The Threat from Ecological Transition:
Implications for Health, Wellbeing and Resilience

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Creating a More Resilient Scotland
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Some Themes

• Change (The “principle of transition”) and its relevance to public health/resilience

• The environment in health and wellbeing

• Conceptual models as tools and their use in environmental health policy in Scotland

• Ecological transition

• The utility of “ecosystem services” in understanding and addressing public health and resilience challenges
“A core notion within public health – however defined - is the notion of change ......and the actions of those seeking to improve public health and wellbeing will vary as circumstances and conditions dictate”

Rayner & Lang (2012)
In the same way, future resilience seems likely to be built on understanding change and communicating its implications in a policy-relevant way.

Many of the changes we now may anticipate relate to the environment will and impact on health, wellbeing, equity and security.
A variety of societal level “transitions” continually interact to create the shifting foundations on which we build public health and secure the safety of our communities.

After John Dewey; Murray Gel-Mann; Rayner and Lang
When perspectives on what creates and destroys health and wellbeing change, so too does understanding of the contribution of the environment.
THE CLASSICAL ENVIRONMENT: HEALTH INTERFACE

“Narrow, Compartmentalised, Hazard Focussed”

(Morris et al, 2006)
Wellbeing

Social Complexity

Environmental Health Inequalities

Environmental Justice

Health Nurturing Environments

A Psychosocial Dimension

Physiology of Deprivation

Stress Biology

HAZARD

EXPOSURE

DIMINISHED HEALTH

A lot has been going on!
Scotland has been unique in formally recognising this level of complexity in its policy approach on environment and human health.
A key part of GPBH was to frame Environment and Health Issues in a more Policy-Relevant Way

Hazardous Environment State or Environmental “Good”

Exposure or Experience

Modified Health and Wellbeing
Drivers

Pressures

State of the Environment

Exposure or Experience

Human Health And Wellbeing
The modified DPSEEA Model

(Morris et al, 2006)

Drivers

Pressures

State of the Environment

Exposure or Experience

Human Health And Wellbeing

POLICY and ACTION

Social, economic & environmental etc. context
Essentially, all models are wrong, but some are useful

George Edward Pelham Box FRS
(1919 – 2013)
Superimposed on the complexity created by these transitions we must now contend with ecological transition.
Planetary Boundaries 2.0
(Steffan et al, 2015)

1. *Climate Change
2. *Change in Biosphere Integrity
3. Stratospheric Ozone Depletion
4. Ocean Acidification
5. Biogeochemical Flows (P & N Cycles)
6. Land-System Change (e.g. deforestation)
7. Freshwater Use
8. Atmospheric Aerosol Loading
9. Introduction of Novel Entities

* Denotes a “core boundary”, Significant alteration would drive the Earth System into a new state.

n.b. This work is an enhancement of the iconic 2009 paper by Rockstrom et al.
THE IMPLICATIONS ARE SIGNIFICANT

• Society can no longer hope to deliver health, wellbeing, health care (and equity in these things) without returning to an “environmental conceptualisation” of public health

• We will face unprecedented challenge to our resilience

• From now on, we must build public health and wellbeing on ecological principles

PEOPLE ARE USING THE TERM

“ECOLOGICAL PUBLIC HEALTH” to describe the required response
THE DYNAMICS OF ECOLOGICAL PUBLIC HEALTH:
A SIMPLE MODEL

HUMAN HEALTH

ECOSYSTEM HEALTH

Rayner and Lang (2012)
http://www.routledge.com/books/details/9781844078325/
The Rockefeller Foundation-Lancet Commission on Planetary Health recently concluded that 3 types of failure must be addressed to maintain and enhance human health in the face of increasingly harmful environmental trends.

- Conceptual and Empathy Failures
- Knowledge Failures
- Governance Challenges
In responding we must:

• reconnect Social and Ecological systems

• integrate Health Impact Assessment and Environmental Impact Assessment

• embrace a Distal Dimension to the relationship between environmental change and human wellbeing
Environmental pathways from human activities to health and wellbeing can be “distal”, usually, for one or more of 3 reasons

• They may be “temporally distal” - because the true extent and gravity of their impacts on health and wellbeing will be felt only with time,

• They may be “spatially distal” - because they relate to those environmental impacts which are happening, or predicted to happen, elsewhere. perhaps after decades or even generations.

• They may be “extremely complicated” - involving an unfamiliar interplay of societal, economic and physical factors which modifies and amplifies risk.

Conceptually, there are **2 Pathways** from human-driven Environmental Change to Human Health and Wellbeing.
HEALTH AND COMMUNITY RESILIENCE IN AN ECOLOGICAL ERA

- Evidence
- Ethics
- Issue Framing
- Infrastructure
- Governance
Why are Ecosystem Services a Useful Concept in Public Health and for Community Protection?

• ES link social and ecological systems

• They have potential to integrate EIA and HIA

• ES are intuitive for most people and the concept is readily communicated
Ecosystem Services are the Benefits Humans get from their Environment

PROVISIONING
- Food
- Freshwater
- Fuel
- Wood
- Fibre etc.

SUPPORTING
- Nutrient Cycling
- Soil Formation
- Primary Production

REGULATING
- Climate Reg.
- Flood Reg.
- Water Purif.

CULTURAL
- Aesthetic
- Spiritual
- Educational
- Cultural

HUMAN
WELLBEING

Millennium Ecosystem Assessment 2005
Ecosystem Services

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Specifically through....

HUMAN SECURITY
- Personal Safety
- Secure Resources etc.
- Security from Disasters

MATERIAL MINIMA
- Adequate Livelihoods
- Shelter etc.
- Fuel, Food, Fibre etc.

SOCIAL RELATIONS
- Social Cohesion
- Mutual Respect
- Ability to Help others

FREEDOM OF CHOICE
- Opportunity to achieve what an individual values doing and being

HEALTH
- Strength
- Feeling Well
- Access to Clean Air, Water, etc

Millennium Ecosystem Assessment 2005
The modified DPSEEA Model

Drivers

Pressures

State of the Environment

Exposure or Experience

Human Health And Wellbeing

POLICY and ACTION

(Morris et al, 2006)
DRIVERS TO HEALTH EFFECT VIA AN ECOSYSTEM SERVICES ROUTE

ECOSYSTEMS ENRICHED DPSEEA
(Reis, S. Morris, G et al, 2013 in press)

POLICY and ACTION

Drivers

Pressures

Supporting

Ecosystem Services

Cultural

Regulating

Provisioning

Experience

Material Minima

Freedom of Choice

Social Relations

Security

Human Health And Wellbeing

Social, economic & environmental etc. context
An Entangled Bank