



The XVIIIth International Conference of the Society for Human Ecology

"Human Responsibility & Environmental Change: Planning, Process, and Policy"
Lake Las Vegas, NV
April 20-23, 2011

CONFERENCE ABSTRACTS

This is a three-part document. Section I contains abstracts from the Organized Sessions (Symposia), arranged by the session title in which they appear. Section II contains abstracts of individual Contributed Papers, arranged in alphabetical order of the first author. Section III has the abstracts for Poster Presentations.

To make a quick search for an author, presentation title or key word(s) use the 'document search feature' [Control-F] and type in the desired item.

I. ORGANIZED SESSIONS

OS-1 TEACHING AND LEARNING NATURAL HISTORY IN THE FIELD (Anderson)

OS-2 MIND AND NATURE (Borden)

OS-3 A, B, C & D ECOCITIES: GUIDELINES AND BEST PRACTICES – AN INTERNATIONAL ASSESSMENT (Douglas – 4 sessions)

OS-4 RESILIENT ROADS TO MANAGEMENT (Begossi)

OS -5 A, B & C FACTORS INFLUENCING CONSERVATION BEHAVIOR (Myers – 3 sessions)

OS – 6 REDEMPTIVE COMSUMPTION: CAN WE SAVE THE WORLD THROUGH CONSUMER CHOICE? (Dumaresq)

OS – 7 SOCIAL, PSYCHOLOGICAL AND INSTITUTIONAL ROADBLOCKS TO SUSTAINABILITY (Pratarelli)

OS - 8 ALASKA NATIVE CORPORATIONS AND SUSTAINABLE LIVELIHOODS (Thornton)

OS - 9 BUSINESS WITHIN A HUMAN ECOLOGICAL FRAMEWORK – EDUCATIONAL AND PRACTICAL ISSUES (Friedlander)

OS1 - TEACHING AND LEARNING NATURAL HISTORY IN THE FIELD

Abstract

This session will include both formal presentations and broader participant discussion of the relationships between teaching and learning Natural History within specific locales and broader lessons that can apply in multiple situations. Participants will present specific examples of the role of place-based narratives and Natural History in understanding both the human and non-human landscape. Then drawing on these and other examples we hope to broaden the discussion to a more general question of the inter-relationships between education, Human Ecology, and Natural History in the contemporary environment. We will actively encourage presentations and participation by undergraduates in order to facilitate the inclusion of outcomes in our debates.

[Session abstract/no individual abstracts]

Natural History and a Sense of Place

John Anderson

College of the Atlantic

Falling in Love with the World: The Path of Natural History

Tom Fleischner

Prescott College

Environmental Education and Advocacy: Outdoor Opportunities for Urban Youth

Arya Degenhardt

Mono Lake Committee

[To be followed by four ‘responses’ from students who have participated in Natural History Field programs and round-table discussion responses of the opportunities and challenges of this sort of education]

OS-2 MIND AND NATURE

Whose Minds?: Neutrality and the Transition to Sustainability

William M. Throop

Green Mountain College

Abstract

By 2050, we will be well into the transition to living with 9 billion humans on a planet almost 2°C warmer than the prior millennium. We will either be enduring traumatic social and ecological disruptions, or we will have learned how to live sustainably. Education will play an important role in determining which of these scenarios is more accurate. If higher education is to prepare us for the benign scenario, the curriculum for all students must be more systems-focused, more applied, more integrated, and more value-laden (Orr, 1994; Cortese, 2010). Such changes will conflict with the traditional liberal arts ideal of the neutrality of colleges and universities (Simon, 1994). I will outline the strong arguments defending neutrality, focusing on its association with the development of autonomous citizens. I will sketch thick and thin versions of education for sustainability (EfS) and show where these potentially conflict with the cultivation of autonomy. I will then argue that a relatively thick EfS is required for the transition to living sustainably and that it can cultivate a reasonable version of autonomy without maintaining a problematic neutrality.

Imaging the Human: The limits of Naturalistic Explanation

John Visvader

College of the Atlantic

Abstract

Despite recent attempts at rapprochement, the tension between the "two cultures" of the sciences and the humanities has increased in several important ways. The causal explanation favored by the sciences is often felt to conflict with and undermine the more intentional explanations favored by humanistic studies. Both the so-called mind/body problem and the free will problem have become foci in attempts to resolve this conflict. This paper attempts to throw some light on the nature of this conflict and argues that the 'human ecology perspective' is in the best position to map out the kinds of concepts that can lead to a new cartography of human experience in both descriptive and prescriptive senses.

Netting the Web: How the Mind Weaves Identity to Naturalize Technology

Patricia Honea-Fleming

Licensed Psychologist

Abstract

Humans participate in the ecology of life at large. We continually evolve new communities which support our health and well being. Methods and mechanisms of such union making among particular individuals alters across time as we create environments of connection. Qualities of connection also alter. The metaphor of Indra's Net has been used previously to explore the transpersonal connections among individuals. Here we will consider the World Wide Web as a literalization of that community making drive which unites individuals into an ecological unit spanning the globe, altering both environment and relationships. By exploring a particular community developed from within the Internet we will examine the power of passionate interest to link individuals in a ecology which changes identity, affiliation and action.

Personal Ecology – Where is the Environment?

Richard J. Borden

College of the Atlantic

Abstract

The standard definition of human ecology is based on a straightforward concept of 'human-environment interaction'. On closer examination, the interface between an individual and their surroundings is far more complex than this characterization. In addition to being organisms in the environment, we are also organisms through which the environment passes. This gastro-intestinal topology is a complex ecosystem that is really part of the body's exterior and home to more than 100 trillion microorganisms. Most of these life processes occur without awareness. At the same time, our sensory capacities extend awareness of our surroundings far beyond the envelope of our skin. The origins of personal ecology are a composition of paleontology, embryology, comparative anatomy, molecular genetics and exploratory psychology. Our inheritance lies in the background of life, which Gregory Bateson called "the pattern which connects". Some parts are found in the Cambrian layers of the Burgess shale, on the Pangean shores and the Pleistocene plains. Others were opened up in Freud's consulting room and the underground chambers of Jung's Bollingen retreat. They reside in our bodies, at the edges of our minds and all around us. Ecology is personal --we have been swimming in it for a half billion years.

OS-3 A,B,C & D ECOCITIES: GUIDELINES AND BEST PRACTICES – AN INTERNATIONAL ASSESSMENT

OS – 3A Ecocities: Guidelines and Best Practices: An International Assessment - A

New Vistas and the Economics of Global Sustainability

Carl Belliston

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Abstract

In relation to any specific time and location, it is not difficult to identify plans, designs, technologies, and practices that may be considered environmentally friendly, at least in comparison with other plans, designs, technologies, or practices in use at the same location or elsewhere. One might say that such environmentally friendly approaches are “sustainable,” meaning they are superior to alternatives. If, however, the objective is genuine global sustainability in the sense of being able to continue literally for many hundreds of years, such an approach is wholly inadequate.

A viable model for genuine global sustainability must have relevance in every location and every stage of economic development, and it must go beyond plans, designs, and technologies to provide a plausible expectation of sustainable economic choice.

NewVistas is a concept for achieving global environmental balance by building a network of environmentally and socially sustainable villages and communities into large urban areas. NewVistas combines sustainability with massive scalability in the planning, design, financing, and construction of planned urban developments, to provide a modern healthy lifestyle for all without compromising the ability of future generations to do the same. Its live-work-cultivate approach to urban planning integrates agriculture, industry, commerce, and residential uses into a single walkable community plat that has the potential to limit the cradle-to-cradle human footprint to 0.1 acres per person. Intensive greenhouse and garden food production uses local and marginal labor and provides a healthy diet of fresh locally grown food. Energy production uses advanced geothermal, solar, and wind technologies, while maximizing efficiency through local consumption and full-cycle design. Heavy industry is within walking distance, and raw materials are extracted locally.

While technology and design are vitally important to the NewVistas concept, the economics undergirding the concept are even more important insofar as it seeks to provide a model for global sustainability. The goal must be alignment of economic realities with environmental objectives. Experiments to evaluate ways in which to achieve such an alignment are discussed.

Ecopolis Planning and Management: Theoretical Goals and Current Practice in China

Rusong Wang

Chinese Academy of Sciences

Abstract

Ecopolis is a form of human settlement that integrates urban life with the surrounding bio-region. It seeks to achieve high efficiency and harmonious relationship in the use and recycling of mass, matter, people and environment rather than mere urban greening and pollution control. Ecopolis management emphasizes the coordination among integration, conjugation, evolution and self-organization rather than the management of isolated environmental elements or single environmental problems. During the past 25 years, 390 national demonstration ecopolis have been appraised and named by the Ministry of Environment including prefecture and county level cities such as Yangzhou, Shaoxin, Panjing, Yancheng, Hangzhou, Xuzhou, Guangzhou, Changsha, Haining, Anji, Changsu, Zhangjiagang, Kunshan, Longgang district of Shenzhen, Rizhao and Dujiangyan, and 32 cities have passed ‘environmental model city’ appraisal. 8 13 provinces have initiated eco province development (Hainan, Jilin, Heilongjiang, Fujian, Zhejiang, Shandong, Anhui and , Jiangsu, Hebei,

Guangxi, Sichuan, Tianjin and Liaoning). 108 experimental cities/counties towards sustainable development covering 29 provinces of China have been appraised and named by the Ministry of Science and Technology.

OS - 3B Ecocities: Guidelines and Best Practices: An International Assessment – B
Climate Change and Sustainability Strategies for the Human Settlements of Estuaries in the World

Xiangrong Wang

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Shixiong Wang

Boston University

Abstract

Climate change has been no doubt a world wide focus for governments, international organizations and scientists in the recent years, it becomes especially important after Copenhagen Climate Conference at the end of 2009. The third edition of IPCC (2001) assessment report also stated that globally, average ground temperature has been increased 0.6 ± 0.2 throughout the past century. This makes the 20th century possibly the one with the most obvious temperature increase in the recent centuries.

Estuaries are affected by both river and marine environment, for example, fresh water and sediment of the former and ocean tides, waves and the large inrushes salt water of the latter. The inflows of sea water and fresh water provide a large number of nutrients, water and sediment, which makes the estuarine areas to become one of the most productive natural habitats in the world.

Climate change will bring tremendous impact on the human settlements of estuary in the world. As a unique natural ecosystem, estuary has abundant nutrients, high biodiversity and varied ecological environment. The impact of climate change on this area is most directly and severe, and at the same time, with the most obvious change and fast urbanization, it makes the research here especially important and urgent. It is a scientific base to understand the eco-vulnerability of land use in the estuary city under climate change.

