From vegetable gardens and clay pits to highways and urban sprawl: the nature of peri-urban environmental change in Asia

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The SCOPE PU-ECH project examines the scientific understanding of peri-urban areas:

the **transition zone**, or interaction zone, **where urban and rural activities are juxtaposed**, and landscape features are subject to rapid modifications, induced by anthropogenic activity.

These critical areas of land cover changes, leading to transformations in the hydrological, ecological, geomorphological and socio-economic systems, **are often neglected by both rural and urban administrations**.

The importance of peri-urban areas to different people and organisations varies:

For the poor: **places where it is easier to build shelters and to occupy land for agriculture.**

- ***For industry:*** **sources of materials essential for urban life: water, brick-clays, sand and gravel, limestone, fuel-wood and timber**

- ***For the middle class*****: a potential residential zone for houses in a rural setting, with golf courses and other recreational facilities.**

- ***For local government:*** **the fringes of urban areas are often a site for locating landfills, waste dumps, peripheral freeways, airports or noisy and toxic industries.**

- ***For conservationists:*** **the site of valuable protected areas, forested hills, preserved woodlands, important wetlands or mangroves, and major coastal ecosystems.**

- ***For education and human well-being:*** **the place of the first contact urban people have with major areas of natural vegetation and biodiversity.**

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Variations and common features of Peri-Urban Problems

In Africa: problems of poverty and food production

In North America: problems of sprawl, affluence and conservation

In Asia: problems of rapid development, habitat loss and old mining and industrial areas: poverty still an issue in areas like south Asia

In Europe: problems of containing sprawl, habitat loss, conservation and old mining and industrial areas

In Latin America: both sprawl and poverty, loss of habitat and historic sites

The peri-urban land use mosaic as a "**hybrid landscape**" (part old rural, part new urban).

Two senses of "hybrid":

a) the bringing together of the natural landscape with a people-made landscape

b) combining two place-making processes in terms of i) formal urban structures e.g. streets and planned open-spaces, and ii) informal uses of land, such as squatter settlements, illegal dumping and informal recreation areas.

The hybrid peri-urban landscape has **greater diversity of land cover, human activity and biota than fully urbanized or totally rural areas**.

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Peri-Urban Areas as constantly changing zones

- The peri-urban area moves outward as the city grows
- The nineteenth century peri-urban areas are today's inner city zones
- The twentieth century peri-urban areas are today's inner suburbs

Changing Chongqing, China

2003

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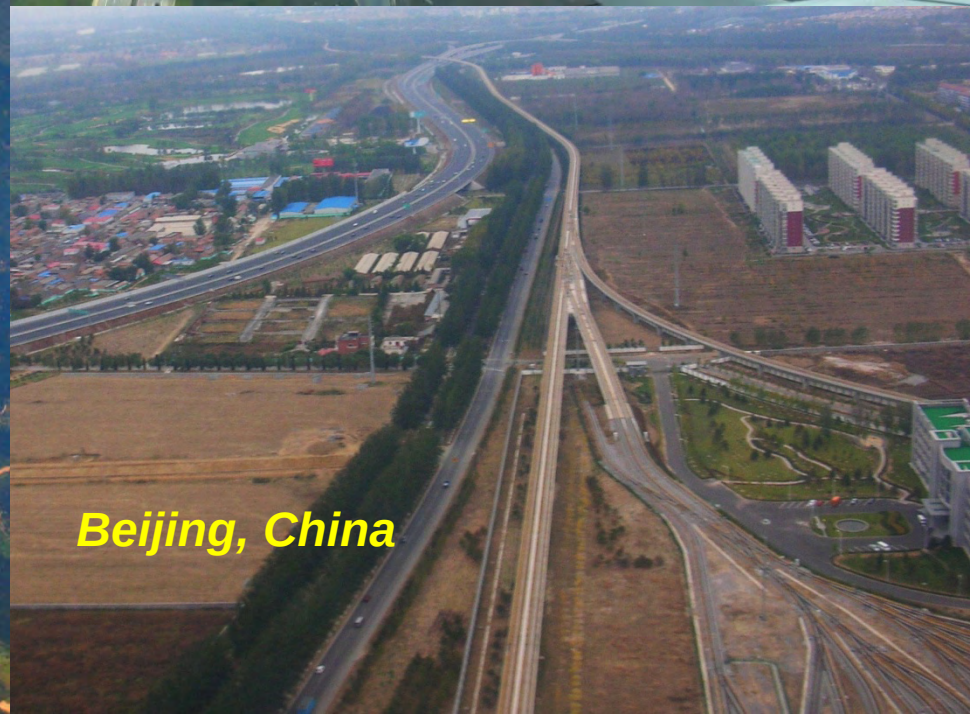
Peri-Urban Sprawl

