

# Towards a new Shezidao

Creating land & water conditions for an attractive, sustainable, resilient Shezidao

Report of findings

Shezidao International Workshop

30 April - 1 May 2016

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# Colofon

## **Hosts**

Mayor Wen-Tse Ke

Deputy Mayor Charles Lin

## **Workshop initiation**

Netherlands Trade and Investment Office (NTIO)

Guy Wittich (Representative and Head of Mission NTIO)

## **Departments**

Urban Planning Advisory Committee

Department of Urban Development

Department of Public Works

Department of Transportation

Department of Land

Department of Environmental Protection

Hydraulic Engineering Office

Sewerage Systems Office

Land Development Agency

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## **Publication**

Wissing Urban Design & Planning (2016)

## **Editing, Design & Realisation**

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# Foreword

On behalf of the Netherlands Trade and Investment Office (NTIO) I would like to thank the Taipei City Government for giving the Netherlands the opportunity to share expertise in landscaping, water management, architecture and new concepts such as circular economy.

The Shezidao International Workshop in Taipei provided an excellent occasion for Dutch and Taiwanese experts to jointly review the masterplan and provide additional suggestions. This report is a summary of these suggestions.

I am therefore very grateful to the Dutch experts from Deltares, H+N+S, Metabolic and Wissing for their interest in Taiwan and the very valuable contributions to this project.

I sincerely hope that this project is only the start of a longer-term cooperation between The Netherlands and Taiwan in all the areas related to urban development and water management.

Guy Wittich  
Representative  
Netherlands Trade & Investment Office





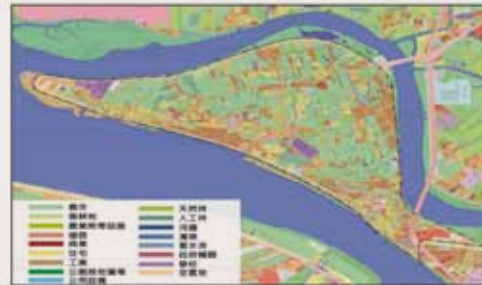
# Acknowledgements

We would like to thank our hosts, and in particular Taipei City Department of Urban Development and the NTIO, for the hospitality received during our visit, the provision of data and information to prepare for the meeting and the excellent discussions during the workshop. Moreover we would

like to thank Vicky Lin, MSc student at Wageningen University and working with Deltares on a thesis on Water sensitive urban design (with Shezidao as one of her cases), for supporting us during our visit.



Residential areas



Land use



Cultural facilities and trees



Water and green resources

1





# 1 Introduction

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A team from The Netherlands was asked to participate in the workshops on the redevelopment of Shezidao. The experts were asked to peer-review and reflect on the existing plans for the redevelopment of Shezidao, focussing on the five topics shown in the figure on the next page. In addition we also gave comments and suggestions on the development process.

The Netherlands' expert team:

- Piet Kalsbeek (Wissing; landscape architect / urbanist)
- Samuel de Vries (Metabolic; sustainability and circular solutions expert)
- Jaap van der Salm (H+N+S; landscape architect)
- Frans van de Ven (Deltares / TU Delft; Urban land & water management expert)

## Five main topics

<b>Land Use and Urban Planning</b> <ul style="list-style-type: none"> <li>• <i>Building coverage ration and floor area ratio adjustments</i></li> <li>• <i>Development on different geographic demarcation in different periods</i></li> </ul>	<b>Water Management</b> <ul style="list-style-type: none"> <li>• <i>Flood-proofing techniques</i></li> <li>• <i>Coastal landscape</i></li> </ul>
<b>Water Belt Park</b> <ul style="list-style-type: none"> <li>• <i>Key success factor for Ecological Scenario</i></li> <li>• <i>Ecological landscape design</i></li> </ul>	<b>Policy on Public Housing</b> <ul style="list-style-type: none"> <li>• <i>Residential resettlement land use (special settlement plan), public-private cooperative housing</i></li> </ul>
<b>Green Energy Transportation System and Ecological Corridor</b> <ul style="list-style-type: none"> <li>• <i>Low-carbon transportation</i></li> <li>• <i>Wetland design or native plants recovery</i></li> </ul>	

## Goals of workshop

It is the objective of the Dutch expert team to have a supportive role towards the development of the Strategy plan for Shezidao. In the preparations for the workshop, we were pleased to learn, that a lot of work already had been done. And we were triggered by the interesting content of the project of the redevelopment of Shezidao into a mixed use urban environment for about 35.000 inhabitants. Our objective of the workshop was to address the major questions and hesitations? We wanted to define how can we help to improve what was already there? The meetings served several goals:

1. Assess the Strategy Plan B-Eco Shezidao;
2. Show approaches and tools used in The Netherlands to create enabling conditions for urbanization and to plan, design and realize sustainable regeneration /redevelopment projects (brownfield regeneration)
3. To propose a realistic drainage-system, making use of green-infra-structure and grey-infrastructure measures in the Shezidao area;
4. To propose interesting ideas for the development of a sustainable and climate-resilient city;
5. To discuss opportunities and major obstacles in achieving these goals and the criteria for success.



"A new mixed use urban environment for 35,000 inhabitants"





## Definition of goals and leading aspects of design

Shezidao in the future will be a sustainable, viable and vital part of Taipei City, where people can enjoy all aspects of life in a non-conflicting manner. A safe environment and the smart use of increasingly limited space and resources is critical to the success of Shezidao. Citizens need a good living environment, with the right mix of services, job opportunities and optimal accessibility. One of the goals of the urban plan for Shezidao is a Cost-effective plan, with the following ambitions:

1. to secure human security and public health by addressing water quality (including waterborne diseases, water supply and sanitation), illegal building codes and flood control;
2. to conserve ecology;
3. to secure interests and rights of the residents;
4. to ensure leisure and recreational functions;
5. to create a sustainable, friendly and safe urban environment;
6. to build new public facilities and service institutes;
7. to create sufficient space for water;
8. to secure Civic Engagement.

The general objective is to develop Shezidao as a vibrant, attractive and healthy area for housing, economic activities and leisure, while strengthening the ecological qualities of this peninsula.

**“Shezidao in the future will be a sustainable, viable and vital part of Taipei”**

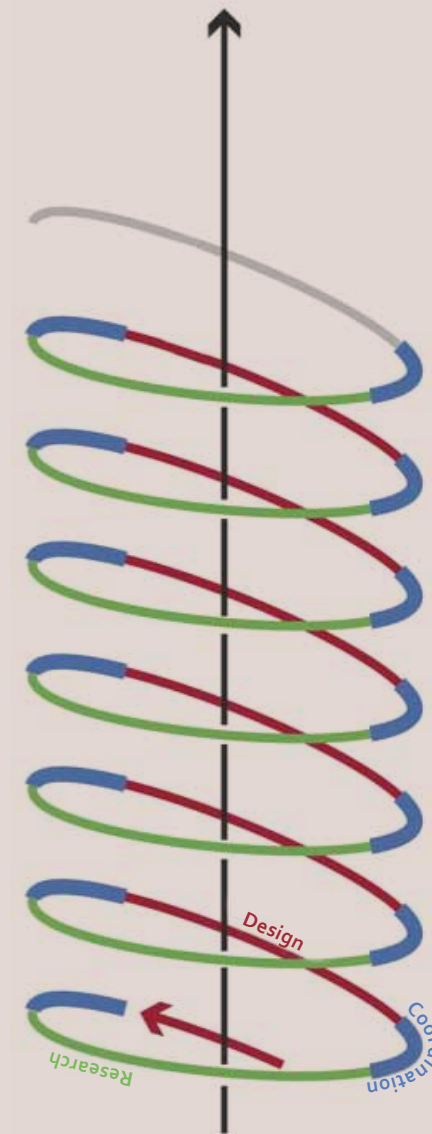


Context of Shezidao in Taipei

## Our approach: integrated development

In order to address the issues and ambitions, the Dutch expert team proposed an integrated approach towards the Strategy Plan for Shezidao. Many of the issues above are strongly interrelated. This calls for an inclusive, integrated approach towards urban development, engineering, management and governance under the uncertainty of climate change. During the workshops we explained our experience with the so-called Integrated Approach, in which the design process is an interactive itinerary with the involvement of all relevant departments.