Estuaries are also the most populated settlements. About 60% of the world populations live in the estuary city and the area along the coastal line, which have great importance and effects in different scales, worldwide, regional, national or sub-national. They are political, economical or cultural centers. First of all, they are located in the intersection of rivers and oceans which makes them important shipping ports, gateways to access to various goods. Secondly, their convenient transportation, water and resources have become these areas into important industrial areas including oil, steel, chemical and other traditional industries, warehouse, advanced manufacturing and high technology industries. Thirdly, estuaries are usually composed with the cities of different levels, functions and importance which turned out to be metropolitan belts (line-type) or metropolitan areas (gulf-type). These metropolitan cities are usually densely populated, resource sharing, and having a developed tertiary industries and become financial centers, famous stock markets, business centers, R & D base and tourist destination.

The human settlement of estuary is one of the major sources of carbon emissions in the world, which has the effects on climate change as well as social development and policy formulation. At the same time, the settlements of estuary are the pioneers which exposed to a series problems of the sea-level rising, environmental pollution, soil erosion and so on. Meanwhile, the majority of the world population lives in these areas, which makes these areas as sensitive ones to climate change. Therefore, lots of countries and regions of the estuary areas have launched their sustainability strategies for response the climate change.

Case studies of major estuarine human settlements around the world, including New York, London, Amsterdam, Hong Kong and Shanghai, show the types of sustainability strategies used by cities to adapt to and tackle climate change. The special locations of these cities have endowed them with perfect combination of continental and oceanic characteristics. Because of their eco-sensitive geographic locations, advantageous political and economic positions and profound international influence, the estuaries in the world should be given much more attention in the n making sustainability strategies for human settlements at a time of climate change.

Finally, the spatio-temporal distribution features of climate change and some potential impacts under various climate changes scenarios, key factors affecting the Yangtze estuary city, Shanghai are emphasized. The eco-vulnerability zoning of land use and sustainability strategy is also provided.

Ecopolis and the Adaptation of Cities to Climate Change, with Special Emphasis on the Developing World

Peter Marcotullio
Hunter College - CUNY

Abstract

Global greenhouse gas emissions have severe implications for all cities, but the severity of future climate impacts is likely to fall unevenly on urban populations, with the poor in the most deprived areas of the world suffering the most. Although, in aggregate, China and India are major contributors to global greenhouse gas emissions, emissions of CO₂ per person are still relatively small; for India less than one-tenth the average per person in high income countries; for China about one-fifth. While all coastal cities are vulnerable to storm surges and sea-level rise, places like Mumbai, built largely on landfill that was dumped to convert seven islands into a single landmass, are particularly vulnerable, with low-income households in informal or illegal settlements facing the greatest risks. Climate change will increase water shortages in many cities, while increased storminess may aggravate flooding and disrupt food supplies to urban centres. All this will impact upon urban livelihoods, again affecting the poor the most. Eco-settlements need to take the need for adaptation to climate change to heart, not only in the design and siting of buildings, but also in the sustainability and reliability of food supplies and urban employment.

Proposed Standards for Ecocities: The International Eco-city Standards Project

Kirstin Miller
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Abstract

The IES project recognizes that the principles of fair share, equity and maintaining ecosystem biodiversity are fundamental to the establishment of a sustainable, just and fulfilling presence on earth. The IES Standards aim to provide tools for assessing the level of eco-city development of current human settlements and a clear path for reshaping them towards deeper and more comprehensive levels of attainment. Five tiers are envisaged ranging from an entry level tier for a car dependent city that has made progress towards a strategic vision for becoming pedestrian oriented to a top tier which would, if all settlements reached that level, mean that human society has achieved an environmentally sustainable, socially and environmentally just, spiritually and culturally fulfilling human presence on the planet. Examples of cities or settlements that have attained the different tiers are discussed.

Eco-region and Eco-polis Planning in Relation to Wetlands and Peri-urban Land Restoration

Wu Yegang
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Abstract

Many cities have expanded into former wetlands, reducing many of the ecosystem services that provided fisheries, flood storage, heat-island effect reduction, wildlife habitats, recreational opportunities and many other benefits. Other cities have wetlands created as a consequence of human activities, such as mining subsidence lakes, swamps due to impeded drainage, flooded brick- or gravel-pits, or simply water reservoirs. These wetland all require careful management if they are to fulfill their potential relation to ecopolis development. Examples include the Everglades of Florida, the subsidence lakes of Huaibei, China, and the gravel pits along the rivers Thames and Seine in the UK and France. The special problems and benefits of ecopolis development in such environments are examined closely.

OS-3C Ecocities: Guidelines and Best Practices: An International Assessment -- C

The Complexity of Urban: Peri-urban Relationships in Ecopolis Development

Larry Li

University of California, Riverside

Abstract

Much of the discussion about cities and their bioregions hangs on the concept of the drawing of supplies into the city from the surrounding countryside and the recycling of organic matter back into the peri-urban and rural production system. Home composting for suburban gardeners is the simplest version of this. Municipal garden waste collections that separate plant materials from other waste and use it in biodigesters are the second stage. Many other components are involved in this urban-rural cycle. How far can it be extended in ecopolis development? What good practice exists? Is it relevant to megacities of over 5 million inhabitants? Is it possible for such large cities to depend largely on their own local bioregion?

Top Down, Bottom-up and Sideways Planning for Future Eco-cities

Dave Greenberg

Hainan, China

Abstract

Ecopolis development requires new thinking and the ending of reliance on traditional urban forms, particularly the individual house surrounded by a garden. New ways of building, appropriate to particular bio-regions and particular societies, are being suggested for developments in Hainan and other regions of China. Comparison with existing eco-city developments and other types of sustainable living can provide opportunities to assess the feasibility of innovative settlements making a large-scale impact on future urban areas, bearing in mind that the majority of new urban inhabitants are likely to be additions to the populations of existing urban areas rather than pioneers in new forms of urban settlement.

Practical Examples of Eco-city Planning and Ecopolis Development from Huaibei and Ningguo, China

Li Feng

Chinese Academy of Sciences and Visiting Scholar, Stanford University, California

Abstract

INTECOPOLIS has taken a special interest in Huaibei and work has also been carried out by INTECOPOLIS members in Ningguo. Adapting existing cities for ecopolis development poses problems of how to use existing natural features and urban infrastructure to achieve more sustainable, environmentally sound urban living. Designing a future for the mining subsidence wetlands of Huaibei and the flood plains of Ningguo requires a delicate balance between human landscape modification and natural geomorphic and hydrologic processes. Adding ecopolis goals to this problem needs a high degree of integrated watershed and river basin planning in addition to meeting the needs of dynamic expanding cities. Discussion of the plans for the two cities shows ways in which this may be achieved.

European Criteria for Assessing Eco-cities and Urban Environmental Achievements and the Application to Cities such as Louvain-la-Neuve

Pierre Laconte

International Society of City and Regional Planners (ISOCARP), Brussels, Belgium

Abstract

European criteria used to recognize the sustainability and ecological planning and management achievements of European cities set standards for modern urban development. Many cities make great advances in terms of some criteria, but do not do so well on other criteria. A critical examination of some cities deliberately planned to have better living conditions and more sustainable environments reveals the good practice and the weaknesses embodied in some urban planning since 1950. Examples of good practice will be highlighted.

OS-3D Ecocities: Guidelines and Best Practices: An International Assessment – D

Ecocity Economics – An Economics Built on what We Build

Richard Register

EcoCity Builders, California

Abstract

One of the chief lessons I've learned from forty years exploring ecocity ideas and attempting to help such ecologically healthy cities into existence is that society in general, and it's leaders in particular, don't know what to build.

Axiom 1. The City is the engine of prosperity.

This in turn becomes a gigantic economics lesson. How do we resolve the fact that almost all everyday people, climate scientists, politicians, architects, economists and even ecologists do not talk about the structure and design of the city when it is the largest creation of our species? By confronting the problem head on.

We begin to find answers if we recognize that cities can come in radically different arrangements with radically different impacts. The compact city built around the pedestrian is fundamentally different from the city built around the automobile. The former is potentially healthy, even a net contributor to ecological biodiversity; the latter is irrevocably damaging.

Throw this thought into the situation in the United States which, by wild speculation in the real estate and the derivatives market, caused the most damaging economic downturn since the Great Depression and we begin to unravel a different kind of economics that could tell us what to build.

Axiom 2. Three Sacred Cows of US Capitalism: if you want to build anything you have to go to where the money is: the super rich, the military and the (presently badly) built environment.

Axiom 3. If we wish to build a healthy economics, there are "Five Big Areas of Action" we need to engage which society has been avoiding, of which the built environment is one. They are:

Physical actions

1. Deal with overpopulation
2. Reshape the agriculture/diet nexus to be far less land and energy consuming
3. Build ecocities

Mental actions

1. Act on generosity, invest in ecological health and peace via the above three
2. Education strongly emphasizing the above four.

Axiom 4. Work Hard – China is proving it works.

Axiom 5. Keynesian spending called for, leveraged largely by the Three Sacred Cows, to pay for family planning, radically more land and energy conserving agriculture and ecocities.

Planning for Better Urban Environments in the UK since 1940: Are the Achievements Sustainable?

Ian Douglas

University of Manchester, UK; President SHE; President INTECOPOLIS

Abstract

During the Second World War there was a gentle subversion of public opinion in Britain towards new urban forms, particularly for high-rise buildings for the rebuilt inner cities after the 1939-45 war, for green belts around existing urban areas, and for planned new towns outside those green belts. Now four stages of planned post-1945 urban settlements exist and can be criticized on many grounds, particular on poor public transport and excessive reliance on the motor car. Many have effectively become dormitory towns for neighbouring conurbations, but a few are still models of the live-work-play goals of an integrated urban settlement. Recent political decisions about the set of proposed new ecotowns illustrate the complicated process of injecting the new technologies and environmental and social goals required for ecopolis development into the British planning system and construction industry.

Discussion on the INTECOPOLIS work programme and publication of session outcomes

The Demographic Challenge in Building Sustainable Communities

Wolfgang Serbser

German Society for Human Ecology (DGH)

Abstract

The demographic change takes its shape to come. Germany is in a frontier position to get an idea how this challenge will look like. The falling birth rate and negative or zero migration rates tends not only to a strongly increasing of elder people in German society, but it leads also to a sharp and rapid declining of the cohorts capable of employment or in an educable or trainable age.

