



RUB

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RUHR-UNIVERSITÄT BOCHUM

Environmental Urban Planning (170173-SS 24) - Introduction

Dr. Blal Adem Esmail

Institute of Geography | Transformation Metropolitaner Regionen | @PlacesLab | @blal_adem

EUP - Session 1: Introduction, Overview, Skarpnäck case study

AGENDA

- Welcome and introduction
- Quick survey
- Introduction to aims and requirements of the course (syllabus)
- Brief introduction to Stockholm-Skarpnäck case study
- Some logistics of organizing group work
- Safety

OUR MISSION

Environmental Analysis and Planning in Metropolitan Regions (EAP) working group aims to advance **teaching** and **research** on **environmental analysis** and **planning** to support **just** and **sustainable transformations** for **people** and **nature** in metropolitan regions.



ABOUT YOU

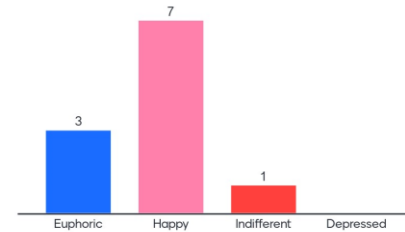
Go to www.menti.com

3 things about yourself that you would like to share with the group, e.g. 1) countries; 2) cities; 3) long-term interests (even beyond your studies)

26 responses



Learning about Environmental Urban Planning makes me feel:



<https://www.menti.com/alp4aj51tyng>

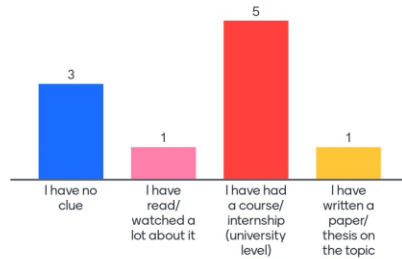
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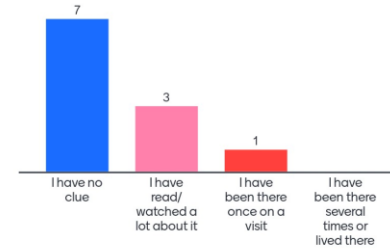
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Mentimeter

What do you already know about Environmental Urban Planning?



What do you already know about Stockholm?



<https://www.menti.com/alp4aj51tyng>

ABOUT YOU

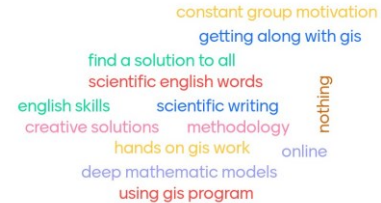
Go to www.menti.com

Please rate your interest in the following topics



What do you think might be your main challenges in successfully completing this course?

13 responses



<https://www.menti.com/alp4aj51tyng>

Aim and requirements of the course

Fakultäten / Geowissenschaften / Geographisches Institut
Environmental Urban Planning (170173-SS 2024)

Course Grades Download center Usage Statistics More

You are viewing this course currently with the role: **Teilnehmer/in**
[Returns to my normal role](#)

> **General** Collapse all

▼ **Syllabus (please check for regular updates!)**

[Environmental Urban Planning - Syllabus SS 2024](#)

> **Lectures**

▼ **Assignments**

- Session 2: Your notes (due April 14, 2024)
- Session 3: Task 1 (due April 21, 2024)
- Session 3: Task 2 (due April 21, 2024)
- Session 6** Presenting joint problem analysis in Skarpnäck (due May 12, 2024)
- Session 8: Developing visions and scenario storylines (due June 2, 2024)
- Session 9** Presenting proposed visions for Skarpnäck (due June 9, 2024)
- Session 13** Presenting proposed solutions for Skarpnäck and their impacts (due July 7, 2024)

