

# Experiences in applying climate change adaptation vulnerability and risk assessment in water and waste water projects

Rachel Brisley, Technical Director and Head of Climate Change Adaptation, JBA Consulting



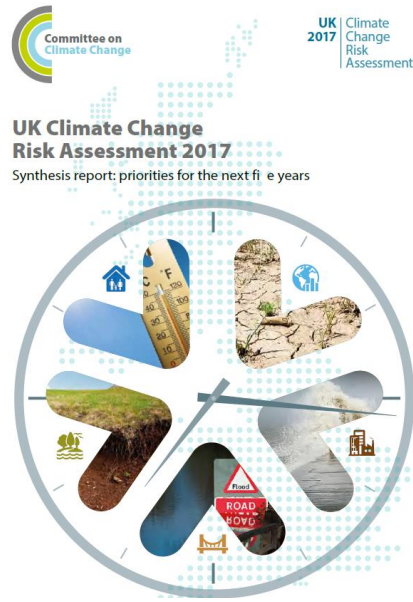
# Overview

- JBA overview
- Our work with JASPERS
- Summary of experience
- Case study examples: Croatia, Slovenia, Romania, Malta
- Lessons learned



# JBA OVERVIEW





## Socially Just Adaptation to Climate Change in the UK – Joseph Rowntree Foundation (2012)



## Ongoing support to UK Committee on Climate Change (2015-2017)



## Coastal Risk Management Programme, Wales (2015 – 2016)

## Flood Risk and Coastal Resilience Assessments Paramaribo, Suriname - World Bank (2016-17)



# OUR WORK WITH JASPERS



# Framework Support Disaster and Risk Management and Climate Change Resilience

- Support the JASPERS team in the assessment of project resilience to:
  - climate change
  - disaster management and the development of national risk assessments related to climate change needs
- Two commissions: Sep 2014 – June 2016 and Sep 2016 – June 2017



# SUMMARY OF EXPERIENCE



# Focusing on climate change resilience

- JASPERS capacity building
  - CCVRA discussions with water sector staff
  
- Member State support
  - Workshops on CCVRA concerning flood risk management and water/wastewater projects in:
    - Croatia
    - Slovenia
    - Romania
    - Malta





# Case studies



# Water and wastewater projects in Croatia

- Project application and CCVRA completed for a water supply and wastewater treatment plant in Croatia
- Key issues and challenges:
  - Vulnerability matrices completed in accordance with Non-paper but limited justification for scoring thresholds and scores given
    - Define these and provide justification
  - Some climate change impacts appeared to be underestimated
    - Thoroughly investigate all impacts
  - Potential need for additional/supplementary water resources identified
    - If potential future measures identified, identify what trigger points would need to be met to implement these



# Wastewater project in Slovenia

- Project under development for a wastewater collection system, connecting pipes and new treatment plant
- Key issues and challenges:
  - Building in climate resilience to a project that is largely developed
    - Report on climate impacts considered in development
  - CCVRA of options?
    - Only the preferred option if retrospective
  - Splitting projects into components when comprised of multiple measures
    - Focus on different parts of the project
  - Assessment of climate drivers and climate hazards
    - Focus on climate hazards but include drivers where have extra impacts (e.g. increase in temperatures and drought)
  - Changes made to project as a result of CCVRA
    - High temperatures included as a risk



# Climate drivers and climate hazards

Primary climate drivers	Secondary effects/climate related hazards
<ol style="list-style-type: none"><li>1. Annual/seasonal/monthly average (air) temperature</li><li>2. Extreme (air) temperature (frequency and magnitude)</li><li>3. Annual/seasonal/monthly average rainfall</li><li>4. Extreme rainfall (frequency and magnitude)</li><li>5. Average wind speed</li><li>6. Maximum wind speed</li><li>7. Humidity</li><li>8. Solar radiation</li></ol>	<ol style="list-style-type: none"><li>1. Sea level rise (plus local land movements)</li><li>2. Sea/water temperatures</li><li>3. Water availability</li><li>4. Storm (tracks and intensity) including storm surge</li><li>5. Flood</li><li>6. Ocean pH</li><li>7. Dust storm</li><li>8. Coastal erosion</li><li>9. Soil erosion</li><li>10. Soil salinity</li><li>11. Wild fire</li><li>12. Air quality</li></ol>