Even if a net migration gain of 200.000 people really happens, as official prognosis in Germany assume, the skills shortages in all economic domains threats the decline of wealth. The challenge of developing sustainable communities therefore becomes a new focal point – how to manage with only a few people still at work.

Looking for falling birth rates worldwide the German development seems to be a prospect of the global demographic change.

The presentation will discuss some aspects of this development and concepts to deal with this challenge in the urban environment to build sustainable communities.

OS-4 RESILIENT ROADS TO MANAGEMENT

Small-scale Fisheries in the Atlantic Forest Coast: Social-ecological and Economic Subsidies Towards Management

Alpina Begossi

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Priscila F. Lopes

Fisheries and Food Institute (FIFO) - Brazil

Renato AM Silvano

Fisheries and Food Institute (FIFO) - Brazil

Abstract

Inhabitants of the Atlantic Forest coast have been part of economic cycles that started as agriculture of sugar cane, coffee and manioc flour, in the XIX and XX centuries. Since half of the last century, due to low prices

from agricultural products, the local inhabitants of the AF coast, called caicaras, moved to fishing, and currently they have incorporated tourism in their activities, often related to ride tourists for fishing sites and participate in fishing trips. In this study, we follow an approach on resilience and on economic activities starting from previous studies in the AF coast, approaching: a) economic cycles of the region of the Atlantic Forest in the SE Brazil; b) the connection and relation of those economic cycles and the resilience of Caicara populations; c) contributions towards the sustainability of the AF coast, taking into consideration the possibilities of incorporating environmental payment services (PES) into tourism within the local fisheries. We will use social-ecological approaches, some related to aspects already under study in the Atlantic forest coast, such as a dialogue between local and scientific knowledge in the fisheries, as well as initiatives of community based management, including adaptive management. The study areas include the fishing communities of Sao Paulo (Almada, Puruba, Picinguaba, at Ubatuba; Comprida Island in Iguape) and Rio de Janeiro coast (Baia de Sepetiba and Paraty).

The Techniques Used In Harvesting Shrimp And Crab And Their Perceived Effects On Selected Coastal Areas Along Panguil Bay

Liwayway S. Vioria, Michaellester O. Monteron, Veron Gay Paragoso.
MSU-Iligan Institute of Technology

Abstract

The focal concern of this study is to examine the techniques utilized in harvesting shrimp and crab in two different habitats, namely sea and fishpond, and how these affect the five selected coastal areas along Panguil Bay. Undertaken in the months of December 2008 to October 2009, it basically employed a triangulation of quantitative and qualitative methods for data gathering and analysis. Primary data were generated through a combination of survey (n=60) and key informant interviews (n=15) supplemented by field observation and secondary sources. The quantitative data were analyzed using mean scores with the aid of Statistical Package for Social Sciences (SPSS), whereas qualitative data were subjected to content analysis. Among fisher folks involved in the study, harvesting techniques are of two kinds, traditional and modern; those of the fishpond are of three types—traditional, semi-traditional and modern. The utilization of sea harvesting techniques and traditional fishpond design is conditioned on certain seasonal geophysical attributes of the Bay: seasonal wind direction, tidal meters, moon position/rotation, tidal cycle, and tidal current. On the other hand modern sea harvesting and semi-traditional and intensive fishpond design are basically operated using harmful chemicals and more advanced equipment like motor-canter boat with enlarged and modified parts. Traditional sea harvesting techniques consist of *bu-bu, sanggab, pukot, baling, sud-sud de manu, bunsod and* *paugmad* and the modern ones include trawl and motorized. sud-sud. In the case of fishpond habitat, this only involves three designs namely traditional, semi-traditional, and intensive design. Both the traditional and in sea and fishpond habitats create relative damage on the environment emerging from their basic component parts, nature of operation, and volume of harvest. Damaging traditional sea harvesting techniques involve equipment made with fine synthetic nettings that catch fine fishes (i.e., sanggab, bunsod and paugmad) or through their mode of operation disturb marine resources as they are dragged or pushed into seabed (i.e., baling and sud-sud de manu). Similarly, devastating effects are created by trawl and motorized sud-sud which are both equipped with heavy board and five synthetic nettings.

Similarly, semi-traditional and intensive fishpond designs create detrimental effects on marine resources since they involve the use of toxic chemicals during the pre-cultivation and harvesting activities. They likewise require the removal of mangrove areas for concreting of sub-floor and dikes to ensure easy water exchange and higher yields limiting productivity of other species around mangrove areas.

Among the environmental damage that these techniques have been commonly perceived to have brought about are dying of coral reefs, loss of fingerlings of sea grasses and subsidence of seabed. The government however has not been remised in its responsibility in coastal management. It has implemented specific laws and

measures for the protection and conservation of coastal resources base. Most of them involved community – based resource management schemes. However much has yet remains to be seen in terms of effectiveness with which these government measures have been implemented. This has been apparently attributed to lack of active participation among local constituents

The Economics of Community Supported Fisheries: Implications for Communities and Sustainable Management

Davis F. Taylor

College of the Atlantic

Abstract

Community Supported Fisheries (CSFs) are emerging as a new means of marketing seafood. Loosely modeled after Community-Supported Agriculture (CSAs), CSFs are said to provide better returns to fishers, support local fishing communities, and potentially aid in sustainable fisheries management. This paper models the economics of CSFs, focusing on fishers' decisions to form a CSF that markets to consumers rather than sell caught fish to a wholesale dealer. The representative fisher has a choice of entering several fisheries based on returns to fishing and marketing efforts. Returns to fishing are based on fish stocks, while returns to marketing efforts are affected by regulations, the number of fishers who agree to form a CSF, and the presence of nonprofit organizations and other forms of social capital that can assist in the formation of the CSF. The paper shows how marketing effects can impact the distribution of fishing effort across different fisheries, and thus impact fisheries sustainability. A key finding is that the opportunity to market fish directly, via CSFs, now links heretofore unrelated marketing regulations and community social capital with fisheries sustainability.

Beyond Sustainability: Resilience, Extinction Thresholds, and Time as a Limiting Factor for Small and Medium Sized Farms

Gigi Berardi, Rebekah Green and Bryant Hammond

The Resilience Institute

Huxley College of the Environment

Abstract

Small- and medium-sized farms are an important component of both regional food supply, as well as the overall economy. With the crucial role such farms also play in land stewardship, it is important to support and enhance their resilience, especially when threatened with extreme events and rapid change such as fuel cost spikes, flooding, climate change, and intense urban encroachment. Using a case study of three counties in western Washington, we identify threats and vulnerabilities to farm resilience, as well as tools resources, and strategies for enhancing resilience. Thresholds, or the point at which the entity being discussed qualitatively changes past a point of easy return (i.e., loss of farmland to development, flood duration causing farms to collapse, continuous denial of water rights) are considered. We apply this characterization at three distinguishable scales – at the macro scale (present state of the food system through which food is produced, processed, and consumed); meso scale (community social networks), and micro scale (farm units). Several factors are necessarily critical -- access to resources and human capital availability. Yet one abstract factor, time, emerged as a novel, overarching concept. Many of the key vulnerabilities found were related to the time taken away from farming activities, such as time spent on regulation compliance, and managing landowner and neighbor expectations. Strategies for enhancing farm resilience need to be assessed for ways in which they enhance or deteriorate farmer's and farm community's time needed to expand and effectively utilize existing tools and resources. It is not sufficient for farms to be sustainable, i.e., to "endure." Rather, they need to develop the adaptive capacity to withstand disturbance, thus reducing vulnerability. Using this information, we intend to

analyze what government policies are likely to best support farm resilience under likely future extreme events and rapid changes.

OS - 5 A, B & C

OS - 5A FACTORS INFLUENCING CONSERVATION BEHAVIOR

Save the Loons! Reducing the Psychological Distance of Climate Change

Christie Manning, Vera Sidlova, Elise Amel, Bryna Helle, Kimberly Brown, and Britain Scott
Macalester College

Abstract

Despite the growing urgency of climate change, many Americans perceive it to be a distant problem: off in the future and unlikely to affect them (Leiserowitz et al., 2009). In addition, most Americans have had little direct experience with climate change and thus cannot imagine its impacts. The perceived distance of climate change, coupled with a lack personal experience with it, makes it a highly abstract issue unable to arouse a significant emotional reaction. Without a visceral sense of risk, Americans are unlikely to respond to climate change with either personal or civic action.

Our research investigated how the distance and abstraction of climate change could be overcome. According to Construal Level Theory (CLT; Liberman et al., 2007), psychological distance occurs along four different dimensions: spatial, temporal, social and probability. We manipulated two of these dimensions, spatial and social, and measured the effect on both perceived psychological distance and intention to make a donation. We employed a 2x2 design to investigate the effects of the presence vs. absence of a human social agent (people vs. local iconic birds) in geographically distant (Kenya) vs. close (Minnesota) areas. One hundred sixty-seven Minnesota State Fair attendees read scenarios describing the effects of climate change upon a particular group. We found that neither social agent nor geographical nearness alone bridged psychological distance or evoked willingness to act; however, there was a significant interaction between the two dimensions. Sense of distance was reduced and willingness to donate increased for Loons in Minnesota but not People in Minnesota. In contrast, Flamingos in Kenya did not reduce distance, but distance dropped significantly and willingness to act increased when the scenario described Kenyan people being affected by climate change. We discuss our findings in terms of empathy and its interaction with the social dimension of psychological distance.

Dimensions of Conservation: Exploring Differences Among Energy Behaviors and their Implications for Intervention

Beth Karlin

Abstract

Residential energy conservation represents one of the most efficient sources for reducing US carbon emissions, with roughly 25% potential savings using currently available technology. Previous research has suggested that these behaviors can be effectively grouped into dimensions that are distinct in terms of influencing factors, environmental impact, frequency of occurrence, and psychological components. The current study analyzed data collected from an online survey of residential energy conservation to test these dimensions for validity as well as differences in their predictive profiles. Participants (n=540) completed self-report measures of energy conservation behavior, demographic and housing characteristic data, and psychological sub-scales testing two general models of pro-environmental behavior: a "rational" model (theory of planned behavior) and a "moral" model (norm activation theory). Factor analysis empirically validated two strong principal components for curtailment and efficiency behavior and subsequent regression analysis revealed significant differences in the predictive profiles of these two dimensions. The data indicate that primarily "moral" psychological variables

predict curtailment behavior, whereas efficiency behavior is better predicted by a combination of “rational” psychological and contextual (demographic and housing) variables. Implications for interventions promoting energy conservation and suggestions for future research are discussed.

