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Environmental Sustainability

Environmental strategies, policies and measures for a healthy ecosystem

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For many years the oil and gas industry has undertaken environmental impact assessment wherever it has been operating around the world. Such assessments, have usually incorporated social aspects and, depending on a country's particular regulatory context, also embraced health, and sometimes security, into the assessment. In what seems an increasingly complex world, with heavy pressure on all natural and mineral resources, a "healthy ecosystem" is now seen as crucial to the future of humanity, not simply a matter of ecological compliance. In addition, overlying the usual impacts on ecology, from oil and gas development, it is imperative to consider climate change as a pervasive additional challenge. This presentation will reflect on what strategies, policies and measures will be needed in order to deliver a "healthy ecosystem" that is able to provide benefits and resource security into the future.

Introduction

1. The title of this presentation is: *Environmental Sustainability~ environmental strategies, policies and measures for a healthy ecosystem*. It is a clear topic, it is understandable, it is conventional, and if one Googles this topic one has access to more than 100 million documents after just a fraction of a second.
2. What can possibly be said that is new? It is this. There is a need to review critically the nature of sustainability, and then design appropriate strategies, policies and measures accordingly.
3. For far too long, "sustainability" has been made far too complicated and somewhat esoteric. Sadly, the original definition is elusive. The ability of future generations to meet their own needs has been compromised for decades.
4. To be fair, the problem that now exists was probably not foreseen nearly forty years ago when the classic definition was elaborated. Back then, it was within the context of international-donor jargon where *development* really referred (and still does mostly) to human development, particularly as it relates to poorer countries. Yet, in many instances, "development" now seems to be synonymous with "infrastructure development".
5. The Club of Rome's *The Limits to Growth*¹ in 1972 recognised that the life-sustaining role of the Earth could not withstand open-ended consumption of natural resources, and that poorer countries had a right to catch up. This inter-connected challenge was later encapsulated in the 1987 *Our Common Future*² produced by the World Commission on Environment and Development. Political action followed with the UN Conference on Environment and Development which brought world leaders together in Rio de Janeiro in 1992. Popularly known as the "Earth Summit", the conference approved Agenda 21, an action programme for sustainable development in the 21st century. A further twenty years on there has been another Rio Summit calling for sustainable development goals.
6. So far so good...?

The Nature of Sustainability

7. Sustainable development is normally assessed by reference to its "three pillars" - economic growth, human development and environmental protection, at local, national, regional or global levels. In practice, though, the emphasis has been on economic growth, with due regard to natural resources (environment) only where it does not compromise the overall goal of human development.
8. The Millennium Development Goals offered a quantifiable basis for post-1992 assessment of human development. There has been significant poverty reduction in South America and Southeast Asia. The

¹ <http://www.clubofrome.org/?p=326>

² <http://www.un-documents.net/wced-ocf.htm>

threat of HIV and AIDS has been brought under control and the incidence of malaria has been greatly reduced. The dream of a basic level of education for all is within reach. That is good news...

9. The situation is not so good in Sub-Saharan Africa and South Asia where hunger, malnutrition and extreme poverty continue to inflict hardship on approximately one billion people. Over 500 million small farmers remain too poor to deliver the environmental services for which they are well qualified – soil conservation, maintenance of the water cycle and protection of forests and natural habitat.
10. Industrialised countries have taken great strides towards the environmental exhortations of Agenda 21. Swathes of national legislation are in place, cleaning up the combustion of fossil fuels in power generation, the use of chemicals in industrial production and the quality of air and fresh water. Yet many scientists regard the rate of loss of global biodiversity as comparable to the mass extinctions of geological time. They also warn that commercial fishing may be redundant by 2050.
11. In reality, there been relatively little sustainable development since the first Rio Summit. (Human) development has mostly been at the expense of the natural resource base. Consequently, there is much crisis language now, partly as an antidote to the indifference of those who govern. The buzz words are now; food, water, energy and resource scarcity and security.
12. Back in 2009, the Stockholm Resilience Centre had already suggested³ that three out of nine environmental boundaries critical to a self-rejuvenating planet had been breached. More recently, in 2013, ten scientists proposed a new architecture for sustainable development and published this in *Nature*; *Policy: Sustainable development goals for people and planet*.⁴
13. This requirement for change seems to reflect the degree of abuse, rather than rejection, of sustainability. So it is not surprising that *Towards a Green Economy* (UNEP, 2011)⁵ concluded that: “*over the last quarter of a century, the world economy has quadrupled....in contrast 60% of the world’s major ecosystem goods and services that underpin livelihoods have been degraded or used unsustainably.*”
14. Economic and electoral imperatives in Europe and the US have downgraded such concerns. The experience of successive UN climate change negotiations suggests that the political elites are now content to shelve even the most apocalyptic scientific research.

