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International Sustainable Development Research Society Newsletter
Welcome!
The second issue of the ISDRS Newsletter for 2011 again celebrates the work that has gone into preparing for the major Conference in New York - ISDRC 17, hosted by the Earth Institute, Columbia University, 8-10 May - and extends the discourse on sustainable development through contributed articles.

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1 EDITORIAL

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With the ISDRC 17 set to take place in New York from 8 - 10 May, we are pleased to present a further insight into the conference programme in the second ISDRS Newsletter for 2011. For this issue, Earth Institute staff invited selected authors to provide ‘extended’ abstracts for the Newsletter. Topics cover a wide range of aspects of sustainable development. Issues of climate change are addressed, focusing on security, the economics of climate change and adaptation to increased salinity in river deltas, and the challenge of climate change for Hong Kong. Locally-driven urban development, life-cycle analysis of rural water systems, implications of hydroelectricity development for rural livelihood, transportation and sustainability and the threat that a declining work-age population provides for economic sustainability are discussed. Other ‘big-picture’ studies focus upon the ability of the state to build a green economy and the impact on labour, mainstreaming environmental enterprises, and campus environmental sustainability.

A wide-ranging discussion is also provided through the short articles, where authors address topics such as CSR and the conflict of corporations creating ‘wants’ rather than meeting ‘needs’; the politics of climate change and the lengths gone to in order to discredit the scientific debate; the epistemological impediments to interdisciplinary approaches to sustainability; the role of corporate social responsibility in avoiding the tragedy of the celestial commons; ways of couching the sustainability discourse so that it is communicated widely, clearly, and respectfully; and an attempt to translate a critical theorization of education for sustainability into praxis with post-graduate students.

2011 is a significant year for the International Sustainable Development Research Society, with new formalisation of the Society’s governance and some far-reaching plans for the future of the Society. All members of the Board thank Dr Van Miller for his consistently valuable work on developing the draft of the Society’s new Charter in a democratic and inclusive manner.

Again, the Newsletter is the result of a joint effort. The authors of the abstracts and articles are thanked for their contributions. In addition, staff at the Earth Institute, Columbia University, have again made a contribution on top of their major responsibilities for the conference. My special thanks go to Lauren Barredo and Pamela Vreelend who have responded to multiple requests promptly and with unflagging cheerfulness and collegiality.
2 ISDRS CHAIRMAN’S REPORT

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I am pleased to welcome you to the second pre-conference issue of the Newsletter for the International Sustainable Development Research Society (ISDRS). With the 17th annual conference (ISDRC 17) only weeks away, the partnership with the Earth Institute, Columbia University, promises to deliver one of our most challenging conferences yet. The extended abstracts included in this newsletter provide just a taste of the wide range of sustainable development research that the conference programme delivers. The full conference programme is available on the website: http://isdrc2011.columbia.edu

The focal role of the Society is to encourage and develop high quality academic research that can inform and influence decision-makers at all levels of policy-making and practice. This makes the forthcoming conference particularly exciting, with part of its programme devoted to the joint input we plan for the Rio+20 conference in 2012.

Our chief means of contributing to the sustainable development debate includes the annual conference and the Sustainable Development journal, established in 1990. Sustainable Development, published by ERPEnvironment in association with John Wiley and Sons (www.wiley.com/WileyCDA/WileyTitle/productCd-SD.html), is rated among the top 10 journals in its field, and there is now much competition from academics for publication in its issues. We look forward to the opportunity to publish the best papers from the forthcoming conference in future issues of the journal. Authors should follow the guidelines provided on the journal website.

The Society was formed five years ago to help to realise the key goals of the journal. We now celebrate a new advance in terms of the Society’s role and its scope as a catalyst for sustainable development research. The new Charter for the Society, in its draft form, is introduced in this newsletter by the Secretary, Dr Van Miller, in preparation for its ratification by Board Members at the conference in May. The Charter formalises the management and governance of the Society and sets in place the basis for the membership scheme that will enable a wider range of researchers at all levels to participate in and contribute to the activities of the Society.

My thanks go to the interim Executive Committee that was elected at the end of 2010 to help drive changes taking place in the governance of the Society and to all members of the Board who have continued to provide their support. The positions of Officers of the Board will be confirmed at the Board meeting in May and members of the current Board will be voted into these positions. My special thanks go to Professor Peter Schlosser, Co-Chairman of ISDRC 17, and his team at the Earth Institute for their enormous commitment to making the conference a success.
3 ISDRS SECRETARY’S REPORT: THE CHARTER

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Since the last ISDRS conference in Hong Kong in 2010, members of the Society’s Board have worked with me to produce the Charter for governance of the Society. After much debate and an inclusive approach that engaged all Board members, we have produced a draft Charter that we believe will contribute positively to the governance and success of the Society. The provisional Charter is produced below and will be discussed at the Board meeting in New York in May. For the first time, we are opening the Society to full membership, with several categories that will meet the needs of different audiences. This means that full ratification of the Charter will be sought in 2012 at Robert Gordon University, Aberdeen, the venue of the next ISDRS conference, giving the opportunity for the extended membership to vote on the Charter.

International Sustainable Development Research Society
PROVISIONAL CHARTER, MARCH 2011

I. Name and Location

The official name of the organization is the International Sustainable Development Research Society (ISDRS), officially registered in Hong Kong in 2006 and formally organized under this Charter in 2011. The Executive Secretary, selected by the Board as specified in section V, oversees the day-to-day activities of the Society and determines where the physical office of the Society is located.

II. Objectives

- To generate research and knowledge about sustainable development. As a research society, we have an obligation to facilitate the work of those who labor to create new knowledge regarding sustainable development, as broadly defined.
- To disseminate knowledge about sustainable development. Consistent with knowledge generation, the Society also obligates itself to the task of spreading knowledge worldwide for the benefit of those with a similar interest.
• To educate others about sustainable development. Sustainable development places multiple and urgent demands upon global and local societies who will eventually determine the degree to which the Earth’s resources are sustained. Thus, the ISDRS feels compelled to become involved in the practical work of sustainable development.

• To establish an information exchange for sustainable development. Given the proliferation of sustainability entities and venues, the Society will strive to provide a coordinating role for linking all these efforts together.

III. Membership and Dues
The ISDRS will maintain three categories of membership for individuals. Each membership category can be subscribed to and granted by registration at the annual conference or through direct payment to the Executive Secretary. The first category comprises regular members—individuals who have paid their annual dues for the current year. The second comprises permanent members who are regular members and have paid their annual dues on an ongoing basis, for at least the past year and the current one. The third or student category of membership is open to all currently registered students. The annual fees for each category of membership will be set by the ISDRS Board at its annual meeting and approved by a two-thirds vote of those in attendance.

The ISDRS Board will also create an institutional membership category for all types of organizations and determine its fee structure on a similar annual basis and subject to the same two-thirds voting requirement.

IV. Meetings
The annual meeting of the ISDRS Board will be held in conjunction with the Society’s yearly conference at a site selected and approved by the Board. During the annual conference, there will also be a meeting of the general membership (inclusive of all membership categories) for the members to express concerns about the objectives of the Society and its role and focus. This obligation to hold an annual conference and general membership meeting
does not preclude the ISDRS Board from disseminating information about or encouraging attendance at other sustainability venues, whether in a virtual or physical form. On occasion and as circumstances dictate, the Board will hold virtual meetings (with a fourteen-day advance notice to all members) for its deliberations and decisions. These meetings will be called and conducted by the officers of the ISDRS.

V. Governance

The ISDRS will govern itself at three distinct levels—the permanent membership, the Board of Directors, and the elected officers.

The permanent membership will have the responsibility of electing the Board members. After the Society’s startup year in 2011, the permanent members will elect annually two new members to serve on the Board for a period of five years under normal circumstances. In consultation with the general membership at the annual meeting, the current Board members will choose the nominees for these two positions or any vacant positions. The election of new Board members annually from a slate of nominees will be decided by the permanent members through an online balloting process overseen by the current elected officers. The successful nominees will be the two (or more in case of vacancy) individuals receiving the most votes cast. Any substantiated irregularities in this process will be resolved definitively by the current Board.

The Board of Directors will consist at a maximum of 18 members coming from as wide a geographic and discipline range as practical. The provisional Board, first selected in the formative period of 2006-2011*, will be validated by the members of the provisional Board at the 2011 Board meeting in New York City. This one-time process will require the two-thirds approval of those in attendance for each provisional Board member to be confirmed. Beginning in 2012, two Board member terms will expire yearly and necessitate an annual

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*The Interim Executive Committee was elected online by the provisional Board Members in December 2010 and mandated to direct the Society until the ratification of the Charter in 2011.
online election by the permanent membership for the selection of new Board members. The length of individual terms for those serving on the provisional Board will be established at the first annual Board meeting in 2011. Board members will be able to stand for re-election once. As it sees fit, the Board may, at an annual meeting, nominate and elect ex-officio members to its body for a defined period of time. However, ex-officio members have no voting rights and do not count in voting tabulations. Board members confirmed by the provisional Board in 2011 can be removed from the Board by a two-thirds vote of that total Board’s membership, and those elected by the permanent membership can only be removed by a two-thirds vote of the total permanent membership at an annual meeting.

The primary responsibilities of the Board of Directors and its members are:

• To select, through a majority vote, the site for the annual meeting of the Society;
• To elect, through a majority vote, the Board officers—the President, the Executive Secretary, the Treasurer, the Newsletter Editor, and the Webmaster;
• To approve the annual and special reports of the Executive Secretary;
• To conduct the business of the Society in matters not delegated to the Executive Committee or an ad hoc committee; and,
• To abide by its own decisions, whether from an annual or virtual meeting, based on the rule of a simple majority (unless stipulated otherwise herein) from those in attendance.

The Board officers shall be a President, an Executive Secretary, a Treasurer, a Newsletter Editor, and a Webmaster. All shall be elected by and report to the Board as requested. The Board has the sole power to remove an officer by a vote of two-thirds of its voting members.

The President will be the official spokesperson and representative for the Society and will serve a two-year term with the opportunity to stand once for re-election. The Executive Secretary will serve a five-year term and be responsible for the day-to-day operations of the Society and all reports,
including meeting minutes and financial statements, resulting from Society activities. In light of the multiple operations of the Society, the office of the Executive Secretary will need to be housed in an institutional setting that supports the Society’s activities and is willing to negotiate a remunerative scheme acceptable to all parties. In its annual meetings, the Board will pre-approve normal operating expenditures for the Executive Secretary to pay on a timely basis. The role of the Treasurer will be to monitor and oversee the financial activities that the Executive Secretary undertakes for the Society and will be limited to two consecutive terms. The Newsletter Editor will be responsible for editing and publishing the Society’s newsletter and will be provided by the Board the discretionary power to undertake this task. The Editor will also serve an annual term with the opportunity to stand multiple times for re-election. The Webmaster will oversee all electronic and virtual communications in which the Society engages, and may also stand for multiple re-elections.

VI. Research Tracks for the Annual Meeting
Consistent with its purpose as a research society and in recognition of the demands posed by sustainable development, the Society will diligently strive to establish and maintain an overarching set of tracks or themes that can be used to organize the annual call for papers that precedes each conference. Given the fundamental importance and evolving nature of these tracks in shaping our knowledge base, time and effort should be devoted at the annual general membership meeting to discussions about the relevance and timeliness of the current tracks. Because the ISDRS is a research society, the continuous need for efforts that ask us to think critically about our research endeavors should not be neglected.

VII. Publications
Congruent with its second objective, the dissemination of knowledge, the ISDRS will endeavor to work with the publishers and editors of reputable journals whose purpose is to advance, enlighten, or scrutinize the field of sustainable development. To further this effort, all direct dealings with
editors and publishers should be conducted in a transparent manner that avoids any conflict of interests, whether perceived or real.

VIII. Fellows of the Society
To recognize exemplary individual contributions to the Society, the Board may, at its discretion, designate a special status to those who have contributed to its establishment and development. This designation shall require a majority vote of the total Board membership at its regular annual meeting, commencing in 2014. The website of the Society will reflect this special status through a designated display that discusses the designated individuals and their contributions.

IX. Amendments to this Charter
This Charter can be amended in the Society’s initial years (defined as the period during which initial Board members still serve on the Board of Directors) by a two-thirds vote of the total Board membership and in later years by a two-thirds vote of the permanent members present at a regular annual meeting.

To be ratified by a vote of the provisional Board on 10 May 2011.

Board Members and Interim Executive Committee of the ISDRS
President - Dr Richard Welford, ERPEnvironment, Professor, Asian Institute of Technology
Secretary - Dr Van Miller, Central Michigan University
Conference Liaison Officer - Associate Professor Dr Walter Vermeulen, Utrecht University
Treasurer - Professor Peter Dobers, Mälardalen University
Newsletter Editor - Dr Delyse Springett, Massey University
Professor Rupert Baumgartner, University of Graz
Dr Pontus Cerin, University of Umeå
Dr Pauline Deutz, University of Hull
Professor Andy Gouldson, University of Leeds
Dr Martina Maria Keitsch, The Oslo School of Architecture and Design
Emeritus Professor Shobhana Madhaven, University of Westminster
Professor Peter Strachan, Aberdeen Business School
Professor Arun Sahay, Management Development Institute, Gurgaon, India
Associate Professor Arnim Wick, Arizona State University
ISDRC 17 CONFERENCE CO-CHAIRMAN’S REPORT

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ISDRC 17 is but a few short weeks away! Much has been happening since our last update in preparation for this event and I can now report on these developments and on the state of the planning for ISDRC 17.

We are thrilled to report that we received over 680 abstracts for submission for ISDRC 17. Of those, 233 were selected by our track chairs for oral presentation and 266 for poster presentation. Our track chairs promise to lead two days of substantive and exciting exchange on the most critical issues facing our global community to date.

We are pleased to report that both the UN and ADBI are official partners of ISDRC 17. The Norwegian Ministry on Foreign Affairs is as a Gold Sponsor of the conference. And we are grateful to ENI, who has also offered support for the conference.

We are pleased to report, as well, that to date over 350 attendees from all sectors have registered to participate in ISDRC 17. Attendees include academics, students and members from the private and public sectors.

Keynote speakers and panelists confirmed so far include Lester Brown, Sanjeev Chadha, Nina Fedoroff, Christiana Figueres, Klaus Töpfer, Jeffrey D. Sachs, Achim Steiner, and Morten Wetland.