To Fly or Not to Fly: Using the Theory of Planned Behavior to Understand Personal Travel

Lyons, R.E., Amel, E.L., Manning, C.M., Scott, B.A.

University of St. Thomas

Abstract

Flying is a behavior that people underestimate in terms of its environmental impact. Additionally, among sustainability-related behaviors we have measured, flying is by far the one that the fewest people have attempted to change. We utilize the Theory of Planned Behavior to articulate the barriers individuals face when deciding whether to fly for personal travel.

We surveyed 94 attendees of a large, Midwestern state fair. All of the participants were currently employed and indicated that they did travel by plane for personal vacation.

Using questions based on the Theory of Planned Behavior (TPB), we assessed control, attitudes and social beliefs regarding flying for personal travel. TPB results significantly predicted flying behavior. TPB questions were also used to predict “Staycation” behaviors. Differences in TPB between Staycation and Flying vacations will be discussed.

Goal Specificity, Goal Difficulty and Perceived Need to Develop Skills in the Context of Environmental Sustainability

Elise L. Amel, Christie M. Manning, Jacob W. Forsman, and Britain A. Scott

University of St. Thomas

Abstract

For issues as potentially overwhelming as sustainability, it is important to consider which goals will be motivational and which will be paralyzing. Previous research found that people respond better to the statement “cut carbon 2% per year until 2050” than to the equivalent but more extreme frame of “cut carbon by 80% by the year 2050”. More recently research has shown a surge in support for the 80%, largely because people now believe that “2% doesn’t sound like enough.” Both statements remain distal goals rather than proximal goals. Goal specificity has been shown previously to increase goal commitment under certain conditions with proximal goals allowing people to regulate themselves more easily through feedback and self-reward. A proximal goal like “I will have one car-free day a week” includes behavioral terms toward which incremental progress can more easily be measured.

At a recent Midwestern state fair we found that people given more specific information about how to accomplish the goal (e.g., biking, carpooling, etc.) increased their sense of efficacy. Including information both about the full scope of change needed (80%) and what has to be done now (2%) also led to reductions in the perceived need to develop new skills.

OS – 5B INTERNATIONAL PERSPECTIVES IN CONSERVATION PSYCHOLOGY

Environmental Concern in the U.S. and China: Effects of Cultural Context, Situational Context and Personality

Susan Clayton and Jill Pape

College of Wooster

Abstract

The two countries with the largest effect on global environmental problems are the U.S. and China. The context in these two countries could hardly be more different. In addition to substantial differences in economic status and political structure, citizens of the two countries have also been described as different in some fundamental psychological attributes. The US is a more individualistic country, emphasizing the primacy of the individual and individual goals, and China is higher in collectivism, emphasizing the primacy of the group or collective. At the individual level, people from an individualistic culture are expected to see themselves as more independent of others, while those from a collectivist culture should see themselves as more interdependent with others. The present study examines differences in environmental concern, self-reported behavior, and attributions of responsibility related to environmental issues in two samples from the U.S. Midwest and two other samples from Chengdu, China. Differences in independent and interdependent self-construal, and their relevance to environmental concern, were also examined. Results showed that environmental concern was greater in China and among those higher in interdependence. A tendency toward environmental behavior, however, was higher in the U.S.

Climate Change and Anthropogenic Effects - The Human Factor in Sub-Saharan Africa

Etornyo Agbeko

University of Ghana

Abstract

Climate Change has been a global environmental challenge. Sub-Saharan Africa (SSA) is purported to be highly vulnerable to the impacts of climate change. This paper briefly identifies and assesses human activities that could contribute to the exacerbation of climate change impacts on water storage in reservoirs in SSA. Veve Reservoir in the Volta River Basin was used as a case study. Human activities including bad farming practices, illegal logging of trees, overgrazing, sand winning and poor water culture were the main human factors that were identified. Future extreme high rainfall values were projected based on IPCC, worst case scenarios (SRES A1FI) and best case scenarios (SRES B2) with climate mid sensitivity and General Circulation Model (GCM: HADCM3). These climate scenarios were run on SimCLIM extreme event analyzer using historic climatic time series data over 1979-2009 for the 21st century. On the basis of reservoir system response, 64.3% of 30 environmental parameters monitored were linked with rainfall as climate indicator. Veve Reservoir under current climate is oligotrophic but could become eutrophic and unsafe due to emergence of cyanobacteria bloom triggered by anthropogenic activities in view of climate change.

Conservation Social Work: Preparing Social Work Students to Aid Communities Facing Environmental Changes

Tedeschi, Sarah M. Bexell and Holly Counter Beaver

University of Colorado – Denver

Abstract

Human induced environmental changes are plaguing the globe with the poorest people being most effected. The field of social work does not currently have a program to help future social workers prepare for helping communities in crisis. Issues such as food and water shortages are already occurring in countries such as Ethiopia and Kenya, biodiversity loss is already leading to wars, political destabilization, and international tension, and environmental racism occurs right here in the United States. We are cooperating with scientists in the fields of conservation psychology and conservation biology to develop a new field of social work practice and research to prepare students to aid future clients and communities in crisis or to help communities avoid crisis in the face of our changing world.

OS – 5C ENVIRONMENTAL VALUES AND ACTION

Why I’m a Concerned Citizen, But Not an Environmental Activist

Britain Scott

University of St. Thomas

Abstract

Among those working to influence people in a sustainable direction, some advocate focusing primarily on encouraging individual-level lifestyle changes, while others advocate focusing primarily on encouraging individuals to demand systemic changes (that will, ultimately, facilitate or force individual-level changes). In this study, 60 attendees at the Twin Cities Living Green Expo completed a descriptive, open-ended survey regarding motivations for, and barriers to, personal green behaviors (e.g., purchasing decisions) and participation in systemic actions (e.g., signing petitions, contacting politicians, donating to or volunteering with environmental groups, community organizing). We asked participants to describe a “turning point” (if any) when they decided to try to live a greener lifestyle and asked them to indicate whether particular “green” labels applied to them (e.g., “Environmental Activist,” “Conservationist,” “Environmental Steward”). Although these participants were voluntary attendees at a green living expo, and all 60 participants responded to the “turning point” question with an answer affirming that they were, indeed, trying to live green, and 57 out of 60 indicated that the label “concerned citizen” applied to them, we found low- to- modest levels of participation in most systemic change actions (e.g., only 25% had “participated in a public rally, protest, or meeting about an environmental issue” and only 27% labeled themselves “environmental activists”). In participants’ open-ended responses, we will be looking for clues to explain whether and how they perceive individual lifestyle changes and actions for systemic change differently, as well as looking at whether the patterns of motivations and barriers for these two types of behaviors are similar or different.

Is Climate Change an Ethical Issue?: Examining Young Adults’ Beliefs about Climate and Morality

Ezra Markowitz

University of Oregon

Abstract

Moral philosophers argue that climate change poses an ‘ethical problem’ for humanity and thus that humans have moral obligations to respond. Little empirical research has explored whether members of the general public agree with these conclusions. This is unfortunate, because non-experts’ moral intuitions about climate change may hold important implications for willingness to engage cognitively, emotionally and behaviorally with the issue; moreover, recent research in the field of moral psychology suggests that there may be significant barriers to viewing climate change in ethical terms for many individuals. In this talk, I first briefly discuss the moral philosophical position on climate change as well as some of the moral psychological research that may bear on this topic; I then present results of two studies conducted with over 1,000 U.S. undergraduate students in which I explored students’ beliefs about the ‘ethics of climate change.’ Across both samples, I found that roughly 40% of students believed unequivocally that climate change represents a moral and ethical issue, 30-35% were unsure and 25-30% said that it is not an ethical issue. While there were predictable differences in ‘ethics beliefs’ as a function of ideology, it does not appear that beliefs about the existence of climate change (i.e., happening vs. not happening) drove morality beliefs. Implications and directions for future research are discussed

A Comparison of Students’ Conceptions of Littering in Washington State Wilderness Areas, State Parks, and a Small City

Stacia Dreyer

Abstract

This presentation discusses the ways in which undergraduate students think about littering across three different settings: Washington (WA) wilderness areas, WA state parks, and the city of Bellingham, WA. A questionnaire was developed to research student conceptions about littering as well as self-reported littering behavior. The questionnaire addressed littering acceptability in all three settings, as well as whether students thought littering could cause environmental problems in these settings. Knowledge of “Leave No Trace” (LNT) principles and the practice of minimum or low impact techniques were also investigated in relation to littering acceptability and littering behavior. Results indicate that students think littering in Bellingham is significantly more acceptable and causes less environmental problems than littering in WA state parks and WA wilderness areas. Students also reported littering more often in Bellingham than the other settings. This supports the idea of individual conceptions and values, which may partly reflect cultural constructions of nature in different settings. These findings highlight the importance of focusing attention on urban areas in environmental education efforts.

Caring About a Carnivore: Risk Perception and the Values Washington Residents Place on Mountain Lions

Olivia Zimmerman and Gene Myers
Western Washington University
Chris Morgan
Insight Wildlife

Abstract

Mountain lions (or cougars, *Puma concolor*) are apex predators and essential in the ecology of areas where they occur. Potential interactions between mountain lions and humans, however, create political and management concerns in Washington State. Education about cougars is one management tool, but must be informed by knowledge of public beliefs and values. Few studies, however, have considered the role of human emotions and risk psychology in attitudes regarding mountain lions. We analyzed responses from a state-wide (n=1,208) phone survey. Preliminary results from factor analysis found five dimensions in attitudes toward cougars: positive values and respect; behavior; perception of risk and threat; holding people responsible; and knowledge (with a subcategory of knowledge of cougar prey habits). A multiple regression analysis indicated that value/respect toward cougars increases as knowledge and personal responsibility increase. Perceived risk and threat, on the other hand, increase as knowledge and personal responsibility decrease. These findings have important implications for education and public outreach projects for risky wildlife preservation. The data suggest that if the public is educated in the measures that can be taken to reduce cougar-human conflict and if they accept personal responsibility for minimizing risks, value and interest in preserving this apex predator may increase.

Keywords: large carnivore, risk, value, knowledge, education

OS – 6 REDEMPTIVE COMSUMPTION: CAN WE SAVE THE WORLD THROUGH CONSUMER CHOICE?

