NOVA SCHOOL OF SCIENCE & TECHNOLOGY

Environmental impacts by type of activity

João Joanaz de Melo
NOVA University Lisbon
Environmental Engineering

Transports


Almada
Lisboa
94-85-ZB

Roads and motorways

- ✓ **Unstructured urban development**
- ✓ **Air pollution (several pollutants)**
- ✓ Barrier effect *
- ✓ Noise *
- ✓ Polluted run-off *
- ✓ Construction Works *

mitigation not practical at project level

*mitigation effective

Railways

- ✓ Less impact than most transports
- ✓ Structured urban development
- ✓ Attention to adequate rail mode!
- ✓ Indirect impacts: electricity *
- ✓ Barrier effect *
- ✓ Noise *
- ✓ Construction Works *

*mitigation effective

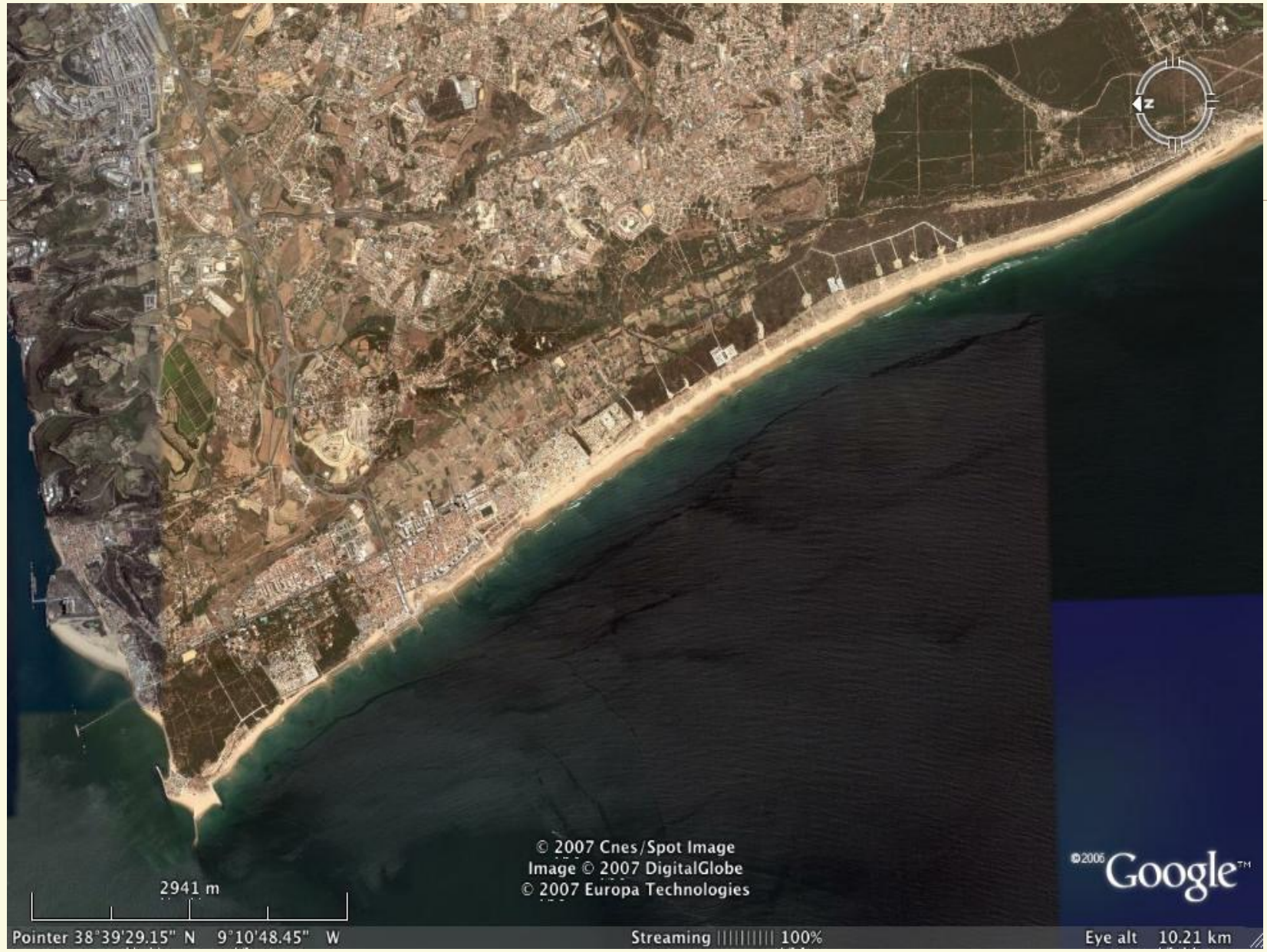
Airports

- ✓ **Air and noise pollution**
- ✓ **Infra-structure requirements**
- ✓ **Urban pressure**
- ✓ Habitat and migration routes degradation **
- ✓ Risk of accidents **
- ✓ Polluted run-off *
- ✓ Construction Works *

mitigation not practical at project level

*mitigation effective **depends much on location


LNG ADAMAWA


© 2007 Cnes/Spot Image
Image © 2007 DigitalGlobe
© 2007 Europa Technologies
2941 m
©2006 Google™
Pointer 38°39'29.15" N 9°10'48.45" W
Streaming 100%
Eye alt 10.21 km