On day three of ISDRC 17, Jeff Sachs will lead the dialogue between conference attendees, decision makers, policy makers and the private sector. This exchange will focus on how academia can contribute to the diverse set of questions posed by stakeholders and how it can provide input into the Rio plus 20 preparation.

We had discussed that the members of the Scientific Committee will produce a white paper with the purpose of informing the United Nations Conference on Sustainable Development Earth Summit 2012 (Rio +20). We will be working on this with the Scientific Committee at the Conference and post-Conference.

A few notes on the logistics for participants. Hotel rooms are still available, and rates have been reduced for some as well. You can find hotel and travel information on the “Travel” tab of the ISDRC 17 Web site or by clicking on the link here (http://isdrc17.ei.columbia.edu/?id=hotels).

We at ISDRC 17 look forward to your arrival in New York City in the coming weeks.
5 CONFERENCE ABSTRACTS
[In alphabetical order by author/lead author.]

(i) Declining Work-Age Population Threats to Global Economic Sustainability

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Rafiqul Islam Molla, Faculty of Business and Law, Multimedia University
Khondaker Mizanur Rahman, Graduate School of Business Administration, Nanzan University
Md. Wahid Murad, Business School, University of Adelaide

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World population exploded throughout the last century; it increased from 2.55 billion in 1950 to 6.396 billion in 2004, and is projected to reach 9.276 billion in 2050 (UN 2005). There is a hidden momentum of population growth; it has a built in tendency to continue growing even after birthrates have declined substantially or to a replacement rate. It is estimated that if the population continues to grow at 1990 rates, world population will reach to 694 billion by 2150; if it grows at a rate just one-tenth above the replacement rate it will reach the level of 12.5 billion by 2050 and 20.8 billion by 2150; and if it grows just at the replacement rate it will reach to 7.7 billion by 2050 and 8.4 billion by 2150 (Cohen 1995). These numbers, however, are to be considered in conjunction with the limits of earth’s population carrying capacity. Based on the agricultural carrying capacity earth’s population carrying capacity was estimated to be only 902 million in 1945 and as high as 147 billion in 1967. However, almost all the scholars seem to agree that the earth’s human carrying capacity finally depends on the technological capacity (ability to unlock/create useful resources from the earth’s nature and environment) and the social choices (life style, social structure, etc.). Its biophysical carrying capacity sets the maximum population size that could be sustained biophysically under the given technological capabilities and its social carrying capacity sets the maximum size that could be sustained under the various social systems. It is worth noting that human ingenuity, through innovations and adaptations of social and industrial engineering and technology, has enabled dramatic increases in both the biophysical and the social population carrying capacity of the planet. The truth of the matter is that there is no single numerical answer, now or ever, to the question how many people the earth can carry; it can at best be conditional (Weil 2009, pp.139).

However, Desvaux (2007) cautions that failing to control population growth the humans risk the worst population crash. Earlier in 1950s there was a similar alarm on the danger of population explosion. In response to that warning a worldwide population stabilization policy was strongly emphasized. Most countries took measures to arrest population growth. It is now envisaged that the annual growth rate of population will decline from 1.21% during 2000-2005 to 0.38% in 2045-2050 (UN 2005) causing significant negative effect on the world economy. It is feared that from 2050 onward the whole world will face the greatest problem of declining work-age population. At that time the work-age dependency ratio - the proportion of youth
(under age 15) and old people (over age 65) to economically active adults (age 15-65) - will become higher and it will be more difficult for a declining economically active population to support an increasing economically dependent population. Declining of the work-age population will then generate low gross domestic product (GDP), low gross national income (GNI), and low tax revenue for the government. It is feared that during the coming decades of this century most of the countries, specially the developed countries, will face the problem of the low tax revenue available to meet the high subsidized expenditure for larger number of the old-age people. This will cause the governments to maintain deficit budgets all the time. In fact, Japan, Germany, Switzerland and some other countries are already under the threat of this phenomenon. Moreover, due to the decline in the labor force, cost of production will rise and the cost push inflation rate will be very high in these countries. Therefore, an economic crisis is likely to prevail all over the world especially in the period after 2050. The decline in work-age population will also seriously affect the technological advancement in the existing and new sectors. This will create demand for additional manpower. If nations fail to engage required number of researchers it will lead to a stagnation of technological growth. Furthermore, the industrial revolution has not yet happened in many parts of the world. When industrialization process will start in these countries, huge labor force will be needed there.

The labor-short industrialized countries are now trying to cope up with the situation through short-time importation and permanent migration of manpower mostly from the high fertility developing countries. This is done in different ways like granting of citizenship, permanent residence status (PR certificate, green card, diversity visa–DV, etc), work permits to foreigners, accepting asylum seekers and refugees, admitting international students and permitting them to stay on to work after completion of studies, etc. Under the DV scheme alone US receives every year 50,000 permanent immigrants from the developing countries. During 2005-2007 more than 1.1 million foreigners per year were granted permanent resident status in the USA. Most of the labor-short industrialized countries are currently using migration as a source of additional supply of labor to meet the growing demand. However, in the world context migration is a zero-sum game - an increase in the number of migrant population in the receiving country is just equal to a decrease in the number of population in the sending country. But there is a need for world population to grow in order to meet the growing demand for labor. To support the growing population there is a need for increasing the earth’s carrying capacity. Planet’s capacity to support any sustainable size of population depends primarily on the sophistication of the society’s life style (including distribution of population and resources) and the technological advancement.

It is expected that in response to the ethical and environmental demands the future social engineering and technology advancement will be geared toward development of a practicable structure of a life style based on a ‘slim-green’ consumption choice founded on the principle of ‘simple living and high thinking’. Society will be more ethical and health conscious and will prefer to return from consumerism. This life style of the society will result in resource saving, resource conservation, waste minimization, etc. It will enhance earth’s capacity to carry a larger sustainable population. In addition, it may also focus on the planned redistribution of population from the resource poor crowded countries to the resource rich sparsely populated
countries to temporarily reduce labor shortage problems in some countries and labor unemployment problems in other countries.

The future industrial engineering and technology development will focus on development and of: a) resource saving technology, in terms of method, process and product, will enable the production of outputs with reduced resource uses. For instance, the energy saving bulb consumes less energy to produce same amount of light. The system of quicker growing livestock and poultry, genetically modified organism (GMO) and hybrid food etc. are other products of such technology; b) resource increasing technology for unlocking new resources from the nature and environment of the earth, like finding or producing new outputs from the sea, desert, air, sunlight etc. Growing seaweed as a food item, solar energy like photovoltaic cells, wind mills, utilization of unused and rival resources like wastes for production purposes, etc. are the products of such technology.

In overall, emphasis on population stabilization policy has led the fertility rate to fall and the work-age population for the future to shrink. This will push the world to a serious economic crisis more particularly after 2050 when only a decreasing size of the work-age population will be available to look after an increasing size of the dependent population. An appropriate solution of this worldwide potential problem must be sought through a policy of maintaining optimal rate of world population growth consistent with the growth of the social and industrial technology, the resultant life style of the people, and the increase in earth’s absorption capacity. The paper argues that to maintain a sustainable economic growth and support the associated technological advancements in the future there will be demand for a larger labor force. It notes that the industrialized countries are now managing with the migrant population drawn mostly from the high fertility low income countries. But in the world context this is only a zero-sum game without increasing the stock of world’s total labor force. Therefore world population needs to grow to meet the growing demand for a larger labor force for economic sustainability. It notes that population growth rate through increased child birthrate passes through a considerable time-lag because of what may be called ‘Child Bearing Habitual Gap’ and ‘Work-age Formation Gap’ (Alam, et. al., 2009). It also argues that since the earth’s population carrying capacity largely depends on the technological capability and the life style of the society the world should not be scared of a planned population growth. It foresees that in the future the social engineering and technological innovations may give birth to an ethics and environment friendly ‘slim-green’ life style founded on the principle of ‘simple living and high thinking’, which will increase the earth’s population absorption capacity.

References:
An Integrated Approach to Sustainable, Locally Driven Urban Development

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Uncontrolled urbanization is a growing, seemingly unquantifiable phenomenon characterizing today’s planet, occurring at a rate most scholars and scientists would call unsustainable. Climate change impacts on the countryside — increased and less predictable drought, flooding, failed harvests — have exacerbated the more traditional migratory pressures, arising from the lure of improved economic opportunity or flight from conflict, to engender unknowable, virtually ungovernable cities. Across the developing world, and particularly across sub-Saharan Africa, such metropolises might more aptly be described as sprawling, improvised amalgamations, invariably located in poorly equipped, unhealthy settings, formed of multiple and diverse constituencies, all with credible claims to recognition and entitlement to fundamental services.

The stresses of this apparently ceaseless in-migration on civil infrastructure and the public health are palpable, but difficult to measure. Indeed, data in underserved municipalities are in hard to come by in any event, even more so in such rapidly changing environments; by the time any telling indicator has been reviewed and understood, it is out of date.

Yet without such information, policymakers cannot begin to prioritize, plan and budget to address their cities’ profound challenges. If local and national government are to be held accountable for the effective delivery of public services, they must begin with reliable information indicating the extent of the gaps in service delivery, the costs of filling these gaps, and technical and financing strategies for doing so. With this information, synergies between sectors can be readily identified, and cost-effective, multi-sectoral planning can take place. In this way, hidden deficits in one arena will no longer inhibit promising advances in another — as evidenced in the simple example of the absence of private girls’ latrines discouraging otherwise eager and ambitious girls from attending school.

Such is the task that the Millennium Cities Initiative (MCI), a project of The Earth Institute, Columbia University, has set out for itself. MCI works to help cities across sub-Saharan Africa achieve the Millennium Development Goals (MDGs), by: 1) ascertaining, through careful research and policy analysis, just how far off each city is from attaining each MDG target and informing citizens accordingly; 2) assisting stakeholders in determining their top development priorities; 3) providing technical support as the city designs an integrated development strategy predicated on realizing those priorities; and 4) identifying, inventing and piloting successful, replicable models to address some of these priorities, models that can then be brought to scale across the Millennium City and beyond.
This holistic orientation differs from the more silo-ed, sectoral approach still generally taken by the traditional donor community. However valuable any particular water or urban transport project, if it is not also linked to affordable access to proper drainage, sanitation, health care, education and lines of credit, it is not itself likely to substantially reduce the poverty levels of the affected population. It is only when the community itself, as the nexus of urban life, is considered as an organic whole – its under-5 children, playing in the markets in uncovered sewage; its youth, too poor to afford schooling, standing on street corners with no jobs in sight; its hard-working women, longing for their own education and job-training, but whose days are consumed with water-gathering, food preparation and childcare; the physical space itself, its crowded, unhealthy conditions, completing land claims, topographical and other civil infrastructure challenges – that the integrated nature of the problematic can be fully appreciated and comprehensively addressed in ways that can materially improve the lives of ordinary urban residents.

MCI’s methodology embraces this more integrated approach. The presentation will show how our own sector-specific research -- our MDG-based needs assessments, costing exercises and poverty-related household surveys -- leads to interdisciplinary development planning, and how cross-cutting interventions are then identified to address more than one critical MDG-related deficit at a time. Examples include: 1) a community-based solution in Mekelle, Ethiopia, to provide readier access to water, thereby improving child health and increasing by several hours per day women’s and girls time for other activities; 2) training teachers to organize and lead Girls’ Clubs in public schools, thereby strengthening girls’ literacy, creative work and interest in science, math and technology, their connections (via the Internet) with Girls’ Clubs in other Millennium Cities and countries and ultimately, their desire to stay in school -- all steps which, in turn, can delay their starting families, improve their earning potential and empower women’s voices in public life; 3) training medical staff and health lay people in essential neonatal resuscitation and infant care, thereby saving newborn lives and substantially improving child and family health.

To address the monumental challenges facing the vast coastal city of Accra, Ghana’s capital and a key West African hub, MCI has forged a successful multidisciplinary partnership with an array of Earth Institute and Columbia institutions – the Urban Design Lab, Center for Sustainable Urban Development, School of International and Public Affairs, School of Engineering and Applied Sciences; Center for International Earth Science Information Network, Mailman School of Public Health – as well as with international development agencies, corporations and non-profits, leading local academic institutions and local NGOs. Through seminars, studios and summer research, MCI has led this consortium to carry out an unprecedented GIS mapping of downtown slum areas, an urban transport study, research on waste-to-energy options, including a solid waste composition analysis and documentation of a composting project for youth, and papers documenting the state of the public health and land tenure systems. More than 30 Columbia architects and designers are currently working in the same slum areas to build upon this work and arrive at innovative solutions that preserve historic architecture and cultural traditions and enhance livelihood opportunities, while improving public safety, health and infrastructure. Policymakers and donors view these research trajectories as valuable and useful. But a more systemic approach is needed if Accra’s fundamental challenges are to be addressed. Fronting the Gulf of Guinea, with its debilitating coastal erosion,
dysfunctional road, water and waste disposal systems and its vital fishing and tourism industries, ecology and public safety at stake, Accra is ill-prepared in every conceivable way to confront the potentially devastating impacts of climate change and its effects. To better understand, prepare for and hopefully prevent some of the worst predicted outcomes, MCI will carry out a comprehensive GIS mapping of the Greater Accra Metropolitan Area and will convene and rely on a trained task force drawn from local and regional government and civil society, whose mandate will be to help create and maintain this innovative, interactive tool. Existing infrastructure, including access and evacuation routes, health facilities and communications, will all be identified and plotted, enabling upgrades to be made on an as-needed basis. This project, and its potential as a replicable, real-time reporting instrument for coastal cities worldwide, will be a lasting contribution by MCI to urban preparedness and urban development strategies, and will figure in the presentation among MCI’s multi-sectoral, cross-cutting initiatives.

In the regional capitals, interventions predicated on strengthening the emergency referral system and the capacity for maternal and child health care delivery; training teachers in early childhood education, uses of the Internet and how specifically to support girls in school; exploring improved mass transit, non-motorized transport and waste-to-energy options; and encouraging the planning and construction of downtown green and community spaces, all play important roles in the MCI agenda: to help create viable, sustainable cities, led by responsive and accountable local governments capable of supporting their populations by delivering on the promise of decent and reliable public goods and services.