> **Materials**

> **Forum**

▼ **Module Evaluation**

▼ **Final report**

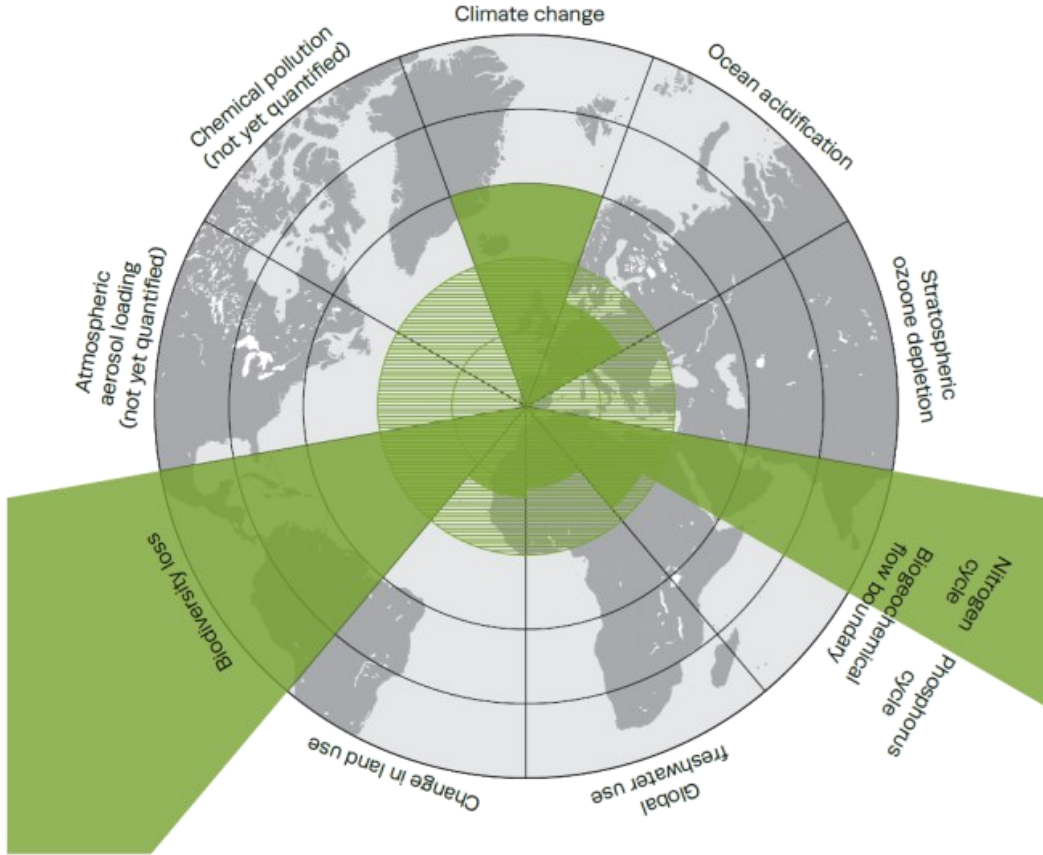
Submission (due August 22, 2024)

Syllabus

Assignments

Final Report

Relative importance of environmental challenges



nature

Vol 461/24 September 2009

FEATURE

A safe operating space for humanity

Identifying and quantifying planetary boundaries that must not be transgressed could help prevent human activities from causing unacceptable environmental change, argue **Johan Rockström** and colleagues.



SUMMARY

• New approach proposed for defining preconditions for human development
 • Crossing certain biophysical thresholds could have disastrous consequences for humanity
 • Three of nine interlinked planetary boundaries have already been overstepped



Planetary boundaries

To meet the challenge of maintaining the Holocene state, we propose a framework based on 'planetary boundaries'. These

boundaries define the safe operating space for humanity with respect to the Earth system and are associated with the planet's biophysical subsystems or processes. Although Earth's complex systems sometimes respond smoothly to changing pressures, it seems that there will prove to be the exception rather than the rule. Many subsystems of Earth react in a nonlinear, often abrupt, way, and are particularly sensitive around threshold levels of certain key variables. If these thresholds are crossed, then important subsystems, such as a meadow system, could shift into a new state, often with disastrous or potentially even disastrous consequences for humans.¹

Most of these thresholds can be defined by a critical value for one or more control variables, such as carbon dioxide concentration. Not all processes or subsystems on Earth have well defined thresholds, although human actions that undermine the resilience of such processes or subsystems — for example, land and water degradation — can increase the risk that thresholds will also be crossed in other processes, such as the climate system.

We have tried to identify the Earth system processes and associated thresholds which, if crossed, could generate unacceptable environmental change. We have found nine such processes for which we believe it is necessary to define planetary boundaries: climate change; rate of biodiversity loss (terrestrial and marine); interference with the nitrogen and phosphorus cycles; stratospheric ozone depletion; ocean acidification; global freshwater use; change in land use; chemical pollution; and atmospheric aerosol loading (see Fig. 1 and Table).