Calgary, Canada

Kuala Lumpur, Malaysia

But where?

Istanbul, Turkey



Beijing, China

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Most cities show elements of urban sprawl

Peri-urban sprawl, Siem Reap, Cambodia

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Peri-urban golf-course, Siem Reap, Cambodia

Peri-urban sprawl, Phnom Penh, Cambodia

Development along Highway 4 south of the city

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Peri-urban issues

Waste Disposal

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Peri-urban waste dump, Phnom Penh, Cambodia

Phnom Penh Municipal Landfill

Poverty leads to peri-urban health and education issues for children working on dumps: this school in Phnom Penh was set up to help them.

Peri-urban waste recycling

Ahmedabad, India

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Peri-urban issues

Changing land uses

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Changing peri-urban land uses:

reclamation of the Normandy Landfill on the foreshore at Beirut, Lebanon, 2004

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Changing peri-urban land-uses

Brick-pit in peri-urban Beijing

New fields:

re-established in old brick-pit near Beijing

Kuala Lumpur: important peri-urban greenspaces

Peri-urban issues

Greenspace

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Benefits of peri-urban greenspace

Traffic flows and emissions

Air quality, including carbon sequestration

Microclimate, including reducing urban heat island effect

Noise attenuation

Accessibility to nature and wildlife

Economic efficiency

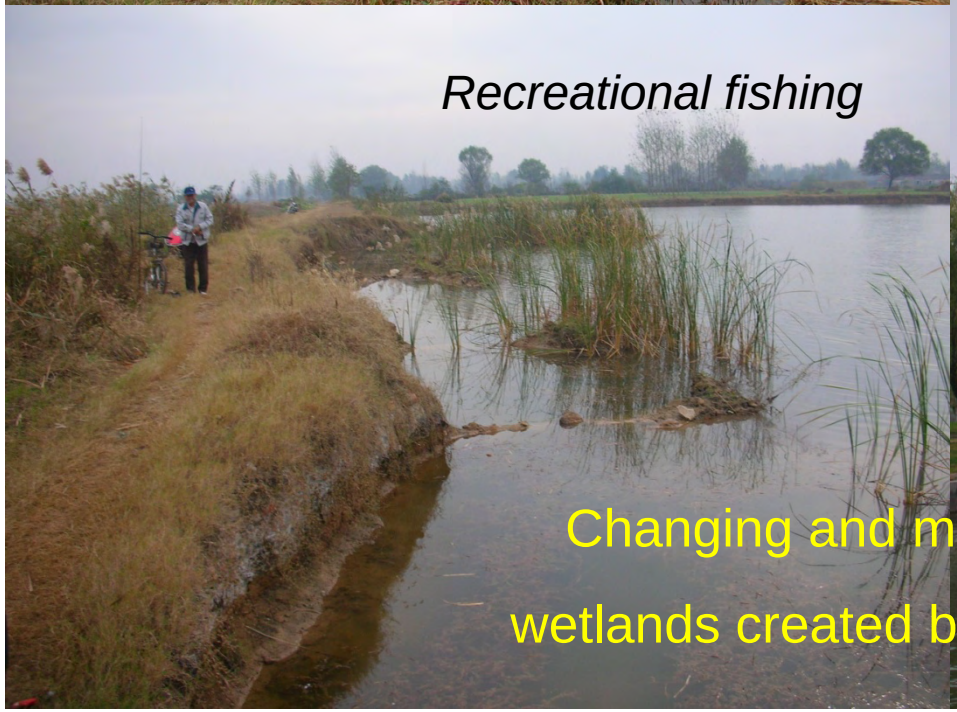
Social well-being

Mental health

Physical health

Biodiversity

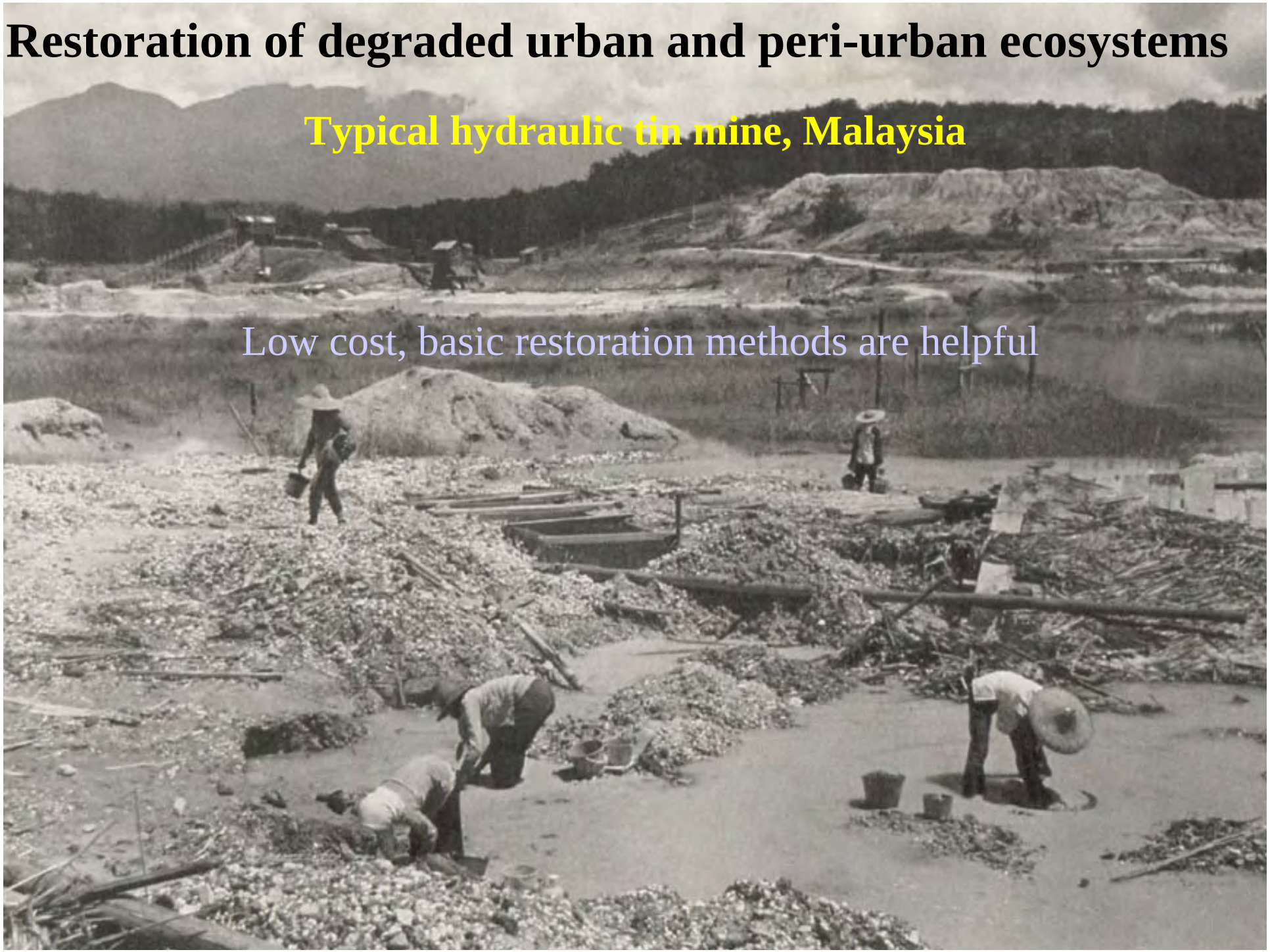
Hazard mitigation, including multi-purpose floodplains