Designing Environmental Strategies, Policies and Measures for a Healthy Ecosystem

15. So, firstly, we need a relatively simple test of what is “*sustainable*”. The test has to be capable of application in almost any context, by almost anyone. It cannot require a PhD in rocket science yet it must have a sound scientific and technical basis and, above all, it must be understandable.
16. Until we begin to explore and obtain resources from outside this planet, it should be considered that our resources are whatever can be found or renewed on this planet. This brings us very quickly to the concept of a planetary limit, beyond which we cannot go.
17. At this stage it is probably useful to establish what we mean by resources:
 - Soil
 - Water
 - Air
 - Space
 - Energy
 - Food
 - Minerals
 - Biodiversity
18. These resources confer fundamental benefits on humanity (space to live, materials to build shelter, food to eat, water to drink, materials to trade and so on) and there is a critical level at which any given resource can no longer be replenished or maintain a beneficial use ~ a planetary limit. Put simply, sustainability is about staying within such limits. Of course, conceptually this involves setting a maximum of consumption that is acceptable or finding alternatives. Whilst there is some debate about the effect of drawing down on these resources and the ability of these resources to respond, the outcome is that sustainability is about resource-limitation, whilst recognising that the seductive concept of resource efficiency may simply translate into greater consumption.

³ http://www.stockholmresilience.org/download/18_408d96d2127f20319c180007627/src-annualreport-2009.pdf

⁴ <http://www.nature.com/nature/journal/v495/n7441/full/495305a.html>

⁵ http://www.unep.org/greeneconomy/Portals/88/documents/ger/GER_synthesis_en.pdf

19. There is a basic presumption that matters should not be made worse by strategies, policies or measures. So, we need to ask will any resources be adversely affected (depletion of a finite resource or exceedance of the regeneration rate of a renewable resource).
20. To be able to say if any one of the resources will be adversely affected will require authoritative evidence of the specific limit for that resource. The answers need to be considered in terms of scale, severity and magnitude (where magnitude itself is a reflection of importance, value, sensitivity, timeframe and reversibility) and moderated by the level of uncertainty.
21. This model appears, of course, to be quite similar to that of evaluating significance within the context of environmental impact assessment (EIA) strategic environmental assessment (SEA) or Sustainability Appraisal (SA). The prime difference is that in EIA, SEA and SA adverse effects can be mitigated, whereas any negative value in the depletion of a finite resource or exceedance of the regeneration rate of a renewable resource, triggers, by default, an unsustainable consequence.
22. To be sustainable, any strategy, policy or measure must not lead, or contribute, to depletion of a finite resource or use of a resource exceeding its regeneration rate. It is really about getting the terminology of "sustainability" right.
23. For each action (strategy, policy or measure) one or more questions should be asked, to which the answer can only be "yes" or "no".

Soil

Will the proposed action exceed the rate of soil regeneration?

Will the proposed action lead to a reduction in soil quality?

Minerals

Will the proposed action lead to the reduction of a scarce resource?

Space

Will the proposed action lead to a reduction in landscape quality?

Will the proposed action lead to a reduction in tranquillity or sense of space?

Will the proposed action lead to any incompatibility with local constraints?

Will the proposed action lead to a reduction of undeveloped land?

Water

Will the proposed action lead to increased scarcity of the resource?

Will the proposed action lead to a reduction in water quality?

Air

Will the proposed action lead to a reduction in air quality?

Energy

Will the proposed action lead to the reduction of a scarce resource?

Will the proposed action lead to use of the resource exceeding regeneration?

Food

Will the proposed action lead to a reduction in the potential for food production?

Biodiversity

Will the proposed action lead to a reduction of rare habitats and/or species?

Will the proposed action result in a reduction of scarce habitats and/or species?

