



REAL SUSTAINABILITY & THE NATURAL STEP FRAMEWORK

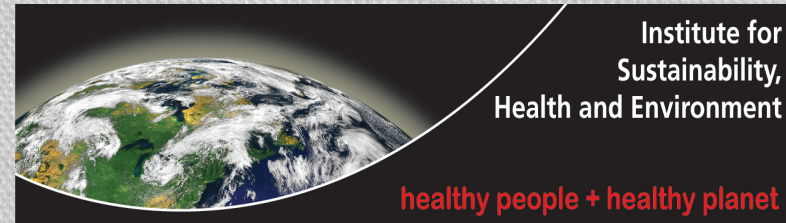
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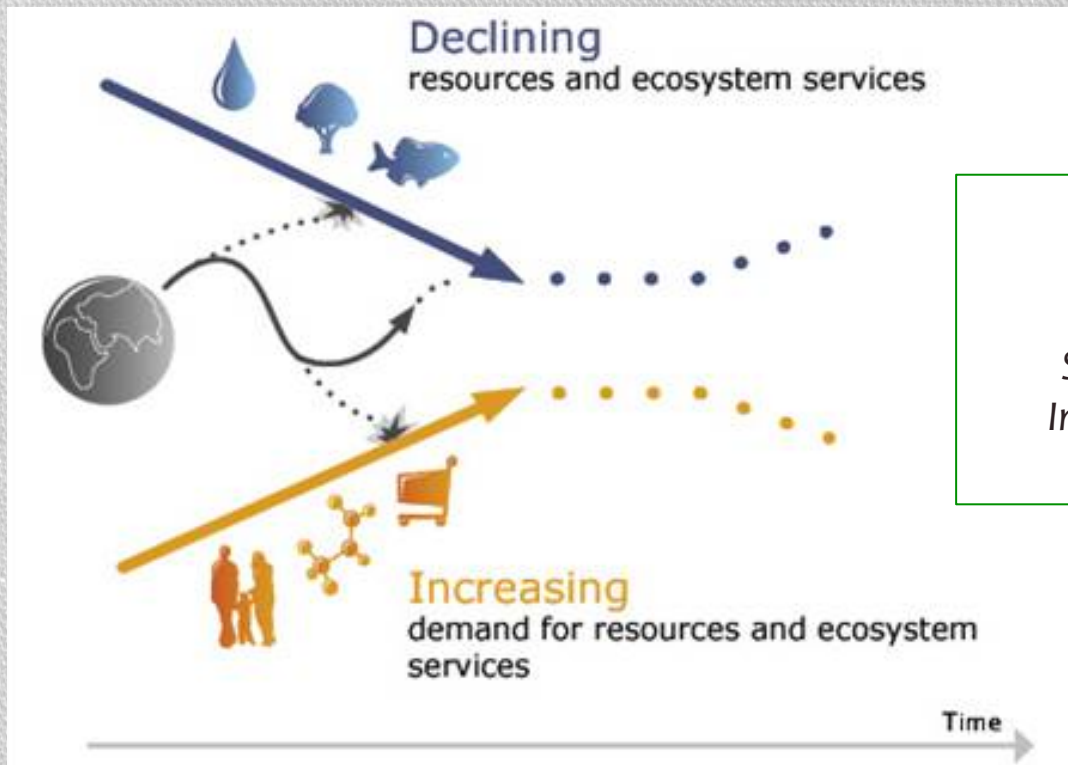
Who am I?!

- Consultant (public and private sector)
- Teacher (university)
- Specialist: biological solutions

- Experience: UK, Asia, ..., Portugal



Why bother?



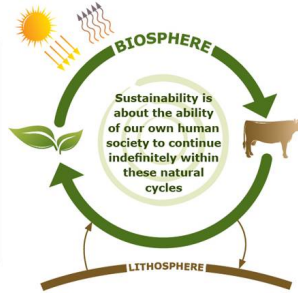
TNS aims for:
REAL sustainability
NOT:
Spurious unsustainability
Incremental improvement
Inevitable disaster!