Removing the Rubbish. Re-Conceptualising Consumption

David Dumaresq
Fenner School of Environment and Society - Australian National University

Abstract

What is the problem with consumption? We all consume. We all have to consume to live. Is it that we just consume too much? Or is it that we consume the wrong things? Are we, the consumer, the wanton destroyers of the world's ecosystems or are we the dupes of an ever increasingly manipulative global marketing system? Can aware consumers make the right choices and by their consumption habits change the world on to more sustainable pathways of development? But which pathways are changeable by consumer choice? Which choices should we make? Is it the rainforest friendly, socially just, organic product that will save a Third World community shipping it across the world or should we choose the same product with low miles from within our own watershed? We can move further and further into deeper and deeper social, political, ecological and culturally dangerous territory surround our acts of consumption. But in the end we all need to know, Should we eat it? Can I buy it? What do I do? How can I go about deciding what to do?

This paper sets out to sort out some of the landscape of consumption. It will try to produce some conceptual clarity that can help us navigate the debates about consumption, the redemptive potential of consumer choice and about the nature of the choices themselves.

Sustainable Diets: What do Consumers Know about their Food Choices

David Pearson

University of Canberra

Abstract

The research presented in this paper examines household food buyer's understanding of sustainable food through investigating factors motivating their food choices and the importance they place on environmental issues. As such it analyses consumer's understanding of the impacts that their dietary choices have on the natural environment and contributes to the emerging literature on sustainable consumption.

After reviewing recent studies on individual's awareness and perceptions of the environmental impacts of their food choices, empirical results from focus groups and an online survey of consumers in Australia are presented. These indicate that consumers have a wide range of perceptions about a sustainable diet as well as specific views about sustainable behaviours in the context for food purchases, consumption, how food is produced, and the types of food purchased. The results indicate that most consumers would like to lead a more environmentally friendly lifestyle but only have a modest understanding of what they could do to make their diet more sustainable. However, only a small portion of the population are actually engaged in activities that are reducing the environmental impact of their diet.

In conclusion, there are significant opportunities to engage more consumers in behaviors that would reduce the environmental impact of their dietary choices. The priority areas, based on impact on the environment and likelihood of buyers changing the specific behavior, for encouraging a more environmentally sustainable diet are: reducing food waste and the amount of junk food eaten as well as minimizing purchases of bottled water.

The Myth of Affluenza or Why Consumerism is not a Disease. Towards a Meaningful Ecopolitics of Consumption

Bruin Christensen

Australian National University

Abstract

Many explain high and rising levels of consumption by claiming that consumers are manipulated by marketing into believing that they can find the good life through consumption. I argue that this is false; the relation

between producers and consumers does not and could not possess the requisite degree of predictability. Most consumers see through advertising, take a self-ironising stance towards consumption and frequently consume in ways never intended by producers. To ignore this is to fail to understand, much less curb, environmentally destructive over-consumption. Using Baudrillard, I then argue that consumerism is a system property of the economy which ensures high levels of consumption even as most individual marketing strategies remain highly expensive, unpredictable affairs. But Baudrillard construes individual consumers as so totally functions of the system that all notions of 'authentic' selfhood must be rejected as illusory. I argue that the autonomy demonstrated by consumers when consuming contradicts such social constructivism. I then sketch a conception of the self as 'phronetically' rational. This allows one to construe the consumerist life style as a sub-optimal realisation of the objectively good life for such selves. In consequence, it provides a framework for thinking about behavioural change.

Towards a Theory of Sustainability Management

Anton G. Camarota
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Abstract

Peter Drucker's Theory of the Business was introduced more than 16 years ago. This approach to management focuses on how value is added to and extracted from customers, the core competencies necessary to provide this value, and how the mission of the organization relates to fulfilling human needs. The key to applying this theory is understanding how management assumptions reflect external realities, and being willing to challenge those assumptions when a business seems to be losing its effectiveness.

This paper explores a sustainability-based form of this theory that includes stakeholder value. This approach to sustainability management places a business organization within its ecosystem of stakeholders, and focuses on how the organization determines, implements, and adapts the value strategy for each stakeholder. Important issues, such as challenging core assumptions, double-loop learning, and assessing organizational mission are defined and methods to resolve them are presented. Organizational resiliency, adaptability, and agility are described in the context of this approach to sustainability management.

OS – 7 SOCIAL, PSYCHOLOGICAL AND INSTITUTIONAL ROADBLOCKS TO SUSTAINABILITY

Marc E. Pratarelli (Organizer)
Department of Psychology
Colorado State University-Pueblo

The Age of Reason – Still Just a Good Idea

William Rees
University of British Columbia

Abstract

H. sapiens is a conflicted species. Humans display high intelligence, a capacity for forward planning and the ability to show compassion for others. Nevertheless, these qualities are not much evident in international attempts to 'deal with' the global ecological crisis. Although ecological change (including climate change) is arguably the greatest threat ever to confront our species, emotional and instinctive factors prevail in the political arena. *H. sapien's* innate tendencies to consume all available resources; to defend the status quo (e.g., social

status, personal prestige and political power); to adhere to accepted paradigms, myths and social narratives; and to deny or reject uncomfortable truths interfere with rational analyses and help prevent significant progress. Instinctive and emotion-based behaviors in support of short-term self-interest preceded rational decision-making in human evolution, have long been tested by natural selection and have been adaptive throughout most of our species history. However, global ecological change also changes evolutionary dynamics. Science and reason suggest that individual and tribal self-interest are converging with humanity's collective interests. Selection pressure may therefore be shifting toward the brighter end of the human behavioral spectrum in favor of cooperation and mutual altruism as we confront a common peril. The sustainability question therefore becomes whether, knowing this, humanity's collective intelligence can prevail over baser instincts in securing the future. Learning intelligently to override opposing and now maladaptive behavioral predispositions would herald a whole new phase in human evolution.

When is Enough, Enough: the Crossroads of Biology and Culture

Brita Radzyski

Colorado State University-Pueblo

Abstract

Understanding and taking responsibility for those biological drives that motivate people to acquire and consume resources in excess of what they need is key to preventing further environmental decay. Although evidence for a biological predisposition toward consuming in excess (i.e., greed) is sparse, there is no question that cultural factors such as media and advertising, religion, social status seeking and others contribute. Many believe that merely being human grants a god-given right entitling us to take anything from any species and the ecosystem. Most are similarly unaware and uneducated about the root causes of overconsumption. While consumption is a behavior that all species possess, our excessive activity is the principal reason the planet is in crisis. As Rees (2006) has demonstrated in his argument that humans may be "unsustainable by nature", as many as 5 identical planet Earths would be needed today to support all 6.8 billion global citizens at the American/Western standard of living, and Pratarelli (2003) exposed the evolutionary basis for that unsustainable nature. This presentation begins with the working assumption that humans are predisposed to consume to survive, but then explores the various cultural mechanisms that act to amplify the effects of resource acquisition. The result is that individual consumers—being ill-equipped to identify and counter the profound forces of conformity—become trapped in an endless self-delusional cycle of believing more is always better without ever defining what constitutes "enough." The psychological result, in the absence of environmental feedback about physical limits, is a culture of excess.

American Social Institutional Structure and Its Effects on Sustainability

Sarah M. Johnson

University of Colorado at Colorado Springs

Abstract

The importance of fostering sustainable attitudes, literacy and behaviors in the American public is well recognized. However, efforts in this area have proven to be more difficult than anticipated. **American social institutional structure could possibly be a significant barrier toward this goal. For example, the** environmental and sustainability movements constitute one of the largest social movements in the United States with over 6,500 national and 20,000 local environmental organizations (McLaughlin & Khawaja, 2000; Buttell, 2000). However, despite its scale, researchers assert that with respect to the overall changes needed to thwart the impending crises of environmental change these movements are insufficient (Pratarelli, 2008). As one of the most diverse and potent social institutions, our colleges and universities are becoming increasingly concerned with sustainability. Thus, over 300 campuses have conducted sustainability assessments (Elder & MacGregor, 2008). Researchers assert that although sustainability efforts in higher education are prolific, they are currently

insufficient in scope and intensity to effect the change needed to impede ecological catastrophe. Several hypothesize that American institutions (including higher education), as they become larger and more prolific, become increasingly bureaucratic, professionalized, willing to compromise, “and conservative in their tactics”, thus, rendering real change difficult to achieve (Dunlap & Marshall, 2007). To test their theory, my research, through a campus-wide survey of students and faculty, measured the degree of sustainability literacy, attitudes and behaviors, to determine the efficacy and support for efforts toward sustainability on campus. Results showed that both faculty and students lacked pro-sustainability attitudes, literacy, and behaviors.

Religion and Sustainability

Brett Ford

Colorado State University-Pueblo

Abstract

Historically, religion has been a challenge for the environmental movement. Beginning with the work of Lynn White in the 1960s, the fact that modern religions are primarily human centered poses a significant roadblock to achieving sustainability. Sustainability necessarily requires that the environment not be seen as something over which people have explicit “dominion.” Religious patrons hold several beliefs which make them resistant to much of science and its conclusions. Most Believers cling to a few scriptural passages to justify behaviors which are destructive and unsustainable. This irony is all the more confounding when we consider the tremendous importance many scriptures place on charity, poverty, and replenishing behavior. Moreover, there are passages in all the major religious texts of the world that refer to responsible stewardship of nature, which implies one must be a responsible consumer of natural resources as well. Organized religions, and in particular, the clergy appear unwilling to hold strong opinions about controversial issues, particularly ones that would challenge our consumer behaviors. This is probably because the practitioners of religion fear the loss of their patrons by taking a stand, even one for their own scriptures. This presentation will also address the idea that many religious gospels implicitly or explicitly encourage overconsumption through their focus on prosperity. The importance of the role religion plays in shaping attitudes and values in society will be addressed with respect to how religion can take “corrective action on specific doctrines that violate the demand of the times.”

Political Correctness Masks Denial and Rates of Pro-environmental Behavior

Marc E. Pratarelli

University of Colorado at Colorado Springs

Abstract

Several hopeful studies over the last three decades report that more than half of survey respondents label themselves an environmentalist. We find this perplexing inasmuch all indices of overconsumption, carbon emissions, pollution, waste assimilation, and even population growth continue to rise. Although very little performance or footprint data of their supposed pro-environmental behaviors exist, it appears that people adopt the label because they may well participate merely in as few as one or two behaviors. One might report recycling their newspapers and aluminum cans, another turns their lights off when they leave the room, and another traded their vehicle for a more fuel efficient one, carpools, or now takes public transportation. Two recent studies report that pro-environmental attitudes and values claimed by such respondents may still rank lower than the value they place on both national security and economic concerns. Our most recent research catalogued and scaled the actual pro-environmental activity of 750 survey respondents, more than half of which had earlier labeled themselves—predictably—environmentalists. Performance data shockingly confirmed that less than 1% had behavior patterns wherein all their daily activities were pro-environmental. We conclude that the overwhelming majority of so-called environmentalists are responding merely in a “politically correct”

fashion and we caution that published reports to date of environmentally friendly green citizens are grossly exaggerated.