24. When answering the above questions in respect of a particular strategy, policy or measure there are some dimensions to consider:

- The effect of the action should be related to the resource at point of extraction for a finite resource or at the point of generation for a renewable resource;
- Various terms e.g. scarcity need to be defined; it is suggested that a 50-year horizon is appropriate (see below);

- The evaluation is based on finite, renewable, and finite/renewable consequences of actions and is a limit-based approach allowing no nuancing, no balancing or trade-offs; and
- Any “yes” results means that the action is not sustainable because it cannot be verified that resource usage is not without depletion (if a finite resource) or exceedance (if a renewable resource).

25. It is important to realise that a “yes” does not stop a strategy, policy or measure, it merely makes clear that the attribute “*sustainable*” should only be used where there is clear evidence that this is the case ~ where a resource is being used and where it can be demonstrated that its usage is either such that there will be sufficient in 50 years (see below) or within a replaceable limit.

26. So, there are no degrees of sustainability; it is an absolute because non-renewable resources are finite and renewable resources have a certain rate of regeneration. This helps the message to become clearer.

So the following are probably meaningless and professional caution should be used:

- Sustainable approach to ...
- Sustainable management of ...
- Sustainable objectives for ...
- Sustainable opportunities for...
- Sustainable patterns of...
- Sustainable practice of...
- Sustainable use of...
- Sustainable transport
- Sustainable community
- Sustainable economy
- ... and so on

There is typically no way of proving that any of the above assures resource integrity.

27. Attribution may be acceptable though requires evidence on a case-by-case basis⁶:

- Sustainable energy use
- Sustainable water use
- Sustainable air quality
- Sustainable food production
- Sustainable extraction
- Sustainable land use
- ... and so on

28. A word about availability of resources for “*future*” generations and satisfying “...*their needs*...” Assuming that humankind lives for many millennia on this planet then even currently abundant resources will become depleted. However, learning from our past human development, it can be anticipated that future needs will look quite different to our own needs. So, there has to be a point in the future which we, at this point in our own human development, can no longer take into account. Again, looking at history, going beyond 100 years is probably unrealistic, and in most cases perhaps 50 years is more appropriate as the horizon within which we should assume that finite resources should not be depleted. In other words we need to ensure that sufficient resources are available for 50 years.

29. Remember, there is no holiday from history; we are where we are. Yet we do need to act. As Giuseppe Tomasi di Lampedusa (of *The Leopard* fame) said; “... *for everything to stay the same, everything must change*...”

30. So, in conclusion, to address Environmental Sustainability ~ *Environmental strategies, policies and measures for a healthy ecosystem*, as professionals there is a duty not only to ensure the situation is not made worse, but also to champion more accurate use of terminology and recognise the limitations of any strategies, policies and measures.

⁶ A Sustainability Indicator is available at: <http://www.futurestates.com/resources.html>

31. Before the credit crunch and the onset of austerity, the message of population growth, water scarcity, renewable energy, local food, and action on climate change was gaining some serious traction, both nationally and locally. That is now history. Of course the rhetoric of government still continues...

"...at every level the greatest obstacle to transforming the world is that we lack the clarity and imagination to conceive that it could be different

Roberto Unger, a Brazilian philosopher

32. Decision-makers see things through a very special prism or, rather, two prisms. One prism where a decision provides final end-result. It is finite. Consider a game such as a card game, or chess, or games such as football, or cricket, the game ends when someone wins. The other prism is one where there is no intention to produce a finite result, rather a decision is made to keep the process in play. It does not terminate because there is no winner.

33. In finite decision-making there are rules that need to remain constant. The decision cannot be made if the rules change during the process. Altering the rules during the process creates chaos. So substantial effort is taken in a finite game to spell out the rules beforehand and enforce them during the process. The process must have boundaries -- spatial, temporal, or behavioural.

34. In infinite decision-making, the process relies on continual rule changing to maintain open-endedness, with no boundaries. The American theologian James Carse⁷, who developed these ideas in his treatise *Finite and Infinite Games*, observed that "*Finite players play within boundaries; infinite players play with boundaries.*" Infinite players play with intentions to keep the game going, to keep all participants playing as long as possible. They do that, as all infinite games do, by playing around with the rules of play. The climate change summits are expected to be finite with definite outcomes yet while some world leaders attend and play as if it is a finite game, the reality is that more leaders go with the intention of playing an infinite game.

35. Recently, the UK Chartered Institution of Water and Environmental Management completed a report, *Re-Framing Sustainable Development: a critical analysis*⁸. Weaved into this was the concept of resilience explaining how individuals, communities, institutions or countries are able to withstand and respond (including by behavioural change) to shifting circumstances and shocks while continuing to function and prosper, though within constraints.