Changing and multi-purpose peri-urban land uses:

wetlands created by mining subsidence, Huaibei, China

Restoration of degraded urban and peri-urban ecosystems




Tin mine regrowth, Malaysia

Former quarries and mines have been converted to many new uses

- Sungei Besi open pit tin mine was converted to a major tourist and recreation resort: only 20 km from Kuala Lumpur city centre
- Other alluvial tin mines have been filled, often by waste dumping and then reclaimed for housing (but a few cases of unexpected subsidence have occurred)
- Quarries are often acquired for building new industrial premises
- Adventurous new uses of quarries include the Eden biosphere project in England

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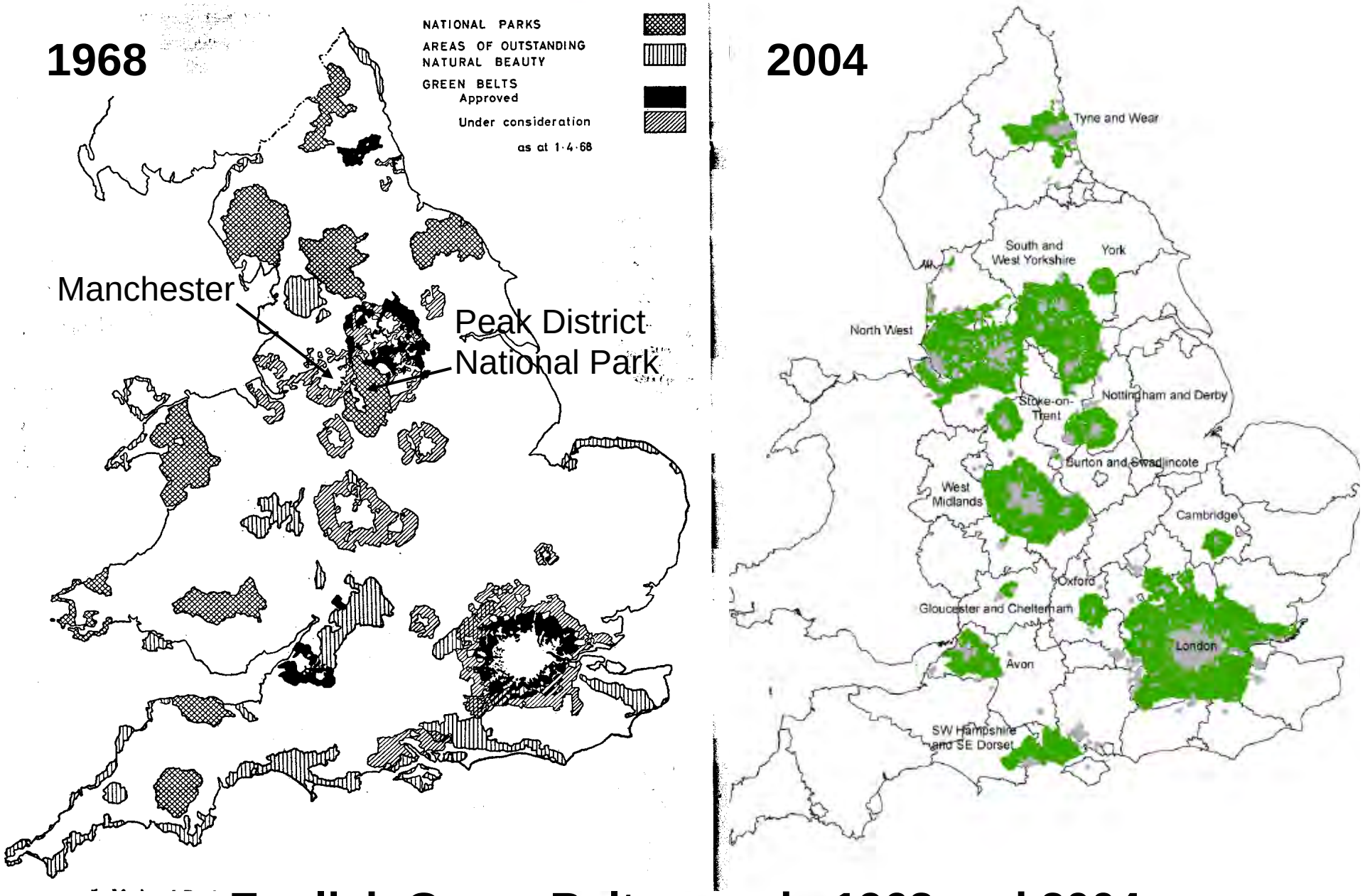
Containing urban sprawl: UK experience