**“The Dutch expert team proposed an integrated approach”**



Process of dialogue in the design assignment

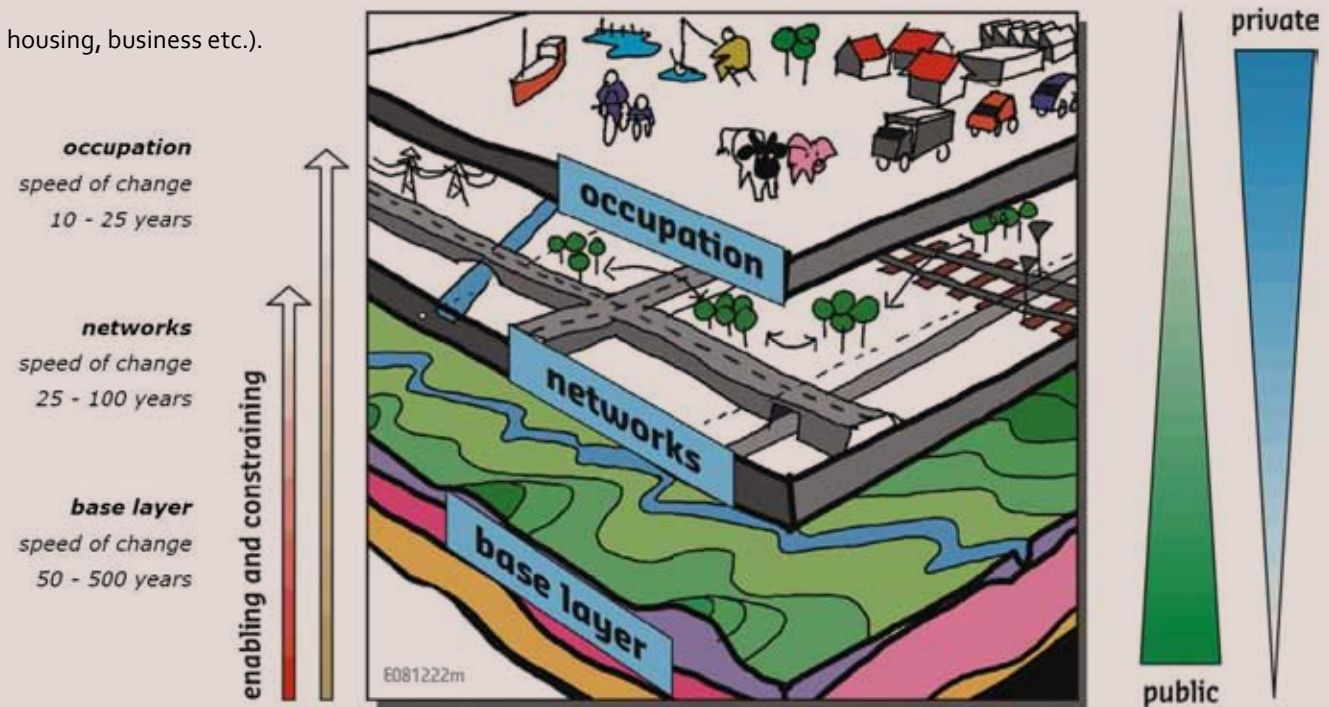


## Our approach: the Layer Model

The second aspect of an integrated approach is the so called 'Layer model'. This model provides insight into the complex system of an urbanizing area in the low-lying Taipei basin. This Layer model recognizes three physical planning layers:

1. the **Base layer** (geomorphology, river system, soil);
2. the **Network layer** (infrastructure, drainage);
3. the **Occupation layer** (zoning of land use functions, housing, business etc.).

Each layer has different but interrelated temporal dynamics and public-private involvement. We can add a fourth layer; the Socio-economic layer, which is not physical, but addresses the strategy of urban development and the effects on equity, ownership and social cohesion.



Layer model with three physical planning layers

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# 4 / 30 (Sat)

text

Time	Program	Topic	Participants
0900-0910	Opening	Opening Speech	NTDO representative (Semin) Mr. Guy Wittich (Representative and Head of Mission) Taipei City Government (Semin) Mr. Charles Lin (Deputy Mayor of Taipei)
0910-1000	Keynote	[Eco-Shezidao: The Usable Future of Shezidao] Creating land & water conditions for an attractive, sustainable and resilient Shezidao Living with water Green Infrastructure in Urban Planning Circular economy and the urban metabolism	Mr. Charles Lin (Deputy Mayor of Taipei City) Dr. Frans Van De Ven (Associate Professor of Urban water Management, Delft University of Technology) Mr. Jaap Van Der Salm (Landscape Architect at H+N+S Landscape Architects) Mr. Piet Kistbeek (Director of Wising Urban Design + Planning) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic)
1000-1020	Break		
1020-1220	Workshop 1	Vision and Urban Planning	1. Preside: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) 2. Introduction: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) (20min) 3. Specialists (10min/person*2) Mr. Piet Kistbeek (Director of Wising Urban Design + Planning) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic) 4. Discussion (80min)
1220-1330	Lunch		
1330-1530	Workshop 2	River Basin Management and Wetland	1. Preside: Mr. Yang Ming-Shyang (Director of Hydraulic Engineering Office) 2. Introduction: Mr. Yang Ming-Shyang (Director of Hydraulic Engineering Office) (20min) 3. Specialists (10min/person*2) Dr. Frans Van De Ven (Associate Professor of Urban water Management, Delft University of Technology) Mr. Jaap Van Der Salm (Landscape Architect at H+N+S Landscape Architects) 4. Discussion (80min)
1530-1550	Break		
1550-1750	Workshop 3	Creating the Future of Sustainable Transport for Shezidao	1. Preside: Ms. Chung Hui-yu (Commissioner of Department of Transportation Taipei City) 2. Introduction: Ms. Chung Hui-yu (Commissioner of Department of Transportation Taipei City) (20min) 3. Specialists (10min/person*2) Mr. Piet Kistbeek (Director of Wising Urban Design + Planning) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic) 4. Discussion (80min)

# 5 / 1 (Sun)

Time	Program	Topic	Participants
0930-1200	Workshop 4	Urban Design and Wetland	1. Preside: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) 2. Introduction: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) (20 min) 3. Specialists (10min/person*3) Dr. Frans Van De Ven (Associate Professor of Urban water Management, Delft University of Technology) Mr. Jaap Van Der Salm (Landscape Architect at H+N+S Landscape Architects) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic) 4. Discussion (100min)
1200-1300	Lunch		
1300-1500	Workshop 5	Public Housing and Smart Community	1. Preside: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) 2. Introduction: Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) (20 min) 3. Specialists (10min/person*2) Mr. Piet Kistbeek (Director of Wising Urban Design + Planning) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic) 4. Discussion (80min)
1500-1530	Break		
1530-1730	Workshop Output & Closing	Output by Taipei City Government Output by Guests Final Discussion Closing Keynote	Preside: Mr. Charles Lin (Deputy Mayor of Taipei City) Speaker: Mr. Yang Ming-Shyang (Director of Hydraulic Engineering Office) Ms. Chung Hui-yu (Commissioner of Department of Transportation Taipei City) Mr. Lin Jou Min (Commissioner of Department of Urban Development Taipei City) Speaker: (10min/person*4) Dr. Frans Van De Ven (Associate Professor of Urban water Management, Delft University of Technology) Mr. Jaap Van Der Salm (Landscape Architect at H+N+S Landscape Architects) Mr. Piet Kistbeek (Director of Wising Urban Design + Planning) Mr. Samuel De Vries (Building Engineer & Architect of Metabolic) Preside: Mr. Lin Chin-rong (Deputy Mayor of Taipei City) Mr. Guy Wittich (Representative and Head of Mission) Mr. Ko Wen-je (Mayor of Taipei City) (10min)
1800-2000	Communion Dinner		



活動時間：2016年4月30日至5月1日  
活動地點：臺北2016國際設計畫工作室  
（台北市松山區長春路339巷2號地下樓）  
參加對象：國內都市規劃、都市設計、交通、水利相關領域專家學者  
市府相關局處同仁

# 社子島 國際工作坊

## Shezidao International Workshop

## Our Conclusions

We greatly appreciated the cooperation with the Taipei municipality and other participants. We hope our recommendations prove useful and inspiring in the further development of the Shezidao project. As we expressed, we gladly offer our continuing support and would like to think with you and your team how the Dutch experts can stay involved and can continue contributing to Shezidao as an exemplary, iconic project. In the next chapters we have summarized our findings, but below we have listed four issues on which we feel we can especially add an essential element to the project:

### **1 Quantify the water system, establish the main water system's structure and it's relation to densities and typologies**

We emphasize the need to quantify the volume of water storage that is required on Shezidao in relation to the water discharge capacity. In addition to this our advice is to design a first layout of the circular system. The groundwater issues we reported about are equally important but can be addresses in the next stage of the Strategy Plan.

### **2 Framework for quantifying ECO ambitions, indicators of success**

We emphasize the need for an integrated approach in which each department clearly defines key-performance indicators (KPI's). By doing so, the municipality will be able to define, realize and control the set goals and ambitions.

### **3 Interrelationship Green and Blue infrastructure, urban structure and public space**

We emphasize the need for the design of a well-functioning 'Water machine', a circulating water system in combination with a Green and Blue infrastructure covering the whole of the island. This in its turn will direct the design of the urban structure, and offers great opportunities for a distinctive identity and beautiful public space.

### **4 Social housing + financing + law and legislation**

We endorse the goal to increase the amount of public housing in the area. This needs the introduction of a Taipei-style of public housing in which design, financing, the legal and institutional framework are combined in an integrated approach.

Additionally, we feel that a more detailed discussion on the next steps in the development process would be interesting.

**Outline for interdisciplinary collaboration and relation to phasing /  
+ room for a gradual growth.**

In order to strengthen the interdisciplinary cooperation we propose the construction of an interdisciplinary project office or work team. We would be happy to coach this team with experiences we have from projects in The Netherlands. Truly bridging the gap between the different disciplines already during the coming stage of the design seems critical for the Shezi-dao process. Therefore an integrated and iterative design process is now needed for it allows for connection of different interests into one coherent plan and development strategy. This may also make the EIS procedures in the future easier, for different interests are integrated during the design stage.

**“An integrated and iterative design  
process is needed to make one  
coherent plan and development  
strategy”**









# 2 Land Use and Urban Planning

## **Ambitious!**

We agree upon the ambition of the project to realize a new urban environment for around 35,000 inhabitants. It might be one of the last major developments of this type and size in Taipei. It is fully understandable that the municipality seeks for regeneration of the area.

We cordially support the ambition to realize an innovative urban quarter, with a high standard for living, a high quality urban environment, an efficient transportation system, low carbon emissions, renewable energy and a healthy ecologic environment for humans and nature.