In general, planetary boundaries are values for control variables that are either a 'safe distance from thresholds' — for processes with evidence of threshold behaviour — or at dangerous levels — for processes without

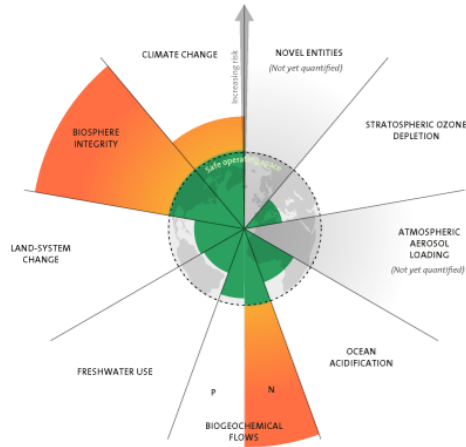
Figure 1 | Beyond the boundary. The inner green wedge represents the proposed safe operating space for nine planetary systems. The red wedges represent an estimate of the current position for each variable. The boundaries in three systems (rate of biodiversity loss, climate change and human interference with the nitrogen cycle), have already been exceeded.

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Source: Rockström et al. (2009).

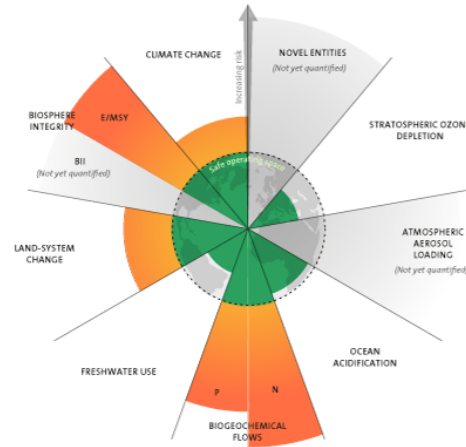
Evolution of the planetary boundaries framework

2009



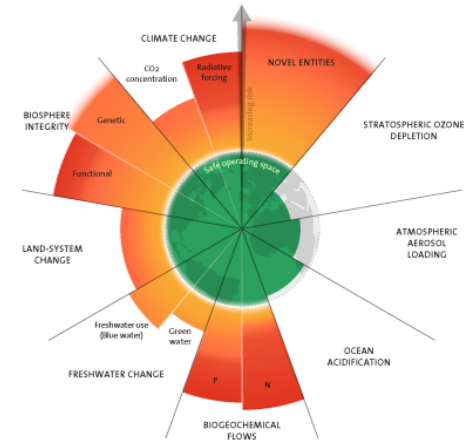
3 boundaries crossed

2015



4 boundaries crossed

2023



6 boundaries crossed

Credit: Azote for Stockholm Resilience Centre, Stockholm University, Based on Richardson et al. 2023, Steffen et al. 2015, and Rockström et al. 2009)