36. Put simply, resilience is the ability to survive, recover from, and thrive in changing conditions (which could be major flooding, prolonged drought, energy and food price hikes, natural disaster, conflict and so on) over foreseeable timescales.

37. This assumes that quality of life and resilient planetary systems are inextricably linked and can only be achieved through a different societal and economic system predicated on the principles of nature, nurture, replenishment and resilience. In other words:

- The economy should work with and reinforce planetary systems;
- Economic growth should stay within planetary limits; and
- Building resilience is the key to withstanding shocks whilst moving towards a sustainable and meaningful human society.

38. Sustainable development is also partly undermined by unpredictable and relentless external variables causing imbalances which overwhelm and distract from such development.

39. Resilience is the ability to withstand and respond (including behavioural changes) to shifting circumstances and shocks while continuing to function and prosper during foreseeable timescales and whilst supportive of longer term sustainable development.

40. Resilience and sustainable development are complementary: sustainable development being the successful outcome of resilience. Whereas sustainable development seeks a balance between economic, social and environmental constraints, resilience recognises the constant disequilibrium and deals with this through trying, failing, adapting, learning, evolving and finding a way through the unpredictable externalities. Sustainable development is an absolute; development is either sustainable or it is not.

⁷ http://www.glg.net/pdf/Finite_Infinite_Games.pdf

⁸ Launched formally on World Earth Day – 22 April 2013

Sustainability requires resilient systems which enable adaptation, learning, and evolving, providing the policy platform supporting the transition from here to sustainability.

41. A key question is: can strategies for resilience be delivered successfully under current political and economic models? This is the beauty of resilience. It allows political (social), economic and environmental strategies to develop which deal with unpredictable externalities. However, resilience only has value provided that there is political will to achieve an end state of sustainable development within meaningful timescales. Therefore, a twin-track approach is required; one which builds resilient systems incrementally, whilst at the same time seriously examining whether mainstream political and economic models are able to deliver the desired outcomes of sustainable development.
42. To a certain extent, a resilient community may be dependent on technological solutions and innovations in the short term and to differing degrees. In the context of current population projections and their associated consumption levels, a resilient community (be that a family unit, a village, a mega city or a country) in an industrialised context can only exist based on external supplies of food, energy, water, trade and so on. As those external supplies become increasingly fragile, only behavioural change will allow “communities” to continue in the long term.
43. In the short term, technology and innovation may be needed whilst behavioural change embeds. The risk is that short term technology and innovation is so seductive that it constrains behavioural change. A non-industrialised country may be less reliant on external connections *per se* (if it has access to plenty of productive land, water and natural resources) but then the desire to “have” what industrialised nations have kicks in (health provision always available, education easily accessible, some form of welfare support in the event of difficulty and so on) resulting in increasing dependency on external supplies.
44. The concept of resilience allows different starting points and the more resilience that can be established in a non-industrialised country, the less exposed it is likely to be to reliance on external supplies and the greater potential it has for a sustainable future state.
45. Resilience cannot reasonably expect to do anything about population, consumption or climate change within the short term, barring nuclear war, pandemic or similar catastrophic event. Over time there will be greater societal pressure for change to which the political elites may or may not respond. Meanwhile resilience helps to chart a way forward to respond to shifting circumstances and shocks while continuing to function, prosper and shift towards sustainable development. This recognises that radical change will be required, to the way humanity functions and its interactions with the planet, in order to achieve sustainable development.
 - Promoting behavioural change to embed considerations of resilience into modern governance and its power relationships (with the political, corporate and media axis) in order to improve decision-making that benefits all people;
 - Securing policy and legislative changes necessary for a more just and equitable economic and societal model with planetary limits at its core, and furthering resilience of communities and society;
 - Drawing on our collective insight, knowledge and experience to inform, influence and support key decision makers and governments;
 - Providing a forum for debate, for the formulation of ideas and innovations, and for policy making;
 - Hosting events to engage the broadest possible range of decision-makers, opinion-formers and stakeholders; and
 - Providing thought leadership on community and planetary resilience, and sustainability.
46. In conclusion, designing environmental strategies, policies and measures for a healthy ecosystem is about building resilience.
47. Recall a reflection of Robert Swan⁹

“...The greatest threat to our planet is the belief that someone else will save it...”
48. They won't, though you could...

⁹ the first person to walk to both Poles