

Supplementary Materials

Table S1 Summary of Influencing Factors of Site Selection in Literature Research

ID	Influencing factors	Literature Source
C1	Distance from surface water	[13,24–33]
C2	Distance from the water source protection area	[13,25]
C3	Distance from Protected Areas	[13,25,27,28,32,33]
C4	Distance to the airport	[23,24,26,33]
C5	Special land use	[25]
C6	Distance from the industrial area	[27]
C7	Distance from the wetland	[13,27,34]
C8	Distance from the coastline	[13,14,34]
C9	Habitat of Endangered Species	[13]
C10	Slope	[13,24,25,27–34]
C11	Groundwater depth	[24–26,33,34]
C12	Soil permeability	[25,26]
C13	Sensitive ecosystem	[26]
C14	Elevation	[24,25,31–33]
C15	Flood risk area	[13,25,30,34]
C16	NDVI	[29]
C17	Normalized differential snow cover index	[29]
C18	Distance from the park green space	[26,29]
C19	CO2 emission	[30]
C20	Infrastructure	[27,33]
C21	Faults and unstable zones	[13,24,32–34]
C22	Distance from residential areas	[13,14,24–26,28,30,31,33]
C23	The distance from historical relics	[25,33]
C24	Wind direction/wind speed	[24,25,32]
C25	Distance from roads	[13,14,24–33]
C26	Land use	[13,14,24–26,28,33]
C27	Soil depth	[25]
C28	Distance from the waste generation point	[13,24,26,28,30,32]
C29	Distance from the waste disposal facility	[30,31]
C30	Waste transportation time	[31]
C31	Natural pipelines/power transmission lines	[14,27,32]

Table S2 Requirements for TDWSS

Influencing factors	Requirement
Environmental impact	It should not be located in the centralized groundwater supply source area and its recharge area, the floodplain and flood discharge channel, the area within 50 meters from the boundary of the landfill storage area and the sewage treatment area, as well as the area within 50 meters from rivers and lakes, and the area within 3 kilometers from civil airports. The site should be selected at the downwind position of the dominant wind direction and wind frequency in the city. It should be built in areas with higher terrain that are not prone to flooding. Sufficient consideration should be given to the data of geology, geomorphology, terrain, hydrology, etc. Additionally, it should be close to areas with superior basic facilities such as water supply, power supply, and drainage systems.
Topography and geomorphology	It should not be located in active collapse zones, unexploited underground mining areas, limestone pits, and lava cave areas. It should not be situated in areas within 500 meters from residential areas or water supply points for humans and livestock. Also, it should not be placed in precious flora and fauna protection areas, as well as national and local nature reserves.
Social influence	It should maintain a certain distance from parks, scenic spots for sightseeing, areas of cultural relics and historic sites, as well as areas for archaeological, historical and biological research and investigation. It should not be located in military key areas, bases, military industrial bases and national confidentiality zones.
Economic impact	The site selection of a domestic waste composting plant should take into account the local geological engineering characteristics and hydrological and geomorphological features. It should preferably be built in areas with low local land use value, or where the construction cost is low and the construction work is convenient. Considering the factors of environmental impact assessment, a newly-built domestic waste composting plant is suitable to be constructed in areas with a low population density. When taking economic benefits into consideration, a newly-built domestic waste composting plant should be located in areas with convenient transportation. In this way, the transportation cost can be saved and the operation cost can be reduced. The site selection criteria should ensure that the site can withstand flood disasters that occur once every 50 years.
Disaster prevention and control	From a long-term perspective of site selection, it should be kept away from artificial water storage areas such as reservoirs and canals, as well as the planned protection scope. The distance from the mountains should also be taken into consideration to avoid disasters such as mountain torrents, landslides, and debris flows, and every effort should be made to reduce the probability of the occurrence of various natural disasters.

Table S3 Site selection standards for TDWSS

Reference guidelines	Content
FEMA: Public Assistance Debris Management Guide	Ownership criteria, public land is given priority, and existing disposal or recycling facilities near the disaster area are ideal locations. If none of the above situations are possible, potential private properties should be considered. It aims to ensure that there is sufficient size for waste treatment. Location criteria, including sufficient requirements for the location in relation to the subway. Environmental and historical protection involves considering criteria based on existing conditions, as the site must be restored when the on-site operation is closed.
The U.S. Environmental Protection Agency (EPA): Planning for natural disaster debris	It should have sufficient area and appropriate terrain and soil types; Be located at an appropriate distance from drinking water wells, rivers, lakes, and streams (planners can cooperate with state or local environmental agencies to determine the appropriate setback distance); Not be located in floodplains or wetlands; Cause no damage to environmentally sensitive areas; Implement control measures to mitigate stormwater runoff, erosion, fires, and dust; Be away from obstacles such as power lines and pipelines; Be accessible for heavy equipment; Have limited access, with only certain areas open to the public, such as debris drop-off areas, to ensure safety. For some waste streams, additional storage control and safety measures may be required; Be close to the affected areas, but away from residences, infrastructure, and businesses that may be affected by on-site operations.
Ministry of the Environment Government of Japan: Disaster Waste Management Guideline for Asia and the Pacific	Adequate space; Sufficient for storage, traffic flow, and separation; Located in a low flood risk area; Accessible roads: Easily reachable by disaster victims (but not too close to hospitals, schools, and residential areas), and situated on a wide road (allowing the access of 10-ton trucks).