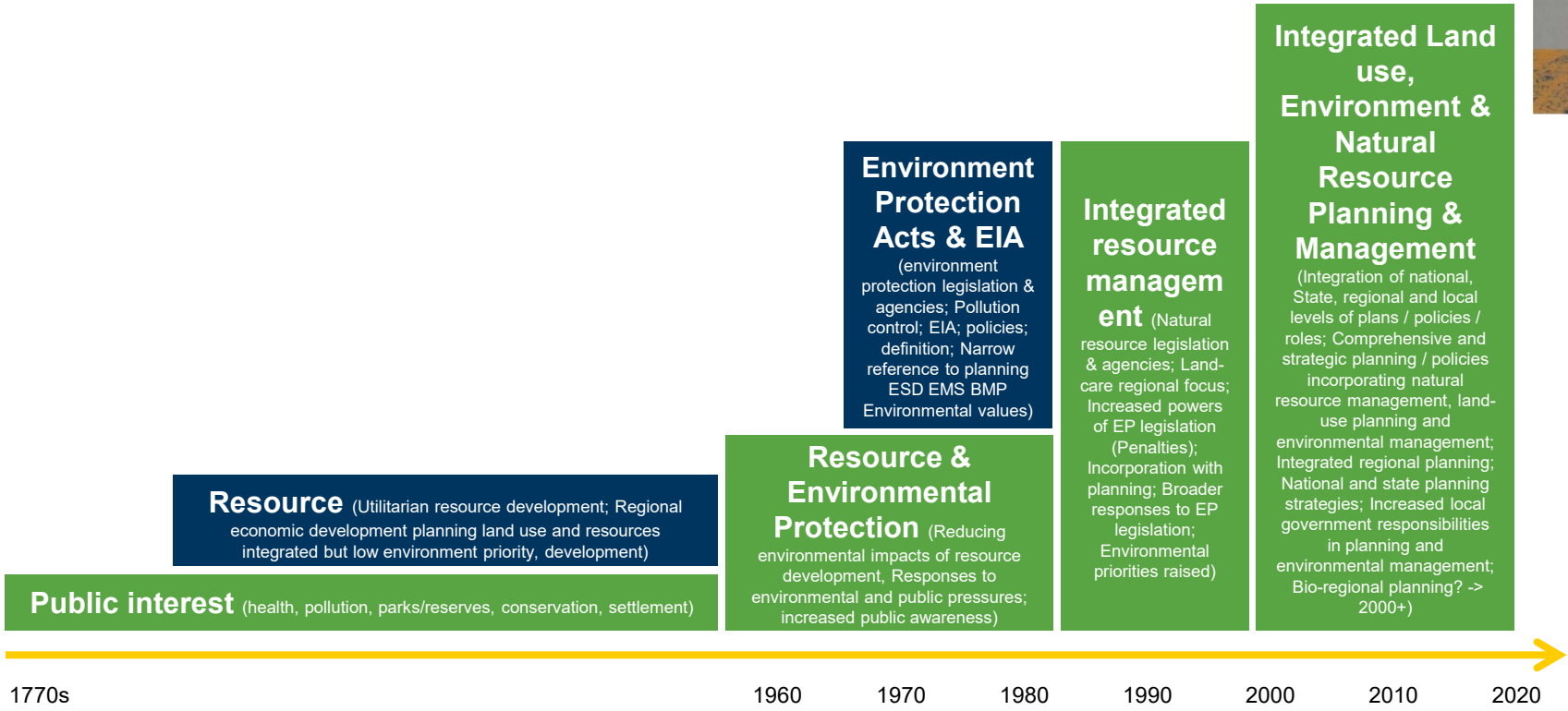
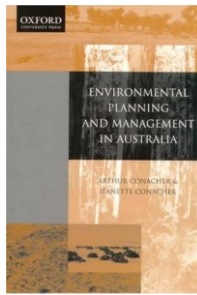
Emergence of environmental (urban) planning

Environmental planning is the process of facilitating decision-making to carry out land development with the consideration given to the natural environment, social, political, economic and governance factors and provides a holistic framework to achieve sustainable outcomes. A major goal of environmental planning is to create sustainable communities, which aim to conserve and protect undeveloped land.

Beathley, T. (1995)

Source: Beathley, T. (1995). "Planning and Sustainability: The elements of a new paradigm". J. of Planning Literature. doi:10.1177/088541229500900405.

Changes of planning focus: E.g. Australia



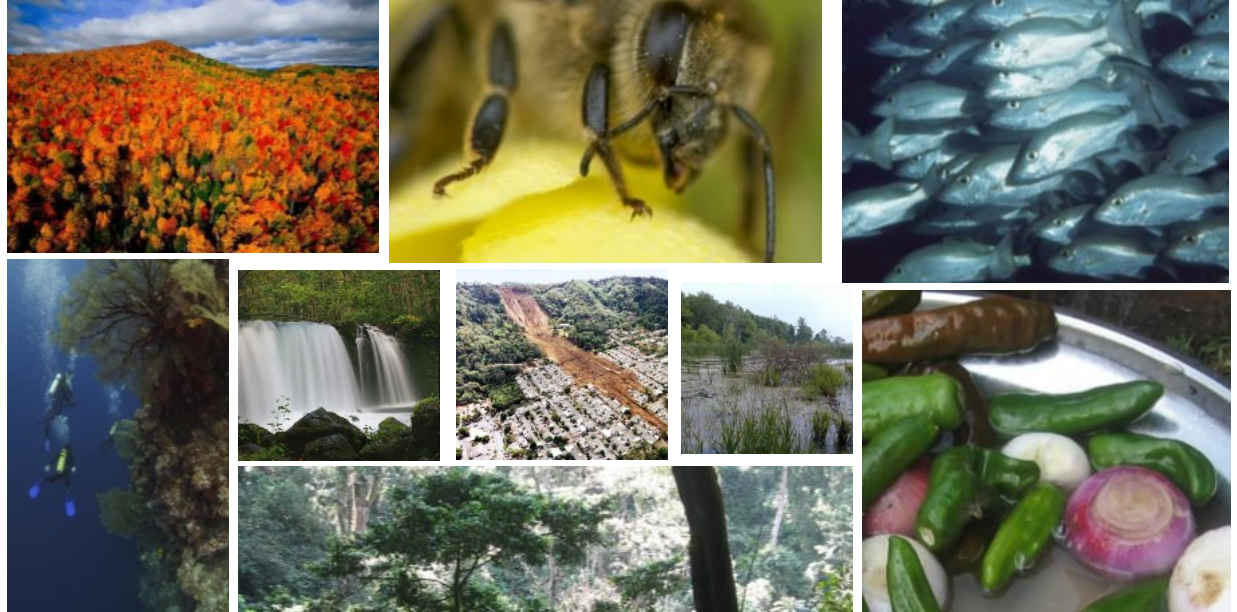
Source: Conacher and Conacher 2000; p. 89)

Ecosystem services concept

One definition:

..direct and indirect contributions of ecosystems to human well-being.

