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Flood Risk and Evacuation Strategies for Social Welfare Institutions under Climate Change：A Case Study in New Taipei City, Taiwan

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Outline

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- Objective
- Climate Change Assessment
- Evacuation Coverage Zone (ECZ)
- Social Welfare Institutions Flooding Risk
- Stakeholder Discussion
- Evacuation Route Analysis
- Conclusion
- Future Work

Objective

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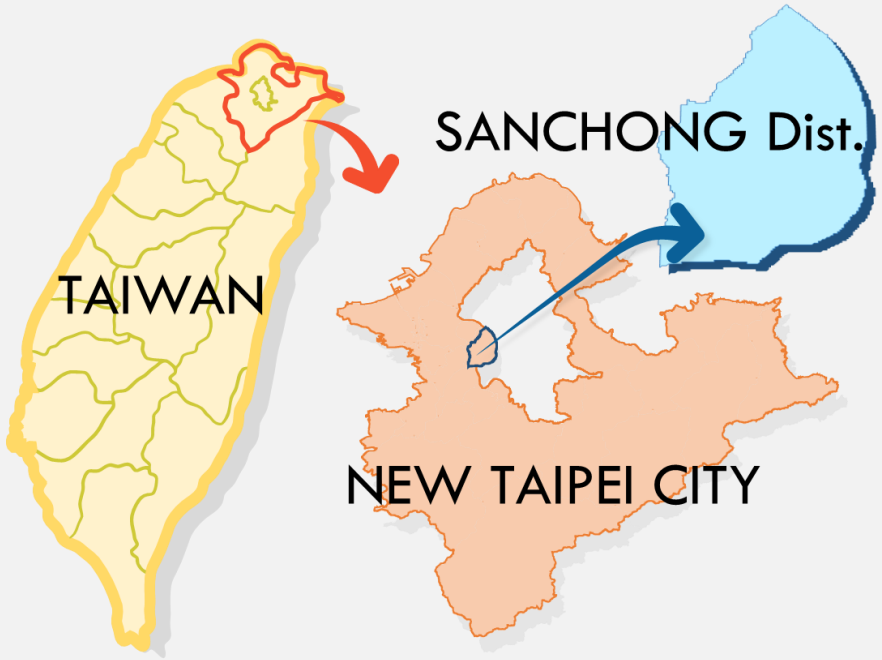
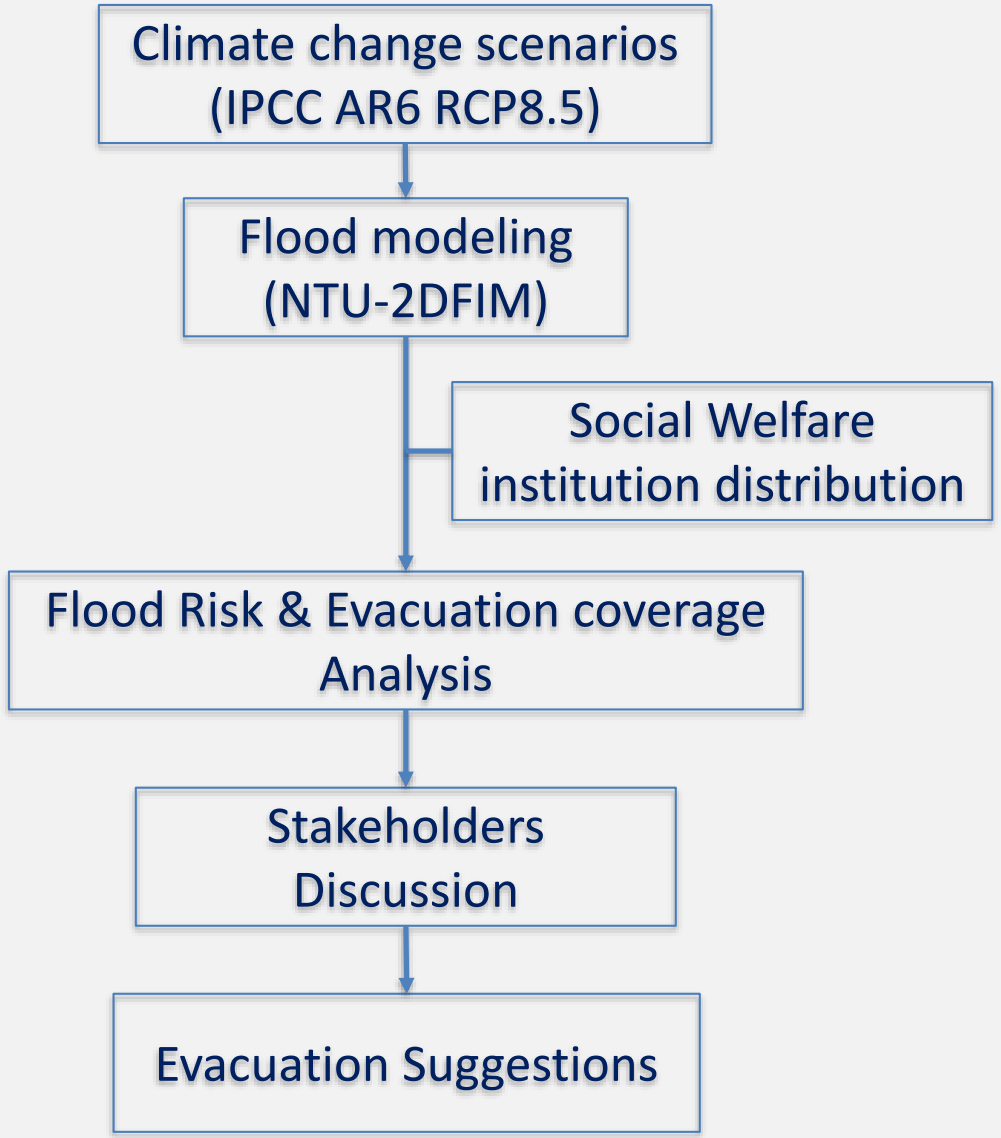


This study focuses on the impact of flooding under climate change scenarios on the evacuation safety of Social Welfare Institutions (SWI) in the Sanchong District of New Taipei City, Taiwan, aiming to assess current strategy and provide viable suggestions.