## Awareness urgency => Speed of development

We endorse the urgency of the redevelopment of Shezidao. A short timeframe is needed in order to create a safe living environment, an island unique in Taipei with the high standards of public facilities used in the rest of the city. Since 1970 the island is devoid of spatial and functional planning. Now that the opportunity for an innovative approach presents itself, one should not lose the moment.

## Quality of urban environment is priority

Shezidao will be the new home for about 35,000 inhabitants of Taipei. It can be considered a small town, situated on an island between two major rivers. Creating a new urban environment not only involves a subdivision of land and introducing parameters for new land use functions. We would like to promote a planning strategy based on providing several identities to the different quarters and neighbourhoods of Shezidao. The 'layered approach' as explained in chapter 1, gives the opportunity to design a diverse urban landscape:

1. A unique island, a safe living environment set in a ring of low wetlands and elevated parks on the levee;
2. The 'Shezidao Water Machine': a showcase for designing with water;

3. An urban planning based on a green and blue infrastructure;
4. A diversity of neighbourhoods, with:
  - a 'green' profile, based on the character of a specific green element i.e. parks, park-lanes;
  - a 'blue' profile, based on the presence of water, or;
  - an urban profile, based on either high or low building densities, urban boulevards;
  - several mixed use areas, housing areas with distinctive characters and a 'business park' for an innovative economy.
5. Eco-smart solutions, circulating water, energy and nutrients.



Goals and principles for development



Goals and Positioning strategies





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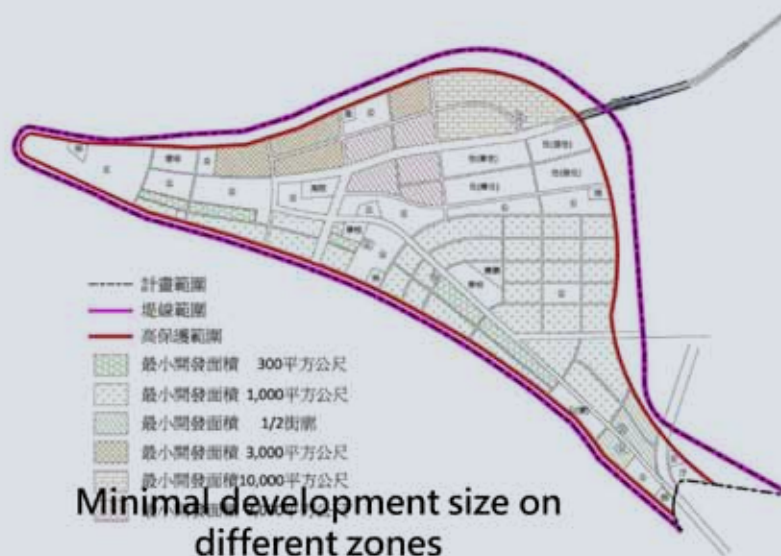




Retreat of site



Traffic system



Minimal development size on different zones



Limits of building heights

## Awareness of opportunities

Shezidao offers a range of opportunities for an innovative functional and spatial design. We suggest that the idea of Eco-Shezidao is not limited to the central waterpark, but might include a sustainable way of living, sustainable transportation and the introduction of a Green Infrastructure. Regarding its functional structure Shezidao can become more than just another New Town. The green belt surrounding the island, adjacent the Tamsui and Keelung rivers, provides an interesting leisure landscape for all inhabitants of Taipei. And why not introduce an area along the Tamsui River dedicated to leisure, retail, a harbour with a Night market. This might give Shezidao an attractive identity for the inhabitants of Shezidao and Taipei.



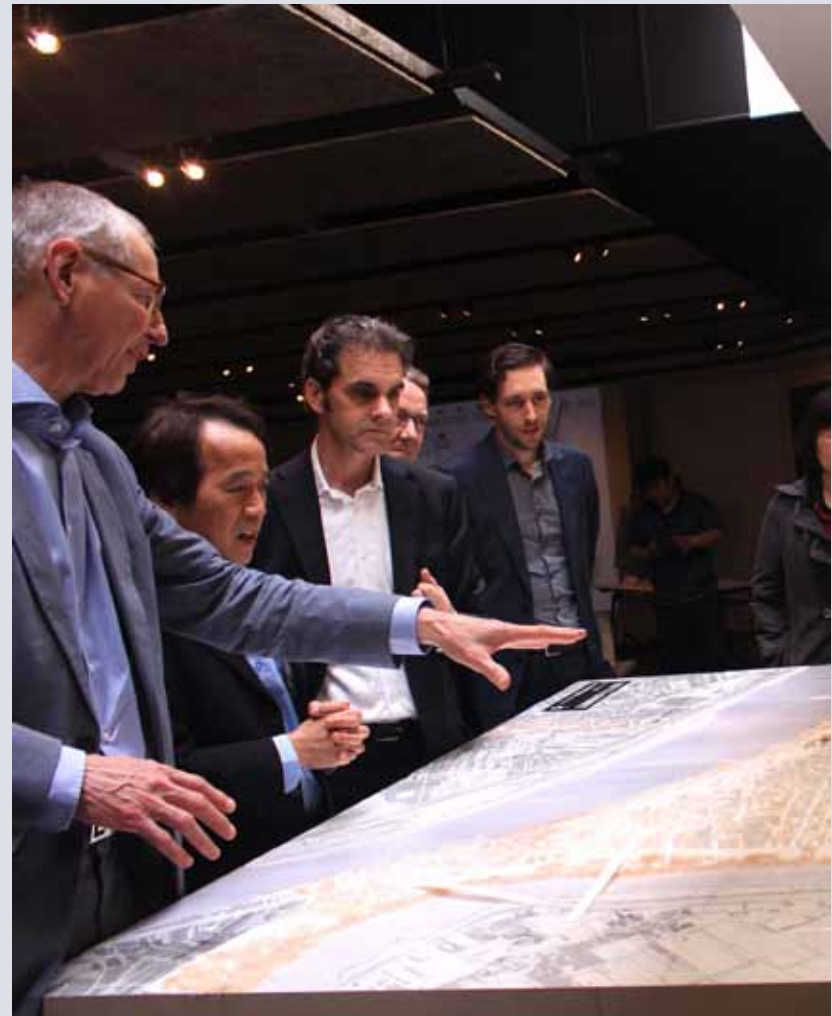
Visualisation of a Night Market elsewhere in Taipei

**“Why not introduce a leisure / retail area with a Night market along the Tamsui River? This might provide the attractive identity for Shezidao”**



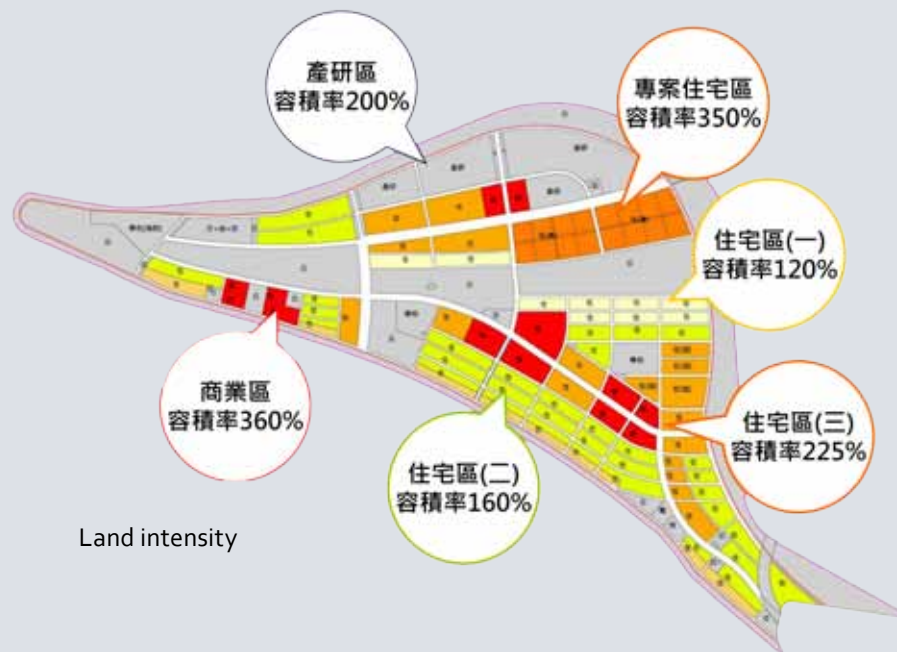
## Innovative Eco-smart design

New industries and an eco-smart approach offers opportunities. During the workshop we were presented with topics like 'eco-smart industry', 'future technology industry' and 'recreational agriculture industry'. These topics resonate with Taiwan's clean tech- and electronic industries, and with circular economy and urban agriculture. Although these topics strengthen the Strategy Plan, they were hardly addressed in the workshop. We see many opportunities linking these concepts to the framework of the circular economy. In The Netherlands we have seen that new developments in clean tech and circular industries offer opportunities on different skill levels. In the new 'eco-smart industry' there might be a role for the entrepreneurs and workers which are currently active on the island. Furthermore if the industry on the island is to be truly eco and smart then there should be an optimal symbiotic exchange of waste streams as well as an optimised energy infrastructure.



## “Live – Work – Play” planning strategy

The overall planning strategy used in Shezidao is zoning and Floor Area Ratio (FAR).