OS - 8 ALASKA NATIVE CORPORATIONS AND SUSTAINABLE LIVELIHOODS

Thomas F. Thornton (Organizer)
University of Oxford, UK

Cultural Models of Well-Being, Sustainability, and Development in Alaska Native Corporations

Thomas F. Thornton
University of Oxford, UK

Abstract

Despite a burgeoning literature on the kinds of institutions needed to develop community-based conservation and sustainable livelihoods and socio-ecological systems, few studies have tracked the interaction and evolution of cultural models of conservation and sustainability in local historical and cultural settings and institutions over more than one generation. The case of Alaska's Native corporations, now in their fourth decade of existence, provides such an opportunity. This paper looks specifically at cultural models of well-being, corporate responsibility, and sustainability among Alaska Native corporation leaders and shareholders, and how they have become both linked and de-linked to various forms of natural, social, cultural, and other capital in these corporations' land and resources investments, organization, and development. It examines in particular three Southeast Alaska Native corporations which have developed and managed their lands and resources in quite different ways and assesses whether their patterns of investment in timber, fisheries, tourism, heritage and other ventures may reflect similar or diverse cultural models of sustainability, responsibility, and well-being. The implications of these findings are then used to evaluate broader frameworks of sustainable development and well-being in the literature.

Vulnerabilities to Sustainable Development in the Bering Straits Native Corporation

Deanna Paniataaq Kingston
Rebecka Rising Daye
Oregon State University

Abstract

Arctic residents are experiencing climate change, causing difficulties in subsistence harvesting practices. In addition, in rural Alaska, where wage employment is scarce, fuel and grocery prices are double or triple what they are in the Lower 48 states. Decreased access to wage paying jobs, decreased access to subsistence resources due to climate change, and increased prices have led to high rural outmigration in recent years. Under these difficult circumstances, the Bering Straits Native Corporation (BSNC) is investing in various initiatives on behalf of their shareholders. One initiative is to invest in alternative energy such as solar and wind power. In addition, like other Alaska Native corporations, BSNC has entered into federal contracts under the Small Business Administration's 8(a) (i.e., minority owned businesses) program. Unfortunately, while both initiatives are successful while posing little risk to their local environment, the wind farm did not operate for several months and Alaska Native corporation involvement in the 8(a) program has come under Congressional scrutiny. These examples show the vulnerability of resource development initiatives in rural Alaska to forces outside their control, whether it be the environment, national or global financial economies, or national politics.

That is Not the Way the Real World Works": Identifying Institutional Barriers to Successful Climate Change Adaptation and Environmental Relocation in Western Alaska

Elizabeth K. Marino
University of Alaska Fairbanks

Abstract

The relocation of Alaska Native communities and consolidation of seasonally nomadic peoples into permanent villages has been a distinct legacy of colonialism in Alaska. Following ANCSA and the establishment of Alaska Native village corporations, in most cases, further consolidation and forced relocation of Native communities ceased. Today most bureaucratic agency workers agree that forced relocation is a violation of basic human rights. In the last 30 years, erosion – linked to climate change – has made western, coastal Alaska vulnerable to significant flooding events. This vulnerability is likewise linked to development and infrastructure decisions made by early government agencies and missionaries. Because of increased flooding, at least 3 Alaska Native communities are being forced to relocate to prevent disasters that could compromise both lives and property. State and federal government agencies today are acting in conjunction with Alaska Native Communities, regional Native Corporations, and regional non-profit Corporations to plan these relocations. This paper argues that while significant progress has been made with regards to interactions between rural Alaska Native communities and government agencies, in times of crisis significant obstacles still arise. These obstacles, in some cases, prevent local communities from having control over institutionally arranged migrations and relocations. Even suggesting Alaska Native communities have complete control over relocation money instigates reactions such as, “that is not the way the real world works.” Disaster literature suggests that development decisions made without local input leads to increased ecological vulnerability. We look at how communication between governing agencies and decision-making processes affect adaptation.

The Alaska Native Claims Settlement Act: Indigenous Cultural and Economic Sustainability

Rosita Worl
Sealaska Heritage Institute

Abstract

Enacted by Congress in 1971, the Alaska Native Claims Settlement Act (ANCSA) was viewed by Congress as a vehicle for Alaska Natives to develop sustainable economies through its provisions for land, corporations, and a cash settlement of near \$1 billion. ANCSA was and remains a congressional experiment in aboriginal land claims settlements. To achieve Congress’ policy of sustainable economies and those of Alaska Native to promote cultural sustainability, ANCSA has been amended multiple times. This paper will examine how Sealaska Corporation, the regional corporation of Southeast Alaska created under ANCSA, is attempting to promote both economic and cultural sustainability. Although Sealaska can be viewed as financially successful, achieving economic sustainability based on its ANCSA entitlement of 375,000 acres, which is less than 1 percent of its aboriginal land base, has proven to be impossible. This is evidenced by the high unemployment and outmigration of its tribal member shareholders from outlying villages. These conditions, which will be the focus of this paper, have required Sealaska as well as Alaska Natives corporations to promote other public policy initiatives with Congress to promote economic and cultural sustainability.

OS - 9 BUSINESS WITHIN A HUMAN ECOLOGICAL FRAMEWORK – EDUCATIONAL AND PRACTICAL ISSUES

Teaching Sustainable Business at College of the Atlantic

Jay Friedlander and Katherine Macko
College of the Atlantic

Abstract

The most entrepreneurial businesses are cross-functional. They communicate between marketing, finance, operations and other departments. College of the Atlantic embodies this entrepreneurial spirit by going beyond cross-functionality and tearing down the walls between traditionally siloed disciplines to spark innovation and to solve problems from multiple perspectives. Students at COA receive only one degree, that of Human Ecology, which studies the relationship between human beings and their physical and social environments through a distinctive interdisciplinary approach. A study of Human Ecology would be incomplete without looking at one of the world's most ubiquitous activities – business. From a business perspective, focusing on a wide variety of stakeholders is a driver of innovation and competitive advantage. By connecting the values of Human Ecology with the skills to work within existing societal frameworks, the Sustainable Business Program helps prepare students to succeed financially and to effectively pursue their dreams of creating social and environmental change. With an eye toward exploring what it means to teach business in a human ecological setting, this session will review the curriculum and pedagogy of COA's Sustainable Business Program. The presentation will explore both the challenges and successes of this nascent program. While the program is less than three years old, it has received national attention with mentions in *Newsweek*, *Fast Company*, *Sierra* and *The New York Times*. It was recently selected as a finalist for the Outstanding Specialty Entrepreneurship Program at the United States Association of Small Business and Entrepreneurship (USASBE) 2011 conference, which is an academic conference focused on entrepreneurship.

Building a Sustainable MBA Program

Karen Martinsen Fleming
Green Mountain College

Abstract

Businesses play a critical role in society. Institutions of higher learning have been teaching business at the undergraduate and graduate levels for centuries but only recently have colleges and universities begun to teach “triple bottom line” principles – that businesses have a responsibility to *people* and the *planet* as well as to earn a *profit* of the organization. Most institutions offer distinct courses on corporate social responsibility that teach triple bottom line principles by offering a few courses. By contrast, Green Mountain College (GMC) in Poultney Vermont offers a Masters in Business Administration that threads triple bottom line principles throughout its entire Sustainable M.B.A. curriculum.

As a college with an environmental mission, GMC was well positioned to offer an M.B.A that focused on sustainability. When introduced into the market in 2006, the GMC M.B.A. program was the first of its kind and is fully accredited. 100% of the courses incorporate sustainability and are taught online; the program requires only two brief residencies in Poultney. Because of its online design, the GMC M.B.A. program attracts early to mid-career working students from around the globe. A strong majority of the faculty possesses meaningful teaching and sustainable business practitioner experience and this experience has been critical to the creation and delivery of the program curriculum.

Green Patents: The Brazilian Experience

Maria Raquel Catalano de Sousa
Drexel University
Marina Christofidis
Brazilian Planning Ministry

Abstract

In the past, natural resources scarcity was not considered a problem to society and their abundance created the fallacy of considering them infinite, uncharged and common use goods. Therefore, there were no efforts toward

its sustainable use. Recently, significant changes in a globalized world have contributed to a paradigm breakdown. Since then, discussions occur issuing the possibility of the exhaustion of resources. As a result of these discussions, the Agenda 21, proposes the use of Environmentally Sound Technologies (EST) as one of the possible solutions to the problem stated above. Environmentally Sound Technologies protect the environment in many ways: polluting less, recycling wastes, producing more in a optimal sustainable way and handling residual wastes better when compared to the technologies they substitute. Intellectual Property Systems protect technologies and simultaneously disclose them to society. Thus, Patent Systems are based on the following exchange: the State grants the inventor a temporary property title – the Patent – which gives the owner a temporary monopoly to exploit the determined technology and in return, the inventor provides his invention to the public, ensuring the continuity of the information flow related to its invention. In this context, the Patent System plays an important role in stimulating the emergence of EST, or green patents, since it ensures the inventor a return on investment from R&D expenses incurred to develop such technology. Therefore, because of the transcendence of green patents into the current political and economic panorama, this paper aims to draw a link between the increase of incidences of intellectual property applications and green innovation. This article also discusses the limitation of the concept of green technologies from the perspective of the International Patent Classification (IPC), and proposes other classifications that might be related to green patents.

Weighing Commercial Interests Against the Archaeological Record: The Case of Peatlands

Rebecca Gabriel
Oxford University

Abstract

The peatlands of the British Isles have provided some of the most dramatic archaeological finds of the past thirty years, due to the bogs' unique carbon-rich, acidic, and anaerobic qualities and the attendant ability to preserve organic matter. The most notable examples of this phenomenon are “bog bodies”—centuries-old human remains that have emerged from the bogs looking astoundingly well-preserved. Also remarkable are the recoveries of wooden artifacts of the Iron and Bronze Ages at sites such as the Lough Boora bog complex in Ireland and Flag Fen near Peterborough, England, as well an early medieval psalter from a peat bog at Faddan More, Ireland. These finds are complemented by paleoecological evidence of the contemporary flora and fauna. However, the human impact on the peatlands of the United Kingdom and Ireland has been extreme and devastating. Large swaths of peatland are drained for real estate, forestry, agriculture, and commercial peat extraction, leaving any underlying artifacts prone to immediate desiccation. The haste with which the peat is removed also precludes any examination of the extracted peat's contents. A considerable amount of archaeological and paleoecological evidence has thus been lost, and what remains is in peril. As long ago as 1985, a paleoecological study of the Thorne Moors discovered that peat extraction had almost wholly removed the last seven hundred years of environmental record from the area. Local flora and fauna are also compromised by air pollution and by sulphur deposition from power stations. This kind of damage cannot be undone: while it is uncertain how long it takes for peatlands to recover their delicate ecosystem, estimates generally range from a few hundred years to an entire millennium—and even then, whatever artifacts have been lost are gone forever.