Climate Change (Baseline vs. RCP8.5 Mid-century Scenario)

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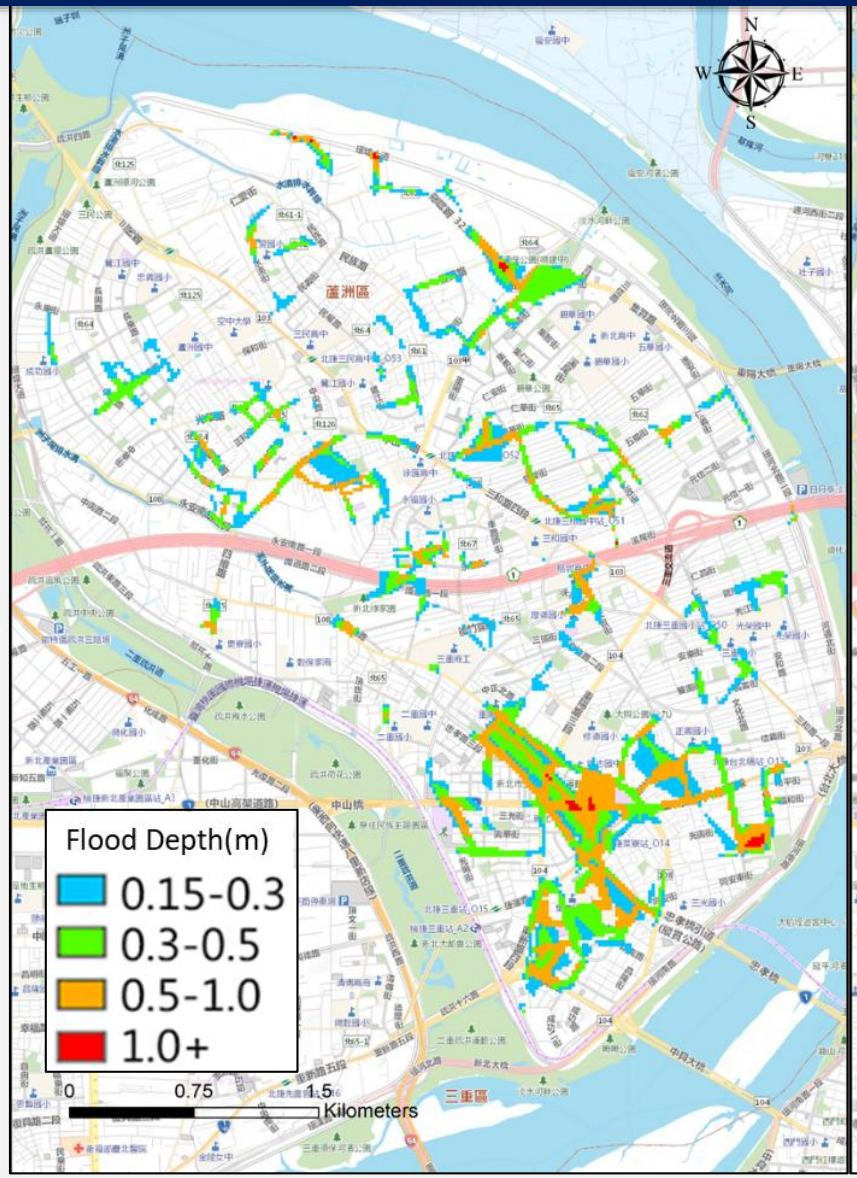
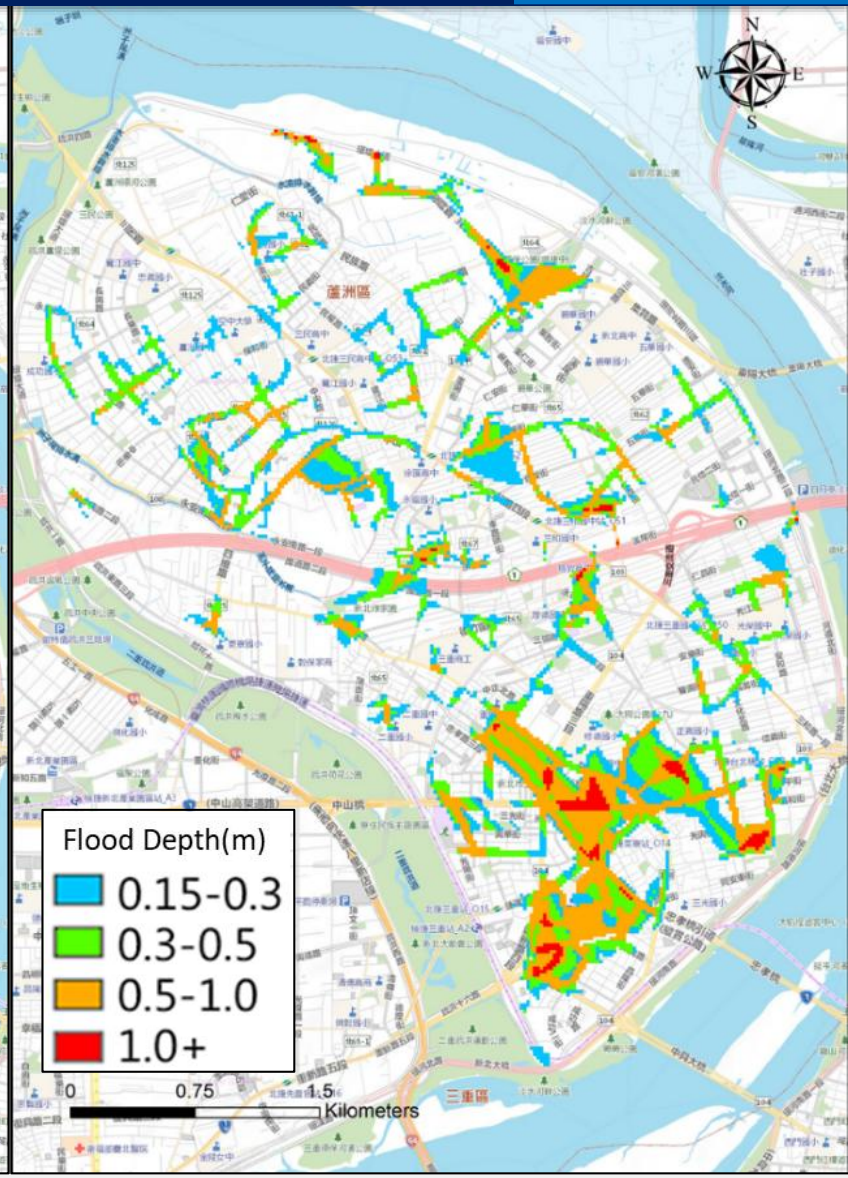
Climate Change Scenario	24-hour Maximum Accumulated Rainfall (95th Percentile, mm)
Baseline (1979–2008)	404 mm
Mid-century Scenario (RCP8.5) (2039–2065)	517 mm