If these regional capitals can in fact attain these objectives, which are readily translated into quantifiable, trackable targets known as the Millennium Development Goals, then those forced from the countryside (for any one of a number of reasons) can find respectable living conditions and economic opportunities in these so-called “Millennium Cities,” thereby compelling fewer former smallholder farmers and urban residents alike to migrate to the already stressed, polluted and increasingly sclerotic national capitals. This decompression of the tensions afflicting Africa’s major cities can only help to improve the socio-economic conditions there, together with the prospects for attaining the MDGs in these densely populated, vibrant centers of cultural and civic life.
(iii) Implications of hydroelectricity development projects for sustainability of rural livelihoods in Sikkim, India

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Mountain economies the world over are undergoing transformation from traditional agrarian to more industrial or service economies in response to forces of globalization and private investment. Such changes invariably have socio-economic impacts on communities residing in these areas leading to more profit-based or cash-income rather than subsistence-level livelihoods (Huston 2005; Ponte 2001; Thongmanivong & Fujita 2006). Social changes resulting from these developments are also common, including social fragmentation and depopulation of mountain villages. (GarciaRuiz et al. 1996; Huston 2005; Khanal & Watanabe 2006).

Sikkim, a State of India in the Eastern Himalayas, has an area of 7096 km\textsuperscript{2} and a population of 0.54 million. It has recently embarked on a program of development that aims to generate 5000 megawatts of electricity by 2015, through construction of 22 mostly medium-sized hydroelectricity projects (Government of Sikkim 2009). This paper examines the current environmental and socio-economic impacts of these projects on nearby communities, and considers the implications for future sustainable livelihoods.

Two case-study village panchayat units (clusters of villages) were selected for this study. One panchayat, Shipgyer, is predominantly tribal and is located near Teesta Stage III hydroelectricity project in North Sikkim and the other, Chujachen, is located near Chujachen hydroelectricity project in East Sikkim. Both these projects are in an advanced stage of construction. According to the last official socio-economic data (Government of Sikkim 2006), the major occupation of villagers in both areas was farming. The impacts of these two hydroelectricity projects were studied using qualitative research methods including focus groups and in-depth interviews. Purposive sampling was employed to select participants to represent the range of ethnicity, age, gender and wealth status. Snowball sampling was subsequently used to select villagers who were affected in various ways from project implementation. Interview data were transcribed to word processor and continuously analysed in the field, by coding and constant comparison methods guided by grounded theory. Some secondary data were collected from different sources in the Government of Sikkim.

In both research sites construction of hydroelectricity projects has caused changes in land use, involving mainly conversion of agricultural lands to roads, tunnels, buildings or other components of the projects. Villagers were compensated for loss of their agricultural land, either by one-off payment, or through the provision of employment in regular or contract jobs in the hydroelectricity companies. Compensation for some unforeseen damage to property has also been made, as a one-off measure by the companies. However, indirect damage to property by landslides,
wash of excavated earth onto arable lands, rolling of boulders and dust pollution has not been compensated for. Road construction work has caused a lot of deforestation and damage to trees in and around the villages. Village forests that people traditionally used for firewood and fodder collection have been destroyed by construction work. Water scarcity is also being experienced to varying degrees by villagers.

Hydroelectricity companies have been major employers of local people in the areas of project implementation, helping, temporarily, to address unemployment problems, especially for the younger generation of villagers. Employments take various forms, both fulltime skilled and unskilled, as well as casual. Some construction and materials-supply contracts are given to villagers and indirect benefits have accrued through business and trade.

Most of the jobs that local people work on pertain to the construction phase of the projects, and so are short-term. The attractiveness of a monthly salary which comes with much less toil than required for agriculture has enticed people to abandon farming. Abandonment of agricultural fields in mountain terrain leads to land degradation and their becoming unfit for cultivation due to landslides, rill and sheet erosion (Khanal & Watanabe 2006). Evidence of serious degradation is not yet perceptible in the study villages.

Agriculture production in Himalayan areas, depends on a number of factors, including the use of livestock for draught and manure production, the maintenance of an adequate forest cover, availability of water for irrigation and the presence of an informal labour exchange system (Avasthe et al. 2005; Ives & Messerli 1989, pp. 44-5; Tiwari 2008). The current study shows that in Sikkim developmental activities have impacted on these factors in various ways. While the need for livestock keeping has declined due to reduced farming, forests and streams have been adversely affected by landslides, earth dumping, tunnelling and road construction. People’s preference for company employment rather than farming has resulted in loss of the informal labour exchange system and its replacement with hired farm labour that is expensive and unaffordable to most villagers.

The results of our research also suggest that employment of villagers in the electricity development companies has diminished the social capital of the communities. Social networking that existed in the form of cooperative sharing of labour for agriculture has weakened. There is increased commoditization of labour and informal village-level networks to meet exigencies such as food or fuel shortages are losing importance. The outmigration of younger people to take up residence in nearby towns has caused social disintegration, leaving villages occupied mainly by the elderly who are unable to undertake agricultural activities. Young villagers who have been working in the companies have little or no knowledge of traditional agricultural systems that formed the basis of the village economy before the companies arrived.

The key findings of this study are that: (i) conversion of land from agriculture to uses associated with construction of large hydroelectricity projects has led to villagers abandoning agriculture - either because of sale of land to the project or because of the lack of time for farming; (ii) a major socio-economic impact of hydroelectricity project construction is that most villagers now prefer regular company employment
and are moving towards urban lifestyles, thereby losing farming skills; (iii) these changes have implications for sustainability of livelihoods of the communities, since most company jobs are of short duration. The change in land use and livelihoods of large sections of the population of the two panchayat units studied represents a transformation from a proven sustainable (though in most cases subsistence) system to a short-term and unsustainable one.

Agricultural fields have provided livelihoods to the villagers for generations. The abandonment of agricultural land and the loss of traditional farming skills threaten to deprive the people of a sustainable livelihood option. It is argued that there is a need to revive land-based economic activities on abandoned agricultural lands, reclaim degraded lands and introduce new products and production methods. The hydroelectricity companies have taken some initiatives in this direction by facilitating the formation and training of self-help groups to work on diverse income generation activities. These measures need financial support, marketing and infrastructure to enable them to become successful and sustainable ventures. Apart from these steps, there may be potential for new areas of economic activity, such as floriculture, tourism and small-scale industries.

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Ability of the state to build a green economy and the impact on labour

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Abstract
The global financial crisis of the late 2000s came at a critical time for the development of responses to the climate change imperative. However, the potential creation of green jobs offers an apparent ‘win-win’: investment in environmental technologies could simultaneously boost the economy and protect the environment. This argument (made by politicians in the UK, the US and elsewhere) follows Michael Porter’s 1991 assertion that economic benefits can accrue from environmental policy implementation. It is argued that environmental policy can be used to direct the process of innovation, fundamental to firms in a capitalist economy, in the interest of the environment. However, whilst the environmental benefits of policies may be widely shared, the financial benefits are likely to be far more restricted in distribution. This theoretical paper seeks to address the lack of attention to labour in standard discourses on economic-environment issues by analysing fundamental contradictions of capitalism. One of these is the capitalists’ need for a market whilst keeping wages low. The second is the tendency, without regulatory restraint, to exploit resources to exhaustion in disregard of potential future needs. This paper argues that the state should not expect to ameliorate one contradiction by drawing on the effects of regulating the other. Innovation inspired by environmental policy is not immune from the broader logic of technological innovation in capitalism, a major aim of which is reducing the cost of labour.

Rationale
Discourses around the environment-economy interrelationship are commonly framed in terms of what has been called the second contradiction of capitalism (O’Connor, 1994). Regulations are needed to protect the environment from businesses’ short term profit taking at the expense of their long term interests in resource supply and ecosystem health. A good example of the second contradiction is the marketing of homes on the outskirts of Tucson, Arizona, for their desert location, when that very environment is encroached upon by development (Prytherch, 2002). Few would argue today that environmental regulation is unnecessary in principle, although of course it is contested in practice. The protection of the environment has become a major task of governance at all scales. However, the complexities of environmental governance and the re-organisation of the state required to bring about something resembling sustainable development are not well understood (While et al., 2010).

The necessity for state intervention to place constraints on capital arises from the constant drive for growth within capitalism. Given the need to compete in the market place, profit needs to be substantially re-invested in business development (Harvey, 1982). Environmental-economic work has focussed on the potential for innovation to bring about operational efficiency savings and environmental product development. Thus, policy instruments incentivising reductions in CO₂ emissions may bring about
improvements to the fuel efficiency of standard internal combustion engines and/or investment in renewable energy technologies, as well as encouraging firms to look for ways to consume less energy in their production processes. These developments may indeed bring with them the hoped for returns on investment and green jobs.

However, the emphasis on innovation as a solution to environmental issues arising from the second contradiction of capitalism overlooks the pressures arising from a more fundamental contradiction. What O’Connor (1994) has termed the first contradiction of capitalism arises from the overlap between workforce and market, manifested by the need to keep wages low whilst having a populace with sufficient spending power to provide a market for the goods they have helped to produce. Investment is also made in the production of goods for sale to other companies, either as part of a supply chain or equipment for use in the production of other goods. Ultimately, however, there is an end market comprising consumers (Cox, 2002). Thus there is a fundamental conflict of interest between labour and capital as the former seeks to maximise the value of its labour power and the latter to diminish it. This contradictory relationship is disguised by the fact that labour is reliant on capital to provide employment, which is an argument that employers and the state do not hesitate to make. However, capital, and individual firms, outride changes and crises of capital accumulation in part by shedding workers. Given that labour is often the most expensive factor of production, the reduction of the wage bill is financially an attractive means of reducing production costs. For the worker, the firm’s survival and even improving prospects for the nation’s economy may be scant consolation for the loss of their job. A major means to reduce labour costs is to increase productivity (production per unit time per worker) by increasing process efficiency, possibly by automation (Harvey, 1982). Technological and operational innovations, therefore, do not resolve the first contradiction, but rather are the process by which it operates.

This paper makes a theoretical contribution. The above arguments will be developed and illustrated with a range of examples from secondary sources. It is intended to provoke a serious debate on the potential for sustainable development that has a critical awareness of the constraints of the economic system within which the world exists. The multiplicity of institutions that govern exchange within capitalism hides the fact that capitalism is itself an evolved institution, and not necessarily one capable of implementing sustainable development.

References
Mainstreaming environmental enterprises – a strategic longitudinal analysis

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The transition towards a sustainable society will require not only the transformation of existing organisational models but also the creation of enterprises that are ‘born’ considering a holistic balance of environmental, social and economic concerns. The concept of sustainable entrepreneurship as a way to promote this transition is gaining increasing attention (Hall et al., 2010; Ivanko, 2008; Schaper, 1995), with social and environmental enterprises considered key to the development of a more sustainable society (Creech and Pass, 2008; Pastakia, 1998). However, little longitudinal analysis exists that considers the evolution of environmental enterprises, especially of those that have ridden the wave of increasing societal awareness of environmental and social issues apparent within public discourse over the last two decades (Barkemeyer et al., 2009).

The early 1990s saw the emergence of the concept of ecopreneurial businesses and the business creation opportunities that might exist associated with this increased awareness of social and environmental issues by consumers. Many of the best practice examples of the time were profiled by Bennett (1991) and Berle (1991). This paper builds on from previous analysis of a sample of such environmental enterprises (Holt, in press; Holt, 2010) to consider the enterprises that are still operating in some form twenty years later, or those that were acquired as branded product(s).

The purpose of the paper is to examine in detail the 223 enterprises identified in the 1991 sample of environmental enterprises, in particular the 87 that are still trading and the 27 that were sold or acquired over this period. The business conditions faced by this group of mature environmental enterprises and their founders or owner/managers may have fluctuated over this time period but there has also been a clear mainstreaming of environmental and social issues within society during this time (Barkemeyer et al., 2009). In the 1990’s these businesses were considered to be innovative and at the cutting edge of potential business creation opportunities but as these issues have mainstreamed has this influenced the strategic direction of these businesses and their survival? This paper considers this research question by considering the 114 companies that have survived, or were acquired by other businesses.

The initial sample was identified using content scanning of the first two publications of ‘good practice’ ecopreneurial examples from 1991 (Bennett, 1991; Berle, 1991). Each business was tracked using news media and online coverage to establish their business history and current status (see Holt, in press). In the second stage of the data collection semi-structured interviews were undertaken with a sample of the original founders to discuss their personal recollections of the business history of their enterprise, and also to explore their personal motivations and values. The interviews should be considered exploratory at this stage given the small sample size. However a number of interesting themes emerge from exploration of the data.
The first emerging theme is the acquisition of these small innovative enterprises by larger traditional businesses to extend their geographical and product ranges, with some of the 1991 firms now existing as branded product ranges. This is typically associated with the so-called ‘green’ products in the food and garden/home sectors.

The second finding that emerges is the strategic shifts that appear to have emerged in the product and service offerings in these environmental enterprises in response to mainstreaming of environmental issues in society. The findings are mapped against a series of strategic models including Blue Ocean Strategy (Kim and Mauborgne, 2005) and Ansoff product/market growth matrix (Ansoff, 1988).

This paper is an important contribution to the knowledge base on sustainable entrepreneurship. It presents one of the first longitudinal assessments of how enterprises born out of an environmental and, to some extent, social agenda have survived and thrived over a twenty-year period. It offers insights into how the nascent ‘greener’ businesses that the sustainability agenda calls for today, may develop as they mature. It also offers insights into the role that the ‘beyond profit’ motives of founders may play in the development and survival of such enterprises.

In recent years the security implications following climate change have received increased attention by policymakers and researchers. Climate change is now in the field of security often described as a ‘threat multiplier’, i.e. a factor exacerbating already existing problems such as water scarcity and food insecurity by making them more difficult to deal with than would be the situation without climate change. However, there is also increasing agreement that non-climate factors such as level of poverty, governance, presence of mechanisms for conflict management, regional diplomacy etc. will largely determine whether and how climate change moves from being a development challenge to a security threat. Accordingly, one must ask to what extent climate change poses security concerns and what differences there might be depending on the climate change effects in focus, but also what kind of security concern that is raised, i.e. when, how and for whom?

This paper is based on a systematising and categorising of the vast amount of studies addressing the nexus climate change and security. The analysis lies as background to perspectives and reflections on this highly complex and politicised field. Furthermore, the analysis is used to discuss the importance of articulating the approaches taken and how the framing of climate change and security is linked to the policy approach.