One key challenge has been to stop urban sprawl through planning instruments and legislation

- In England, The Green Belts approved through structure plans now cover approximately 1,556,000 hectares, about 12 per cent of England.

- There are 14 separate English Green Belts, varying in size from 486,000 hectares around London to just 700 hectares at Burton-on-Trent.



English Green Belt areas in 1968 and 2004

Limitations to the Green Belt idea

- “The idea that a green belt should limit the growth of a town has been shown both impracticable and undesirable; a town determined to grow will simply leap over it and result in a still more undesirable and extensive sprawl” (Dudley Stamp, 1969).

- “The green belts helped to limit the physical spread of the conurbation but prompted the leap-frogging of populations and housebuilding into more distant towns and deeper countryside” (Hall et al., 1973)

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The human driving forces and constraints on environmental change in peri-urban areas have to be seen in terms of :

- formal administrative, jurisdictional and policy frameworks

- informal decision making processes at different levels from the community and village up to the state and national level.

- In addition it is necessary to understand political power in peri-urban areas and the relationship between science and the policy-making process.

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The problems of peri-urban areas may be direct:

- the installation of urban structures

- changes in land use and resource exploitation in peri-urban needs to meet urban requirements, such as the exploitation of clays, sands and gravels for building materials.

They also may be indirect:

- land becoming degraded as owners wait for urban land prices to rise,

- through disposal of wastes, atmospheric contamination of ecosystems and surface and groundwater quality deterioration.

They are also political:

- Peri-urban areas have urban problems but often are under rural local governments and planning authorities for whom the new urban issues are not a major concern

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In highly urbanised regions, cities are seen as individual entities and the green spaces between them as mere hinterlands.

In eco-city terms, the green areas are key resource units, often providing the water resources needed by the cities, the opportunities for having areas of highly productive agriculture and carefully managed recreational uses.

Integrated environmental assessment of such regions and their problems and potentials needs to be made at the global scale, to identify the full range problems and to examine most effective solutions to those problems being developed in individual countries and regions.

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Conclusions

Peri-urban areas are a crucial part of the urban scene, but they are often marginal concerns in urban management and planning.

Their rapid changes and their crucial health issues make them a key area for sound environmental management and improvement of human living conditions and ecosystem integrity.

They offer the opportunity to achieve multi-purpose benefits and to reduce urban sprawl.

Good planning can make peri-urban areas a key element in adapting to climate change.