Ports and coastal defences

- ✓ **Degradation of coastal habitats: dunes, marshes, cliffs, lagoons**
- ✓ Change in habitats and water flows **
- ✓ Maintenance dredging **
- ✓ Maritime pollution: operations, acidents*
- ✓ Construction Works *

mitigation not practical at project level

*mitigation effective **depends much on location

Land and water use

Waterworks

- ✓ **Destruction of riparian habitats by flooding, drainage, varying water level**
- ✓ **Modified water flow and habitat**
- ✓ **Lower solid flow in rivers**
- ✓ Flooding of human settlements and archeological sites **
- ✓ Low water availability for other uses *
- ✓ Construction Works *

mitigation not practical at project level

*mitigation effective **depends on location

Agriculture

- ✓Habitat degradation by direct destruction or fragmentation **
- ✓Soil and water pollution by fertilizers, pesticides and salts *
- ✓Soil erosion and compactation *
- ✓Water consumption *

*mitigation effective, depends much on technology and practice **depends on location

Forestry

- ✓ Change in water cycle regulation *
- ✓ Habitat degradation by direct destruction or fragmentation **
- ✓ Soil erosion at installation *
- ✓ Destruction of archeological sites *
- ✓ Fire hazard *

*mitigation effective, depends much on technology and practice **depends on location

Industry

Animal and plant products

- Pulp, paper and woodworks
- Animal farming
- Food processing
- Leather
- Textiles

✓ Water biodegradable pollution *

✓ Habitat degradation **

✓ Bad smells

*mitigation effective but costly **depends on location

Mineral extraction

- Inerts: rock, gravel, sand, clay
- Fossil fuels: coal, oil, natural gas, uranium
- Metals, rare earths and other minerals

✓ Destruction of habitats and landscape **

✓ Air pollution (energy, suspended particles) *

✓ Unbalance (e.g. sand extraction) *

✓ Water pollution: solids, corrosives, toxics (e.g. heavy metals), radioactive (uranium) *

✓ Large waste deposits *

*mitigation effective but costly **depends on location

Construction materials industry

- Cement
- Lime
- Ceramics: bricks, tiles
- Glass

✓ Air pollution (energy and process) *

✓ Water pollution: suspended solids, toxic chemicals *

✓ Wastes *

*mitigation effective, depending on scale


BOREALIS

Manufacturing

- Chemicals and petrochemicals
- Metalurgy and metalworks
- Consumer products

✓ Air pollution (energy and process) *

✓ Water biodegradable pollution

✓ Hazardous chemical pollution to water and soil (toxic, corrosive, persistent) *

✓ Habitat degradation **

✓ Risk of accident (dangerous chemicals) *

*mitigation effective but costly **depends on location


GALP GÁS

Energy

- ✓ Oil refining and transport: air pollution, wastes, risk of accident (spills, leaks, explosions, black tides) *
- ✓ Thermal power: air pollution, wastes, consumption or warming of surface water *
- ✓ Hydropower: multiple impacts from dams **
- ✓ Wind, PV, geothermal: landscape change, intrusion, noise and other local impacts *
- ✓ Electric lines and pipelines: corridors with constraints, construction works **

*mitigation effective but costly **depends on location

Cities


Q.ta Conde

Urban development

- ✓ **New artificial landscape: good and bad…**
- ✓ Habitat fragmentation *
- ✓ Air pollution: buildings and transports *
- ✓ Water consumption and pollution *
- ✓ Urban waste *
- ✓ Mobility and facility requirements: bad quality of life in badly planned cities *
- ✓ Direct destruction of natural habitats **
- ✓ Flood, landslide and other risks **

*mitigation effective but costly **depends on location

Waste treatment

- ✓ **Global pollution reduction**
- ✓ Wastewater treatment: concentration of pollution, risk of eutrofication, riverbank or wetland degradation **
- ✓ Chemical treatment: hazardous waste *
- ✓ Incineration: air pollution, toxic waste *
- ✓ Landfilling: groundwater pollution, methane, bad smell, risks to next generation *
- ✓ Social impact: the NIMBY syndrome *

*mitigation effective but costly **depends on location