The analysis focuses on peer reviewed articles published during the period 2000 to 2010 dealing with security implications from climate change. The articles include all kinds of methodological and theoretical approaches and include case studies, statistical studies and discursive analysis. The articles are selected through searching in data bases using key words relating to ‘climate change and security’. The selection made is, hence, based on the authors’ own classifications. Clearly, there might therefore be articles overlooked due to that the authors’ have not categorised them as climate change and security-related.

The categorisation of the articles focused on five elements.

- **Definitions of climate change**: whether the studies refer to e.g. temperature, precipitation, sea-level rise or extreme weather events.
- **Time periods**: whether the studies are based on e.g. historical data or future orientated scenarios, as well as the time horizon used (5/20/50/100 years).
- **Applied methods**: e.g. empirical studies, review studies, discursive studies, statistical studies, semi-quantitative studies.
- **Security paradigm**: the security approach adopted, e.g. human security, state-based security or international security.
- **Effects of climate change on security**: the types of effects in focus, e.g. humanitarian catastrophes, migration, conflicts.

The analysis recognises three main problems in this growing field of research. Firstly, many studies provide overly simplistic causal connections between climate change and its potential security implications. Climate change is generally treated rather uncritically assuming that certain types of effects and responses will be generated...
automatically due to climate change. A second problem puts emphasis on the importance of the premises adopted for the analysis, i.e. how the premises affect the interpretation made concerning whether, how and to what extent climate change is considered having security implications. The third problem is related to the previous one but focuses on the methodological foundations and their implications on the analysis’ results.

The findings from this analysis are discussed emphasising the need for scrutinizing the security approach taken and acknowledging how different approaches shape the analysis. Climate change evidently has security concerns, but depending on the security approach different effects become more prominent than other. As such, different perspectives need to be adopted in order to give a coherent understanding. Moreover, the shifting character of security, which has lately increasingly moved from state-based security to human security, is also likely to lead to very different social impacts depending on the security framework applied.

The analysis recognises that the explicit articulation of what kind of security one considers has major implications for the policy response developed. Considering that the human security approach stresses issues of vulnerability, adaptation and justice it provides a broader and more encompassing notion of climate security than e.g. the state-based approach. Moreover, since its emphasis lies on the effects on people and their situation it can better merge with the approaches vital in the discourse of sustainable development.

(vii) The Economics of Climate Change in River Deltas: Adapting to Increased Salinity.

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Introduction
Climate change impacts in the water cycle will be strongly felt in river deltas due to their hydrologic characteristics. The sustainability of the ecosystems which enable economic activity to take place in these areas can be in jeopardy due to these changes in the climate. We present a case study of climate change impacts and adaptation in the Lower Dong Nai Delta of Vietnam, an area characterized by having important agricultural production areas. The delta has relatively flat topography combined with low elevation with respect to sea level. The area has two clearly distinct seasons, the dry season when salinity intrusion occurs and the wet season when flooding happens.

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The assessment of some the physical impacts of climate change in the delta suggests that salinity concentration levels will increase due to a combination of higher sea tides and lower upstream flows in the dry season (Dung Do Duc, 2010). These impacts can have an important effect on the sustainability of production from agricultural land in the long term. Adapting to increased salinity may involve changing cropping patterns, adjusting the crop input mix, constructing new water infrastructure or abandoning land.

We integrate agronomic and hydrologic aspects of climate change into a hydro-economic framework that examines the economic desirability and tradeoffs between available adaptation options in the districts located downstream in the delta. Our framework has two components, a model for agricultural land use, and a model for water infrastructure investment analysis. Using these components we are able to implement an integrated cost benefit approach that allows us to study aspects such as the economic desirability of adjusting agricultural land use as well as the appropriate timing and location of new water infrastructure in the delta.

**Methods**

An economic model of agricultural land use is constructed using data available from crop cost and return studies and land use observations for the area. The model structure and calibration is similar to the one introduced by Howitt (1995) and later on by Merel and Bucaram (2010). Our model aims at maximizing the net annual benefit from agricultural production in each of the delta’s districts taking into account biophysical and economic constraints. An agronomic function is also incorporated in the model to relate crop yield and salinity levels following the work by Van Genuchten, M. T., and G. J. Hoffman (1984). When this yield-salinity relation is introduced in the model, the overall impacts of salinity in agricultural production can be studied in a more robust manner where both agronomic and economic aspects are integrated. Using mathematical programming techniques the model is able to identify economically feasible adjustments of crop (agriculture land use) and input changes that can reduce the impact of increased salinity on production. Our model simulations allow us to parameterize a relationship between the value of annual agricultural production and different salinity concentration levels.

Secondly, we construct a model for analyzing investments in water infrastructure. The implicit objective of the model is to minimize land value loss in a district given different salinity levels by investing in water infrastructure. The economic value of agriculture land is derived using our agriculture model, which relates annual net benefits from agricultural production to salinity concentration levels. In other words, our model treats agricultural land as an asset that generates annual profits whose value is depreciating over time due to increased salinity. Hence, our model allows us to study the economic desirability of building protective structures that can prevent land from loosing value.

Our water infrastructure model has an inter-temporal structure to study investment planning in a context of long-term climate change adaptation. The model maximizes the expected net present value of agricultural land using a stochastic dynamic programming model with one control and one state variable. Our state variable is salinity level and is randomly distributed based on hydrological simulations. Our control variable is a binary variable that represents whether or not a given water infrastructure is built. The formulation of this problem as a dynamic stochastic
discrete choice problem allows us to study the timing of investment that will minimize the impact of climate change on agricultural production, which can also be described as an optimal stopping problem (Dixit and Pindyck, 1994). Using our dynamic model we study how the optimal timing for infrastructure investment differs depending on the district characteristics such as regional crop productivity or distance to the sea.

Conclusions
The results of the agriculture model simulations suggest that salinity damages to agriculture are not as pronounced when adjustments in the farming systems are allowed for a certain range of salinity levels. The possibility of switching towards more salinity tolerant crops such as changing from rice to beans can reduce the overall economic impact of salinity in the region. The water infrastructure model simulation results suggest that there is economic value for building protective infrastructure in certain districts within the delta. Earlier investment in infrastructure is preferred in districts located closer to the sea due to their greater degree of exposure to salinity damages.

The analysis presented in this paper provides an example of an integrated framework for assessing the economic performance of adaptive measures that aim at reducing the long term climate change impacts of increased salinity on agricultural production. This framework can be a useful planning tool for climate change adaptation in a river delta where agricultural production is important.

References
Issues of sustainability are quickly becoming central to most ecologically-based systems, which is especially true for rural water systems in the developing world. An important feature of sustainable systems is the dependence of the system on the socio-economic and physical-chemical-biological context in which it exists, whether this is buy-in of the utilizing population, economic support, or resource availability (Ostrom et. al, 1993). Ignoring the interconnections of these issues and the relative local context will ultimately result in an unsustainable system. We propose an agent-based simulation model that can be used to integrate individuals' socioeconomic decision-making into scenario-based analyses of alternative water delivery systems. While the model we propose is in the preliminary stages of development, the approach represents a different way of addressing these issues and illustrates the many aspects that contribute to sustainable water systems in this particular context.

Understanding how sustainable systems function requires a detailed analysis of the community and the projected impacts after a system has been implemented. Life-Cycle Analysis (LCA) is a standard approach to analyze the projected environmental and economic inputs and outputs at each stage of the life cycle of a system, plus the ultimate impacts of such a system. While LCA has not traditionally handled social impacts, we add to this framework of evaluating inputs and outputs at each life-cycle stage by incorporating Agent-Based Modeling (ABM) techniques to represent decisions made by many heterogeneous individuals. Our approach captures the community context, including spatial relationships, which can be used to model the sustainability of various water delivery options. This approach allows a predictive model that can be tailored to a variety of communities, allowing stakeholders to consider how the sustainable system should be tailored to the specific context before the majority of capital investment has occurred.

ABM is a computer simulation technique that captures the important model features as individual decision-making agents (Epstein, 2007) in software. Agents have a location in the model that changes over time, allowing for time-varying local interactions with the environment and other agents. The combined interactions represent the community at large going about its daily activities, driven by each agent’s internal process and the surrounding decisions of others. Decisions are derived from rule-sets that allow a layering of functionality, proving incremental design and exploration of heterogeneous agent types. The simulation aspects of ABM also allow the consequences of specific agent interactions to be easily examined for consistency with modeled system features (Ruebeck et. al., 2011).

Our model captures subsistence farmers in the developing world with limited access to reliable potable water. The model consists primarily of three agent types:
households that determine water usage, water boards collecting monetary reserves for maintaining water systems over time, and water assets of differing quality (Weir et al., 2010). Households are clustered in the model space to represent a living community, with water assets distributed throughout the model to approximate their physical distribution. Households track available water quantity of various qualities, family health, and general household wealth. Water asset characteristics include: reliability, economic cost, quantity, and quality. The model incorporates distance to measure the time cost associated with family members traveling to specific water assets. Movement occurs over a path network to reinforce the physical topology of the modeled community, and provides a computationally efficient mechanism for tracking movement. Time is also considered, using 15-minute increments, with the desired ability to track up to twenty years of simulation time in a reasonable period of computation.

Water assets include springs and surface water (lakes and rivers), groundwater, rainwater, and piped water. These sources can be potable or not, depending on treatment options. In combination with retrieval distance, the sources form a set of possible assets for households. Travel time is determined by field studies of villagers using standard operations research techniques. From water gathering activities, households build up limited water reserves representing water supply over part of a day. This limited reserve is reduced using an estimated diurnal model of water demand, also from field studies. Standard diurnal models for the developed world are driven by easy access to piped water. For the developing world the diurnal model is less predictable, driven by demand and proximity of family members to a water source. The household water retrieval decisions are also field-based, accounting for proximity, price, crowding, quality, and random factors (Nyong et al., 1999).

The water asset choice by each household has outcomes affecting household health, financial resources, the health of the greater environment, and the sustainability of a possible community-based water system. Household health is based on the mathematical model introduced by Fewtrell et al. (2007), approximating the burden of disease based on a combination of factors including non-potable water, sanitation access, and hygiene practices. The life-cycle cost and greater environmental burden are based on a combination of published LCAs for various water system contexts (Stacey et al., 2009). Water system sustainability is based on the aggregate community financial reserves available for ongoing operation and maintenance (Brikke et al., 2003). Previous ABM work (Pape et al., 2010) shows that conjectures can be made about a population’s increased welfare as a result of groundwater management. Our work takes into account previous literature (Ahuja et al., 2010), providing evidence for gains from modeling use, take-up based on surveys, and randomized trials, along with potential divergence between actual and stated preferences as well as experience in parameter estimation for structural policy simulations. While there is work studying self-supply of water by the urban poor (Grönwall et al., 2010), we study the rural poor and provide guidance for efforts to improve water quality and access. Additional studies considered, such as Kremer et al. (2009), examine political and social interventions that promote efficient resource use, finding that choice between private and public solutions may depend on income.

In summary, we are establishing both an exploratory-process and modeling-framework that combines field work, published studies, and simulation to determine
how capital decisions regarding rural water system infrastructure will affect a hypothetical developing world community represented by the fieldwork. The computer simulation is tuned to efficiently represent a hypothetical 20-year system design life to capture both the amortization and physical change of the infrastructure in the long-term. Our intent is to provide policy makers with tools to explore and develop an effective understanding of multiple possible solutions with substantiated rationale for choosing one solution from the presented alternatives.

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Higher Education Leadership Stages and Strategies that Relate to Campus Environmental Sustainability at U.S. Colleges and Universities

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The Higher Education Association’s Sustainability Consortium (2005), an informal network of institutions with a shared interest in moving environmental sustainability forward on college campuses, acknowledges that higher education has both a challenge and lead role in society. In addition, higher education has been identified as one of the leading entities in society that could have long term cognitive, physical, and philosophical transformative impacts in the area of environmental sustainability (Calhoun & Cortese, 2005; Cortese, 2003; Sharp, 2002). According to Schmidt-Bleek (2008), institutions are expected to incorporate goals that support environmental sustainability, environmental development, policy, and management within a certain time frame among college and university campuses worldwide. The researcher stated that the time frame in the majority of literature, such as the Talloires Declaration of 1990, the 1993 calculation released by the Business Council for Sustainable Development, and the Rio Declaration of 1992 will terminate around year 2040. With such a short time frame to make significant strides, institutional leaders have been seeking guidance through organizations such as the Association for the Advancement of Sustainability in Higher Education (2001), and Society for College and University Planning (SCUP). As part of the second wave of improvements toward environmental sustainability on college campuses, Sharp (2002) mentioned the American College & University President’s Climate Commitment (ACUPCC), which encourages a public proclamation by university presidents to commit to environmental efforts in campus policy, procedure, and action. ACUPCC, if signed, signifies a significant step toward sustainability on campuses. ACUPCC requires the creation of a viable plan of action that incorporates strategy by the institution toward environmental sustainability. In the creation of an action plan, strategies of implementation become important to short and long term success in meeting the expectations of ACUPCC. The ACUPCC suggested that institutions examine similar institutions for strategies and emphasized that leaders should utilize strategies that were “institution-specific”. This suggestion was most likely made due to the variability among institutions. How would a leader know which strategies to focus upon and which to forgo when examining similar institutions, and more importantly, the operation criteria of identified strategies? Also a challenge to institutional leaders, an expectation of environmental sustainability has been realized through such declarations as the Talloires Declaration of 1990, but how do leaders begin to tackle the challenges of becoming sustainable?

According to Cortese (2007), the well being of the earth, the human population that resides on the earth, and all of earth’s resources has approached a critical point. Human beings will be forced to make difficult decisions in response to these changes. Humans can choose to ignore the challenges of the world and witness the destabilization of ecosystems, the climate, and waterways, or humans can choose to organize and develop solutions to counteract the mounting damage to the earth. Contributing factors to the decline of the earth include human population growth, and a higher demand for resources such as water, food, and energy. Unfortunately,
technological advances and economic talent has established an artificially increased carrying capacity that has allowed for a situation of overpopulation of human beings worldwide. According to Cortese, events, such as global warming, have the potential to undermine the precarious position of humans in the form of increased health ailments, limited food sources, degradation of soil, and contaminated drinking water. Cortese also noted how the associated consumption rate of resources was approximately 20% in developing countries whereas the consumption rate of resources in developed countries, such as the United States has approached 80%.