Climate Change Scenario	Inundation Area (ha)	Average Inundation Depth (m)
Baseline	52.51	0.41
Mid-century Scenario (RCP8.5)	76.36	0.45

NTU-2DFIM Flood Modeling



Baseline



Mid-century scenario (RCP8.5)

Evacuation Coverage Zone (ECZ)

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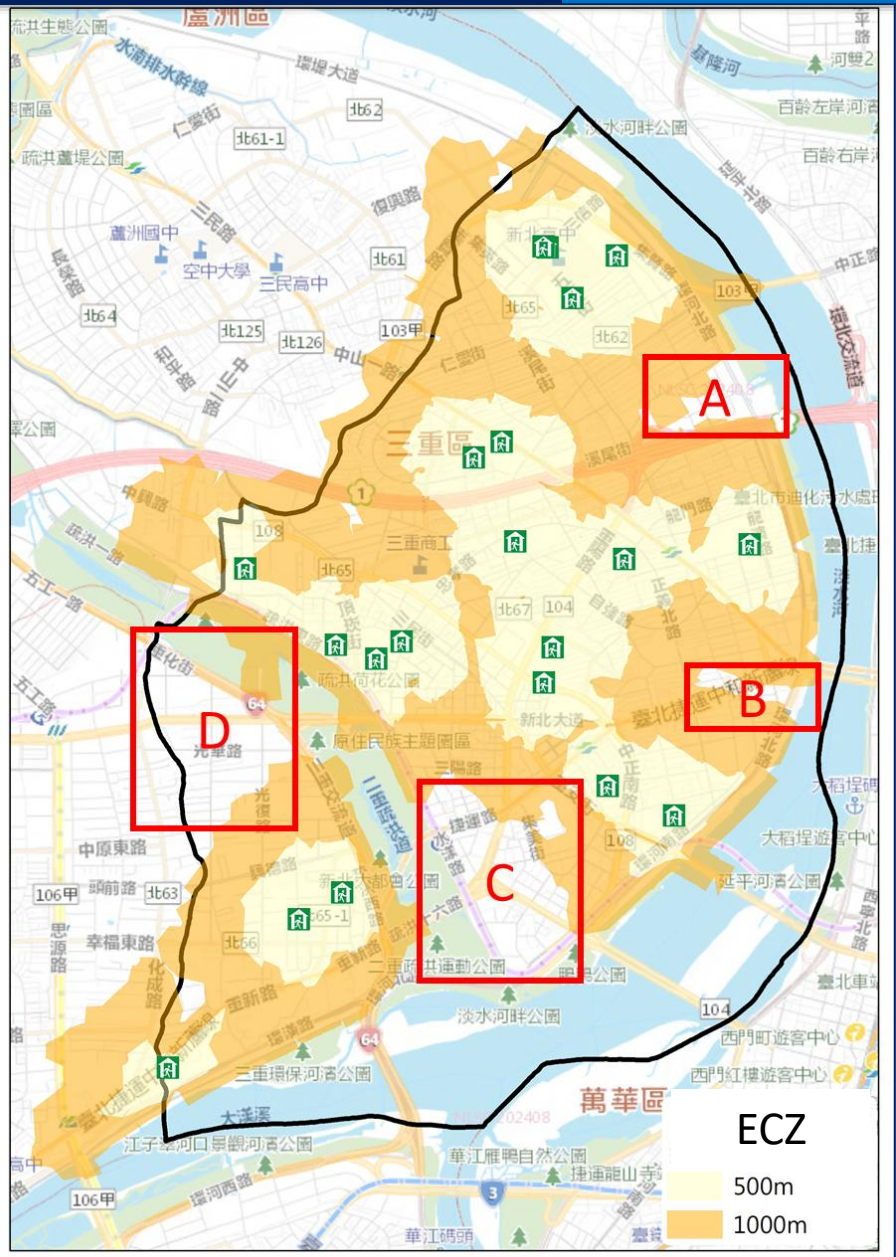
- There are 20 shelters suitable for flood disasters.
- Since most residents prefer shelters within 500 meters of their homes and over 90% accept those within 1,000 meters, this study uses 500 m and 1,000 m as the buffer distances for evaluating shelter accessibility in flood scenarios.



Social Welfare Institutions Flooding Risk

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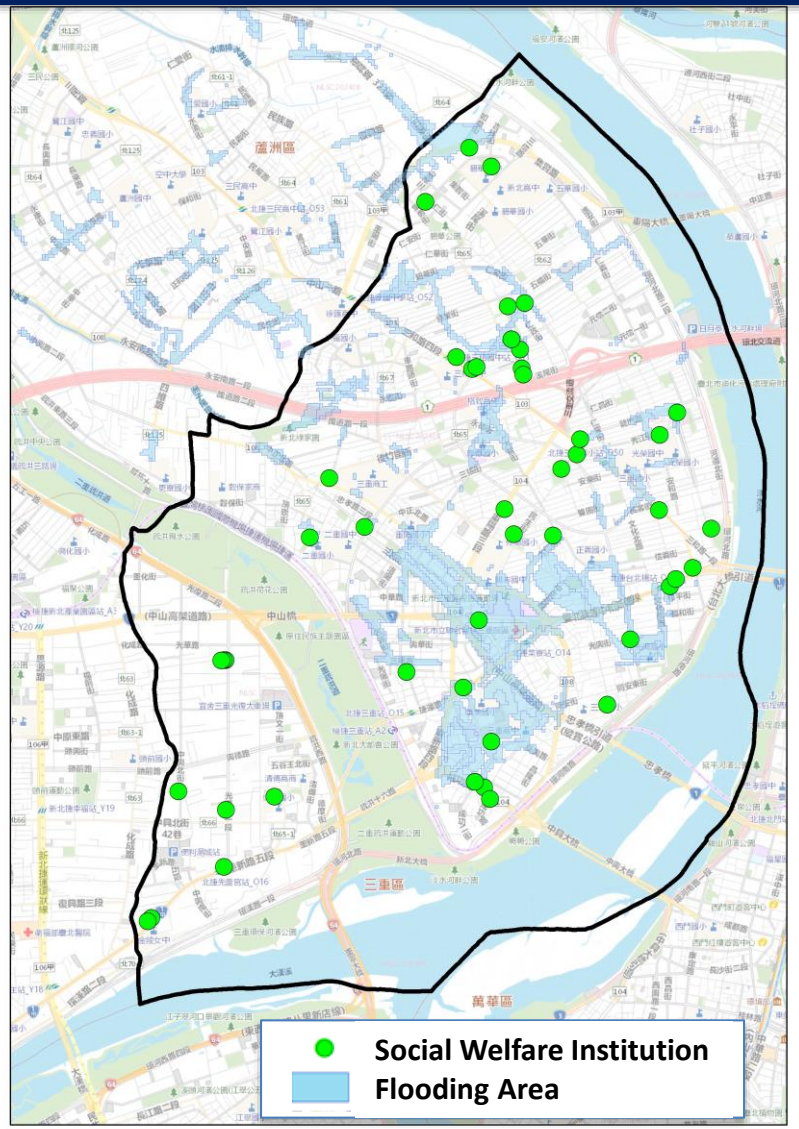
Flooding Risk

