat terrain of Bangkok. These EP/IA scenarios enhanced the absorbed spaces of interconnected waterways, promoting the concept of resilient cities, which has been academically studied in Bangkok [6,49]. Recognising the importance of the detention role in landscape management necessitates a process-oriented approach to value restoration, which is significant in managing intricate landscapes [113,117], and this can be performed through multi-stakeholder involvement, as evidenced by the EP/IA/RE recognising both the natural inundation and flood prevention values of the BUWs, including their scenario recommendations.

4.2.3. Challenging the Preservation Value of the BUWs

The conservative approach to water infrastructural heritage is long-standing [118,119] and frequently refers to its presented (unalterable) nature [118]. The BUWs in Old Town Bangkok are considered by the GA to be protected, highly preserved, and unchangeable. The day-to-day cultural value has changed over time and is now replaced with the dominant value of preservation. This preservation value illustrates the BUWs as the symbol of revered historical significance in the present context, deserving protection. The oversight of the once integral local dimension is evident in Banpantom, where the conservation plans aim at attracting visitors and do not provide encouragement to the locals of Banglampoo Canal. The local dimension's value to the BUWs has not been acknowledged by the GA or the policy documents. This is echoed in other Rattanakosin Policy studies [35,40]. A similar decline in local values was also found in other water villages, like Kampong Ayer, Brunei [120], and the heritage water cities of Zhouzhuang and Wuzhen in China [121].

This study highlights the problems of taking a narrow focus on heritage considerations alone within the confines of Bangkok's conservation boundary. This issue arises due to the limited interpretation of the preservation value, which impedes a holistic approach. In contrast, the recommendations from the EP/IA, shown in scenario IV, proposed the inclusion of cultural heritage considerations beyond the conservation boundary, while the RE/EP/IA addressed both preservation and day-to-day cultural values. Thus, the involvement of the RE/EP/IA in management decisions is recommended. The findings indicate how the expression of the preservation value of the BUWs in a conservation area by management actions influences and exacerbates the divide between heritage preservation and flood mitigation. The prevailing notion in preservation efforts is to maintain the conservation zone in a dry condition, a belief that has persisted throughout history. This aligns with decision-making processes that have remained unchanged over time, with the primary focus here being the protection of the Old Town. Hence, there is an understanding through the preservation value that this conservation effort does not need to integrate flood mitigation measures. This paper challenges this fixed understanding. This is also echoed in Thai literature on the cultural significance of the integration with flooding mitigation [17,122].

5. Conclusions

Landscape values have driven the direction of BUW management and reveal a historical shift for stakeholders. Residents continue to value waterways, although the values have diminished, are absent, and have evolved. Government agencies primarily value the

BUWs for their role in urban settings. Discrepancies also exist in their interpretation, such as the flood prevention value presenting the distinct roles of free-flow drainage, recognised by government agencies, and the role of water detention, identified by other stakeholders. Landscape values associated with the BUWs, recognised by the residents, experts or practitioners, and the NGOs, go beyond the limited conceptualisation and understanding expressed by the government agencies. This indicates that particular stakeholders have the potential to offer solutions for managing the complex BUWs rather than relying solely on the government authority's BUW managers. The full range of the BUWs' values in this study also represents a potential method for evaluating the landscape values [123] beyond just identifying the important landscape, e.g., in the conservation zone.

This paper does not intend to favour any particular scenario as the 'best' recommendation. On the contrary, the different alternatives show how various solutions are crafted based on the values held by different stakeholders. Whether individuals prioritise professional interests or local interests, they all have the potential to contribute to a more holistic solution in managing the BUWs, and the research shows how they should be involved in management decisions. Although there has been a degradation of the BUWs, these research findings indicate that stakeholders still hold diverse and positive landscape values towards the BUWs. Therefore, sharing landscape values could be highly significant for the future changes to the BUWs. This research confirms that involving more diverse stakeholders can address more comprehensive values, potentially leading to a holistic approach. This novel research recommends re-evaluating the BUWs as landscape elements that comprise various values, such as ecosystem services and cultural significance. It advocates for enhancing environmental quality, community well-being, and local inclusivity in the future. This drives the conclusion that multi-stakeholder involvement is necessary, integrating local knowledge from residents with professional knowledge, which is currently not performed in the Bangkok context.