Cortese (2007) stated that there was an ethical responsibility for higher education institutions worldwide to become major players in the stabilization of those events that have become risk factors on planet earth. Fiksel (2006) suggested that organizations, such as higher education institutions could become influential forces in the movement toward sustainability through systematic practices. Sharp (2009) stated, unfortunately, that although higher education institutions were interested and supported environmental transformation, and some institutions went as far as sustainable building on campus that supported environmental sustainability, occasionally those same institutions reverted back to previous habits of not being environmentally sustainable.

Two theories, transformational leadership and strategic leadership theory were recognized as the most prominent and relevant theories for this research study and were used to provide a fundamental framework for this research. The two theories mentioned, transformational leadership and strategic leadership theory were identified as the most prominent theories due to the close alignment and association to the study conducted. Both transformational leadership and strategic leadership theories involve the leaders of an organization as decision makers capable of manipulating an outcome. In this case, the organization is the higher education institution. According to Bass (1985), transformational leadership is the ability of a leader to move an organization and the constituents within the organization toward positive change. In this study, university leaders were investigated, strategies were examined, and potential transformations, in the form of environmental sustainability, were evaluated. The theoretical framework also focused on the theme of leaders as decision-makers and sought to prepare leadership professionals with the knowledge and skills to make environmental sustainability a reality. Leaders, as a result, will be forced to reflect on current practices, refine environmental practices, identify current problems and solve implementation issues within an increasingly diverse, complex, and dynamic technological society. According to Skinner (1971), behavior patterns of not only institutional leaders, but followers as well, can be modified. The behavior patterns of all institution stakeholders can be transformed to accommodate the dynamic pace of change in the area of sustainable development.

This study explored and described leadership strategy implementation stages that related to the development of environmental sustainability on college and university campuses within the United States. The goals of the study were to: 1) document prominent leadership strategy implementation stages used on university campuses in the United States, 2) develop a holistic understanding of environmental sustainability as it relates to college and university campuses, 3) recognize the strengths and weaknesses of tools used for sustainable assessment and evaluation on university campuses in the United States, and 4) establish a working bank of leadership strategy...
The study consisted of a quantitative, non-experimental design. A sample of 284 colleges or universities was selected from a population of 332 institutions that were included in the 2010 Sustainability Report Card. Institutions represented both private and public institutions throughout the United States.

The Auditing Instrument for Sustainability in Higher Education, created by Roorda and associates (2001) was the survey instrument used to collect leadership implementation stage and strategy data from university leaders in the form of ordinal data. The Spearman rho correlation coefficient was used to determine the magnitude and the direction of the relationships between leadership strategy stages and institutional environmental sustainability rankings. Three of nineteen research questions were found to be significant and inversely related. Environmental policy resulted in a significant correlation \( r (86) = -0.209, p < .05 \), the collection of environmental sustainability comprehension data on professional organizations and area businesses was significant \( r (86) = -0.213, p < .05 \) and the degree of society data availability was significant at \( r (86) = -0.248, p < .05 \). The effect sizes for all significant correlations were low. A simple regression was used to predict the environmental sustainability ranking from the degree of leadership strategy implemented. No significant relationships were found.

(x) Adaption to Climate Change: the Sustainability Challenge for Hong Kong

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Climate change is one of the defining issues of our time. As the frequency of extreme weather incidences continues to rise in recent years, climate change has become one of the top priorities on the global policy agenda. Internationally, communities continue to define and redefine sustainable development strategies to cope with the dynamic impacts of climate change, from the 1972 Stockholm United Nations Conference on the Human Environment to the 2009 Copenhagen United Nations Climate Change Conference. The International Panel on Climate Change (IPCC) forecasts that during this century, the average global surface temperatures will increase by 2.8°C on average \(^2\). Hong Kong is a metropolitan city with seven million residents that has been contributing to and suffering from the impacts of climate change, but only recently has its government committed to join hands with the international community to move Hong Kong towards a low carbon economy \(^3\).

According to a Technical Note issued by the Hong Kong Observatory, the average temperature in Hong Kong increased by 0.12°C per decade over the past 118 years.

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period, but in the period between 1989 and 2002, the rate increased significantly to 0.61°C per decade⁴. United Nations Environment Programme’s (UNEP) *A UN Guide to Climate Neutrality*⁵ states that climate neutrality is defined as living a lifestyle that produces no net greenhouse gas (GHG) emissions, by reducing our own GHG emissions and using carbon offsets to neutralize the remaining emissions. Mobilizing the entire Hong Kong society to transform into a sustainable ‘low-carbon’ city is a formidable task, and implies that its citizens will need to reconsider their current lifestyles and behaviours in order to help reduce GHG emissions.

The Hong Kong Special Administration Region (HKSAR) Government has made climate change a higher priority in its policy agenda in recent years, and is gradually recognizing the need to respond promptly. In the 2009-10 Policy Address of the Chief Executive of the HKSAR Government, Mr. Donald Tsang overtly stated that the Government has attached considerable importance to climate change issues. The Government has commissioned a consultancy study to develop comprehensive strategies and measures to cope with climate change⁶. He further asserted that the Government has made building a ‘low-carbon economy’ a top priority for the HKSAR’s policy agenda. Currently, the Government is launching a public consultation on Hong Kong’s climate change strategy and action agenda⁷. It is clear that action must be taken, and the key challenge is to determine how Hongkongers can be mobilized to help transform the city into a more sustainable and climate-neutral society. The imminent question is whether Hongkongers are ready to support this agenda and to adopt a change in their lifestyle. If not, what should be done, individually and collectively? To this end, a public survey⁸ was conducted in December 2010 to study people’s perception towards climate change risk in Hong Kong. It also attempts to evaluate the extent to which people are willing to adopt a climate neutrality lifestyle. The followings are highlights of the preliminary findings of the survey.

Overall, the study revealed that the majority of respondents (over 95%) were aware of the challenges of climate change. Many of them (over 80%) felt that weather conditions have worsened in recent decades and are adversely affecting their daily lives. In particular, many respondents associated climate change with deteriorating air quality. The survey asked the respondents to compare the relative seriousness of climate change with other social problems, and the results showed that slightly more respondents were concerned about other social issues over climate change, such as medical, social security, natural disaster and income inequality. Similarly, respondents were more concern about conventional environmental problems such as air pollution, water pollution, solid waste disposal, and ocean pollution than the impact of climate change. Therefore, climate change was still regarded as a “distant

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⁵ Kirby, A. (2008), *Kick the Habit: A UN Guide to Climate Neutrality*, UNEP.
⁸ The survey was funded by the Faculty Research Grant of the Baptist University of Hong in a Project entitled “Climate Change Risk Perception in Hong Kong: Perspectives of the General Public & the Environmental Professional Groups Kong” (FRG2/09-10/095).
concern” when compare to conventional social and environmental problems. The survey also assessed the degree of support on the Government’s proposed adaptation strategies to combat climate change. Nearly all strategies and actions suggested were highly supported by the respondents, with the exception to the suggestion of revamping the fuel mix for electricity generation in Hong Kong. Although over 95% of the respondents were aware of the climate change issues, they held little confidence that the Government will be able to solve the problem. The majority of the respondents agreed that Hong Kong should take action to combat climate change issues, and suggested engaging people to change living habits as the most feasible way to tackle this issue at this time. Regarding lifestyle changes, the top three actions that respondents considered most effective and would consider taking are: (1) taking public transportation; (2) to supporting recycling projects/programs; and (3) using energy-efficient products at home and in their workplaces. On the other hand, one of the major barriers that hinder low carbon living development in Hong Kong is the lacking of support from key stakeholders such as the Government, environmental NGOs, and leaders in the commercial/industrial sectors. Moreover, the materialistic lifestyle in Hong Kong also hinders the adoption of low carbon living.

To conclude, climate change is a global challenge that calls for global actions. The Hong Kong SAR Government is now committed to working closely with the global community to combat climate change. To ensure its success, the entire Hong Kong society is urged to take green actions in their daily activities. Conventionally, the social values of Hongkongers are dominated by the pursuit of economic returns and materialistic lifestyle. For more than a century, these values have contributed to the city’s success as a commercial centre, but they have also contradicted the aspirations of being a climate-neutral city. Undoubtedly, Hong Kong’s society as a whole is now more mindful of environmental problems. As citizen participation and lifestyle changes are necessary to tackle climate change issues, it is important to understand the extent of people’s awareness of climate change risks, and their acceptance in adopting a shift in lifestyle. It is encouraging that the study revealed positive signs of a greener development and positive support from Hongkongers. However, the challenge to incorporate a green culture into a traditionally ‘ungreen’ society is a formidable task, and the Government should work to overcome hurdles that may hinder Hong Kong from adapting to the ‘low-carbon society’. It is a challenge to ensure that eco-friendly living practices can coexists with the modern, capitalist, and consumer driven society. This paper provides a detailed analysis of the data collected and aims to seek new breakthroughs that will be conducive to the long-term sustainability of the city of Hong Kong.

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A vital underpinning of any modern economy and society is its transportation system. Within the past century, transportation systems have greatly evolved and transformed cities and communities around the world. In particular, freeway networks and private automobiles have gained prominence in many countries – indicated by a significant increase in vehicle miles of travel (VMT). The fact that VMT and gross domestic product (GDP) have increased simultaneously in many societies has led some researchers to conclude that an increase in automobile travel signifies a strong economy and, consequently, that a decrease in automobile travel signifies a poorly performing economy. (1, 2) However, other researchers suggest that strong economies can exist with low levels of vehicle travel. If true, this is an important result because it is widely acknowledged that excessive vehicle use results in a myriad of adverse socioeconomic and environmental impacts that jeopardize the sustainability of a society. (2, 3)

Furthermore, the fact that sustainability is often viewed exclusively as an environmental issue helps to exacerbate the misconception that economic growth and sustainability are incompatible. (3) In this work, we examine these issues by studying the inter-relationship between GDP and VMT for the 50 states and the 50 largest metropolitan regions in the United States. In this study, we also examine how economic equity and economic resiliency vary across the country for places with different types of transportation systems.

In order to assess the relationship between GDP and VMT we use a measure of transportation efficiency, which we define as the ratio of GDP to VMT. The resulting measure for transportation efficiency is in terms of dollars per mile of travel. The idea is that the most efficient places are those that maximize economic activity – represented by GDP – while minimizing the social and environmental costs that are associated with increasing VMT. (4) Our assessment of efficiency looks at the GDP to VMT ratio in absolute terms and how this ratio has changed over time in terms of GDP growth to VMT growth. For GDP, we use the value adjusted for inflation, which is chained to the year 2001 dollar value.

The results at the statewide scale show that in 2007 (the latest available data), GDP per vehicle mile of travel ranged from $2 in the worst performing state to $7 in the best. Looking at changes in efficiency over a period of ten years, the state of Oregon significantly outperformed all other states with an increase in GDP per vehicle mile of travel from $3 to $4. This reflects the fact that in Oregon GDP growth far outpaced growth in VMT. Oregon has been able to increase GDP while implementing policies...
that have restrained the growth of VMT. At the other end of the spectrum, the state of Mississippi saw a decrease in GDP per vehicle mile of travel from $2 to $1.50. This signifies a place where the growth of VMT outpaces the growth of GDP. In general, states with more diverse travel options performed better on these measures of transportation efficiency.

Results for the urbanized areas reveal even more extreme differences. In San Francisco, GDP per vehicle mile of travel increased from $7 to $10. The data for San Francisco shows a GDP increase of 13 percent, while VMT actually decreased by 20 percent over the ten year period. In Miami, GDP per vehicle mile of travel decreased by more than half, from $11 to $5 per vehicle mile of travel. The reason for this was that in Miami, GDP increased by 25 percent while VMT increased by nearly 200 percent. As with the statewide results, the areas that performed the best were the ones with a more diverse suite of transportation options.

We also compare the states and the metro regions with respect to economic equity and potential economic resilience in the face of a global run-up in gasoline prices. The cost of transportation has implications to individual accessibility and overall economic robustness. (5) Transportation costs are an equity issue because people do not always have a full range of transportation options to choose from. (6) Furthermore, transportation costs are regressive in nature – meaning, as a percentage of income, transportation costs place a greater burden on lower income households. (6) The parameter we use to assess economic equity is the average expenditure on transportation services. This is measured in terms of average percentage of median household income spent on transportation – which included the cost of transit, car ownership (insurance, registration, taxes, depreciation), and car use (gas, maintenance). In addition to looking at how transportation costs impact individual households, we also look at the relation of gasoline prices to the overall economy. One approach to describe this relationship is to look at it from a resiliency perspective. (6) A resilient transportation system will be able to continue operation and support economic activity despite dramatic increases to the price of gasoline. (6) We measure economic resilience by using the total expenditure on gasoline for transportation as a percentage of total GDP in the state or region.

The results for the economic equity parameter reveal major differences both among the states and among urbanized areas. For example, in Mississippi – where the median income is the lowest – residents spend roughly 44 percent of their income on transportation. In New Hampshire – where the median income is the highest – residents spend only 23 percent of their income on transportation. However, this difference in percentage is not just because of the difference in levels of median income. The gross expenditure on transportation is also greater for residents in Mississippi than in New Hampshire. In urbanized areas, the percent of median household income spent on transportation ranges from 18 to 37 percent. Those with the lowest transportation expenditures are those with well-established transit systems such as New York City, San Francisco, and Washington DC. The results also suggest that differences in the cost of transportation to households are dependent not just on the local availability of transportation options but also on the location and distance between jobs and housing.
With regard to the overall economy and transportation’s reliance on gasoline, which is highly volatile in price, we again found a wide gap among the states and among urbanized areas. For the states, the percent of GDP spent on petroleum (excluding local taxes) ranged from less than 2 percent in places like New York to more than 7 percent in places like Mississippi. These results suggest that when the price of petroleum increases, some states, such as Mississippi, will face a significantly greater economic shock than what will be felt in other states. This is particularly debilitating because expenditure on transportation fuel represents money leaving local economies because transportation fuel is mostly imported. As with most of our other findings, the results show that the most resilient places are those with less automobile use and a wide selection of transportation options available.