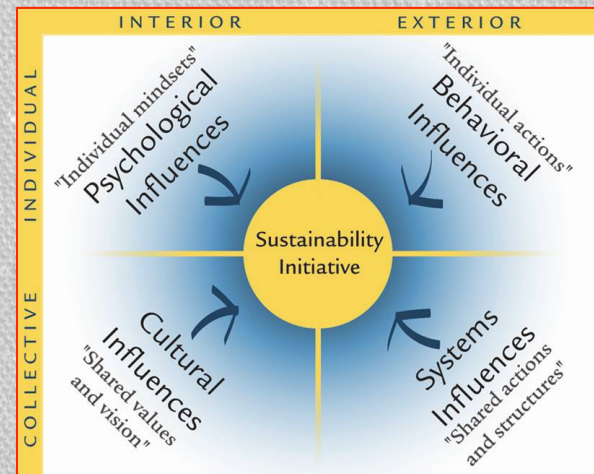
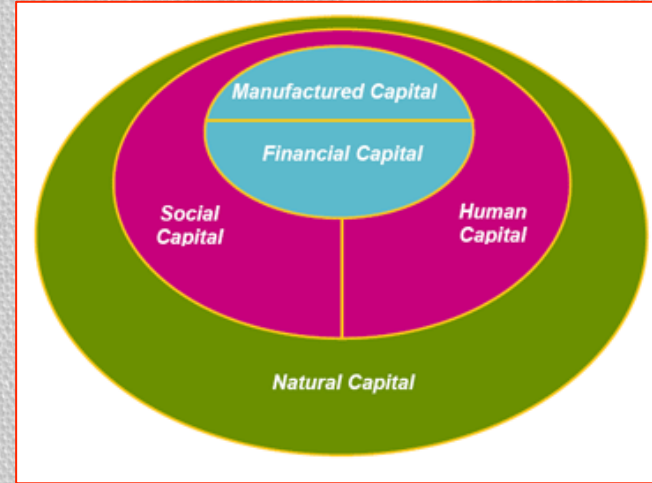
Frameworks

Defining sustainability (1): TNS system conditions

- In a sustainable society, nature is not subject to systematically increasing...
-  ...concentrations of substances extracted from the Earth's crust,
 -  ...concentrations of substances produced by society,
 -  ...degradation by physical means,
- and, in that society...
-  ...people are not subject to conditions that systematically undermine their capacity to meet their needs.



An entity is considered sustainable if it does not contravene any of the System Conditions. But the devil is in the detail!



The Natural Step Framework

- Robust definition
- Process for strategic planning / innovation
Scientific and systems thinking

In a sustainable society, nature is not subject to systematically increasing...