Land intensity



容積率 FAR 120%  
Plot Ratio FAR 120%

容積率 FAR 160%  
Plot Ratio FAR 160%

容積率 FAR 225%  
Plot Ratio FAR 225%

容積率 FAR 350%  
Plot Ratio FAR 350%

FAR



FAR and zoning

Planning practice in The Netherlands usually provides a design based upon a spatial framework, in which communities can develop, grow and change. In this approach, parts of Shezidao can gradually transform into a mixed use urban area, instead of a 'blueprint approach' in which the redevelopment takes place at once. Gradual growth patterns add interesting layers to the urban structure and add to the urban identity. In some instances a plot by plot development or the simultaneous development of mixed-use zones could potentially have the merits of minimising risks, spreading development costs over a greater timeframe and the generation of revenue in an earlier stage of development. Finally this strategy

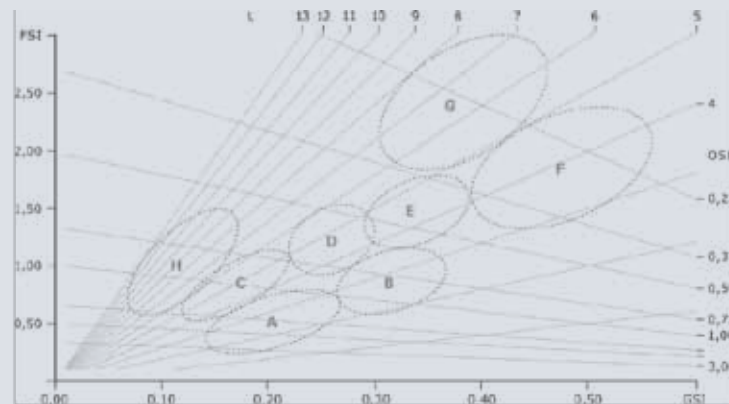
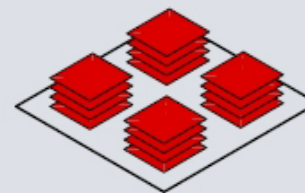
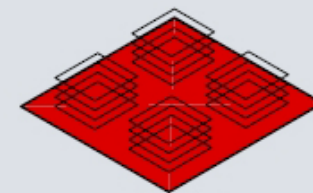


Figure 6 Land development typologies

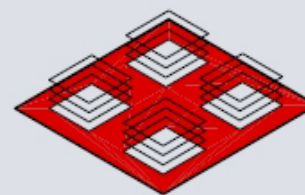
- |  |                              |
|--|------------------------------|
| A. Low-rise spacious strip developments blocks | E. Mid-rise compact building |
| B. Low-rise compact strip developments blocks  | F. Mid-rise closed building  |
| C. Mid-rise open building blocks               | G. Mid-rise super blocks     |
| D. Mid-rise spacious building blocks           | H. High-rise developments    |



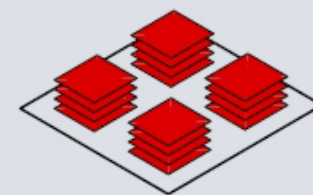
Floor Space Index (FSI) = gross floor area / plan area



Gross Space Index (GSI) = footprint (m<sup>2</sup>) / area of aggregation (m<sup>2</sup>)



Open Space Ratio (OSR) = (1 - GSI) / FSI



could also enable the area to develop its character more naturally. Different from 'Blueprint planning', this planning strategy enables communities to 'live-work-play' and introduce a distinctive character of its own. Shezidao should not become the next New Town. Some of the already existing characteristic elements can be used in the redevelopment, with new spatial elements added. By combining existing and new spatial characteristics, Shezidao should become a 'showcase' of a new urban design tradition in Taiwan.

A greater control over the urban structure and spatial characteristics of the neighbourhoods can be established by expanding the planning instrument within the zoning repertoire. We suggest to also include a 'gross space index' (GSI) and an 'open space ratio' (OSR)

**“Shezidao should not become the next New Town. Some of the already existing characteristic elements can be used in the redevelopment, with new spatial elements added”**

## Planning Strategy KPI's

Planning an innovative and eco-smart environment like Shezidao requires a well-defined socio-economic plan, developed in line with the principles of a circular economy. Such a plan should include a set of key-performance indicators (KPI's) which inform the Strategy Plan and help select which functions (housing, innovative industries, research institutes) can be welcomed in Eco-Shezidao. This is also essential for designing the infrastructure (energy, water, waste, etc.) of the island. We also see potential in the 'recreational/ urban agricultural industry'. Potentially this type of agriculture can play a role in closing organic waste cycles and agricultural nutrient cycles (phosphates, nitrates, etc.). Closing these cycles at an urban level is of great economic and ecological importance and is amongst the big challenges that cities are currently faced with. We do stress the importance of actively stimulating urban agriculture in the Strategy Plan by designating certain areas to it.





Reference of Papendorp: a Clean-Tech business park  
with water retention (Utrecht - The Netherlands)

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# 3 Water management

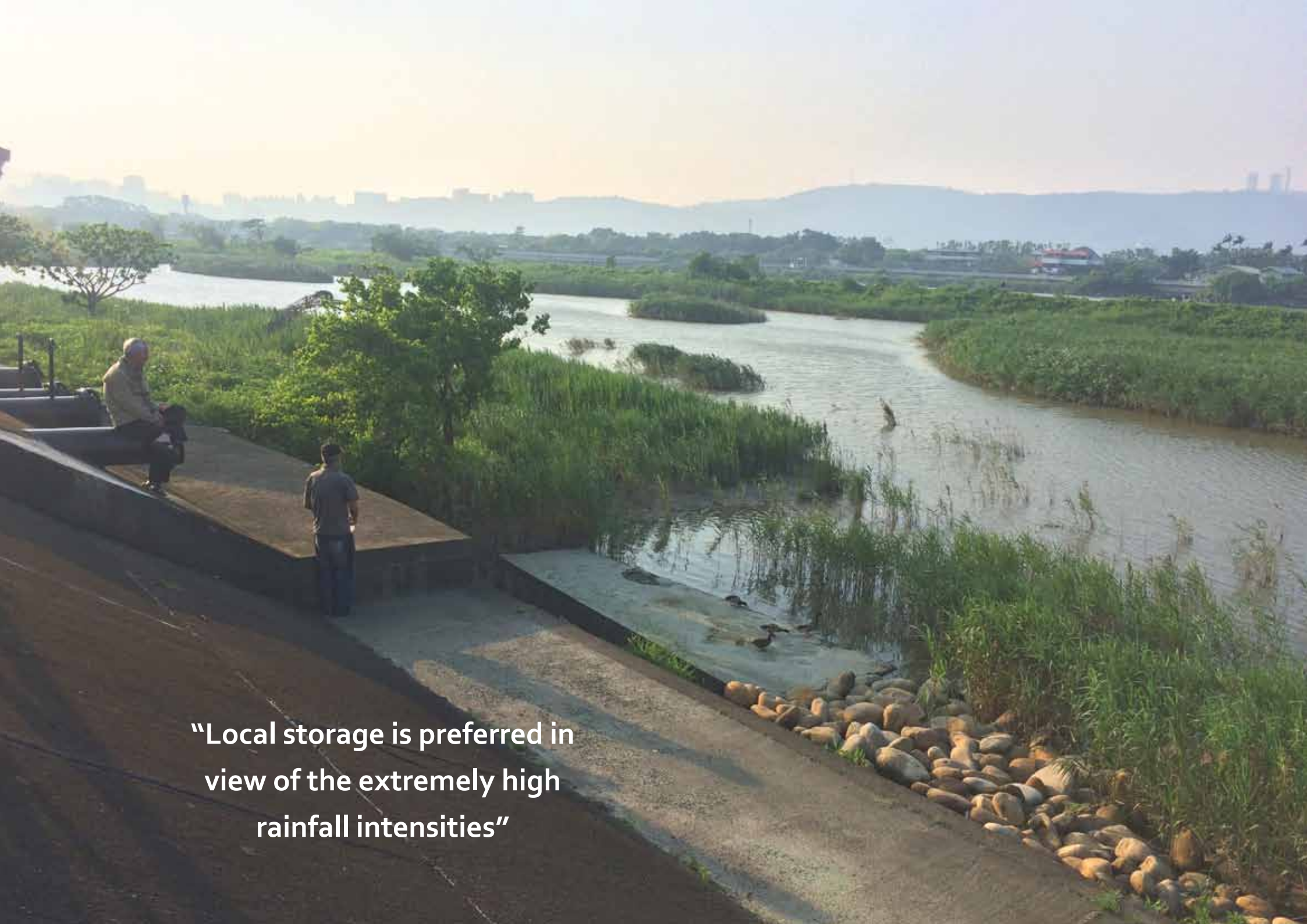
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## **Risk based approach to fluvial & pluvial flooding**

A risk-based approach to flooding, as agreed upon, includes both the risk for fluvial flooding and the risk for flooding by extreme rainfall (pluvial flooding). The risk for fluvial flooding should include all failure mechanisms of the dikes (overtopping, piping, slipping, liquefaction,..) while pluvial flood risk should also include the probability of failure of pumping stations, blocked drains and limited outlet capacity.

## **1/200 yrs. + climate change + sea level rise**

The safety standard for fluvial flooding of 1/200 years is applied in other tropical cities as well. For pluvial flooding a standard of 1/100 years is more common. Acceptability of these levels of protection is a political choice, related to the value that is to be protected in this area (risk based approach). Sea level rise scenarios and expected climate change is to be taken into account when formulating protection levels and design capacities of storages, pumps and outlets.



“Local storage is preferred in view of the extremely high rainfall intensities”

## Extra protection for critical infrastructure

Critical infrastructure (object and networks) as well as vital and vulnerable population groups need extra protection for flooding, drought, water quality problems and heat stress. Water and climate resilient urban design helps realize this extra protection level.