CONTRIBUTED PAPERS

SHE Single Paper Abstracts

Saud S. Al-Oud

King Saud University

Environmental Effects Of The Gold Mining Activities In Albidayah Village-Central Of Saudi Arabia

Saudi Arabia is one of the leading countries in the field of mining, oil, and petrochemical industry. These huge developments brought with it some problems to the environment. Recently, some environmental problems in the area of the ALbidayyah village arise affecting a number of residents with health problems due to heavy metals soil, water, and plant contamination because of mining activities. Due to this matter the idea of this research paper was carried out. The aims of this study is investigate the depth of heavy metals accumulation in the environment surrounding the ALbidayah village as a result of mining activities.

The results showed a major contamination to the soil, water, and plants. From the factor of abundance (Enrichment Factor EF) there was some contamination of to the soil surrounding the ALbidayah village, element arsenic (As) in the surface layer of the sample numbers (9, 11, 13 and 15), where values ranged between factor abundance (6.77 9.78).

Plants analyses showed a high accumulation for arsenic and lead and cadmium. The Hars plant was the most accumulative for all heavy metals elements, followed by Howa and Sfera respectively. The result indicated a greater harm for consuming such plants whether by animals or human.

Key words: Mining, Contamination, Heavy metals , cadmium, arsenic.

Molly D. Anderson

College of the Atlantic

Sustainable Food Security: Who Has the Solution?

Providing sufficient food for healthy lives without degrading the natural environment is probably the most basic way in which humans interact with their environment. Agriculture is responsible for serious water pollution, soil erosion, greenhouse gas emissions, and other intractable environmental problems. Many societies have collapsed in modern as well as ancient times because they were unable to meet their populations' food needs. For example, the government of Madagascar was overthrown largely because of sharp food price rises in 2008; and archaeologists tell the stories of countless societies that disappeared after their people became increasingly malnourished, sometimes resorting to eating foodstuffs previously considered inedible or even to cannibalism. Recently the Food & Agriculture Organization (FAO) reported another sharp jump in food prices, leaving the door open to another food crisis such as the one in 2008-2009 in which the numbers of hungry people exceeded one billion. Agriculture and food security have become headline news, after decades of diminishing public investments in agricultural development. Since 2008, several major "roadmaps" have been created that lay out solutions to recurring food crises: the International Assessment of Agricultural Knowledge, Science & Technology for Development; the World Bank's World Development Report 2008; the UK Global Food & Farming Foresight Report 2011; the Updated Comprehensive Framework for Action (2010) from the UN High Level Task Force for the Global Food Crisis; and the New Vision for Agriculture that came out of the World Economic Forum in Davos in January 2011. Yet these roadmaps often seem to be mapping the route to different destinations. What are the key differences between them? Are they beginning to converge on a common solution? Why is there so much controversy about what needs to happen, and who will do it? This paper analyzes recent international solutions that have been proposed to food insecurity in terms of actors who assess and define the problem, parties responsible for implementing the solutions, who will benefit, and actual

recommendations. It explores Convention Theory as an appropriate analytical tool to understand the lack of resolution between alternative solutions to global hunger.

Assogbadjo AE , Glele Kakai R.

University of Abomey-Calavi

Impact of Anthropogenic Pressure on the Population Structure of *Anogeissus leiocarpa* within Wari-Maró Forest Reserve in Benin (West Africa)

The present study focused on the analysis of the structure of the *A. leiocarpa* dominated natural stands in the Wari-Maró forest reserve which are under high and minimal anthropogenic pressures. These stands were considered for forest inventory after carrying out a random sampling scheme of 40 sample units of 30 m x 50 m. In each level pressure stand, the dbh and tree-height of identified tree-species were measured in each plot. Data analyses were based on the computation of structural parameters, establishment of the stem diameter and height distributions and the floristic composition of the two types of stands. Results obtained showed higher values for the overall basal area, mean height and diameter for *A. leiocarpa* presented in low-pressure stands. In the high-pressure stands, the frequency of trees in the successive diameter classes dropped rapidly and the value of the logarithmic slope of the height-diameter relationship was lower indicating a lanky shape. These two types of stand exhibited the same species composition. However, some species like *Azelia africana*, *Detarium microcarpum* and *Burkea africana* had less influence in high-pressure stands than in low-pressure stands. Results from the present study suggest that effective conservation is needed for *A. leiocarpa* stands under high pressure by limiting human interference and developing appropriate growing strategy for restoration purposes.

Corrin Behm, Joanne Vining

University of Illinois at Urbana Champaign

Student Perceptions of Sustainability: A Foundation for Planning and Policy

The term sustainability encompasses a variety of concepts. Because of this, there are many misconceptions that can be confusing. The University of Illinois recently developed a sustainability vision to move the university forward. As Illinois, and many other institutions of higher learning begin prioritizing sustainability, understanding student perceptions, as well as areas of student awareness and interest, can inform spending of limited resources on more effective sustainability initiatives.

In this exploratory study, freshmen were surveyed via an online questionnaire to gather information on how they perceived and defined sustainability. Qualitative data were analyzed theoretically to learn about student understanding of the concept in light of its three components: environment, society, and economy. Data were also analyzed with a practical focus to assist in university sustainability planning.

A large majority of participants were beginning to understand sustainability in light of one or two of its major components. Most also included reference to usage (maintain, conserve, improve) of resources as well as recognized a temporal aspect to that usage. However, complexity within individual responses was limited, with a focus on human needs as the most common element.

Student awareness and interest levels in sustainability were moderately high. Eighty-three percent of students thought sustainability was an important university issue, placing the greatest importance on what the university could do to save energy, enlist renewable energy sources, save money, and mitigate direct negative effects on natural systems. Interest in personal education in sustainability and development of courses and initiatives were ranked quite low. This information, as well as much more, can be used to guide program planning and policy.

Mohamed Behnassi
Syracuse University/Ibn Zohr University of Agadir, Morocco

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Marie Bonin
Institute for Research and Development
Global Science Governance and Science Diplomacy to Foster Transitions Towards Sustainability

The last half century has seen a number of transitions in how society views the relationships between environment, development, and knowledge. In addition, many challenges of the 21st century - from climate change and food security, to poverty reduction and global health - have scientific and technological dimensions and it has become common practice to speak of science and technology when dealing with these issues. Yet, it is increasingly clear that the enthusiasm with which much of the political world embraced sustainability ideas during the last decades, thus putting environmental politics, negotiations, and agreements at center stage in the resulting debate, have relegated science and technology to the side wings if not thrown out altogether. At the same time, efforts to make progress in the implementation of sustainable development were increasingly being stalled by lack of technical knowledge rather than just weakness of political will. Given this trend, we suggest this paradigm be expanded to encompass a new concept of governance and diplomacy.

It is true that science and technology (S&T) have been important forces behind both positive and negative development trends. And despite the fact that S&T by itself does not hold the power to achieve the goal of greater sustainability (since individuals and institutions must choose if and how to use the information and knowledge produced by S&T), it is nonetheless essential for providing options and informing decisions that enable all actors to move towards more sustainable pathways. In doing so however, it is important to examine closely the ways in which social institutions, processes, and values shape the priorities of research and development, and the conditions under which its potential benefits can be reaped. Currently, there is a widespread view of modern S&T as a market-driven enterprise, dominated by an excessive technological optimism, with research agendas that do not often address the hardships faced by billions of impoverished people around the world. In this paper, we will focus on the question of how a global governance of science and a sound science diplomacy can help integrate a broader set of perspectives into the S&T agendas in order to generate new knowledge and implement robust solutions to society's most pressing development challenges. We believe that no one country will be able to solve these challenges on its own. The tools, techniques and tactics of governance and diplomacy need to adapt to a world of increasing complexity on all levels by placing science and technology at the heart of agendas and policy options. Ethics, North-South equality and justice, gender equity and human rights can be guiding principles in this direction.

Keywords: Challenges, Sustainability, Governance, Diplomacy, Science & Technology.

Xiomara Cabrera Bermúdez
Central University of Las Villas

The Human Ecology Insertion at the Curriculum of the Undergraduate Studies at the Central University “Marta Abreu” of Las Villas

In this paper is evaluated how is included in the different study programs of the university (UCLV) carers the main concepts, objectives and subjects linked to Human Ecology. This evaluation is assumed from the accumulative experience in the last five years for the IVMA, university organism created in our centre with the objective of assessment to the university council in the introduction of environmental dimension in all areas related to the professional formation of the students.

Erik Bond

College of the Atlantic

The Shape of the Family: Human Ecological Impacts of Economic Structure on Family Systems

“Family” has taken different forms across time. For most of human history, it has been a very mutable structure, flexible and adaptive to Human Ecological needs within both social and environmental context. In the modern world, however, legal, social, and economic pressures force the family network into a very specific mold, one that is useful to the national structure, regardless of its ecological flexibility. The consequences of this phenomenon are well documented—stress, divorce, mental illness, the feminization and ethnicization of poverty, abuse and neglect, and so on—but the historical causes of this structure and its systemic mechanisms of perpetuation merit further review. This presentation will examine the historical and social patterns of connection between familial structure and the multidimensional aspects of the human ecological situations of which they are a part. The family will be assessed as an ecological adaptation, with attention given to the contexts of particular structures and configurations. Recommendations will be made toward an understanding of the family's present condition of decline, and toward the human ecological dimensions of contemporary family situations.