...concentrations of substances extracted from the Earth's crust,



...concentrations of substances produced by society,



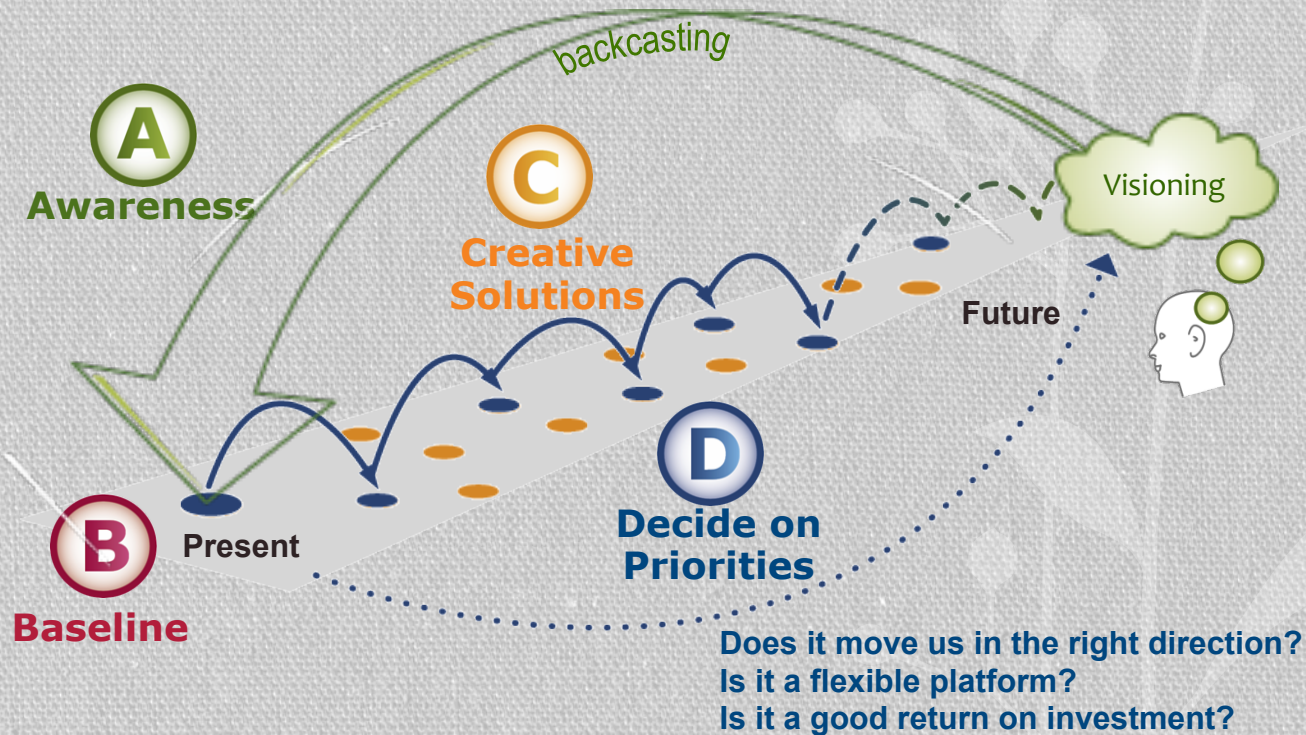
...degradation by physical means,

and, in that society...



...people are not subject to conditions that systematically undermine their capacity to meet their needs.

Easy as ABCD



What can you use it for?

- **Products**

- Carpets, trainers, light-bulbs, paint...

- **Complex systems: supply chains, companies, sectors...**

- PVC, Ikea, McDonalds Sweden, InterfaceFLOR, agricultural suppliers, many more!

- **Places!**

TNS eco-municipalities: e.g. Sweden, Canada (e.g. Whistler), etc

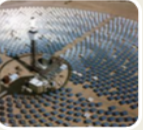







- **Services**

- Hotels, ESCOs, switching from mining to recycling, transport...