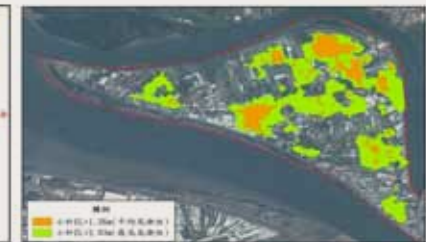
## “Retain – Store & re-use – Drain” + “Accept & Accommodate”

Shezidao is a lowland area; water retention and storage are priority over drainage capacity. Even with a pump it is hard to make water flow in a land without gradient. Local storage is preferred in view of the extremely high rainfall intensities. This storage capacity cannot be found on public land only; private land owners have to create storage capacity as well in order to avoid pluvial flooding. Private retention is also a first step towards re-use of harvested rainwater and storm water.

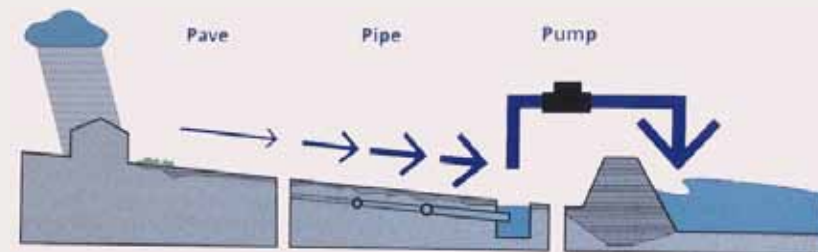
In addition to this RSD strategy the drainage system should be prepared to Accept & Accommodate flood water without significant economic or social damage. By creating water resilient buildings and infrastructure damage due to local flooding is to be minimized.



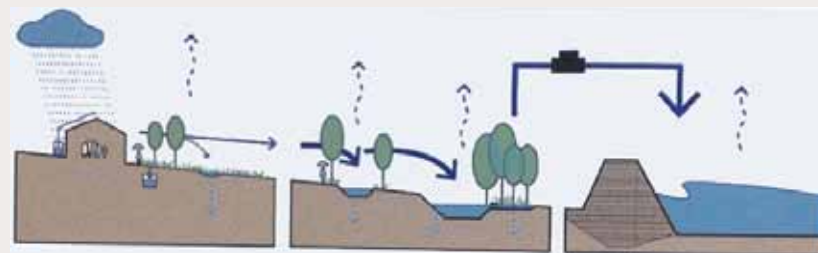
200-year flood plain in urban area



Bad drainage in low-lying areas

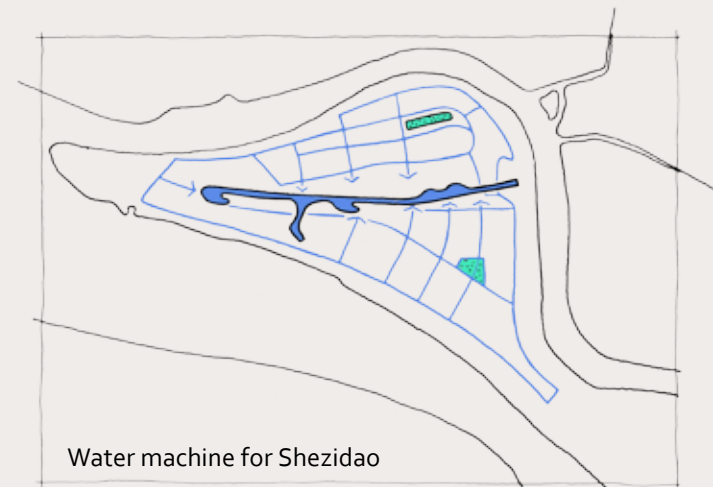
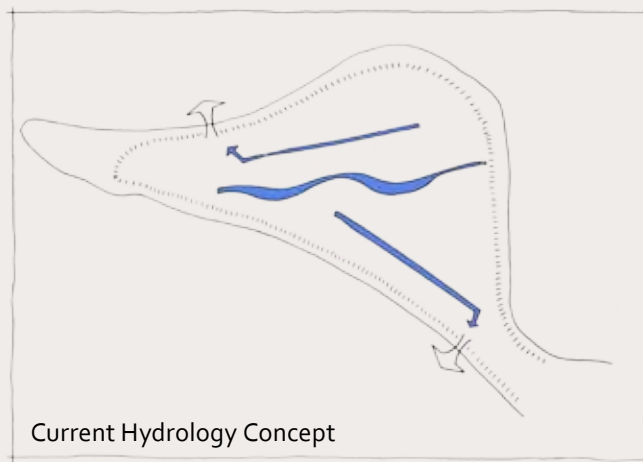
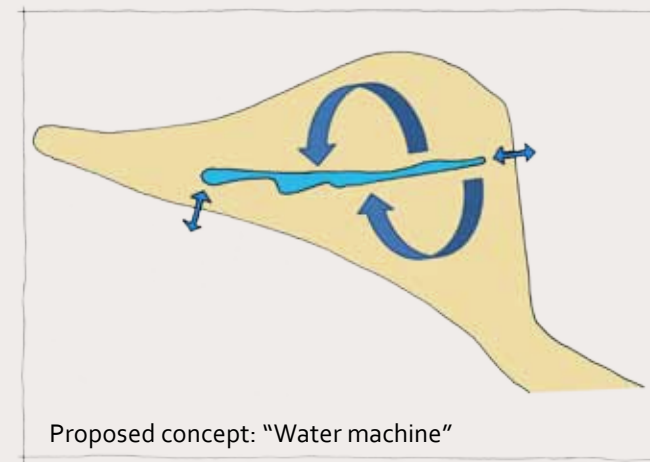
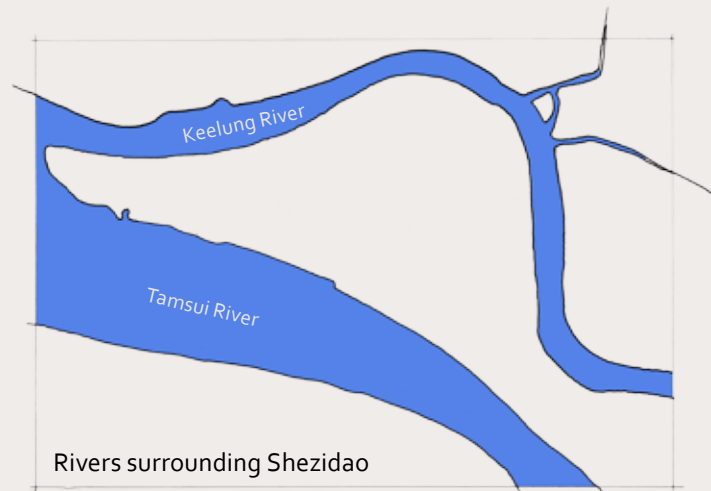


Current practice: pumping all pluvial water out



Innovative approach: “Retain - Store & re-use - Drain”





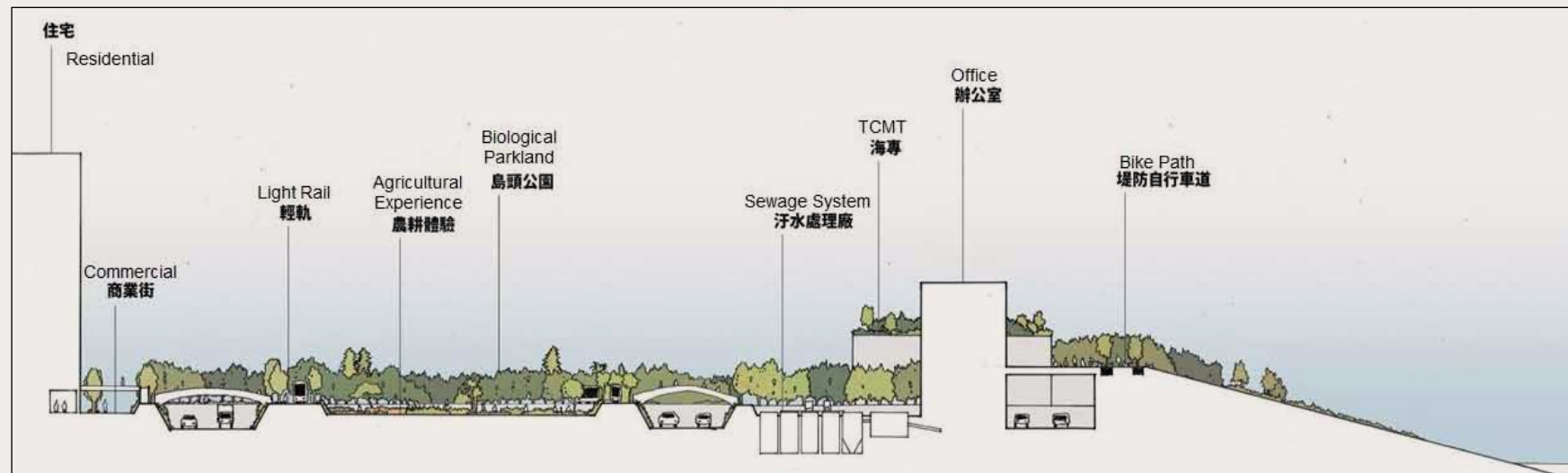
## Quantify storage/drainage targets

The water assignment for Shezidao is to be quantified. The required storage capacity is to be calculated in relation to the available drainage capacity, by assessing Storage-Discharge-Frequency-curves, as this is the way to find out how much space is required for water storage. And in the next step we have to investigate where this storage capacity is to be realized; in the central canal system, the local drains and in green infrastructure solutions on public and private land.