TEEB (2010)



Credit: Bernd Hansjürgens, UFZ (slide design)

Ecosystem services concept



This is the 2nd most cited article in the last 10 years in the Ecology/Environment area according to the ISI Web of Science.

NATURE | VOL 397 | 15 MAY 1997 253

article

The value of the world's ecosystem services and natural capital

Robert Costanza[†], Ralph d'Arge[‡], Rudolf de Groot[§], Stephen Farber^k, Monica Grasso[†], Bruce Hannon[¶], Karin Limburg[#], Shahid Naeem^{**}, Robert V. O'Neill^{††}, Jose Paruelo^{‡‡}, Robert G. Raskin^{§§}, Paul Sutton^{kk} & Marjan van den Belt^{¶¶}

[†] Center for Environmental and Estuarine Studies, Zoology Department, and ^{††} Institute for Ecological Economics, University of Maryland, Box 38, Solomons, Maryland 20688, USA

[‡] Economics Department (emeritus), University of Wyoming, Laramie, Wyoming 82070, USA

[§] Center for Environment and Climate Studies, Wageningen Agricultural University, PO Box 9101, 6700 HB Wageningen, The Netherlands

^k Graduate School of Public and International Affairs, University of Pittsburgh, Pittsburgh, Pennsylvania 15260, USA

[¶] Geography Department and NCSA, University of Illinois, Urbana, Illinois 61801, USA

[#] Institute of Ecosystem Studies, Millbrook, New York, USA

^{**} Department of Ecology, Evolution and Behavior, University of Minnesota, St Paul, Minnesota 55108, USA

^{††} Environmental Sciences Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37831, USA

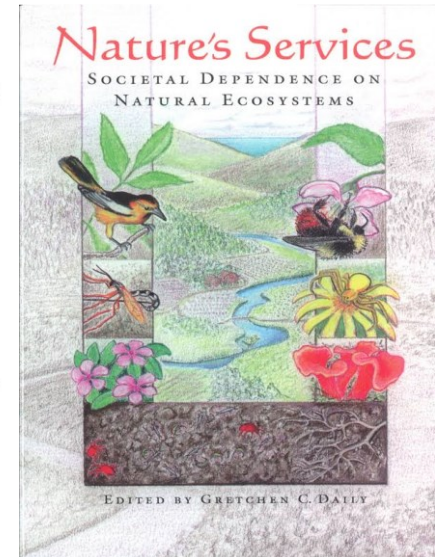
^{‡‡} Department of Ecology, Faculty of Agronomy, University of Buenos Aires, Av. San Martin 4453, 1417 Buenos Aires, Argentina

^{§§} Jet Propulsion Laboratory, Pasadena, California 91109, USA

^{kk} National Center for Geographic Information and Analysis, Department of Geography, University of California at Santa Barbara, Santa Barbara, California 93106, USA

^{¶¶} Ecological Economics Research and Applications Inc., PO Box 1589, Solomons, Maryland 20688, USA

The services of ecological systems and the natural capital stock that produce them are critical to the functioning of the Earth's life-support system. They contribute to human welfare, both directly and indirectly, and therefore represent part of the total economic value of the planet. We have estimated the current economic value of 17 ecosystem services for 16 biomes, based on published studies and a few original calculations. For the entire biosphere, the value (most of which is outside the market) is estimated to be in the range of US\$16–54 trillion (10¹²) per year, with an average of US\$33 trillion per year. Because of the nature of the uncertainties, this must be considered a minimum estimate. Global gross national product total is around US\$18 trillion per year.