Transportation systems play a vital role in the economic growth of societies, but this does not mean that increases in vehicle travel and economic activity should be linked conceptually or in practice. This study shows that the relationship between VMT and GDP is highly variable due to differences in the form of transportation systems across the country. In a number of studies, high levels of automobile use have been linked to issues of environmental and social sustainability. Our study reveals that the economies in communities with higher levels of automobile use also tend to be less efficient, less equitable, and less resilient. The most important finding from this analysis is that in the transportation field, solutions that improve social and environmental sustainability tend to also have favorable economic outcomes.

6 ARTICLES

The short articles provided for the Newsletter are intended to stimulate debate. Responses to authors or to the Editor are welcomed, as are articles that further develop the debate on issues for subsequent Newsletters. Articles are in alphabetical order by author.

(i) Design and Fashion Challenge Sustainability

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Design and fashion of products

Some products are designed in ways that many people recognise them as designed: when looking at certain highly designed furniture, for instance, you could hear someone say, “Wow. This chair is cool! It has some really hot lines.” Those are typical remarks for things being designed. That is how we hear about design in everyday life, journals and TV shows. Thereby, good design is a product that someone thinks is beautiful, cool or hot. Design is something that looks styled. It has to do with the outside, with the external appearance. According to Wikipedia,

Design, usually considered in the context of the applied arts, engineering, architecture, and other creative endeavours, is used both as a noun and a verb. As a verb, “to design” refers to the process of originating and developing a plan for a product, structure, system of component. As a noun, “a design’ is used for either the final (solution) plan (e.g. proposal, drawing, model, description) or the result of implementing that plan (e.g. object produced, result of the process).

This description shows that design is a result of what someone has thought, planned and intended to do. Such a definition helps create a consent on one level, but it hides the fact that design has many perspectives to it, many meaningful threads that weave an interesting network of perspectives. An all these perspectives help explain why the interest in design has increased so much lately. For instance, design can be related to a product when thinking of a chair, a car or a wine glass. Design can be related to processes when thinking of the distribution of IKEA furniture in flat packages from production to point of purchase or even to your home destination. Design can be related to ecology and technology when thinking of different types of cars that have more or less environmental impact. There are many more perspectives, of course, but I would like to point to the relation of expressivity and identity in considering design.

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These should not be underestimated. Design is in many aspects a matter of people wanting to express themselves, both as a designer and as a consumer. When thinking of the many brands surrounding our social lives, design has become an important identity marker. Aesthetic ideals and design have always been formed by a cultural elite: in the 18th century there was a chain of translations from the Royalty, aristocracy, the high nobility and then to the rest of the people. And that is just as it is today: the well-informed design-interested people in media and art industries lead the way before the uninterested mass consumers, the mass market.

Mass markets today are saturated markets and thus subject to fierce competition. Products are equal to each other in a technical sense, and often industrial production has been able to cut large costs through increased work specialization, mechanizing and mass production. As an example, it is said that, in 1986, it took 100 hours to assemble a Saab car compared to the 30 hours to assemble a Saab car today and 20 hours to assemble a Toyota car.

It seems as if the most cost cutting lies behind, and that car makers need to charge their offer with other values that increase brand value and sales revenues instead, such as emotion, ethics, aesthetics and epic (Strannegård and Salzer-Mörling, 2004): a) emotions that products or companies evoke, such as Porsche or Alessi; b) ethics embodied in actions and communication of values that companies stand by, such as the Body Shop or Paul Newman; c) aesthetics and an aesthetic experience on behalf of the consumer that a certain company or product evokes, such as Apple or iPods; and d) epic and a story of the company that can be offered that strengthens the consciousness of sustainability-aware consumers, such a Patagonia or Ben & Jerry’s.

Ethics, emotions, aesthetics and epic are illustrations of how design can contribute to upgrade an offer of products with similar functions, but different design to them. For industry, businesses focus more and more on revenues, because the cost side is not enough to create profit. The large margins can be created with ethics, epic, emotion and aesthetics. And design is the tool by which these offers differ from the mass.

One illustration of how design and branding can increase revenues is that of toilet brushes. Alessi once said: “People have an enormous need for art and poetry that industry does not yet understand.” The toilet brushes of this producer are made of happy coloured plastics with fun forms and thus differ widely from the most simple toilet brushes in white plastic that can be found in IKEA, for instance. The prices also differs widely: at IKEA you could, in early 2000, buy VIREN, their cheapest toilet brush, for only 8 SEK (in 2011, you can have their most recent toilet brush, Bolmen, for only 4 SEK), while you pay more than 600 SEK for the design version from Alessi.

**Reflections for research agendas**

Despite examples that deal with marketing designed products and how fashion helps to influences how we consume products and that we consume at all, this quotation by the design guru, Bruce Mau, helps us to understand that design is much more philosophical than you may at first imagine:

“… life doesn’t simply happen to us, we produce it. That’s what style is. It’s producing life … Style may be presented as theory, serendipity, or
happenstance. But fundamentally style is a decision about how we live. Style is not superficial. It is a philosophical project of the deepest order.” (Mau, 2000:27).

It is very interesting that toilet brushes can be sold for so much more than the IKEA version and buyers do not feel fooled at all. At some point I can understand it. At some other point, I just do not understand it, because corporate social responsibility is also about bringing quality and reliable products to customers at fair prices. I want to end this discussion with a few hypothetical research agendas for better understanding sustainable development, or, even more importantly, to point out why we have an unsustainable situation in the first place.

First, aesthetic consumption has become more important for sustainability than production. We ought to examine critically the role of consumption, and thereby examine critically the role companies play in consumption when proclaiming promises for sustainable development. Corporate sustainability as a concept may be used by many people, but it may still remain misunderstood since the corporation is the wrong unit of analysis when interested in sustainable development because the latter takes place in society, to which companies, just as any other actor, contribute through social responsibility, for instance. When reflecting on the increasing market share of hybrid cars, for example, we can ask ourselves if design can serve sustainability or just commercialism, as expected for corporations and their market role. Second, “everyday life” has become more important to study than products. It may be fruitful to rely on “everyday life” in the Gergenian sense (Gergen, 1991; 1994) that our lives and identities are constructed around all the relations we surround ourselves with (social, including technological). Thus, it becomes important also in a sustainability context, which means that it does matter what restaurants we dine at, at what hotels we spend our nights, or how and where to we travel, if at all. It is what we do in our everyday lives that counts, rather than focusing on products and the point of purchase (Zukin, 2004).

Third, it seems that desire, bad habits and addiction of people, and how corporations exploit these, has become more pressing to focus on in our studies of unsustainable development. We should focus on the unhealthiness of “shopping addictions” to understand another side of business ethics and current consumers.

Fourth, tourism is yet another important area for sustainability-related research. Tourism is not only the world’s biggest industry according to the World Tourism Organisation, it seems to be the world’s fastest growing industry as well, which leads to the result that hardly any place is spared from the commercial powers of tourism and the economic rhetoric of growth. Thus, to study the performative role of guide books and guided tours and their consequences on society, organizations and individuals could very well be an important study in sustainability.

And I am a bit worried that most companies are more willing to exploit our addictions rather than to explore our needs or contribute to sustainability. It becomes crucial to understand these mechanisms behind aesthetic consumption. If aesthetic consumption promotes a lifelong identity project, then we shall have a problem. How are our basic social needs to be determined? By what we ‘have’ or
what we aspire ‘to be’? This is the key question that Fromm (1976) posed in ‘To Have or to Be?’ It is still a central question for how we are to live sustainable lives. In what ways does corporate social responsibility relate to our basic needs beyond promoting consumption? If we think aesthetic consumption is bad, who is responsible for that? What’s the difference from other demands put on companies? Governments? Consumers?

(ii) Climate Scientists the Target in Culture War

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In January, Americans were shocked at the attempted murder of Arizona Congresswoman, Gabrielle Giffords, and the killing of six bystanders. The local County Sheriff, Clarence Dupnik, captured the immediate assessment of many when he linked the attempted murder to the rise of violent anti-government rhetoric and imagery, observing, ‘The anger, the hatred, the bigotry that goes on in this country is getting to be outrageous.’

When asked if the Congresswoman had any enemies her father replied: “Yeah. The whole Tea Party”. Many, including Giffords herself, had had a premonition that the inflammatory language of radical right-wing activists would sooner or later find real expression. The same vicious rhetoric that created the circumstances in which Gabrielle Giffords was gunned down also stokes ferocious attacks on climate scientists and environmentalists in the United States.

Some of the bitterest attacks on climate scientists are made by commentators employed by Fox News. Bill O’Reilly and Sean Hannity often ridicule climate science. Glenn Beck calls global warming ‘the greatest scam in history’ and gives air-time to Christopher Monckton to attack the work of climate scientists as fraudulent with his unique blend of statistical gobbledegook, invented ‘facts’ and off-the-planet conspiracy theories.

The network sometimes features Steve Milloy, an energy lobbyist who ran the The Advancement of Sound Science Coalition, a front group initially devoted to denying the link between smoking and cancer. Milloy is introduced as an expert on ‘junk science’, meaning climate science.

Another Fox regular is Marc Morano, the former aide to Republican Senator James Inhofe, founder of the most malicious anti-science blog, and the man who said climate scientists deserve to be publicly flogged. Last April, on Fox News, Morano launched a virulent attack on Professor Michael Mann of Penn State University, calling him a ‘charlatan’ and responsible for ‘the best science that politics can manufacture’.

When Morano singles out a climate scientist for attack on his website he includes their email addresses and invites his followers to ‘get in touch’. Many of them do.
Last year I wrote a series of articles detailing how Australia's most distinguished climate scientists have become the target of a new form of cyber-bullying aimed at driving them out of the public domain. Each time they enter the public debate through a newspaper article or radio interview they are immediately subjected to a torrent of aggressive, abusive and, at times, threatening emails.

The exposé of cyber-bullying was immediately picked up in the United States where the phenomenon is even worse. *Scientific American* gave it prominence and, in Britain, *Nature* did too, and many more stories of intimidation emerged into the light of day.

Dr Kevin Trenberth, head of analysis at the National Center for Atmospheric Research in Colorado, turned over to university security 19 pages of ‘extremely foul, nasty, [and] abusive’ emails collected in the four months after the Climategate storm broke in November 2009. Another prominent climate scientist had a dead animal dumped on his doorstep and now travels with body-guards.

Stephen Schneider, an eminent climatologist at Stanford University who died a few months ago, said last year that he had received hundreds of threatening emails. Exasperated he asked: ‘What do I do? Learn to shoot a magnum? Wear a bullet-proof jacket?’ He believed that a scientist would be killed, adding: ‘They shoot abortion doctors here’.

They shoot Congresswomen too. When his name appeared on a neo-Nazi ‘death list’, alongside other climate scientists with apparent Jewish ancestry, the police were called in. Schneider said he had observed an ‘immediate, noticeable rise’ in emails whenever climate scientists were attacked by prominent right-wing commentators.

Paul Ehrlich was quoted in *Nature* saying: ‘Everyone is scared shitless, but they don’t know what to do’. The story noted that the bullying and threats intensify after anti-climate science rants from the likes of Rush Limbaugh, Glenn Beck, Marc Morano and Steve Milloy. Except for Limbaugh they are all either employed by Fox News or appear often on the network.

Michael Mann of ‘hockey stick’ fame said the same about the hate mail he had received. ‘I’m not comfortable talking about the details, especially as some of these matters remain under police investigation,’ he said. ‘What I can say is that the emails come in bursts, and do seem to be timed with high-profile attack pieces on talk radio and other fringe media outlets.’ The most influential ‘fringe media outlet’ vilifying scientists is Rupert Murdoch’s Fox News.

**Official harassment**

The campaign of harassment against scientists took a sinister turn last year when Oklahoma Republican Senator James Inhofe called for some of the world’s most eminent climate scientists to be investigated for criminal violations. A document prepared by his staff on the US Senate Committee on Environment and Public Works claims scientists mentioned in emails stolen from the Climatic Research Unit (CRU) at the University of East Anglia are guilty of manipulating data and obstructing its release. It lists federal laws they may have violated and names 17 climate scientists whom Inhofe claims should be investigated for possible criminal prosecution.
One of those listed, Raymond Bradley, the director of climate science research at the University of Massachusetts Amherst, responded: ‘I am worried about it, I have to say. You can understand that this powerful person is using the power of his office to intimidate people and to harass people and you wonder whether you should have legal counsel. It is a very intimidating thing and that is the point.’

The accusation of criminality against leading climate scientists takes the denialist campaign of harassment and intimidation to new depths, and immediately conjures up images of McCarthyism. In November 2009, Inhofe’s fellow Republican Congressman James Sensenbrenner of Wisconsin wrote to the Intergovernmental Panel on Climate Change (IPCC) demanding that scientists whose names appear in the stolen CRU emails be blacklisted from all further work with the IPCC.

According to Scientific American, deniers in Congress have used their offices to send ‘intimidating letters’ threatening dire consequences to scientists working on climate change. One of the recipients, NASA scientist Gavin Schmidt, said: ‘That is chilling the work of science in the agencies. It’s certainly very off-putting for scientists who want to talk about their stuff in public but fear the political consequences. Nobody wants to create an enemy on the hill.’

In an editorial last March on cyber-bullying, Nature reported on Senator Inhofe’s attempts to criminalise climate scientists before commenting: ‘As a member of the minority party, Inhofe is powerless for now, but that may one day change.’ That day came last November with the mid-term elections in which the Republicans, powered by a surge of support for the Tea Party, won a majority in the House of Representatives.

Before the election Climate Progress noted that ‘every single GOP [Republican] Senate candidate now either denies climate science or opposes even the most moderate, business friendly, Republican-designed approach to reducing emissions’. With the elections, both houses saw a flood of new representatives who are climate deniers. ‘Of the freshmen Republicans … 36 of 85 in the House and 11 of 13 in the Senate have publicly questioned the science.’

Sensenbrenner is now the deputy chair of the House Science Committee, which plans to investigate the veracity of climate science, despite the fact that all American Academy of Science has reaffirmed its validity and a series of inquiries into ‘Climategate’ has exonerated the scientists mentioned and concluded that there is nothing in them to undermine the science.

In the United States there is now a deep divide between liberal and conservative voters in their beliefs about global warming. As is now well documented, the opening of this gulf was due to the fact that from the mid-1990s Republican Party activists, in collaboration with fossil fuel interests and conservative think tanks, had successfully associated acceptance of global warming science with ‘liberal’ views.