# Flood risk management project in Romania

- Project application, feasibility study and CCVRA for defence works, storage reservoir, soil erosion control and new bridges
- Key issues and challenges:
  - CCVRA of projects that focus on climate impacts is challenging
  - Initial CCVRA had taken on EIA focus – with and without the project
    - Note that EIA now requires consideration of climate vulnerability
  - Insufficient justification for thresholds and scoring
  - No evidence that flood modelling had built in climate change impacts
  - Unclear how proposed measures address climate change impacts
  - Assessment of climate drivers and climate hazards
    - As with Slovenian project plus combined some climate hazards
  - Uncertain climate projections
    - Project should be reviewed if more certain climate projections produced



# Water and wastewater projects in Romania

- Range of projects at different stages in project development, application and CCVRA
- Key issues and challenges:
  - How to split a project into components
    - Better to focus on processes than geography
  - Some confusion between sensitivity and exposure
    - Not intuitive to split but helps ensure assessment is thorough
  - As with others, some confusion around climate drivers/hazards
    - Resolved as previously plus combined some hazards
  - Do vulnerability and risk assessment take project into account?
    - Vulnerability assessment is high level screening, risk assessment takes project into account



# Water and wastewater project in Malta

- Water supply and wastewater projects across Malta and Gozo – in project development stage
- Key issues and challenges:
  - Similar issue with project components as others
  - Discussion around stakeholder involvement
    - Ministry of Climate Change agreed to look into providing consistent exposure assessment
  - As with others, some confusion around climate drivers/hazards
    - Resolved as previously plus combined hazards
  - In considering exposure assessment, should existing resilience measures, such as flood defences, be taken into account?
    - Recommended not, but if they are, be specific about this
  - Additional adaptation measures
    - Increase groundwater production, educate stakeholders who abstract to be more efficient



# LESSONS LEARNED





# Lessons learned (1)

- Guidance and advice is useful but difficult to explain without actually doing it
  - Justification is of key importance
- Projects can be split in many ways
  - Non-Paper categorisation is not easily applicable to projects with packages of measures
- CCVRA best conducted at the option appraisal stage, so climate change **does** influence option selection
  - When applied retrospectively can focus on preferred option
- Inclusion of climate drivers and hazards can be confusing
  - Both need to be included if the driver and hazard can have different impacts
  - At risk assessment stage, hazards can be combined



## Lessons learned (2)

- Setting clear thresholds understood by project team is essential
  - Important to explain these and justify all scores
- Workshops largely attended by environmental experts – need to involve engineers
  - Involving those not in project team can provide new insights
- CCVRA differs from EIA approach
  - But EIA now requires consideration of climate vulnerability so some overlaps
  - Climate impacts ON not OF the project is the key consideration
- Vulnerability assessment is high level screening, risk assessment is focused on detailed project impacts



# Overall benefits

- Tests whether proposed projects are robust against a full range of climate change impacts
- Verifies climate resilience measures already built into the project
- Facilitates integration of a wide range of issues e.g. soil loss, agricultural impacts, extension of growing season, greater demand for water etc.
- Every project we have worked with has identified additional adaptation measures that should improve climate resilience as a result of the CCVRA



Any questions?



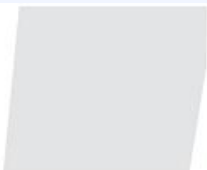
## Contact details

E: [rachel.brisley@jbaconsulting.com](mailto:rachel.brisley@jbaconsulting.com)

T: +44 (0) 1925 570876

M: +44 7436 545359





For info or further questions on this workshop and the activities of the JASPERS Networking Platform, please contact:

JASPERS Networking and Competence Centre

[jaspersnetwork@eib.org](mailto:jaspersnetwork@eib.org)

[www.jaspersnetwork.org](http://www.jaspersnetwork.org)