## Level of surface water (canals; gates; control)

The required level and the acceptable level fluctuations of the surface water in the canals and surface drains, ditches and swales depends on many aspects such as groundwater seepage, groundwater level control, hydraulic gradients, freeboard requirements, wet perimeter/hydraulic radius of the drain, hydraulic load, storage capacity requirements, discharge capacity under gravity flow and pumped discharge conditions and so on. With help of a geo-hydrological (groundwater) model and a hydraulic/drainage model an analysis can be made of the most appropriate choice of the water levels and level regimes.



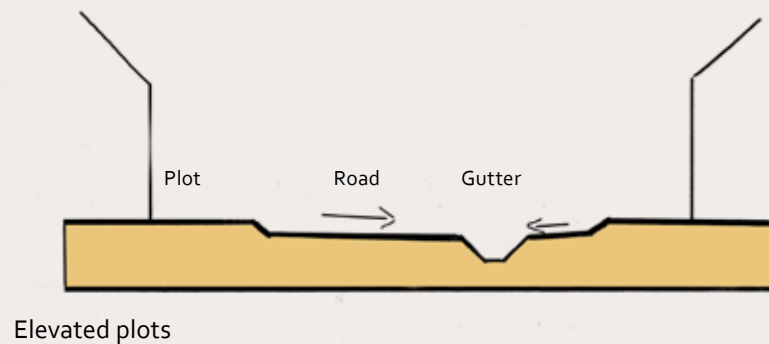
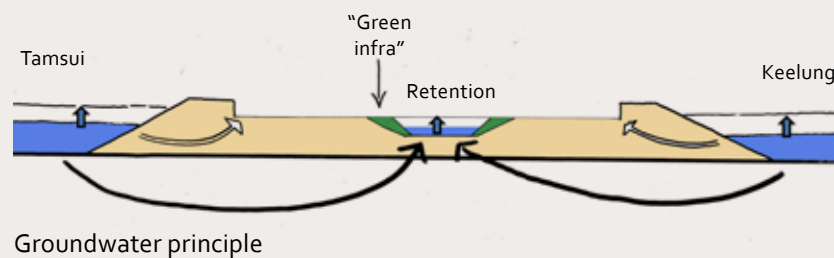


Profile landscape



Flood control and drainage





## Water circulation system, incl. artificial wet-lands

Water quality is a serious concern as it relates to public health issues. Pollution control starts with controlling the sources of pollution in the area. In addition, stagnant water should be avoided at any time. That is why a circular drainage system is recommended. This is what we call a Water Machine. In dry times water is circulated through the area with help of a pump. Dead end streams are to be avoided, as they are breeders for algae and mosquitos. Another issue is the salinity of the water in the surface water system in relation to the salinity of the river water, in particular during dry spells. Is it acceptable to let river water in, to keep the surface water to level, or is the quality of the river so low that intake should be avoided any time?

## Building with nature on foreshores of dike

The riverside (foreshore) of the dikes could be developed more intensively for ecology / biodiversity, recreation, mooring boats or even housing (floating, on piles,...) Building with Nature solutions can help strengthen the quality and diversity of this foreshore land.



“Shezidao wetlands and mangroves”





Water management in Shezidao

“Original streams became  
canals: no space left to retain -  
store - drain”







# 4 Water belt park

## **Make every square meter count**

A climate resilient Shezidao requires collective and individual efforts. To increase resiliency it is important that water retention also takes place on private lands. This could mean obligations and stimuli for maintaining green and blue areas on private plots but also stimulating the application of green roofs.

Also more public space should be utilised for water retaining function. The central canal and the water belt park are great solutions and they should be complemented with a sustainable urban drainage system (the 'Water Machine'). This could mean the inclusion of bio swales and infiltration fields along streets within the neighbourhoods.

# 生態社子島

## Eco- Shezidao

Potentially part of this infrastructure can also be allocated to waste water treatment. Storm water and low pollution industrial or residential waste water could be cleansed using helophyte wetlands to relieve the municipal waste water system and consequently prevent pollution, reduce energy consumption at municipal waste water treatment facilities and save costs.

## Establishing a well-functioning 'Water Machine'

An important step in the design of the water system is the functional relationship of the central green park with the urban water system, and the surrounding rivers. Three concepts are imaginable:

1. A 'polder' model in which water is let in from the river in dry times, and pumped out during rain events;
2. An isolated, self-sustaining water system fed by rainfall;
3. An open, gravity drained system that can be closed off when flood levels occur in the rivers.

A rainfed water system combined with pumping during extreme events seems promising. This system reduces the dependency of (poor quality) river water. Considering the rainfall volumes pumping will likely be necessary during rain-events.

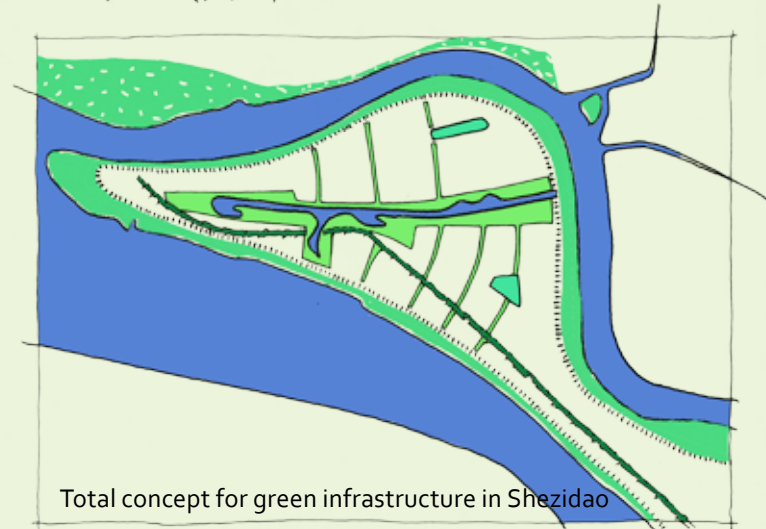
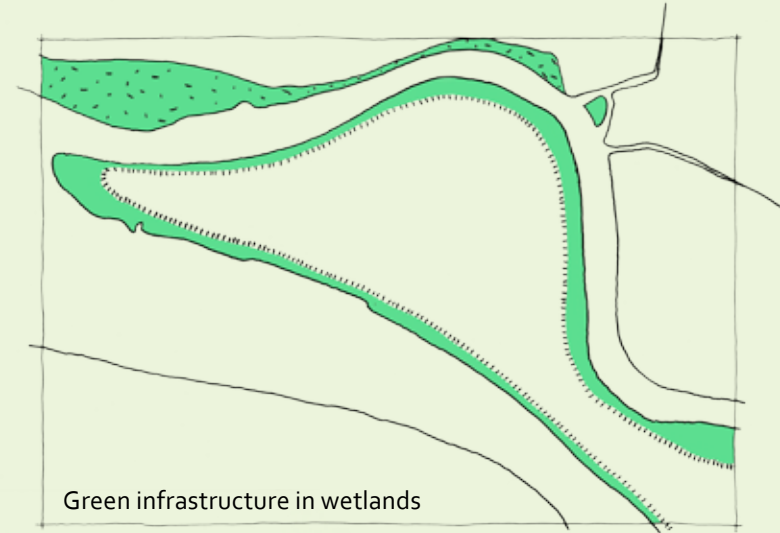
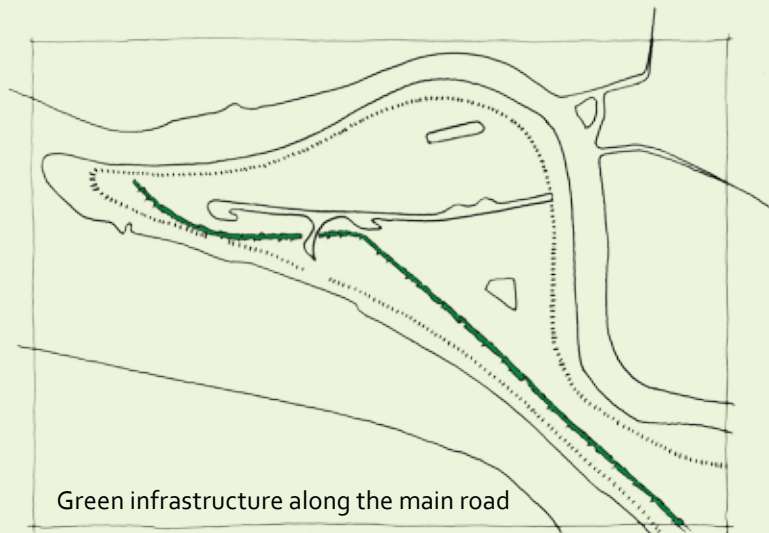
## Green/Blue Framework connected to central park

It is important to further develop the design of the urban areas in close relation to the central park. The unique location of Shezidao offers the opportunity to closely intertwine the park zone and surrounding urban environment. A fine grained network of canals and greenways can bring the ecological qualities into the grids of the living environments.