That global warming has been made a battleground in the wider culture war is most apparent from the political and social views of those who reject climate science outright. Among those who dismiss climate science, 76 per cent describe themselves as ‘conservative’ and only three per cent as “liberal” (with the rest ‘moderate’). They
overwhelmingly oppose redistributive policies, programs to reduce poverty and regulation of business. They prefer to watch Fox News and listen to Rush Limbaugh.

Like those whose opinions they value—shock jocks and television demagogues—climate deniers are disproportionately older, white, male and conservative—those who feel their cultural identity most threatened by the implications of climate change. While the debate is superficially about the science, in truth it is about deep-rooted feelings of cultural identity. This makes deniers immune to argument, and their influence will wane only as they grow old and die.

(iii) Facing up to the Epistemological Dilemmas Impeding Serious Inter-disciplinary Engagement with Sustainability

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I’d confidently wager that few reading this would contest the emphasis in sustainability studies on inter-disciplinarity and on crossing the boundaries of substantive disciplines as central to a proper understanding of issues of sustainability. Transitions towards sustainability require both that the material footprint of economies and societies on the natural world be lowered but also that those economies and societies be organised in more equitable, socially just and humane ways. This requires at a minimum crossing the boundaries between the natural and social sciences. Moving towards sustainability undoubtedly requires theoretical understanding of the changes between materials transformations and the ways in which economies and societies are organised. But this can only ever be a necessary and not a sufficient condition. In the end such changes will undoubtedly depend upon politics and practice rather than theory per se, though certainly informed by a more sophisticated understanding of the interrelations between material and social changes. Crucially, however, developing such knowledge will depend upon crossing disciplinary boundaries in deeper and more profound ways.

That said, it also seems to me that this commitment to inter-disciplinarity is more talked and written about than it is practised. I’d certainly want to defend a claim that there is a pressing need for more genuinely inter-disciplinary work around sustainability issues and it is important to understand why this isn’t the case. Why is it that where one would expect constructive dialogue across disciplinary boundaries, there has by and large been either silence or a dialogue of the deaf as natural and social scientists talk across one another? While some social scientists have certainly begun to show more interest in the materiality of the economy and social life, there has been little interest, as Tim Ingold12 has put it, in “the stuff that things are made of” and the processes by which such stuff is transformed from one state to another via human activity. While social scientists have developed sophisticated theories of how economies and societies operate and develop, they have mostly bracketed out the

12 Ingold T, 2007, Materials against materiality, Archaeological Dialogues, 14, 1-16.
material dimension of such processes. Conversely, while natural scientists have
developed a deep understanding of the properties of materials and their processes of
transformation from one state to another, they have done so in a way that brackets out
the social context and the social character of these processes. Where one might have
expected dialogue, therefore, there has very largely been silence.

Now it could be argued that the problem could be resolved via adopting a rather
different approach to education, as few of us are qualified as students with a deep
knowledge of both – say – sociology and physics - with their very different
substantive concerns epistemological presumptions and conceptions of theory. However I want to argue that while this sort of pedagogic change might be a good
thing for a whole range of reasons, it would not resolve this particular problem,
precisely because its roots are much more deeply seated. I want to suggest that there
are epistemological boundaries that cut across the conventional disciplinary
boundaries and are much harder to cross than those that separate conventional
disciplines because they make radically different assumptions about what constitutes
valid evidence and about the criteria against which theories should be judged.

The is not to deny that there has been a lot of work in recent decades that has sought
to demonstrate that there are in fact considerable commonalities and shared ground
between the epistemologies and approaches to theory of the social and natural
sciences. For example, realist and in particular critical realist approaches emphasise
that observable events are a product of the realisation of the causal powers of invisible
structural forces that may or may not be realised, depending upon specific
contingencies and circumstances in time and space. Again, and rather differently,
there are the approaches developed in science and technology studies (STS) and
actor-network theory that emphasise the conjunction of human and non-human
actants as central in bringing about social action.

Much of this work seeks directly or indirectly to reveal the weaknesses in the
approach advocated by Max Horkheimer\textsuperscript{13} some 70 years ago that drew a sharp
distinction between ‘traditional’ and ‘critical’ forms of theory. But despite all this I
want to argue that the difference established by Horkheimer between these forms of
theory continues to exercise a powerful effect and makes conversations across
conventional disciplinary boundaries between the natural and social sciences
problematic. Traditional theory aimed to emancipate people from nature by giving
them control over it – with the corollaries that prediction became the key criterion for
judging the adequacy of theory; and crucially that prediction and explanation became
seen as synonymous as traditional theory presumed an unchanging world of processes
invariably operative across time and space. Worryingly, some social scientists still
cling to this conception of theory, as they seek respectability by mimicking the natural
sciences. In contrast, critical theory rejects this identity of explanation and prediction
and prediction as the criterion for deciding the adequacy of theory. In contrast, it is
concerned to reveal and understand the processes that give rise to social inequality
and to change them. Its criterion for a successful theory is that predictions that might
have been possible under an old repressive social order no longer hold in a more just

\textsuperscript{13} Horkheimer M, 1937, Critical and Traditional Theory, Re-printed in Delanty G and Strydon P, 1983,
Philosophies of social science: the classic and contemporary readings, Milton Keynes, Open University
Press.
world because social structures have been progressively altered and social processes are specific to particular time and space contexts.

And therein it seems to me lies the nub of the problem. A serious concern with sustainability has to embrace understanding the processes of the natural and physical worlds and that entails an engagement with ‘traditional’ forms of theory. But a serious concern with enabling transitions towards sustainability also requires a commitment to changing the existing dominant social relations, and changing them radically. Changing the social relations of an iniquitous and unequal capitalist world requires serious engagement with a’ critical’ form of theory. It is challenging to hold on to and work with both concepts of theory simultaneously; yet it is also necessary to do so. As Claus Offe\textsuperscript{14} might put it, this looks like another instance of the necessary being impossible, the impossible necessary. So how might this dilemma be resolved to allow a more profound interdisciplinary approach to understanding what sustainability entails and requires to be developed? Clearly, this is a hard and challenging question. It is a major challenge to those committed to the pursuit of ways of moving towards more sustainable ways of living – but one that must be faced head-on.

**(iv) Corporate Responsibility in the Celestial Commons**

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The idea that corporations, not governments, would fly spacecraft was pure science fiction when Arthur C. Clarke wrote *2001: A Space Odyssey* in 1968; and while *2001*’s vision showed a little too much optimism in the longevity of the corporation (he chose PanAm, the ‘Lehman Brothers’ of airlines, as his space transportation firm), the corporatization of the heavens gave Clarke and other writers of his time yet another notch in accurately predicting the future of space society.

Today, corporations are not just flying spacecraft, they are actively involved in almost all aspects of space travel. And with the retirement of the US Space Shuttle fleet, private companies are about to take a much wider role in global space operations. The question is, can we trust corporations not to mess it up? Space is a lawless commons, and, without any applicable legislation or guidance on social responsibility or sustainability, tragedy is inevitable.

Right now, orbital spaceflight, particularly manned orbital spaceflight, is far from routine [Stafford 2010, Cassidy 2010], even after five decades of technological development. And despite lobbying and marketing from commercial space tourism companies, no corporation is close to safely launching a person into orbit, for a

vacation or otherwise. Space is hardly yet the "new Caribbean", to use a phrase coined by Dickens and Ormrod [2007].

Nevertheless, there may only be three souls orbiting Earth today\(^{15}\), but the true "population" of space can already be measured in hundreds of thousands of people who work in space infrastructure, technology and mission support. Billions of people rely on the communication and observation satellites sharing the sky.

We may expect governments to be accountable, responsible and transparent, but corporations, with an entirely different set of stakeholders, should not be given such free reign. And given the state of international law in space – laws which have difficulty in even defining a "space object" (Viikari 2008) – defining a company's social responsibilities in space must surely be even more difficult than defining it on Earth. Space debris is one area of concern made popular in the press. But what about labor issues, consumer issues, human rights, community issues, corporate governance? These too deserve a place in the register of social responsibilities in space, but without critical intervention, space debris may well turn out to be the only space issue that the general public knows or cares about.

From a critical perspective, the sociology of space is already moving in a familiar and possibly undesirable direction. Recently the term "sustainable" was used in conjunction with a device which cleans up space debris (Amos, 2010). Is this the beginning of the hijack, to use Welford's term (1997) of "sustainability" language in space? Do we want a space future where space debris is created in the first place (and supports a 'space waste management' industry)? While the technical, economic and ethical arguments for this particular issue belong in other papers, it seems undesirable to see any space behavior casually labeled 'sustainable' without greater care and consensus on its meaning.

**Measuring CSR in space**

It is certainly too early to begin prescribing behavior in space. As with any exploration or frontier, economic, social and environmental tradeoffs must be made. Behavior we might find appalling in the future may be necessary for survival now (Hardin 1968, Redclift 2000).

What we can do is examine the status of corporate social responsibility in space. This at least gives an idea of any gaps or issues in company behavior, in terms of reporting, power, transparency and process.

In mid-2010, as part of a Masters' thesis, I undertook a detailed benchmarking of CSR in upstream space companies (loosely defined as companies putting things or people into space, or making things which travel to or in space). Measuring CSR is a challenging, imprecise task, but is made easier by Global Reporting Initiative (GRI) guidelines on sustainability reporting. 90 upstream space companies were analyzed for reporting on 114 traditional CSR metrics derived from GRI's G3 indicators (GRI 2006) and a specially developed set of seven 'space CSR'

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\(^{15}\) As at April 6, 2011; (http://www.nasa.gov/directorates/somd/reports/iss_reports/index.html).
indicators designed to measure corporate environmental and social performance in space.

The results show a startling inconsistency between the reporting quality of traditional sustainability reporting metrics and the quality of CSR reporting on space activities. Companies either performed very well overall, but badly in space CSR; or badly overall but well in space CSR. Performance in the space category showed absolutely no correlation with depth of reporting on other issues.

The key conclusion from this is that companies wishing to practice good CSR are very good at being transparent in areas where best-practice demands it – but they also stick rigidly to these areas.

For example, league table leader Ball Aerospace, the space instrumentation company which built the Hubble Telescope, clearly aims to be a good corporate citizen and has world-class sustainability reporting. However, since 'world class' sustainability reporting does not include reporting on space CSR issues (because, quite simply, no-one has, to my knowledge, ever asked for this) the company is less transparent in this area. I could be fairly confident that, if space CSR indicators were included in the GRI guidelines, the space companies which topped the league tables would report on these indicators.

But what about the companies which performed relatively badly in their sustainability reporting but performed well in space CSR reporting? The most obvious feature of this group is that only three of the top 13 companies in space CSR have any significant business outside space – the majority are 'pure space' companies.

I conclude that these companies perform well in the space category naturally, because space is their constituent. These 'pure space' companies, with a leading position in the space community, and whose leaders are figureheads in lobbying and space community events, are good at practicing and reporting CSR as it reflects on them and affects them; a natural result of being active in a relatively small community. So while they may not report on the human rights issues regarding their labor practices or their corporate governance, as required by an A+ GRI report, they DO score relatively well on the environmental impact of their activities in space.

These findings have implications in the development of CSR in space. As companies' constituencies widen from 'pure space' to other stakeholders such as shareholders and global CSR professionals (as is to be expected through organic growth, mergers, acquisition and public listing) their CSR reporting may tends towards the 'world-class' reporting we have seen demonstrated by companies such as Ball Aerospace, but perhaps at the loss of this unique 'space CSR' serving the space community.

As small private spacecraft begin rolling on regular commercial missions from the Governor Bill Richardson Spaceway in New Mexico, our society would do well to try to preserve at least what CSR activities do exist in space companies by ensuring that existing space CSR can find a framework with more mainstream CSR reporting. At the very least, we should ensure such work isn't wiped out as a space company's sustainability reporting matures and becomes more mainstream.
Truth Telling

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Tell all the Truth but tell it slant---
Success in Circuit lies
Too bright for our infirm Delight
The Truth's superb surprise
As Lightening to the Children eased
With explanation kind
The Truth must dazzle gradually
Or every man be blind---

Emily Dickinson

Emily Dickinson’s poetry speaks to our modern condition. Right now, scientists, scholars, economists, and activists understand that we must act immediately if we are to save our planet from ruin; what they cannot seem to do is convey their urgent message in a way that compels people to action. They would do well to take counsel from Ms. Dickinson - “tell all the truth but tell it slant.” Predictions of floods, famine, filthy air, and abject poverty may be spot on but when delivered raw they often send people reeling into despair or nihilism. Gloom and doom, blame placing, and shrill admonishments rarely keep a movement going. Of course, ignoring facts about our planetary crisis is not an option, but helping people to understand the data in a way that invites them to be part of the solution is key to any effective call to
action; “With explanation kind/ The Truth must dazzle gradually/ Or every man be blind.” If we hope to translate hard data into effective action we must find ways to identify, respect, and speak to the hopes, fears, traditions, and loyalties of our communities as they relate to global sustainability.

In a Background Paper prepared for the High Level Panel on Global Sustainability, John Drexhage and Deborah Murphy of the International Institute for Sustainable Development (IISD)\(^1\) found, “A huge constituency around the world cares deeply and talks about sustainable development, but has not taken serious on-the-ground action. Deep structural changes are needed in the ways that societies manage their economic, social, and environmental affairs; and hard choices are needed to move from talk to action....” The very language that Drexhage and Murphy use is overwhelming; “societies” need to make “deep structural changes” and “hard choices” in every facet of their lives. Large-scale talk about large-scale problems is daunting. As the authors noted, people do actually care deeply about the earth. But they have been given little guidance, if any, in understanding what all the charts, facts, and hard data say about how an individual is to behave in, and for, the world. All too often academicians concerned with sustainable development make the mistake of declaring their work “too complicated” for those outside the academy. Given the state of our planet this unwillingness to communicate their work beyond the borders of their disciplines is irresponsible. If we are serious about working toward a sustainable, just and healthy planet we will have to find ways to tell our truths in the particular languages of particular communities.