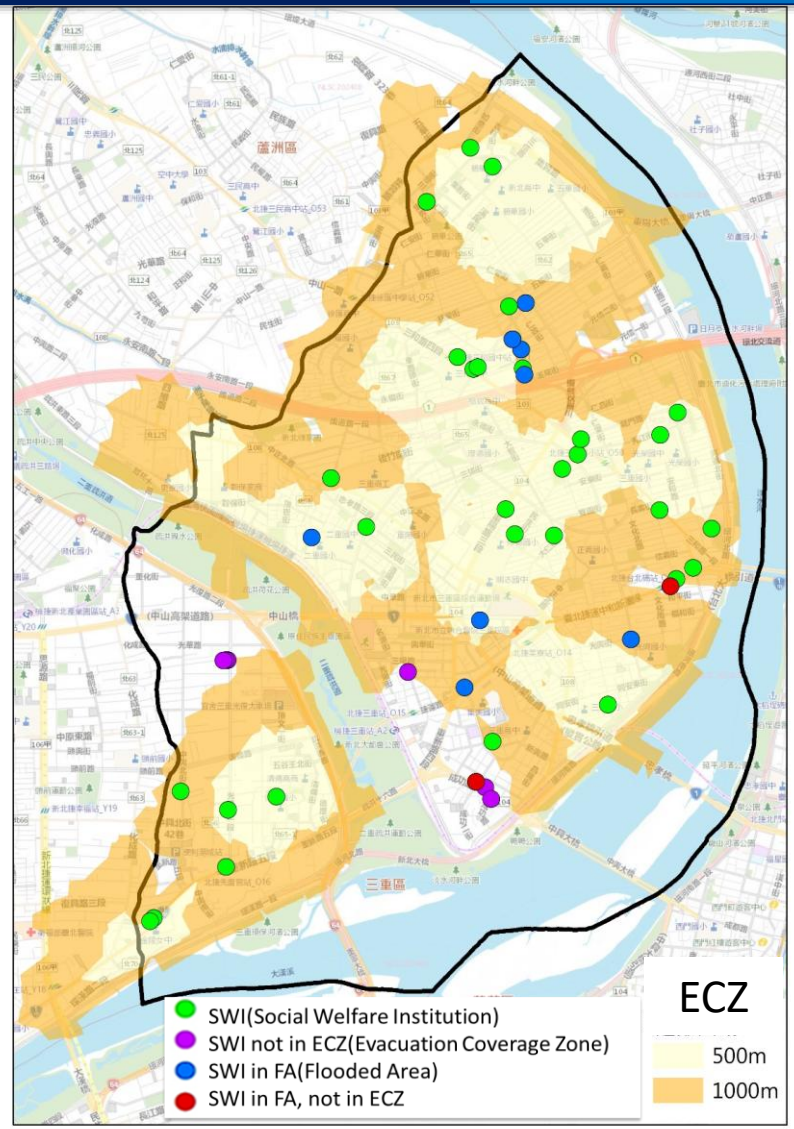
- **A total of 12 social welfare institutions are located within flood-prone areas, with 5 of them situated on the first or second floor, making them more vulnerable to flooding.**

Evacuation Coverage Zone

- **Three institutions are both outside the 500 m and 1,000 m evacuation coverage zones and within areas of flood risk.**



Institution within potentially flood area



Risk of flooding and evacuation for social welfare institutions

Stakeholder Discussion (Public Sectors)

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Stakeholder

Social Welfare Department

- **Division of Social Assistance**
- **Division of Child Care**
- **Division of the Disabled**
- **Division of the Senior Citizens**

Discussion Topics

- **Selection of Receiving Institutions**
- **Evacuation/Transfer Route Planning Principles**
- **Activation Timing and Evacuation Logistics**
- **Inter-Institution Coordination and Drills**

Document from SWI

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Types of Social Welfare Institution

- Senior Nursing Home
- Infant Daycare Center
- Child Daycare Center
- Child Development Center

Sweet House Infant Daycare Center

Receiving Institution 1
Name: Anbei Private Infant Daycare Center
Address: 1st and 2nd Floor, No. 281-1, Longbin Road

Receiving Institution 2
Name: Elisabeth Infant Daycare Center
Address: 1st Floor, No. 89, Section 3, Chongyang Road

Receiving Institution 1

Receiving Institution 2

Document from SWI

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Contact Directory of Centers and List of Post-Flood Evacuation Facilities (Example)							
Note	In the event of flood risk, horizontal evacuation may be adopted, relocating from the current center to a designated primary receiving center. A secondary receiving center for horizontal evacuation should also be identified in case the primary center does not have sufficient capacity to accommodate all evacuees. If the condition of the children cared for at the center permits, local facilities such as community activity centers may also be used as alternative receiving sites.						
Type	Name of Center	Address	Contact Person	Contact Number	Approved Capacity	Current Number of Occupants	Remarks (Disaster Potential / Transfer Priority / Supportable Number of People)
Original Institution	Zi Yi **Infant Daycare Center**				15	15	Flood Potential Area
Receiving Institution 1	Sanchong Taipei Bridge Public Childcare Center				75	15	Primary backup facility support: 15 people
Receiving Institution 2	Emergency Shelter and Relief Station at Guangxing Elementary School				602	15	Secondary backup facility support: 15 people