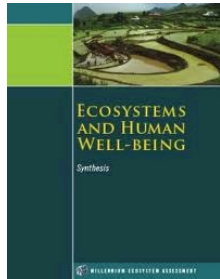
Credit: Bernd Hansjürgens, UFZ (slide design)

Increasing importance in science and policy

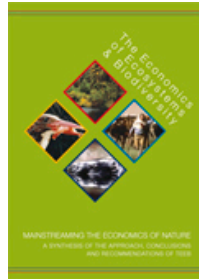
“... the benefits that people obtain from ecosystems” **MA, 2005**

“..the direct & indirect contributions of ecosystems to human well-being” **TEEB, 2010**

“Nature Contribution to People”, **IPBES, 2019**



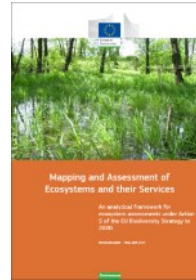
MEA



TEEB



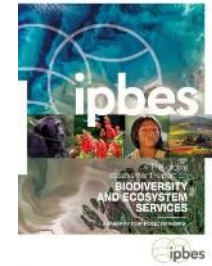
UK NEA



MAES



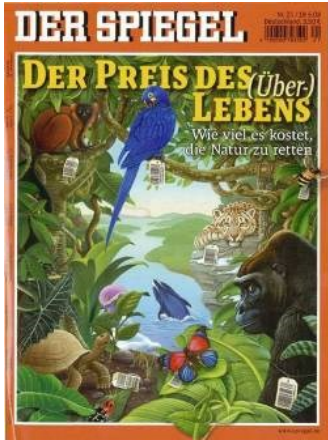
TEEB-DE



IPBES

2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020

Increasing attention in media



REUTERS SEARCHED BY **EPSON**
Print | Close this window
U.N. experts warn of economic cost of species loss

Independent.co.uk

Loss of biodiversity threatens livelihoods of world's poorest

By Emily Dugan
Friday, 30 May 2008

Economic report into biodiversity crisis reveals price of consuming the planet

TIMESONLINE

From The Times
May 30, 2008

Destroying the world's wildlife costs economy £40bn a year

Raubbau kostet Menschheit Billionen

UN-Artenschützer: Waldverlust verschlingt jährlich sechs Prozent des Bruttosozialprodukts

Ecosystem destruction costing hundreds of billions a year

The Guardian, 30.05.2008

Nature loss 'dwarfs bank crisis'

By Richard Black
Environment correspondent, BBC News website, Barcelona

SEE ALS
▶ Wildlife
09 Oct

Handelsblatt

Artensterben wird für die Wirtschaft teuer

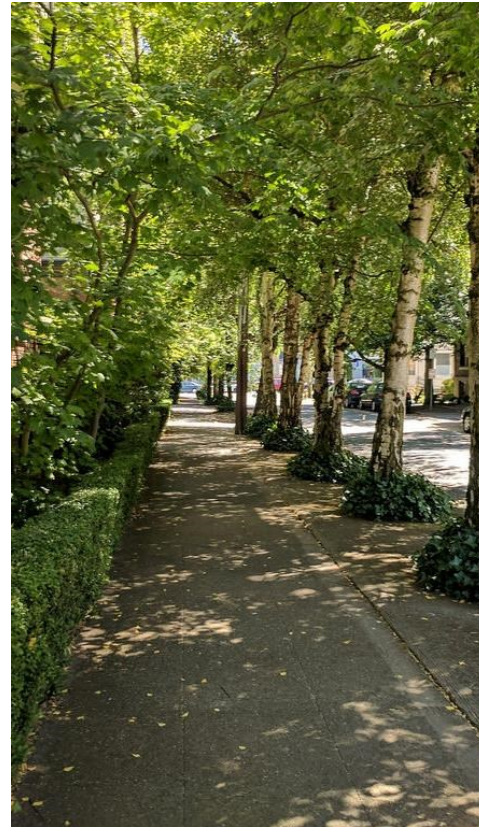
The Economic Times India, 30.05.2008

Printed from

THE ECONOMIC TIMES

Nature loss could halve living standards for the world's poor
30 May 2008 1303 hrs IST ANI

Ecosystem services & cities



Case study city: Stockholm



Travel Guide: Stockholm, Sweden

Stockholm City Plan 2018

ÖVERSIKTSPLAN FÖR STOCKHOLM

STADSUTVECKLINGSKARTA
Gränser för stadsutvecklingsområden, stadsgräns och utvecklingsområden med mer än två kvadrater. Efterfrågad planering kommer att presenteras i detaljplanens planer. Stadsutveckling ska prävas av övervakningsplanens stadsbyggnadsform samt västra kanten av vägar och utbyggnadsstrategi för vägar.

