Climate Smart Lessons from the Netherlands

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LOCAL SOLUTIONS:
Northeast Climate Change Preparedness Conference
May 20, 2014
Climate Smart Communities

Goal:
Prepare a Climate Action Plan that:

- Reduces greenhouse gas emissions by:
  - Increasing energy efficiency
  - Reducing waste
  - Increasing use of renewable energy
- Adapting to climate change by:
  - Altering the built and natural environment
- Saves taxpayer dollars

New York agencies: Department of Environmental Conservation; Energy Research and Development Authority; Public Service Commission; Department of State; Department of Transportation; and the Department of Health.
Climate Smart Communities

- No cost services provided to municipalities by Climate Smart Communities Coordinators
- Program funding from NY portion of Regional Greenhouse Gas Initiative (RGGI)
APA Trip to the Netherlands

- Trip organized by the American Planning Association in cooperation with the Netherlands Embassy
- Water management & climate change
- Historic & new approaches
- Soft & hard techniques
- Protection & adaptation

The yellow provinces are north & south ‘Holland’
Elevation
- Relative to N.A.P., or Normaal Amsterdamse Peil or average sea level
- Standard since 17th century
- 27% of country below sea level
Land from Sea

- God created the world, but the Dutch created Holland (the Netherlands)
- First dikes over 2,000 years ago
- Dike failure in 1287 created Zuiderzee
- Dike in 1932 created Ijsselmeer
- Polders in 20th century
Rivers & the Sea

Source:
*The Effects of Climate Change in the Netherlands: 2012*
Netherlands Environmental Assessment Agency
Dutch Approach

Disaster Management – learn from the Americans

Spatial Planning & Design - new emphasis

Prevention - traditional
Dutch Strategies

- Knowledge/action/marketing
- Plan well into the future
- Provide protection
  - Strengthen dikes
  - Utilize sea barriers
  - Utilize canals/gates/pumps
- Adapt to climate change
  - Design/build with water
  - Increase stormwater storage
  - Provide ‘Room for the River’
- Base on cost/benefit
- Monitor continuously
Plan Far Ahead for Climate Change

- Dutch plan for 2100
- NYC plan for 2030
Dikes by the Sea and Inland

- 20-mile dike from North-Holland to Friesland separates Ijsselmeer from sea
- Ring dikes surround cities, towns, hamlets

Dike along new island in Amsterdam harbor
Dikes Part of Urban Form

- Dikes integrated into city landscape
- Pumps move water from series of canals to the sea
- Continuous level monitoring
Dunes for the Shore

- Natural dunes along North Sea coast
- Additional sand required periodically
Sand for the Shore – ‘Zand Motor’

- 11 million cubic meters sand pumped from offshore to foreshore
- Current distributes sand
Dike by the Sea – Scheveningen

- Seaside resort
  - Hotels, beach pavilions
  - Shops, condos, pier
  - ‘Surf dudes’
  - 18 million visitors/year
  - Similar to Long Beach, NY and Jersey shore

- Challenges
  - With climate change, dike is too low, too narrow
  - Preserve views
  - Integrate active resort
Dike by the Sea – Scheveningen

- New dike over the old on sea side
- Sand pumped to widen beach
- Hard structure, sand, plantings
- Integration of promenade, boulevard, amenities
- Multiple uses/users
- 900 m long (~1/2 mile), $90 million
Sea Barriers – Delta Works

- Here the tide is ruled, by the wind, the moon and us (the Dutch)

- 1953 flood - 1835 deaths
- Solution - install inlet barriers
- 200-year life; 1:4000 protection

- SCHELDT BARRIER
- 10 years to construct, $12B, Completed 1987
- 62 open gates, closed 25 times in 26 years
Sea Barriers – NYC & Long Island

- **Here the tide is ruled, by the wind, the moon and MAYBE us (the New Yorkers)**
  - 2012 Superstorm Sandy storm surge - $68 billion in damages
  - Solution - install movable inlet barriers – NYC and Long Island
Adaptation

- Politics, policy, payments
- Water planning
- Water storage
- Build with water
- Blue/green solutions
- Room for the river
Water Planning - Rotterdam

- 400 km canals, 1,000 pumping stations
- Shallow groundwater
- SLR, greater river discharge and rainfall
- Plan - Rotterdam ‘Climate Proof’ by 2025
  - Plazas - aesthetics, play, gathering, water storage
  - Canal promenades with water storage
  - Water storage beneath plaza, garage, street
Water Storage - Rotterdam

- Water - Plaza
- Storage - Recreation
  - 475,000 gallons storage
  - Automated operation
  - Empties in 24 hours
Build with/in Water - Amsterdam

- Watergraafsmeer polder
  - Reclaimed in Amsterdam harbor
  - Protective dike, canals/pumps/locks
  - On land and in-water residential
Green Blue Delft

- University requests building permit
  - Permit for density increase if increase quality of life with ‘natural’ elements

- Issues
  - Flooding from more intense and frequent rainfall
  - Inadequate stormwater capacity

- Project Sponsors
  - City of Delft, Delft Technical University, Delfland Water Board
Green Blue Delft

- More ‘blue’ storage
- More ‘green’ spaces
- More natural treatments
Room for the River

- Rhine, Meuse, Waal, and Ijssel Rivers
- Problem
  - Sediments reduced ‘room for the river’
  - Floods greater with more snow melt
- Solution
  - Public process/marketing
  - Structural changes
  - ‘Green channel’ bypass to sea
  - Residential relocation
Room for the River

- Lower floodplain
- Deepen bed
- Relocate dike
- Provide high water channel

- Depolder
- Remove obstacles
- Strengthen dikes

Source: http://www.ruimtevoorderivier.nl/

Cameron Engineering & Associates, LLP - Long Island’s Climate Sma
Windmills

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