

# 摘要

氣候變遷影響下，未來城市恐難單純透過工程與非工程保護措施而倖免於極端氣候的災害衝擊。目前城市僅著重於「預防災害發生」與「減低災害衝擊」，面對極端氣候之影響，城市必須提升自身的水韌性能力，使城市減少災害衝擊，並能迅速從災害中重新恢復城市功能，亦能從災害中學習加以調適，使城市比災害前更具有水韌性。本計畫以「韌性水城市評估-地方政府首長參考手冊」為基礎，協助地方政府進行韌性水城市評估，同時連結國土計畫與韌性城市之觀念，期透過國土利用與空間發展之掌握強化推動水韌性，進而接軌國際提升城市面臨極端氣候影響下的水韌性能力，以達成不怕災之韌性目標。

## 一、雲林縣與臺南市韌性推動

根據水韌性評估指標提供地方政府瞭解自身城市的狀態，研擬相應的水韌性提升主軸。雲林縣韌性水城市提升主軸為「優化組織調度」、「強化防災意識」、「提升洪旱對應」、「永續都市利用」、「韌性復原重建」、「健全收容安置」、「提升社區自救」、「農業災後復原」、「強健農業防災因應」等韌性政策推動綱要與建議行動計畫。臺南市韌性水城市提升主軸為「優化重建調度」、「國土永續發展」、「強化耐災規劃」、「提升社區抗災能力」、「企業自我防災」、「政府企業合作防災」等韌性政策推動綱要，並據以研擬韌性提升方針與建議行動計畫。

## 二、水韌性提升與國土計畫融合分析

在水韌性提升與國土計畫融合分析中，調整雲林縣的建議行動計畫為：「依據國土功能分區劃設分區等級，規劃治洪原則」、「針對水災風險地區，擬定並推動土地開發建議事項與耐淹建築法令」、「洪災風險地區公共設施逕流分擔方案」。而臺南市在擬定行動方案時已融入國土計畫之原則，則不再調整。

## 三、以地層下陷地區特性研擬雲林縣的水韌性發展建議

針對雲林縣地層下陷特性，以綜合性面向為地區特殊議題提擬發展建議。軟體面建議著重於產業發展引導與組織協調，硬體面應著重於

強化水利工程與建築減災及適應，而中介面向者則是要建立土地使用管理原則，建構潛勢淹水地區土地管理策略。

#### 四、提供縣市國土計畫通盤修正建議

協助審視所有 18 個直轄市、縣(市)國土計畫內容之公開閱覽版本，提出九項通案的研修意見：1.落實「逕流分擔、出流管制」、2.推動公共設施做多目標使用以降低淹水、3.強化藍、綠帶空間規劃設計、4.思考還地於河的概念、5.太陽光電設施下方蓄洪、6.農塘與埤塘作為蓄洪空間、7.水資源節流措施、8.都市公共設施空間滯水用途、9.都市森林化。

## Abstract

The impact of climate change has been increased. With the increasing flood disasters by extreme climates, cities may not have enough ability to deal with the impact of disasters just simply through the engineering and non-engineering protection measures. At present, cities only focus on “disasters preventing” and “reducing disaster impacts”. Under the extreme climates, cities must improve their resilience to reduce disaster impacts and quickly restore urban functions from disasters. Besides, the national spatial planning is under going. Resilient actions for the city should be linked to the national spatial plan to reduce the extent of disasters and accelerate recovery under extreme climates. It can also learn from disasters and adapt them to make cities more resilient than before.

This project adopts a two-year research to enhance the resilience ability of Yunlin County and Tainan City following the “Water Resilience City Guide for Taiwan” provided by WRA. Though the resilient evaluation, strategic review, and resilience improvement action plan drafting, this actions can help local governments to improve resilience more effectively and quickly.

### 1. The resilience enhancement strategies of Yunlin County and Tainan City

The resilience enhancement strategies of Yunlin County are: (1)Government management optimization, (2)Enhance the awareness of disaster prevention, (3)Response to flood and drought, (4)Sustainable urbanization, (5)Resilient recovery and restoration, (6)Robust shelters and settlement, (7)Enhance the self-rescue ability of community, (8)Post disaster recovery of agriculture, and (9)Disaster prevention for agriculture. The resilience enhancement strategies of Tainan City are proposed. They are (1)Optimized reconstruction scheduling, (2)Sustainable national spatial development, (3)Strengthening disaster resistant planning, (4)Improving community disaster resistance, (5)Enterprise self-disaster prevention, and (6)Government- Enterprise cooperation in disaster prevention.

## 2.The integration of water resilience improvement and the national spatial plan

In the analysis of the integration of water resilience improvement and the national spatial plan, the action plan of Yunlin County was adjusted to: "Making flood control principle based on the functional zoning", "Suggestion and Flood-Resistant Building Act for the land development in flood risk areas", "Proposal for runoff sharing of public facilities in flood risk areas". However, Tainan City has incorporated the principles of the national spatial plan when drawing up the action plan, and will no longer adjust it.

## 3.The development suggestions of Yunlin County under the subsidence disaster

Finally, due to the subsidence in Yunlin County, the development suggestions are as follow: The software recommendations should focus on the guidance of industrial development and the coordination of the organization, the hardware aspect should focus on strengthen water conservancy engineering and building disaster mitigation/adaptation. The intermediary aspect should establish land use management principles and construct land management strategies for potential flooded areas.

## 4.The general suggestion for the national spatial plan

Assisted in reviewing the national land plan, this project provide nine general suggestions: (1)Implement "runoff apportion and outflow control", (2) Promote the use of public facilities for multiple targets To reduce flooding, (3)Strengthen the planning and design of the blue and green belt space, (4)Thinking about the concept of room for river, (5) Flood storage under solar photovoltaic facilities, (6)Agricultural ponds as flood storage spaces, (7)Water conservation measures, (8)Urban public facilities space to provide flood detention, (9)Urban forestry.