Stadsutvecklingsområde - omvandling

Område som förväntas omvandlas till bostadsutvecklingsområde med ökad bebyggelse, service, kontor, parker, kultur och skolor. Ett utvecklingsområde är grönt, blått och vitt. Området ska utvecklas till ett område som innehåller ett eller flera av de nämnda områdena.

Stadsutvecklingsområde - komplettering

Område med bostadsutvecklingsområde eller omfattande komplettering förväntas. Området kan kompletteras med bostäder, service, utrustning, kontor, parker, kultur och skolor. Ett utvecklingsområde är grönt, blått och vitt. Området ska utvecklas till ett område som innehåller ett eller flera av de nämnda områdena. Området ska kompletteras med utbyggnad av vägar och utbyggnadsstrategi för vägar.

Område där komplettering kan prävas

Område där komplettering kan prävas genom planering av bostäder, service, utrustning och vägar.

Fokusområden

Särskilt utpekade områden för investeringar och planeringsresurser ska utvecklas.

Strategiskt samband

Samband som är strategiskt viktiga för att uppnå målet om en sammanhängande stad. Kopplingen kan vara till exempel av väg eller järnväg som ett utvecklingsområde med byggbara, parker, skolor, utrustning, möbiler och utrustning. Ett strategiskt samband kompletteras utöver vad som krävs för att kopplingen ska fungera.

Urbant nät

Urbant nät är lokala vägar och trottoarstråk med samband som på ett eller flera sätt utvecklas till utvecklingsområden. Dessa kopplingar utvecklas utifrån ett utvecklingsområde och utvecklas till ett utvecklingsområde. Dessa kopplingar utvecklas utifrån ett utvecklingsområde och utvecklas till ett utvecklingsområde. Dessa kopplingar utvecklas utifrån ett utvecklingsområde och utvecklas till ett utvecklingsområde.

Framtida kommunikationer

Planerade eller beställda spår- och vägutbyggnad.

Spår eller väg i pågående förhandling.

Ny järnväg eller pendeltågstation.

Ny spår- eller vägutbyggnad.

Ny tunnelbana.

Utvecklingsområde ekologiskt samband

Område där förbrukningen förväntas i den regionala bebyggelseplaneringen utvecklas ekologiskt samband. Samtidigt kan relevanta värdnader utvecklas för att locka till utveckling.

Förslaget naturreservat

Område där utövning av naturreservatbildning pågår.

PÅGÅENDE MARK- OCH VATTENANVÄNDNING

Naturmark

Vatten

Väg

Tunnel

Spår

Järnväg eller pendeltågstation

Spår- eller vägutbyggnad

Ny järnväg eller pendeltågstation

Ny spår- eller vägutbyggnad

Ny tunnelbana

Station som ska omvärldas

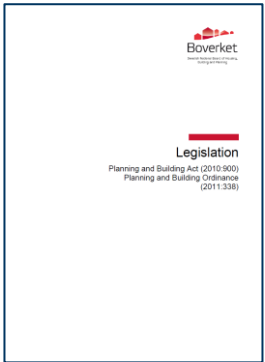
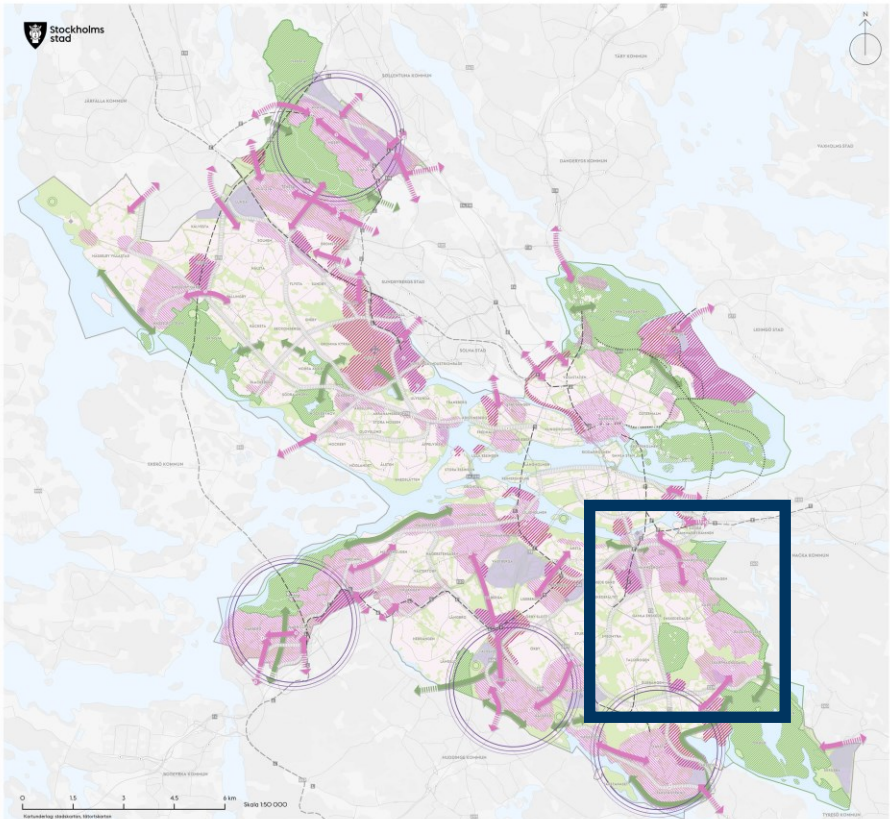
Utvecklingsområde ekologiskt samband