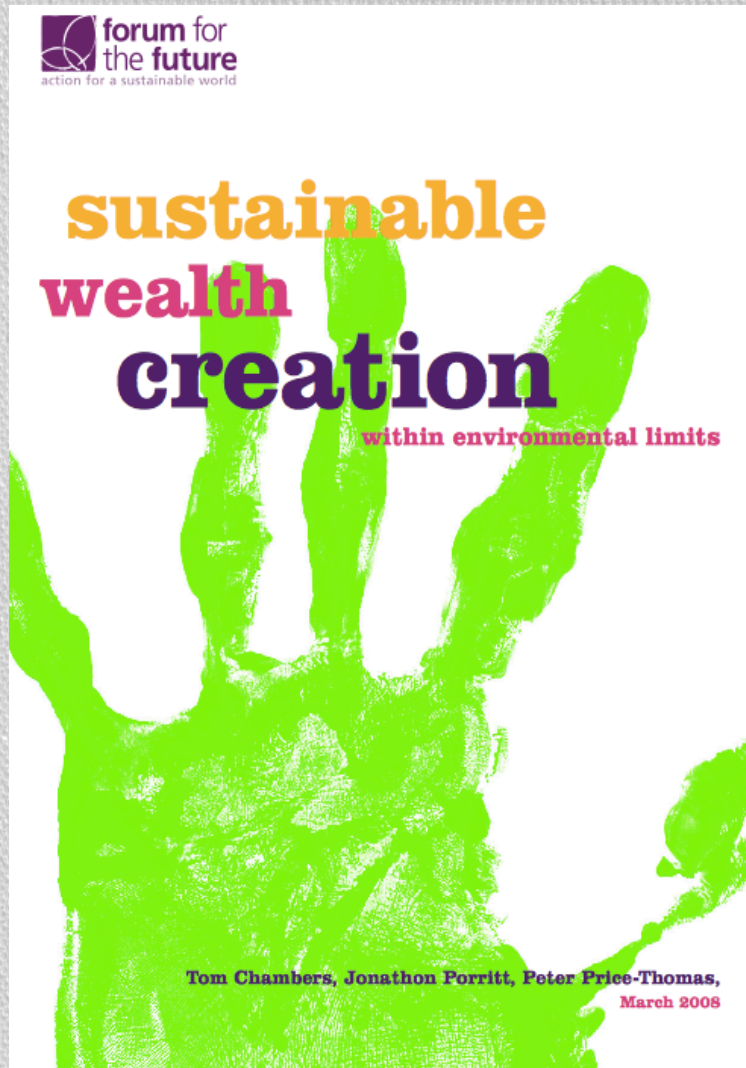
- **Lifestyles**

- TNS guides to green lifestyles

*TNS is
inclusive –
helps us make
the best use of
any other
available tool*

	B. 'Business as Usual'	Bi. 'Environmental management' Monitoring & quick wins	Bii. 'Industry Good Practice' High efficiency	Biii. 'Industry Best Practice' Carbon neutral ground ops	Biv. 'Pioneering' Carbon neutral ground & flight	C. 'Sustainable Success' Zero emissions and fully effective
 <p>Climate Change, Energy & Aviation</p>	<p>Kerosene flights Fossil fuel ground operations. No consideration of climate change adaptation, nor energy security / peak oil.</p>	<p>Monitoring and reporting of emissions. Some quick-win initiatives.</p> <p>[ACA 'mapping' and 'reduction' levels]</p>	<p>High fuel efficiency but not yet neutral. Completion of quick-wins. Egs of innovative practice (e.g. renewable power generation)</p> <p>[ACA 'Optimisation' level]</p>	<p>Carbon neutral ground operations via portfolio of efficiency, renewables & accredited offsetting. Efficient flying: integrated air traffic control, bio-fuel mix, plane & runway design, towing aircraft [ACA 'Neutrality' level]</p>	<p>Carbon neutrality of ground & flights via efficiency, renewables & offsetting. Planning for climate change adaptation & energy security (with off-site outreach). Helping cut C emissions in wider area.</p>	<p>Zero/benign emissions from ground & flights through renewables mix (e.g. biofuels, solar, wind, water, wind). No need for offsetting. Moving towards carbon negative through net sequestration. Wider Aerotropolis region is low carbon.</p>
 <p>Planning and Built Environment</p>	<p>Designed and built for short-term low cost without consideration of sustainability criteria or interlinkages between usage zones.</p>	<p>Some sustainable features, possibly whole buildings (efficiency, low embodied C, turf-roofs, micro-generation, non-toxic, userfriendly, etc).</p>	<p>Widespread 'green' buildings. Planning procedures encourage tenants to contribute to sustainability. Examples of industrial symbiosis (waste as input).</p>	<p>Components intelligently located (eg less need for transport). Systematic industrial symbiosis. Onsite solutions to energy, materials & waste.</p>	<p>Designed around site energy flows, achieving efficiencies, passive cooling/heat, aesthetics, ecosystem services etc. Design allows for organic evolution.</p>	<p>Exemplary design for people & nature. Use of site energies (wind, solar, water, biomass) and assets (aesthetics, heritage). Infrastructure in place for future developers to start from.</p>
 <p>Water</p>	<p>Over-extraction from rivers and aquifers. Flow obstructions and alterations. Polluted rivers</p>	<p>Some water use reduction measures. Some water harvesting for grey-water uses. Conventional treatment facilities, possibly wetland attenuation.</p>	<p>Comprehensive water efficiency measures and harvesting for grey water usage. SUDS & pollution control.</p>	<p>On-site water purification - re-used, diverted to plant growth (e.g. biofuels, food) or released to natural cycles.</p>	<p>Water neutral. No net depletion of aquifers. Natural hydrology intact (flow rates, evaporation, etc). Outreach projects for net neutrality and community wellbeing.</p>	<p>Water +ve. No depletion of any aquifers. Closed loop system, site-wide harvesting, zero pollution, natural water flow patterns maintained, 100% community access to clean water & sanitation.</p>
 <p>Land & Ecology</p>	<p>Greenfield seen as low value. Damage to ecosystems & land. Limited green landscaping. Compliance driven. Clearing birds.</p>	<p>Some green landscaping (mainly aesthetic). Green bird management.</p>	<p>Landscaping for biological solutions, e.g. Cooling trees, sewage rebeds, wetland attenuation, etc). Onsite biodiversity provision. Local organic food.</p>	<p>Offsite projects on ecological restoration / sustainable land use.</p>	<p>Biosphere neutral via offsetting localised (farm & eco) damage with off-site restoration (e.g. reforestation, soils, decontamination).</p>	<p>Biosphere +ve increase in ecological services-farming area & quality through on & offsite projects. On + off-site carbon sequestration. Provision of biosphere resources (e.g. food & timber).</p>
 <p>Ground transport</p>	<p>Depends on cars and HGV freight. Poor public transport (unsafe, dirty, slow, unreliable). Legacy of apartheid spatial separation & different levels of service.</p>	<p>Demand management (parking pricing, etc), car pool, transport plan, efficient lay-out of parking, etc. Promoting walking and cycling.</p>	<p>Majority of access by efficient public transport (rail and bus). Provision of greener car fuels (eg LPG, electricity, biodiesel). Low emission freight strategies.</p>	<p>Offsetting residual emissions (see Energy). Provision of some zero carbon public transport. Rail connection enhances national network/routes.</p>	<p>Provision of innovative transport modes.</p>	<p>Zero/benign emissions transport. Predominantly public transport (safe, clean, reliable, efficient, cheap & accessible to all, benefitting local/regional transport).</p>
 <p>Community</p>	<p>Legal compliance (e.g. health & safety). Airport lacks sense of place. Operates in isolation from nearby areas of deprivation re: health, nutrition, education, livelihoods, well-being.</p>	<p>Some HR benefits for employees. Aims to provide local economic benefits (possibly with emphasis on PR from small initiatives). Community Strategy.</p>	<p>Aerotropolis design informed by consultation (lifestyles & needs). Diversity of positive livelihood outcomes - not solely low value jobs.</p>	<p>Inspired by local culture & traditions, integrates with existing communities. High wellbeing, liveability, sense of place (staff, clients, residents).</p>	<p>Outreach projects tackling problems in nearby communities (e.g. climate adaptation, sanitation, nutrition, healthcare, energy, indoor air, etc).</p>	<p>Positive links & continuous projects beyond the fence. Sense of place & community. Strong social capital (not undermined by disparities in wealth and living standards).</p>
 <p>Procurement</p>	<p>Priority given to lowest cost & compliance (e.g. BBBEE). Possibly ad-hoc fair trade or green buying (i.e. not yet integrated as Sust. Procurement (SP)).</p>	<p>Basic (SP) training. SP Policy & objectives. Some quick wins (e.g. recycled paper, efficient lighting, local produce, etc).</p>	<p>Central & professional SP team. Spend analysis + sustainability impacts prioritised. Beyond quick wins. Supplier engagement (incl. small local suppliers).</p>	<p>Sustainable specs, then competing on cost. Whole Life Costing. High performance (e.g. energy, materials, food, waste). Monitoring of supplier performance.</p>	<p>Life-cycle impact assessment (LCA) on priorities. Exemplary performance (e.g. clean energy, recyclables, local produce, waste mgt, etc).</p>	<p>Helping influence markets to innovate on sustainability. Stimulating new local livelihoods (in addition to supporting existing ones). Integral to delivering other sustainability themes.</p>
 <p>Waste Management</p>	<p>Vast majority of waste to landfill or incineration without energy recovery. Saving at landfills. No practice of 3R's (Reduce, Re-use, Recovery / Recycle).</p>	<p>Some measures from 3R's with emphasis on recycling efforts of easy materials (e.g. paper, glass).</p>	<p>Thorough application of 3R's. Return of biological nutrients to appropriate ecological cycles (e.g. composting).</p>	<p>Extensive waste recovery with spin-off industry. Full utilisation of green waste (biogas, compost).</p>	<p>Waste flows of solids, liquids & gases are minimised and benign. Full separation of bio. & technical nutrients and re-use where possible (including offsite).</p>	<p>Zero end disposal and mainly onsite/ local recovery. 100% recycling. Near closed-loop cycles of technical nutrients; minimal down-cycling. Closed loop bio nutrients & capture of bio-gas for energy.</p>