## Green infrastructure versus grey infrastructure

Greening of infrastructures (Green infra) is an innovative approach towards the effects of climate change, such as pluvial flooding and heat island effects. It helps for instance to solve the storm water problem as greening of the urban environment increases the water retention capacity and reduces soil erosion. It is an excellent example of services that nature (i.e. ecosystems) provides to humans for their well-being. These are called 'Ecosystem Services' (ES). The 'grey to green' transition has been successfully realized in practice in other cities. We are convinced that the advantages and potentials of green infrastructure contribute to efficiently

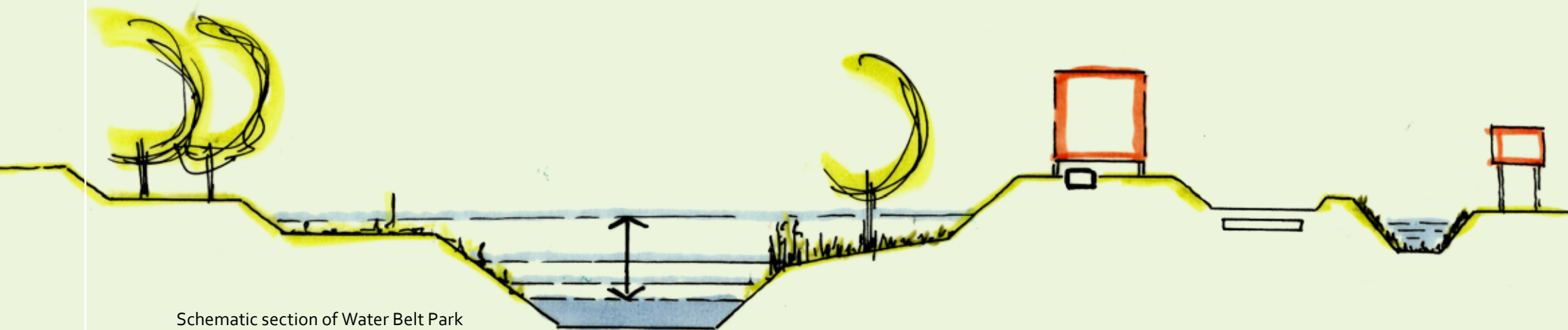




protect coastal cities, help them to adapt to the effects of climate change (flooding, coastal erosion). It is our hypothesis that the Taipei stakeholders and policy makers will go for the transition i.e. towards green infrastructure as a realistic alternative to solely a grey infrastructure solution for solving their storm water problems. Using green infrastructure as a planning tool in Shezidao might be the first step.

## Ecosystem services: KPI's

Shezidao has the potential to become a fair and liveable home for both people and nature. The emphasis on ecology within the current Strategy Plan is not commonly seen in contemporary planning. We see much potential in the Strategy plan and feel that Shezidao could become a place where man and nature live in a reciprocal balance. In order for Eco-Shezidao to become successfully 'Eco' it is important however to specifically set the ecological goals. One has to start with a survey of the current state of biodiversity. Such a survey will help to set specific goals



Schematic section of Water Belt Park

## Home for creatures



## Cozy Trails



ECO Shezidao section of flood defense system





輕軌  
Light Rail

Vertical Greenery System

立體綠網

Natural Shading

喬木遮陰

Outdoor Airflow

戶外通風

混合密林

Forest

自然護岸

Natural Revetment

生物廊道

Biological Corridor

for the design of the future ecosystem. Based on a survey measureable performance indicators can be defined. These indicators function as a tool to further design the parks and urban spaces, to set the requirements for tendering processes, and can be used by UDD to check whether they're on track to meet their goals during development. Indicators include a variety of topics such as enforcing local habitats by green infrastructure, planting schemes in the urban space, and methods for decreasing the disturbance of wildlife by construction activities.

**“Shezidao has the potential to  
become a fair and liveable home  
for both people and nature”**

## Soil and groundwater issues

We mentioned earlier some strategies to manage groundwater quantities and tables. Also the quality of the soil and the water it contains is of great importance. Illegal industrial activity is very likely to have polluted soil and groundwater. Soil remediation might be required in some areas which can be quite expensive and time-consuming. Environmentally friendly strategies like bioremediation, where plants are used to cleanse the soil, might provide a solution for these problems. We recommend that such solutions are investigated in coherence with the Green/Blue infrastructure. Ideally soil remediation, the development of green blue infrastructure and construction are done in a timeline which optimises human and ecological health.





Porous Biological Habitat

多孔隙生物棲地

Sustainable Energy

再生能源

Light Rail

輕軌

Vertical Greenery System

立體綠網

Permeable Paving

透水鋪面

Biological Corridor

生物廊道

Forest

混合密林



## Building on and above water

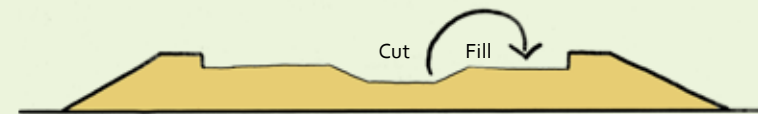
In the Taipei basin area water demands a vast amount of space for storage, as it does in delta cities of The Netherlands. In the Dutch Approach it becomes essential to live with the water rather than fight it by increased pumping and higher levees. This involves a larger percentage of land be dedicated to water storage and striving towards multifunctional land use, also on water, by living on and above water. Throughout the world successful examples can be found of building partially or fully above water; also floating housing is becoming increasingly popular. In The Netherlands this became very common and even sought after, both in the social housing sector as in the medium and higher price-range.



Examples of living on the water

## Closed soil balance – ‘cut and fill’

For ecological and financial reasons it is important to strive for a closed soil balance within the Shezidao project, reducing the need for importing soil – often sand - for infill. Excavation in order to create open water and low-lying park land can be combined with raising other land to a safer elevation in one integrated strategy. Ideally canals would be dimensioned such that they offer enough soil for the levies. This requires research of the available soil quantities and quality.



Cut and fill principle





# 5 Housing and Public Housing

## **Social housing is a big issue!**

We are glad to learn that the municipality strives for a higher percentage of public housing within the city. It is important that the amenities and service that cities have to offer remain accessible to all income groups. A fair distribution of resources and enmities within a city is an integral part of sustainable development.

## **Financing and organizational infrastructure**

In The Netherlands, social housing organisations ensure that more than 2.4 million households (out of 7.7 million households) have access to adequate and affordable housing. They also contribute to the quality of life in neighbourhoods, districts and regions.





At present, social housing organisations account for some 60 per cent of the construction of new dwellings. The current financial and organizational infrastructure developed in a decade long process. Social housing is to be seen as a responsibility of the government together with the social housing organisations. The implementation of a successful policy involves not only building and financing, but also legislation on rents, taxes, land ownership and land prices.

## Taipei style social housing

We discussed several international housing policies, including the system used in The Netherlands. However, we recommend not copying policies from abroad, but defining a typical 'Taipei-style' housing policy. It should be based on the typical circumstances of the political, financial and real estate climate in the city.



House with shop in Shezidao



Current state of social housing in Shezidao



## Adding diversity by mixed use zones in the neighbourhoods

We endorse the goal to realize a diverse and interesting living environment in Shezidao. This cannot be reached by urban planning alone. We recommend to implement in the Strategy Plan a chapter on the planning of functional diversity. It is essential to stimulate a greater mixture of functions that can increase the liveability, urban quality and safety. This can be done by complementing the zoning instrument with a prescriptive approach in which the functional programme is defined at the level of the neighbourhood, the building-block and the plot.

Another way to successfully create functional diversity is by including a



Mixed Use Index for Amsterdam

quantitative measure into the zoning instrument: the Mixed Use Index. Within this instrument the mixture of functions is expressed using three percentages expressing the amount of floor space designated to housing, working and amenities (Live+Work+Play). The picture below shows how the functional diversity of different neighbourhoods in Amsterdam were quantified using this method.

The function mix triangle displaying the functional diversity for different neighbourhood's in Amsterdam. Each triangle segment represents a gross floor space percentage of ten per cent. Image by van den Hoek, 2010.

Right page: Contemporary Social Housing references

Top left: KOZ Architects, Paris, France

Top right: Aga Khan, Nanhai, Guandong, China

Bottom left: Ripolltizon, Palma de Mallorca, Spain

Bottom right: Nice Architects, Bratislava, Slovakia









## Social equity

Within the people, planet and profit framework social equity can be found within the overlap of people and profit, which concerns equity. It has been shown by social scientist (Richard Florida and Jane Jacobs) that lower income groups most benefit from the emancipating value of living in inner-city districts if they live in mixed use and mixed income neighbourhoods. Likewise high concentrations in housing for low-incomes tends to lead to unwelcome side-effects. By spreading public housing developments throughout the planned urban structure social diversity and the long-term quality of the urban environment can be improved.

## Green building

The integration of energy modelling into the design process will lead to an energy efficient urban layout and a comfortable microclimate in Shezidao. We believe that the department's vision of developing 'green' social housing is in line with the big questions that society is currently facing. UDD has great ambitions with the implementation of sustainable building techniques in residential housing. The use of rainwater, renewable energy production, green roofs and the reduction of irradiation on facades are but a few of the sustainability measures. We feel that the goals on green building need to be defined more clearly. What measure of energy efficiency, water consumption and waste water treatment should Shezidao achieve? And how do we measure the performance of the area? By defining ambitions, demand reduction strategies should be valued above innovative technologies (e.g.: valuing the prescription of exterior shading and designing for natural ventilation above implementing PV panels). The combination of performance indicators for sustainable building and planning instruments like FAR can truly stimulate sustainability measures in public and private housing.