Förslaget naturreservat

Natur- och kulturreservat, naturreservat eller utövning

FÖRKLÄNINGAR AV ÖVERSIKTSPLANEN

Översikten för naturreservatplanen - stadsdelarna, uttagen av kommunfullmäktige 30 april 2008 och förändrad - Hovås Station. För uttagning av två stadsdelar - stadsdelarna, uttagen av kommunfullmäktige 17 september 2008 - stadsdelar som pågår eller pågår om för den två stadsdelarna. Gränserna för förklaringarna av stadsdelarna redovisas i stadsutvecklingskartan.



Moodle: Stockholm Case Study Material

STUDY AREA

Bagormossen and Skarpnäck Gard

- +18,420 new inhabitants in Skarpnäck district (from. 46,145 in 2016 to 64,574 by 2040)
- + 40,000 homes (close to the metro from Gullmarsplan to Hagsätra, Farsta Strand and Skarpnäck)
- +3 new schools, +2 sport halls, +1 swimming pool, +1 ice rink in Skarpnäck city district



Major local development opportunities (Stockholm City Plan, 2018)

- Add **homes, services, businesses**, more **public spaces** and interventions to increase safety and reassurance.
- **Skarpnäck industrial** area to be developed, with non-disruptive businesses.
- The **central green strip** between Bagormossen & Skarpnäck will be enhanced with new activities & destinations to connect the 2 areas.
- Existing **corridors and social links** both within the areas themselves and to neighboring districts need to be promoted, as does the ecological corridor between **Bagarmossenskogen** and **Skogskyrkogården**.
- The **barrier effect of the main road Tyresövägen** could be mitigated to better link Skarpnäck to Sköndal and the Flaten nature reserve.

Case Study Area: Skarpnäck, Stockholm

Skogskyrkogården

Bagarmossen

Skarpnäck Gard

Co-define
setting

Understand
challenges

Create
visions and
scenarios

Assess
potential
impacts

Hands-on Environmental Urban Planning Exercise

Sköndal

Teams formation

- Take 10 minutes to form **3 Teams of 4-5 people**
 - **Two RePIC teams?**
- Topic/perspectives will be assigned/discussed later





https://miro.com/app/board/uXjVNdC6VIQ=?share_link_id=664550361886


Discussion


- Your questions
- Assignment and deadlines


▼ Assignments

 Session 2: Your notes (due April 14, 2024)


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 Session 13**: Presenting proposed solutions for Skarpnäck and their impacts (due July 7, 2024)

- Seminar room for weekly **self-organized meeting**



Thank you!

blal.ademesmail@rub.de

Dr. Eng. Blal Adem Esmail



WORK EXPERIENCE

- **Postdoc** - *Planning NBS in Metropolitan Landscapes* (RUB, Germany)
- **Researcher** - *Sustainable urban water systems* (KTH, Sweden)
- **Postdoc** - *Mapping and assessing ES for policy-making* (UNITN, Italy)
- **Technical Manager** - *Environment, Health & Safety* (Amir, Italy)

EDUCATION

- **PhD** - *“ES for watershed management and planning”*, (UNITN, Italy)
- **Ba, MSc** - *Civil Engineering* (UNITN, Italy)

CURRENT RESEARCH

- **REP-NBS** – (re)Planning Nature-Based Solutions and Green Infrastructure for Sustainable Urban Transformations (KTH, 2021-2025)
- **MAES Eritrea** – Mapping and assessing ES for sustainable policy and decision making: a case study application in Eritrea
- **NBS4Water** – Nature-based solutions for water security in Asmara, Eritrea.

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