Recently, Nobel Peace Laureate Wangari Maathai spoke at the Cathedral of St. John the Divine in New York City. During Q and A an eight grader told her that he had no hope for the planet, and asked her what kind of earth his generation would be inheriting. It was heart sinking moment, particularly because his classmates seemed to nod their heads in agreement. Dr. Maathai encouraged him to believe that change for a better world was possible. She counseled him to think on a local scale, his own scale, by recounting the story of her Green Belt Movement beginnings. In 1977 hungry, water-deprived, impoverished women of Kenya took action by planting trees in their small communities. The trees served to advance the women economically and restore an ecological equilibrium to their land. Her movement caught on and has served as a model for communities all over the world. Dr. Maathai emphasized that her movement has been successful and imitable not just because it offered a source of income but also, and more importantly, because it appealed to people’s deepest values.

Ms. Maathai advised her young audience members to nurture the four core values that she has recognized in people all over the world: love for the environment, gratitude and respect for the Earth’s resources, self-empowerment and self-betterment, and the spirit of service and volunteerism. Ms Maathai understands that her movement is sustained, not by fear in the face of facts, but by human values that are very powerful despite the fact that they are difficult to quantify.\(^2\)

\(^1\) Available online PDF [26p.] at: http://bit.ly/eQDZIw

\(^2\) Ms Maathai elaborates on these core values in her new book Replenishing the Earth (Doubleday, 2010)
To avert what the philosopher Hans Jonas called “the apocalypse of the too much” we must tell the truth of our situation in words, rituals, and symbols that appeal to people’s reason, obviously, but also to their hearts, hopes, and sense of community. Jonas understood this when he wrote:

It was once religion which told us that we are all sinners, because of original sin. It is now the ecology of our planet which pronounces us all to be sinners because of the excessive exploits of human inventiveness. It was once religion which threatened us with a last judgment at the end of days. It is now our tortured planet which predicts the arrival of such a day without any heavenly intervention. The latest revelation—from no Mount Sinai, from no Mount of the Sermon, from no Bo (tree of Buddha)—is the outcry of mute things themselves that we must heed by curbing our powers over creation, lest we perish together on a wasteland of what was creation.18

That Jonas also understood the power of community is made obvious by his use of inclusive language: “our tortured planet”, “we perish together”, “us all”. Although his admonishment is aggressive he acknowledges that this is a communal problem which “we” must address together. By not singling out any one person or group for blame Jonas draws us all into a community committed to saving our lone, “tortured” planet. Jonas keenly understands the human need for community. A person is far more likely to fight for what she holds dear if she is joined by like minded individuals. Today, there are any number of examples of communities, small and large, empowered by their shared commitment to eco-justice and environmentalism.

The 17th Annual Conference of the ISRSD will “focus on identifying practicable steps toward a sustainable future that are ready for implementation on the local, regional, and global scale.” We would do well to keep in mind that those steps are only “practicable” if they are communicated widely, clearly, and respectfully. The urgency of our planetary situation calls for a more interdisciplinary, inter-community, multi-cultural recognition of the visions and values that are foundational to justly meeting the needs of the present without compromising the ability of future generations to meet their own needs. Researchers can’t assume that others will give their work actionable meaning. They must go the extra step to “tell all the truth but tell it slant.”

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(vi) Education for Sustainable Development as Ideological Struggle - From Theory to Praxis

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The article published in the previous newsletter (Issue 1, February 2011) focused on the ontological and epistemological implications of a critical theorization of education for sustainability in the business studies curriculum as employed in two post graduate courses. Here, the turn is made to praxis and the pedagogical choices made in the condensed course taught over two days. In order to engage students in the discourse about business and sustainability, action methods of learning and teaching are favoured, since these provide for experiential learning and help to create democratic learning contexts. As noted previously, the action methods approach is best regarded as a paradigm for teaching and learning rather than merely a set of ‘methods’. At the same time, once a range of ‘action methods’ for decision-making and experiential learning is acquired, both learners and teachers can employ these to explore issues and to clarify and resolve problems. Students gain a higher degree of control over their own learning and a basis for responsible decision-making. The age range of students can be from early twenties to mid-fifties; some are already middle to senior managers in companies. Being part of the decision-making for their own learning therefore sits well with them.

The curriculum content of the course begins and ends with values - students’ clarification of their own values, understanding the changes in values and worldviews that have led to the sustainability dilemma, and the values that make it possible to envision a more sustainable future in order to address the crisis. The critical perspective is employed to promote the goal of emancipating students’ capacity to engage in critical inquiry, and is built into the course to include their reflections on the course itself, its content and delivery: the process becomes an ongoing learning process for the teacher as well as the taught. An overview of what a critical perspective sets out to examine includes:

Challenging taken-for-granted beliefs and understanding the contingent nature of the world as we know it;


20 A double-semester course taught at Massey University, 1994-2006, allowed for more action learning, for example, through visits to sites and meetings with key people from industry, local government and NGOs. The concentrated two-day course taught at Hong Kong University, 2005-2010, imposed some limitations on action learning, but still left much room for changing the dynamics of the classroom.
Asking how things came to be constructed as they are, and why; and to consider who benefits or loses from these contingencies.

Discovering who holds power to maintain the status quo and how they attain and maintain asymmetric power.

Understanding how others are persuaded to accept the perspective or ideology of those who hold power.

Being alert to how ‘alternative’ agendas (such as sustainability/sustainable development) may become appropriated, normalised or ‘hi-jacked’.

The course content focuses on the following areas:

Values for Sustainability

Introducing Critical Perspectives

The Sustainable Development Debate: Problematizing a Contested Concept

Critiquing the ‘Business Case’ for Sustainable Development

Learning in Action: Focus on You

‘Learning in Action’ is integral to the delivery of the course and student involvement commences well before the teaching component is delivered. Students are provided with all course materials and clear guidelines about the level of action learning that is to be introduced. A wide range of pre-course readings reinforces the interdisciplinary nature of the study and introduces a discursive approach. The institutional, social, political and economic dimensions of the problem of unsustainability are examined in the readings, as well as the associated cultural, spiritual and intellectual impacts of changing worldviews over time. Focusing on the institutional imperative of sustainable development helps students become aware of the functions of business, government and international institutions that have impacted on the environment and people, some of which they may formerly have perceived as taken-for-granted forces for good. The genealogy of the environmental/sustainable development debate is examined through a critical lens. The business sector response to the dilemma is also examined and problematized along with the discourse that has largely normalized ‘sustainable development’ into ‘sustainable growth’.

Students generally appreciate the discursivity and new perspectives introduced through the readings, but also comment that they are not generally expected to read so much. The required engagement with the readings is ensured by selecting seminal articles for student reviews to be presented orally and discussed in class and included in the overall assessment of the course. There are other tasks to be completed in self-selected groups before the course begins. Students form their teams for class debates on pre-assigned topics with the debating ‘rules’ provided, with topics also negotiable in class. The major assignment is a group assignment and students choose their groups and their assignment from provided topics, but can again negotiate their own. They are then able to examine their selected topic through the ‘lens’ of the course.
content and process. The assignment also requires a degree of action research, such as interviewing relevant actors from the broader community. The topic most frequently selected requires a critical examination of sustainability in Hong Kong and invites students to envision how a sustainable Hong Kong could be achieved.

Another pre-course activity that students readily engage with is a web-based exercise for measuring their ‘ecological footprint’. This prepares students for an exercise early in the first session, where, based on their ‘footprint’, students and the course director physically place themselves on a ‘continuum’ across the room and discuss their ‘footprints’ and the life-style and consumption habits that these reflect and set goals for the future. The continuum is a useful clarifying and decision-making tool that can be used at any point in the course to explore or resolve issues. The footprint exercise leads to another activity where students consider their ‘needs’ and then distinguish between ‘needs’ and ‘wants/desires’ and the current focus in the developed world on ‘aspirations’ and what this generally means. Using Maslow’s ‘hierarchy’ of needs (Maslow, 1943), we discuss the levels of need on that hierarchy and where our own expressed needs and wants fitted it. This generates discussion about ‘self-actualisation’, agency and goals for the future. Foucault’s (1984) concept of ‘self-construction’ is discussed in terms of becoming an agent of change, as well as warnings from writers such as Bandura (2007) that selfish individualism has also been a cause of much social and environmental unsustainability.

Seminar-style teaching is the basis of the course, with the furniture arranged in a horse-shoe shape to allow for mobility. Action methods start immediately with an exercise where students introduce themselves. The aims of each session are presented and discussed with students before it begins and each session concludes with an informal round-class evaluation of the session: ‘The most important thing I gained from this session was …’; or, ‘One thing this session made me think about was …’. This helps to establish the climate for employing an action learning paradigm. It makes for a more democratic learning context where the course director is also learning from student perspectives which then feed into the ongoing development of the course. The technique also provides important ‘rehearsal’ for those students who may need some encouragement to voice their views and to take part in class activities. A comment made by other staff has been that formerly ‘quiet’ or non-participant students find their ‘voice’.

How do the ‘action methods’ work? Generally, students have read the texts for the reviews thoughtfully and have prepared sophisticated slide presentations for the class. Often, they have searched the library and/or internet for other readings on the topic to provide comparisons. They choose different styles of presentation, sometimes even using role-play, and frequently incorporating challenges for the course director and the rest of the class. Eventually, the decision was made that students would distribute their reviews to each class member as additional items for their kit of resources.

The student reviews and debates are interspersed with the rest of the course process, meaning that the ‘leadership’ of the course constantly flows between the course director and the students. One student commented: “I didn’t expect it to be like this, I’ve realised - we ARE the course. The students are the course,” which indicated that the goal of participatory learning was being achieved and recognised. The debates are conducted with considerable gusto and good humour and, again, not without
challenging the views of the course director. The debating rules are ‘relaxed’ and are also intended to encourage reticent members of the class to become involved.

A role-play is enacted between the course director and groups of students representing three key industrial sectors in Hong Kong. The goal is for these ‘companies’ to determine if they will take part in a survey of environmental and social responsibility that the course director has run with major companies for more than ten years. Students receive a copy of the survey questionnaire, select their industry sector and choose their role cards. After preparation time, the course director engages each group and each individual in a ‘meeting’ where the decision to participate or not is discussed. The role play encourages students to think about the level of progressive agency managers and other workers actually possess and the contingencies that affect their decisions about issues of sustainability in the workplace.

Perhaps the most important aspect of the course is the level of student reflexivity that emerges. At each stage, they are engaged in evaluating the process and content of the course, its philosophical underpinnings, the methods employed and the course director’s style, as well as to reflect on their own learning and development. Students appreciate the ‘open’ style of interaction and their own strong involvement in the process. They comment on the unusually high level of involvement they experience and especially enjoy the parts of the course that they drive themselves. Student evaluation also helps to determine if the complex concepts from critical theory are being clarified. In addition to the informal evaluations referred to, a more formal evaluation instrument is introduced which is completed anonymously. This is in addition to the formal evaluations of courses required by the institutions in which this course has been delivered. The goal is to determine the level of ‘legitimacy’ the course has attained in the eyes of students. Open-ended questions and qualitative feedback reveal the topics which most or least interested students and the reasons for this. Comments are invited on how they perceive their own development and understanding as a result of taking the course and they explain why they would or would not recommend the course to other students. This feedback helps to illustrate how the goals of student engagement, reflexivity and action are being met.

The attempt is made to ‘practise what I teach’: participatory and democratic discourse and a preparation for life are the goals of the course. This invites student contestation that promotes a discourse that is more dialectical, empowering and emancipatory in its aims. Students begin to perceive themselves as having a role as agents striving for a turn towards greater environmental and social sustainability. One token of the degree to which they take the goals of the course to heart is the amount of communication that continues post-course between the course director and some students who continue to discuss how they are meeting their own challenges in the workplace.

References
7 RECOMMENDED READING


‘From climate change to GM foods, we are increasingly confronted with complex, interconnected social and environmental problems that span disciplines, knowledge bases and value systems. This book offers a transdisciplinary, open approach for those working towards resolving these ‘wicked’ problems and highlights the crucial role of this ‘transdisciplinary imagination’ in addressing the shift to sustainable futures.

Tackling Wicked Problems provides readers with a framework that will guide the design and conduct of their own open-ended enquiries. In this approach, academic disciplines are combined with personal, local and strategic understanding and researchers are required to recognise multiple knowledge cultures, accept the inevitability of uncertainty, and clarify their own and others’ ethical positions. The authors then comment on fifteen case studies which provide real life examples of how researchers have engaged with the opportunities and challenges of conducting transdisciplinary inquiries. The book gives those who are grappling with complex problems innovative methods of inquiry that will allow them to work collaboratively towards long-term solutions.’


‘Corporate social responsibility is one of many popular expressions focused on long-term accountability of corporations. Such accountability, however, poses challenges since CSR issues transcend traditional boundaries of organizations, cities or countries and is relevant to globally oriented corporations, small local communities and self-sufficient family businesses alike. The leadership challenge in society is thus immense and the foundation to face this challenge rests on identity, values and moral concerns of managers, consumers, and family members playing the roles of responsible citizens and accountable social beings.

This book, with 14 essays by prominent European business scholars, is an authoritative account of CSR challenges, practices and excellent case studies of corporations integrating sustainability into everyday practices and the core of their business.’


‘Sometimes facing up to the truth is just too hard. There have been any number of urgent scientific reports in recent years emphasizing just how dire the future looks and how little time we have left to act. But around the world only a few have truly faced up to the facts about global warming. This book is about why we have ignored
those warnings, so that now it is too late. It is a book about the frailties of the human species: our strange obsessions, our hubris, and our penchant for avoiding the facts. It is the story of a battle within us between the forces that should have caused us to protect the earth, like our capacity to reason and our connection to nature, and our greed, materialism and alienation from nature, which, in the end, have won out. And it is about the 21st century consequences of these failures, and what we can do now.’


‘While decades of space ventures have led to significant technological advances, space activities have also brought increasing environmental problems. This book examines the current international legal regimes in space law and environmental law in order to ascertain their applicability and efficacy in addressing environmental threats in the space sector. The research suggests mechanisms which could improve environmental protection in the sector and strengthen the environmental element in space law. These mechanisms include a variety of norm-setting strategies used in international environmental management. Special attention is drawn to the potential of environmental impact assessment in the space sector and to dispute resolution procedures. Like other areas of human activities, the space sector should accommodate both economic interests and environmental protection in line with the principle of sustainable development.’

8 ISDRS NEWSLETTER, ISSUE 3, 2011.

Copy for the next issue of the ISDRS Newsletter, including responses to articles in this issue that expand the discourse, can be sent to the Editor at editor@isdrs.net. Closing date: 29 July, 2011.