Left page: Contemporary Social Housing references

Hamonic + Masson & Associés and Comte Vollenweider, Paris, France



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# 6 Low carbon transportation

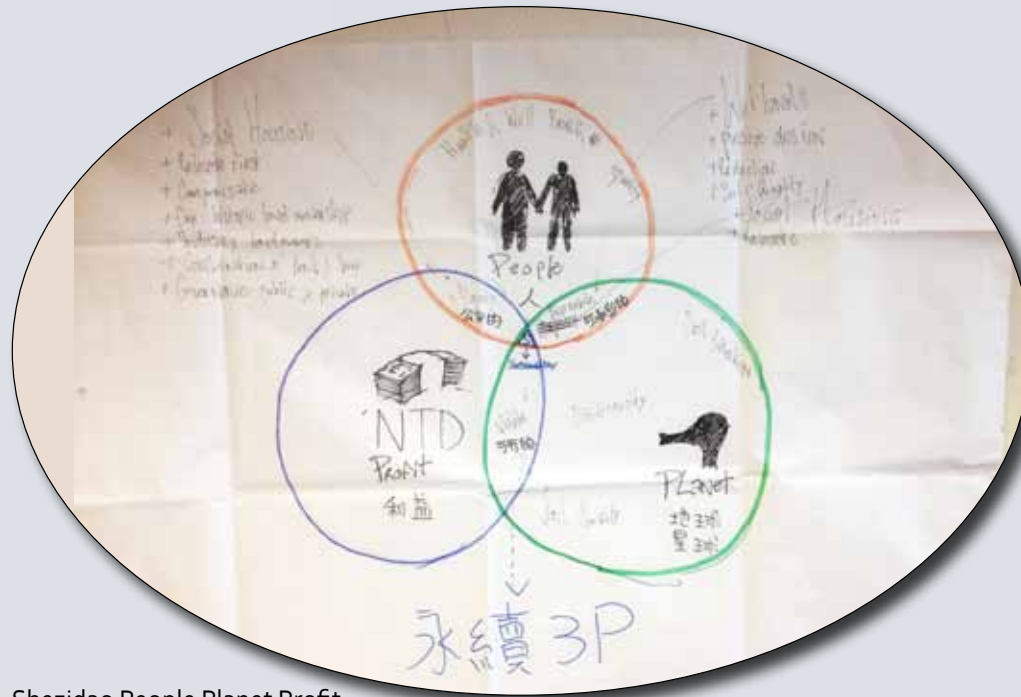
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We support the transport oriented development. This approach ensures good access to affordable mobility for lower income groups and helps to decrease emissions. Offering local job opportunities and introducing local mixed-use areas might also help to reduce traveling distances and emissions. Although the transition towards an all-electric mobility system takes time, it is of great importance that the infrastructural plan is designed to enforce this transition. Roads, parking spaces and public transit are to be planned in such a way that by the time the infrastructure for electric vehicles is implemented, this infrastructure offers a better traveling experience than fossil fuelled counterparts. Simultaneously the use of fossil fuelled

transport should be made less attractive by for instance designing neighbourhoods with less parking space, narrow roads, lower speed limits, or car free areas. If for example an urban area has limited and expensive parking spaces, but does offer free parking for e-scooters people will be more inclined to use sustainable transit. Within the approach of the department of transport we see that multimodal transport strategies have been adopted. We feel that complementing mass rapid transit system with the Youbike system is offering a carbon light solution for urban mobility. Such multimodal transport systems should be explored further, as should the possibility of transport over water.

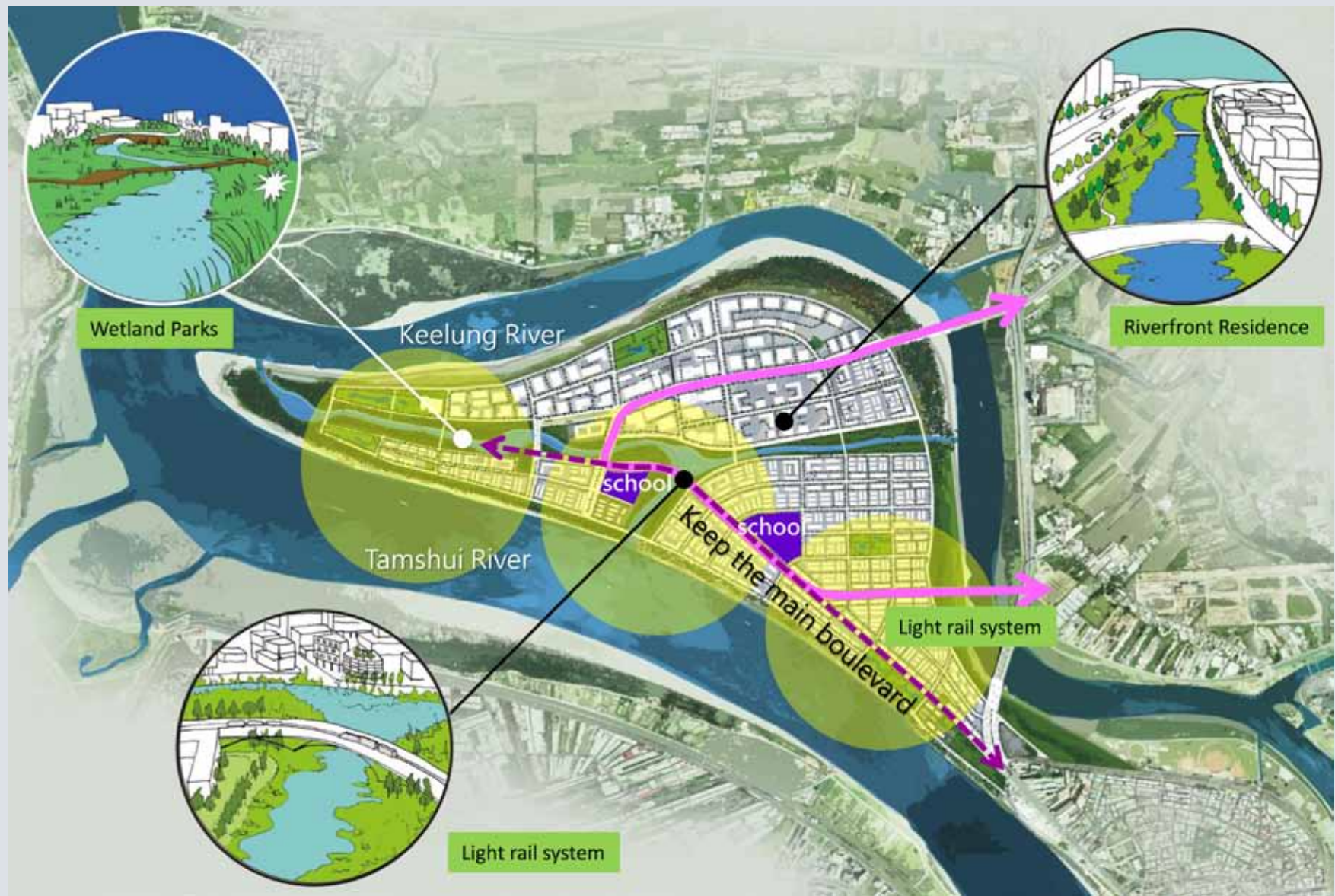
Proposed Public Transport Network for Shezidao

-  Shezidao Downtown area
-  Transit station



Shezidao People Planet Profit





Proposed Traffic Network for Shezidao







# 7 Planning & Development Process

## **Impressive local stakeholder engagement**

The expert team was impressed by the way local stakeholders were invited to participate in the planning of Shezidao. Local knowledge was disclosed in effective and efficient way. The results of the iVoting process are taken serious as starting point for the next steps of the planning process.

Engagement of disciplinary & knowledge partners  
Development of an area like Shezidao is a true interdisciplinary effort. Hydraulic Engineering and Mobility Departments seem well connected

to the process; the Department of Finance however seemed to be missing? Development of an interdisciplinary project office or work team for the Shezidao development could be thought of. Equally important is the involvement of knowledge partners from Universities and knowledge institutes. Eventually, formation of a small (applied) research division to support the development process (technology, social and economic affairs) could help minimize costs and maximize quality of development.



## Elaborate business case for Shezidao development

In order to attract interest from private project and business developers in the Netherlands we would have to produce business cases that demonstrate the financial attractiveness of investments by private parties. We do not know if that is similar in Taiwan. But such a clear financial underpinning of the project could help the financial sector's decision making on investments.

## Cherry-pick good ideas for the Canal and Our scenarios.

Now that the Eco-scenario has been elected as the preferred development scenario, one could look for elements in the Canal scenario and in Our scenario that would benefit the Eco-scenario.

## (Next) steps in the development process

For many participants it remains vague what the next steps of the planning and development process will be. The planning process would benefit from having a clear overview of the schedule of activities.

## Start pilots and showcases ASAP e.g. IBA

It is strongly recommended to start developing smaller pilot projects and showcases in Shezidao, so that sitting and future residents can get an impression of the future situation. The planning of phase 1 will take several years before building activities can start. We recommend to develop several showcases at short term, to build trust and to demonstrate the future quality of Shezidao.

## Dutch approach?

The Dutch approach to planning and development - including the layers-approach, water is leading, retain-store/re-use-drain, Water Machine / circular systems, stakeholder engagement / interdisciplinary planning & design, social & private housing, public-private partnership in urban development - seems an inspiring example for development of Shezidao. The expert team is cordially willing to stay involved in the development process and to continue sharing its expertise with our Taiwanese hosts.



# 生態社子島

## Eco- Shezidao

基隆河

島頭公園  
City Park

產研區  
Reserved Land

濕地公園  
Wetland Park

專案住宅  
Residential Project

中央軸帶公園  
Central  
Green Link

運河  
Canal

商業區  
Commercial  
Use

商業區  
Commercial  
Use

商業區  
Commercial  
Use

淡水河



環境藝術  
Environmental Art



市民農園  
Community Garden



親水空間  
Water-friendly  
Space



飛鳥棲地  
Natural Habitat



賞鳥平台  
Habitat Lookout



親水公園  
Water-friendly  
Park



