NORTH AMERICA

Nevada • Las Vegas

Context

Covering approximately 650 km² with approximately 650,000 inhabitants, Las Vegas is located in a vast desert valley in the far south of Nevada, surrounded by mountains rising to 3000 metres and drawing 90% of its water from the Colorado River. The city is part of an extended urban area that covers two counties making up a territory of 67,487 km² with 2 million inhabitants. The hot desert climate offers a dry and very hot summer season and a short winter season. Due to its geographical location, population and activity needs, the water supply that depends on Lake Mead is increasingly difficult. Las Vegas is one of the three cities that reported the most adaptation actions to the CDP.

Stakeholders

The Southern Nevada Water Authority (SNWA) is an agency that was created in 1991 to manage the water needs of southern Nevada. Comprising seven water agencies, SNWA is responsible for the treatment, distribution and management of water resources in the short and long term for southern Nevada. As a member of the Environmental Protection Agency's (EPA) Creating Resilient Water Utilities programme, SNWA conducted a vulnerability analysis of Las Vegas to the climate impacts of two selected scenarios (2035 and 2060) on which its Water Resource Plan published in 2018 is based. Several levels of government help Las Vegas with water supply: at the county level, the Clark County Multi-Jurisdictional Hazard Mitigation Plan, the Nevada State Drought Plan and Enhanced Hazard Mitigation Plan, and the Department of the Interior's WaterSMART programme.

Methodology

The approach used has been to highlight the solutions proposed by the institutional actors responsible for water management and their technical partners. The vulnerability analysis conducted by the SNWA identified more than 60 potential actions to address the impacts of climate change, while assessing the availability of the resource in relation to its future demand. The methodology used for this analysis was inspired by several tools made available by the EPA, namely the Climate Resilience Assessment and Awareness Tool (CREAT), the Adaptation Strategies Guide and the Hydrologic and Water Quality System modelling platform.

VULNERABILITIES

ANTHROPOGENIC PRESSURES: water demand greater than river supply (Lake Mead); additional pressure from tourism demand; continuous urban development.

WATER RESOURCES: drinking water shortages; dependence on the Colorado River; declining water quality; increased algae; increased droughts; flash floods.

ADAPTATION ACTIONS

ENERGY MANAGEMENT: modernisation of energy-intensive municipal buildings and construction of new LEED-compliant facilities; incentives to improve building efficiency in the face of high temperatures; renewable energies and smart grids to guarantee and manage energy consumption during peak periods (summer cooling) on the hottest days;

AWARENESS: awareness campaigns for residents and motorists to avoid flooded areas and reduce water consumption and watering; development of the WET (Water Saving Technologies) programme for residential and commercial customers to help them reduce indoor water consumption;

SUPPLY AND DEMAND MANAGEMENT: water use restrictions based on low supply times and days; construction of a third intake at Mead Lake; study of groundwater development and flow from eastern Nevada to Las Vegas (project under study for over a decade while groundwater rights have been acquired);

RISK MANAGEMENT: long-term flood control master plan through the construction of retention basins and flash flood mitigation infrastructure; emergency plans for flash floods and rescues by local public safety actors (fire, police and first responders); establishment of flood zone mapping (insurance sector requirements);

PLANNING: specific green buildings to mitigate the urban heat island effect; restriction of landscaping for new residential and commercial construction; incentives to replace existing turf with low-water landscaping (cactus); residential and commercial sheds to help reduce outdoor water consumption; incentives to replace turf with synthetic (Cash for Grass programme); a programme to plant trees and green spaces in downtown Las Vegas; zoning the Las Vegas Valley floodplain against urban development; designation of national monuments, federal lands and protected spaces to restrict development; integration of shade, green and ventilated spaces into the Las Vegas Downtown Masterplan;

OTHERS: integration of adaptation measures into the City's 2050 Master Plan; provision of air-conditioned commercial areas during hot days.

STRENGTHS OF THE APPROACH

- Strengthens awareness and measures already in place for water resource saving;

- Many options presented at the consumer level;

- Informing local public decision-making on climate change adaptation.

LIMITS OF THE APPROACH

- Lack of a participatory approach and integration of populations in the search for solutions;

- Significant placement of engineering and technical solutions in the options presented;

- Few options for radical transformations of the existing water distribution system.

SOURCES

• CDP data (2019)

• US EPA (n.d.). Southern Nevada Water Authority Assesses Vulnerability To Climate Change

• Water Utility Climate Alliance (2018). Strategic Plan and Publications

• Southern Nevada Water Authority (2018). 2018 Water Resource Plan

• Division of Emergency Management – Homeland Security (2018). The State of Nevada Enhanced Hazard Mitigation Plan

• ArcGIS. Extreme Weather Adaptation in Las Vegas, Nevada

• Photo: Nathan Roser