Sustainable flood management: working with nature

Dr. Ute Collier,
WWF Global Freshwater Programme
Dr. Li Lifeng
WWF China
Amur Floodplain, Russia
Rhine River
Causes of increased flood risk

- Overgrazing
- Deforestation
- Floodplain development
- Impermeable surfaces
- River regulation (incl. dams)
- Wetland drainage
- Climate change
A disaster waiting to happen (Scientific American, 2001)
New Orleans is slowly sinking into the Gulf of Mexico. The construction of flood walls and dams north of New Orleans over the past century have prevented sediments carried by the Mississippi River from reaching New Orleans and the Mississippi River Delta. Before the dams were built, river sediments would empty out onto the delta adding layer upon layer of new soil each year.

http://visibleearth.nasa.gov/view_rec.php?id=2421
Dams and flooding - problems

- False sense of security
- Design floods and climate change
- Risk of dam breaks
- Peaking operations of hydro plants
- Conflict flood control and other functions
- Sediment retention
- Destruction of downstream wetlands
- Loss of beneficial aspects of floods
Solutions

• Flood management as part of Integrated River Basin Management
• Restore floodplains and wetlands
• Maximise natural vegetation cover
• Stronger development control
• Adjust operation (and design) of existing dams
• Additional structural measures (dams?)
Giving more space to the river

Transforming agricultural management of floodplains into nature management
Ta Trach case study, Vietnam
Ta Trach dam – WWF recommendations

Combination of structural, preventative and non-structural measures:

- One reservoir only, keep Huu Trach dam free
- Improved design, management and operation
- Flood warning system
- Reforestation
- Cease gravel extraction
- Control urban development
Direct economic loss of floods in China (million CNY, 8 CNY = 1 USD)

China experience

New policies after 1998 Yangtze Floods:

- Converting cultivated lands to wetlands/lakes
- Breaching polders for floods
Problems in a polder community
Xi-pan-shan-zhou Polder:
- reclaimed in 1972, 110 ha, with population of 580
- 80% of income invested for flood prevention during 1995~1998
- restored to wetlands/lake in 1999
Economic benefits:
- Biogas – Organic Food Production – Eco-tourism
- total income tripled

Environmental benefits:
- flood retention, bird wintering, hydrological restoration

Social:
- Organic Farming Association
Conclusions

- Flooding is a natural process and has benefits as well as costs
- Dams only as a last resort in flood control
- Give preference to non-structural measures
- Working with nature rather than against it
- Recreate floodplains and other wetlands
- Control urban development in floodplains
- Implement early warning systems and environmental monitoring
Gracias!

www.panda.org/dams