Evacuation Route Analysis - Jin Guang Senior Nursing Home

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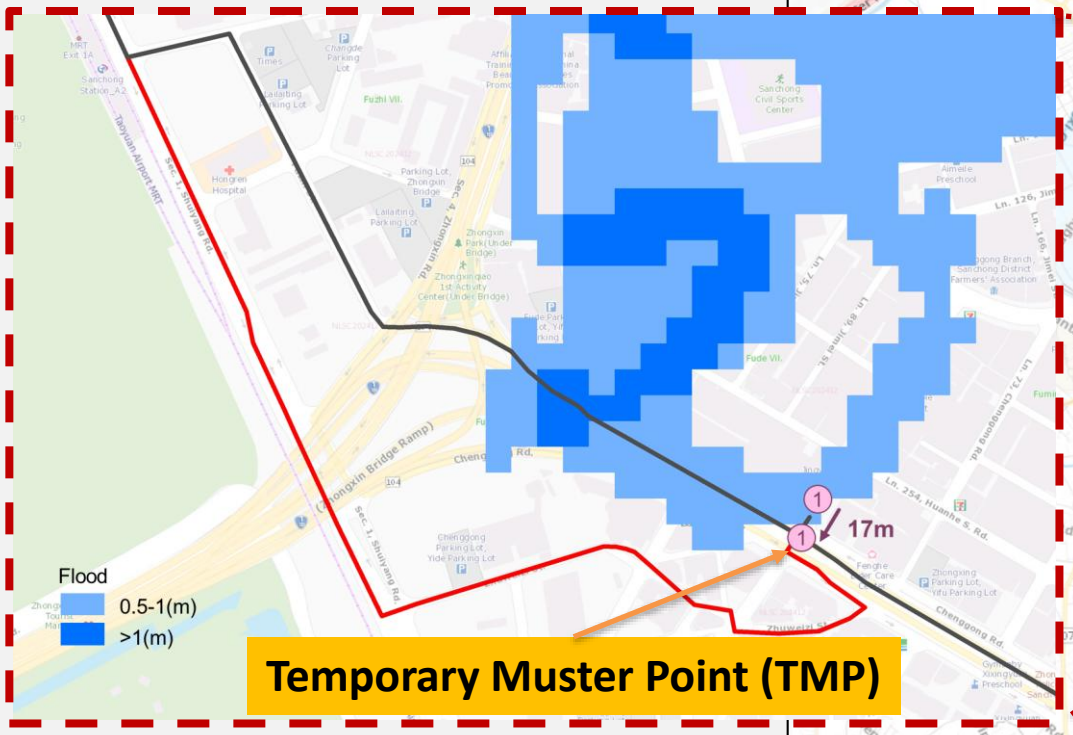
Problem

- Long distance transfer
- Original route to receiving institution 1 passes flooded area.



Original Route
Suggested Alternative

Receiving Institution 1

Jin Guang Senior Nursing Home

Receiving Institution 2

Flood
0.5-1(m)
>1(m)

Evacuation Route Analysis - Zi Yi Infant Daycare Center

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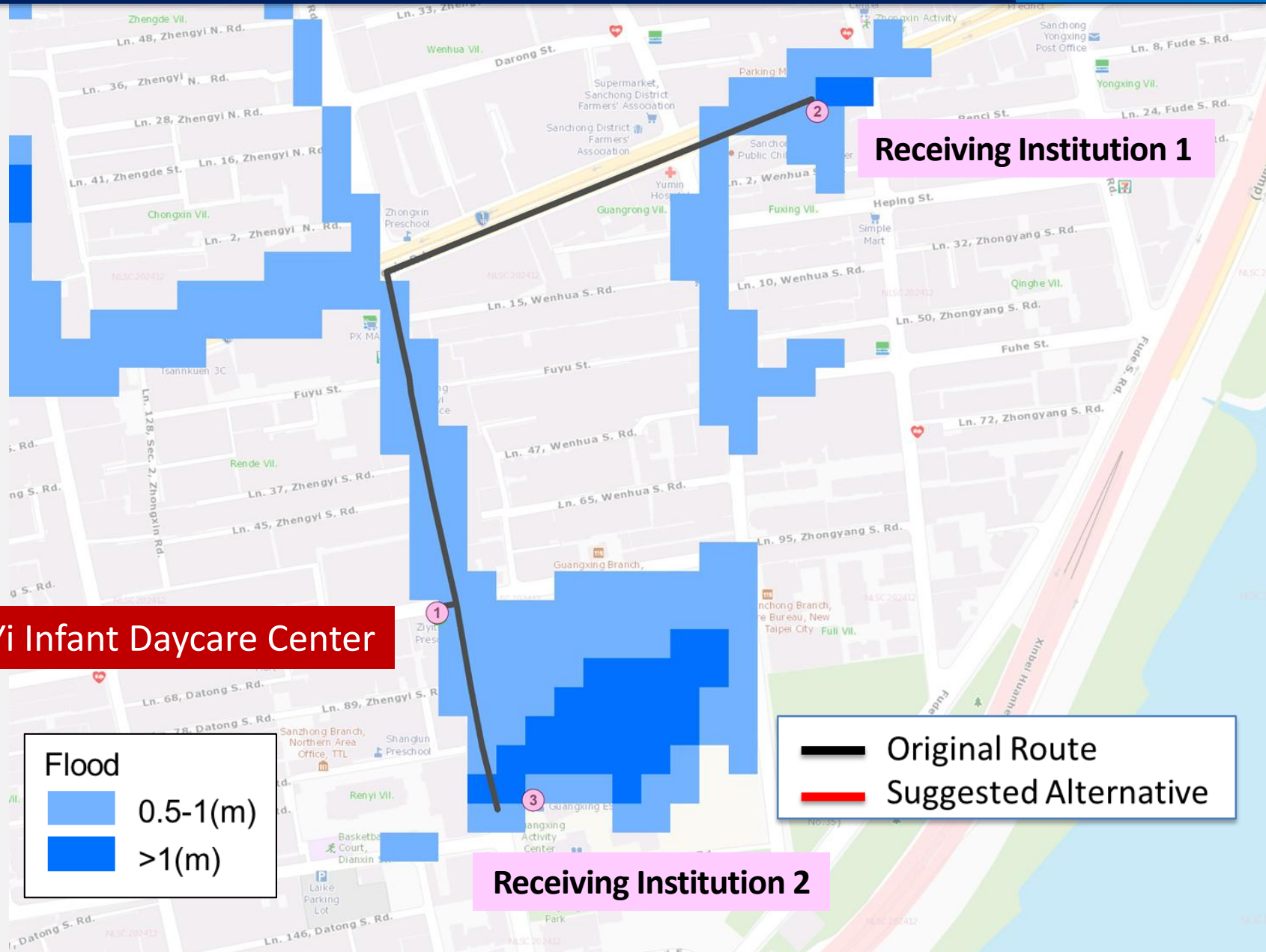
Problem