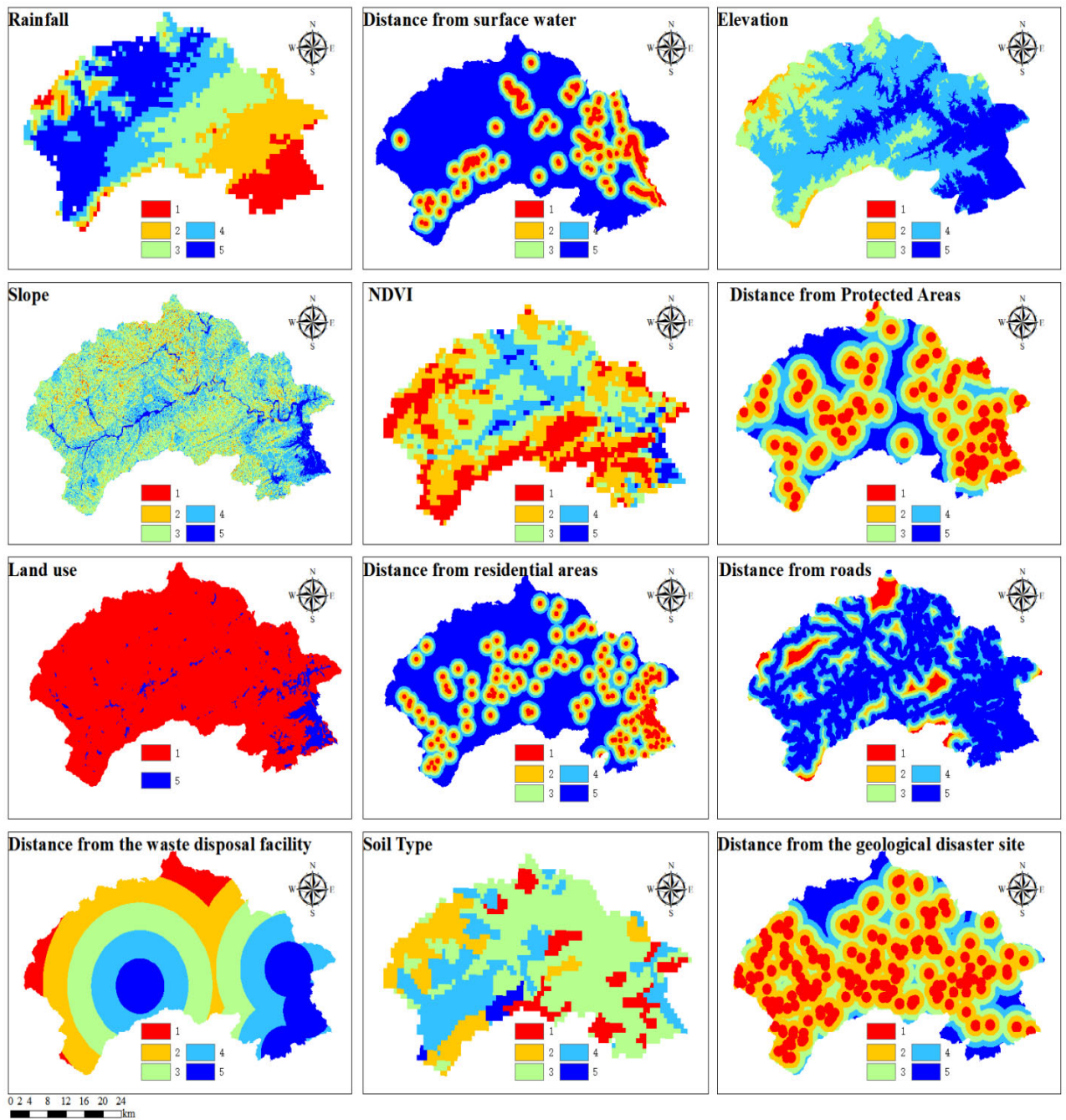


Figure S1. Reclassified Result Layers of Factors Affecting TDWSS Site Selection