More info



GREEN BLUE WORLD HOME ABOUT OUTER LANDSCAPE INNER LANDSCAPE PROJECTS FREELANCING
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Abundant landscapes for people and nature

April 26, 2014

Ben and Philo's water retention landscape, North Portugal (2014)

Benjamim and Philo Fontes have been doing a great job repairing the land on their small farm in Santa Maria da Feira, north Portugal. Thanks to planting a diversity of trees and allowing others to grow naturally, the land is already recovering from the barren state it was in prior to Ben and Philo taking it on. They have bigger dreams, though! The site is blessed with two all-year water inputs (a stream, and a spring emerging in a broken water tank), and one winter only input (a stream occasionally contaminated by a neighbour's herbicides). We designed a water system for this small quinta to ensure these water inputs do not cause erosion damage but instead provide constant hydration for Benjamim's vegetables and Philo's fruit trees. The design includes the establishment of a permanent water course and development of valuable riparian habitat; distribution of water by swales running off water retention spaces (controllable with swivel pipes); a drip irrigation system; a chicken/crop rotation system with swales; and new yields from ducks/geese, cranberry, vaccinium species, fish, firewood (willow, alder), extended fruit and nut trees, and marsh ledges for rice! The potentially contaminated stream input is treated by a swale planted with wetland plants, and kept separate from the tank which is to be restored and converted into a fish pond (and source of irrigation water).

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- [Portugal - Mountain farm \(2014\)](#)
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