- **Receiving institutions are in the flooded area.**
- **Reassigning receiving institutions is necessary.**



Evacuation Route Analysis - Sweet House Infant Daycare Center

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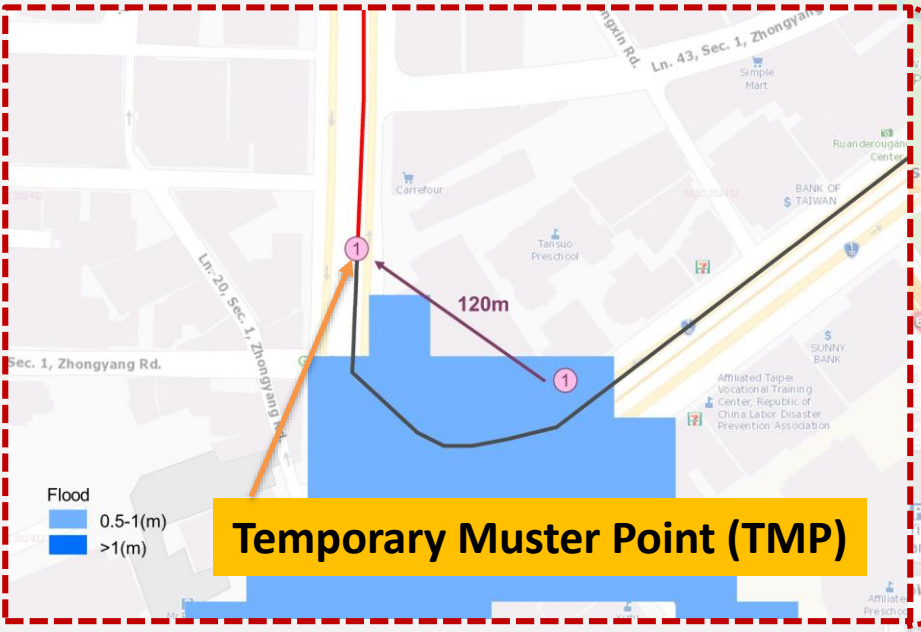
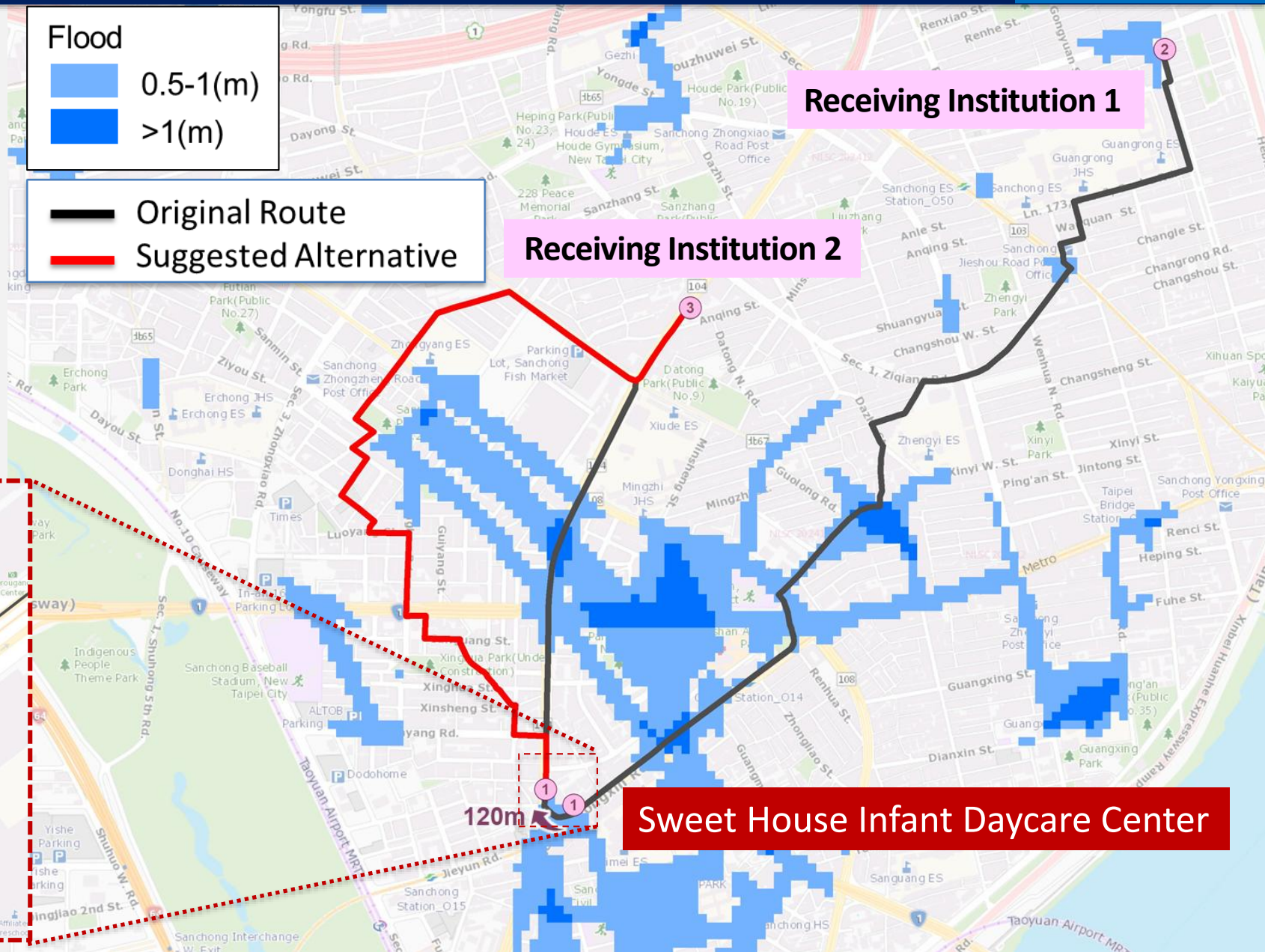
Problem

- Receiving institution 1 is in the flooded area.
- Original route to receiving institution 2 passes flooded area.