While flood management and heritage management stakeholders emphasise the flood prevention value and preservation value, respectively, and separately, future research should focus on bringing them together. A notable dilemma also emerges from the findings. There is a divide between the values catering to visitors and those prioritising the locals, including the separation between the natural and cultural significance. Future research is needed to explore how these values can be effectively integrated. There remains a lack of justification concerning the continued ('business-as-usual') performance within institutions, which may impede collaboration and exacerbate the limited scope of the values held by government agencies. The persistent rigid boundary approach of government agencies, favouring delineation between the waterways and the land, needs further scrutiny, as, in light of these research findings, their preference for this boundary control scenario becomes increasingly unjustified. Therefore, there is a need for more institutional examination and investigation into agency performance and decision-making processes to improve urban waterways like those in Bangkok for all stakeholders involved.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su16167117/s1. Table S1: List of questions for interviews. Table S2: Stakeholders' value of the Bangkok Urban Waterways; Table S3: Summary of the five scenarios recommended for the three community contexts; Table S4: Detailed recommendations for the three community contexts.

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Informed Consent Statement: Informed consent was obtained from all interviewees involved in the study. Written informed consent has been obtained from the interviewees to publish any papers.

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Appendix A

Table A1. List of interviewees (n = 29).

GA-01	Public Works and Town and Country Planning Department (PWTPD)		
GA-02	Town Planning Department (TPD)		
GA-03	Royal Irrigation Department (RID)		
GA-04	Drainage and Sewerage Department (DSD)		
GA-05	Rattanakosin Committee, the Office of National Environment Policy and Planning (RC-ONEP)		
GA-06	Urban Development and Renewal Office, TPD (UDR-TPD)		
GA-07	Fine Art Department (FAD)		
IA-08	SPAFA-ICOMOS		
IA-09	UN-Habitat		
EP-01	Urban planner	RE-01	Community leader (Banpantom)
EP-02	Ecological landscaper	RE-02	Resident (Banpantom)
EP-03	Heritage experts	RE-03	Resident (Banpantom)
EP-04	Water resource engineer	RE-04	Resident (Banpantom)
EP-05	Political science researcher	RE-05	Community leader (Minburi Upatum)
EP-06	Hydrological ecologist researcher	RE-06	Resident (Minburi Upatum)
EP-07	Environmental engineer	RE-07	Resident (Minburi Upatum)
EP-08	Landscape practitioner	RE-08	Community leader (Talad Nongchok)
EP-09	Academic historian	RE-09	Resident (Talad Nongchok)
EP-10	Local historian	RE-10	Resident (Talad Nongchok)

Note: Government agencies (GA); International agencies (IA); Experts and practitioners (EP); Residents (RE).

Table A2. List of policy documents used in the analysis.

Agencies	**Policy Documents**	**Year**
RC-ONEP	Rattanakosin Plans	1994, 1997
RC-ONEP	Rattanakosin Plan	2020
TPD	Banglampoo Heritage Corridor	2016
TPD	Khlong Rob Krung Redevelopment Project	2017
TPD	Redevelopment plan in Minburi	1997
TPD	Redevelopment plan in Minburi Upatum	2014
TPD	Redevelopment plan in Minburi District	2020
TPD	Redevelopment plan in Nongchok	1997
PWD	Chaophraya Development Plan- Chaophraya For All	2016

Table A2. *Cont.*

Agencies	Policy Documents	Year
TPD	Town plan development: annual reports	2015, 2018, 2020
TPD	The Comprehensive Plan (draft)	2019, 2020
DSD	The Road Rail Boat Policy	2020
DSD	Flood prevention: annual reports	2017, 2011, 2012, 2020
DSD, CODI	Plan of increasing drainage capacity	2015
BMA	Bangkok Resilience Strategy	2017
ONWR	The Reclamation of Sanseab Canal	2021
ONWR	The 20 years of water management policy	2018

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