Evacuation Route Analysis -Sacred Heart Child Development Center

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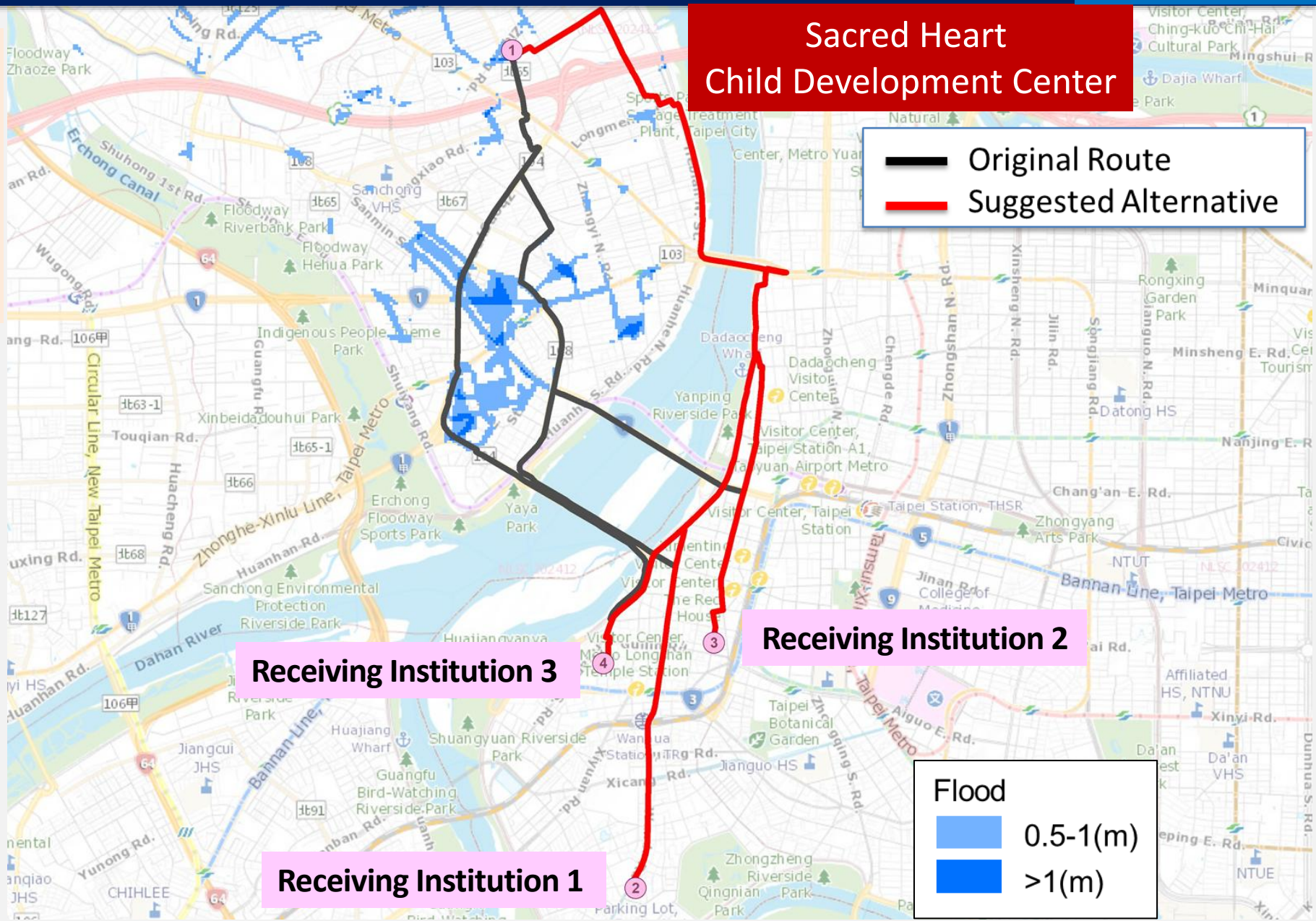
Problem

- **Long distance transfer**
- **Original route to all receiving institutions pass flooded area.**



Evacuation Route Analysis - Autism Potential Development Center

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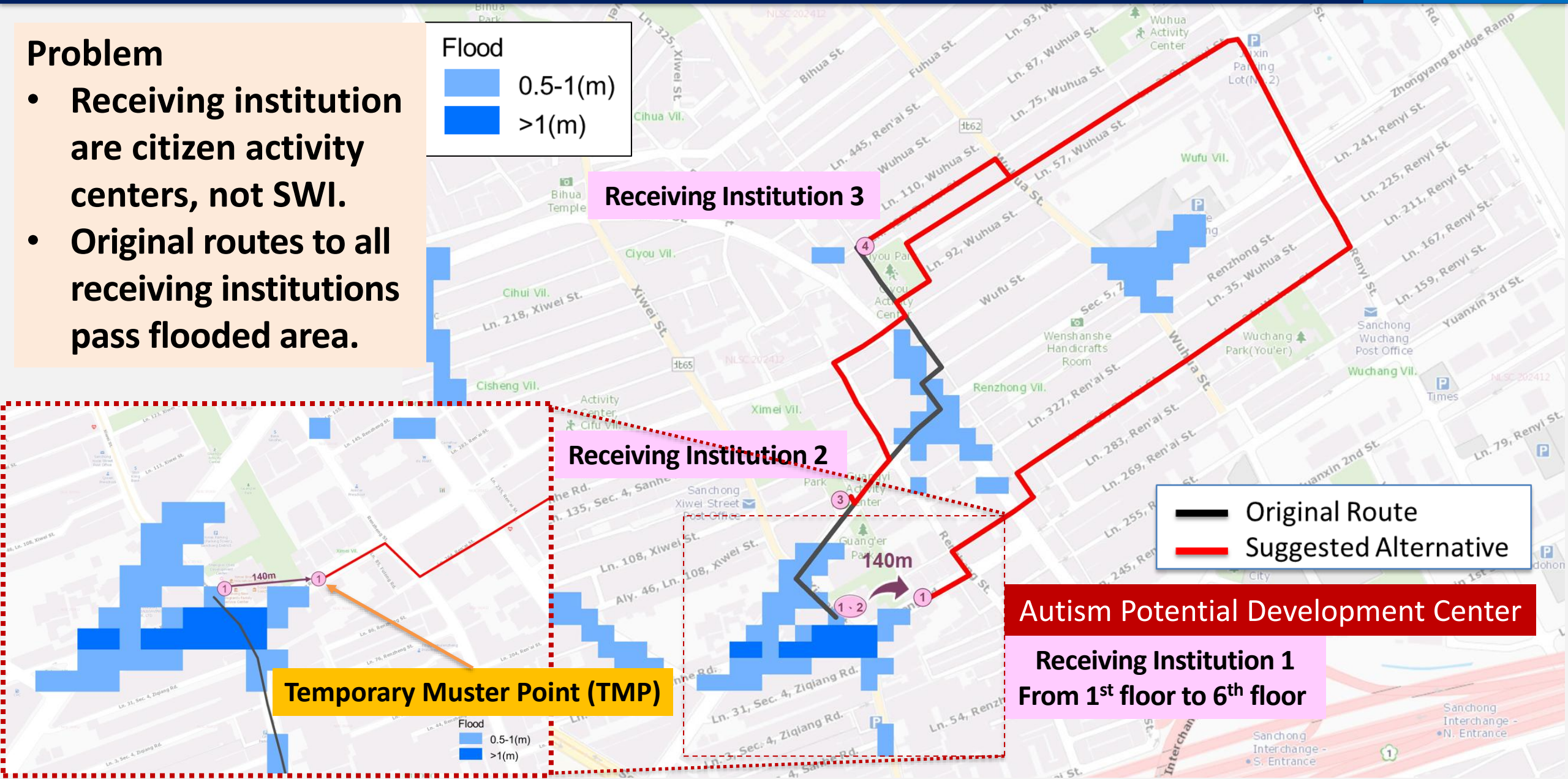
Problem

- Receiving institution are citizen activity centers, not SWI.
- Original routes to all receiving institutions pass flooded area.



Conclusion

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Strategy Suggestion

1. Five social welfare institutions located on the first or second floor in flood-prone areas should establish Temporary Muster Points (TMPs) to facilitate initial assembly and coordination during emergencies.
2. Evacuation routes should be re-planned to avoid flooded zones, taking actual flood risks into account.
3. If the originally designated receiving institutions are also located within flood-prone areas, they should be reassigned to safer alternatives.
4. For institutions with excessively long transfer distances, it is recommended to designate closer receiving institutions, considering both accessibility and flood risk.

Future Work

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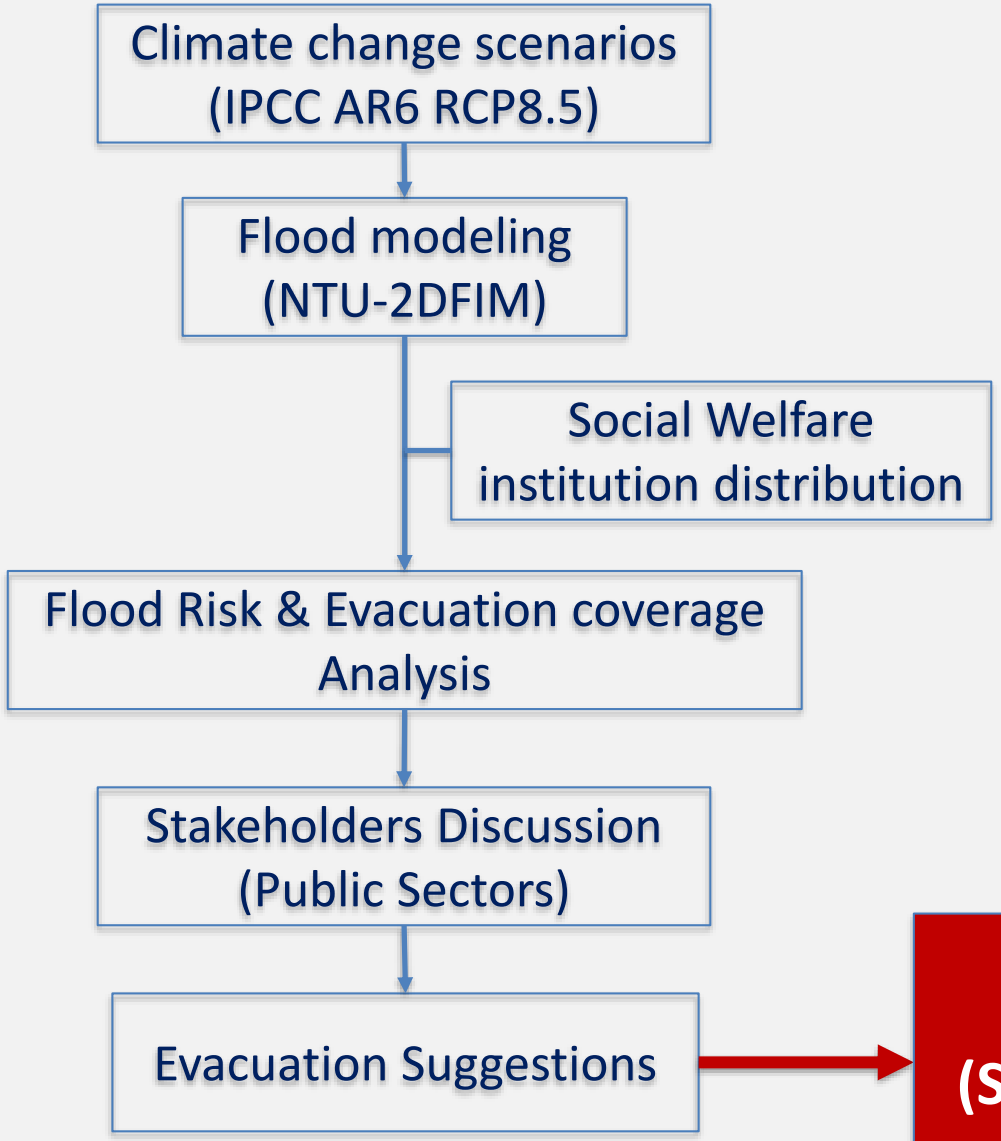

Acknowledgement

This research was supported by
the Ministry of Science and Technology, Taiwan
(MOST 113-2625-M-002-003-).