Jacqueline Bort, Sean Todd, Sofie Van Parijs, Peter Stevick, Erin Summers

College of the Atlantic

Acoustic Behavior of North Atlantic Right Whales in a Potential Winter Breeding/Feeding Ground: Implications for Management of human activity

The North Atlantic right whale (*Eubalaena glacialis*) is critically endangered, with a current population of approximately 425 individuals. Although this population has been protected internationally from whaling since 1935, it continues to decline because of negative human interactions. Protecting these animals from ship-strike and fishing gear entanglement requires additional legislation that is dependent on careful and continuous monitoring. One monitoring technique that leads to a better understanding of behavior and habitat preferences of the species is passive acoustic monitoring (PAM). Automated PAM units can monitor key areas in even the worst conditions, and provide a more comprehensive look at whale behavior and range. This study utilized PAM in the Outer Fall/Jordan Basin region of the Gulf of Maine, an area recently identified as a possible wintering and breeding ground for right whales. A recording unit was deployed in the region for 11 months from October 2009 to October 2010. We analyzed the recordings for two right whale call types—the upcall or contact call, and the gunshot call. Gunshot calls are thought to be associated with reproductive behavior. Preliminary results indicate that gunshots are the main call type detected in the region. There is also a strong seasonality in the frequency of call detections, with the majority of calls found in December and January, periods of notoriously unfavorable working conditions in the Gulf of Maine. Determining how right whales use this area is essential to establishing protective legislation, especially when determining if Outer Fall/Jordan Basin should be considered a Dynamic or Seasonal Management Area.

Alice Brites

São Paulo University

Monitoring the Ecological and Socioeconomic Effects of the Commercialization of Non-timber Forest Products.

Trade in non-timber forest products (NTFPs) has become in the last two decades a popular strategy for improving the well-being of traditional communities, while minimizing environmental impacts. Despite that, there is accumulated evidence that harvesting NTFPs can produce negative ecological and socioeconomic effects, which has resulted in the increased popularity of monitoring practices. Putting monitoring into practice

is however difficult because trade in NTFPs, particularly in the Amazon, takes place in remote areas and in poverty contexts. Because of that, it is compulsory to restrict monitoring to those parameters identified as more relevant in previous evaluations. In order to do that, this study summarizes the empirical evidence on the ecological and socioeconomic effects of NTFP harvesting and, thereafter, suggests which parameters should be monitored. The study also raises the extent to which monitoring of NTFP trade is implemented in the context of the Brazilian Amazon, and evaluates which are the most important and feasible parameters to follow in this particular case. To do so, we adopted a twofold methodology. First, we carried out a systematic review of the published literature to evaluate the most relevant parameters. Second, to evaluate the viability of implementing monitoring practices in the Amazon, we conducted an expert panel consultation through the Delphi method. Results indicate negative ecological effects are common, especially when harvesting leaves or barks. Changes in organs or physiological processes, as well as the survival rate of harvested specimens are parameters which should be monitored, particularly when harvesting fruits and vegetative parts. For all types of NTFPs, population size and population structure are parameters which should be prioritized. Community species richness also deserves attention when harvesting fruits. As regards socioeconomic effects, positive outcomes were more frequently observed than negative. The contribution and regularity of monetary income from NTFP trade, as well as the safeguard role of NTFPs are parameters from the financial capital domain that should be monitored. Women empowerment, group cohesion and access to the benefits generated by trade are important social capital parameters which deserve monitoring. As regards the context of the Brazilian Amazon, although monitoring is considered important by experts, there are only a few monitoring initiatives due to the absence of institutional support, policy incentives and financial resources. The Delphi panel experts consider the size and structure of the harvested population, the mortality rate, the amount of resources harvested and the harvesting technique employed as the most important parameters to monitor. Within economic parameters, the ones that should be followed are market aspects such as the price paid to gatherers and monetary income received, market demand and product quality. Finally, for the social aspects, the effects on culture, well-being and to the internal organization of the community were prioritized. The experts judged that it is feasible to monitor all these parameters.

Keywords: Amazon, non-timber forest products, ecological effects, socioeconomic effects, monitoring.

Thomas J. Burns

University of Oklahoma

A Critical Look at the Persistence of Anti-Environmental Beliefs

Much of contemporary culture in general, and American culture in particular, was founded upon a set of beliefs that resources are virtually unlimited. Until recently, that may have been close enough to true in the experience of many, that it came to be incorporated into widely held cultural attitudes and practices. Combined with a tendency to adduce universals (perhaps imposing them, even if unwittingly, in the absence of their actual discovery), these beliefs have come to influence major swaths of American culture. The perception that the natural environment is limitless and capable of withstanding any strain, though faulty, remains widespread. The paper examines American myths in light of rhetorical and cultural theories. Of particular interest is how certain ideas have persisted and how they have morphed into contemporary anti-environmental attitudes. The paper concludes with observations that more pro-environmental ideas can be found in history as well, and how those might be resuscitated and promulgated for the culture to take a turn toward greater long-range sustainability.

Keywords/Phrases: Cultural Lag; Anti-Environmental Attitudes; Cultural Myths; Rhetoric and the Natural Environment

Lee Cerveny, Rebecca McLain, Diane Besser, Kelly Biedenweg.

Pacific Northwest Research Station

Understanding Socio-cultural Values and Resource Uses at a Regional Scale: Human Ecology Mapping on the Olympic Peninsula

Social scientists, agency planners, communities, and indigenous groups are exploring ways to integrate sociocultural values into GIS-based environmental planning. Community mapping, indigenous mapping, sense of place mapping, and landscape values mapping are just a few of the approaches being developed. This paper describes the development and implementation of the Human Ecology Mapping Project on the Olympic Peninsula, Washington, USA. Mapping workshops were conducted in Olympic Peninsula communities to understand landscape values and resource uses. We discuss the project's conceptual development and challenges associated with gathering socio-cultural data across agency jurisdictions and analyzing them on a regional landscape scale. We share insights about stakeholder identification, recruitment, and participation in community workshops and the challenges of wrangling with and rendering landscape values. We also explore practical, scientific, policy, and ethical issues associated with gathering, analyzing, and using geospatial socio-cultural data for environmental planning.

Lee Cerveny, Erin Seekamp, Allie McCreary.
Pacific Northwest Research Station

The Changing Structure of Natural Resource Partnerships in the U.S. Forest Service

This paper describes the changing structure of partner relations in a federal land management agency, the U.S. Forest Service. We present data collected from a pilot study of key informants (n=28) and in-depth case studies of six national forests (n=45) in diverse regions of the United States. Semi-structured interviews were conducted with employees (e.g., recreation managers, partnership coordinators, line officers) at all levels of the agency to understand how recreation partners were being engaged to help the U.S. Forest Service meet goals for recreation programs and services. In this paper, we describe factors leading to the growing reliance on partners to achieve the agency's mission and meet mutually defined goals. We describe various structural arrangements partnerships assume, including: individual volunteer agreements, joint ventures with specific groups (both place-focus and activity-emphasis), single event collaborations (e.g., clean-up day with multiple parties), long-term collaborations with multiple government agencies and stakeholders. In addition, we discuss factors leading to changing patterns in the structure of recreation partnerships and the emergence of new forms, including: umbrella partnerships, strategic alliances, networked alliances, partner funneling, and other forms. We reflect on how these new forms reflect changes in internal agency capacity to partner and external interest from partners.

Abhik Chakraborty
Ritsumeikan Asia Pacific University

Transitional Landscapes and Post Growth Society The Case of Kizu River Basin in Japan

This paper analyzes the Ulrich Beck's Risk Society and Reflexive Modernity concepts in a river basin context by exploring the interrelationship between a post industrial society and landscape transformation. The case explored is that of the Kizu River basin in the Kinki region in Japan. The Bubble Growth era vision of building dams is seen as the principal driver behind drastically changing the basin landscape during the latter half of the 20th century, and the paper finds that the commitment to sustain old dams and build new ones continues in the Post Growth Japan of today even as their purpose of serving as reservoirs is increasingly becoming obsolete with population decline. Solid waste dumping, pollution from pesticides and erosive land use practices like creation of golf courses caused water pollution to rise sharply in the 1970s and 1980s. However, since then pollution has come down and the landscape has become greener owing to the state vision of preserving river landscapes for recreational purposes and persistent demands by the civil society. A particular

case is highlighted, where a citizen's movement secured judicial victory against solid waste dumping in the upstream reaches of the basin and explores the lessons learnt from the struggle. This paper discusses the findings of fieldworks spanning across a year in the basin, during which interviews, landscape photography and visits to dam sites in the river basin were carried out. As an ongoing research, the paper draws the tentative conclusion that while Japan has entered a clear phase of demographic and economic transitions with an aging society and a slackened economy, drivers of landscape changes often coexist and share the same physical space and a point of clear delineation cannot be empirically identified between the industrial and post growth modernities.

Marina Christofidis

Brazilian Planning Ministry

Maria Raquel Catalano de Sousa

Brazilian Institute of Industrial Property - INPI

Water Use Charge And Reuse Of Water In Brazil – Public Policies Inducing Behavior Modulation And Environmental Change

The use of natural resources around the world is intense and their scarcity has provoked a need to establish prevention and control tools in order to reduce the risk of resource exhaustion. The Brazilian National Water Policy has determined in 1997 as one of its Water Management Tools the Water Use Charge, therefore users and polluters may be induced by water committees and agencies to pay for both catchments and effluent disposals ever since. The main reason this tool was proposed was to implement the polluter-payer principle that acts in two diverse manners: both preventing environmental damage from occurring and punishing responsible for previous environmental impacts. The expected result when applying water use charges are both the reduction of water catchments and water pollution associated to the increase of investment on water quality purification technologies. Data exposed in the last Workshop about water use in industries taken in Florianopolis, Brazil, point to a great reduction in many types of industries regarding both catchments and effluent disposals and an increase of water reuse especially in the state of Sao Paulo where the water committees are very proactive and apply water charges systems. One of the examples are the data from FIESP, ABIQUIM year of 2008 leads to a reduction of around 25% in the chemistry industry for catchments and 55% in effluent disposal and an increase in the water reuse of around 31,5% since the induction of behavioral change that begun in 2001. This shows that when Public Policies are well applied they can have fast and adequate Results, especially when economical tools take place modulating human behavior and generating environmental changes.

Key Words: Water use Charge, Industry, Reuse, polluter-payer principle, Water Management

Lindsay A. Clark

Kansas State University

Exploring Symbolic Space: Toward an Archetypal Method

This presentation examines one approach to cataloging existing theories on the symbolic meaning of space. The author will begin by presenting a method developed from Jung's theory of archetypes. Next the author will examine the language used by various fields to describe symbolic space and offer suggestions for a unified vocabulary. Finally, the author will describe how both analytical and synthetic thinking must be used in examining the interrelationships of theoretical and practical works. The author will conclude and ground this presentation in a practical application of the method in the college-level design classroom. The worksheets provided by the author at the time of the presentation may be of use to educators, practitioners, and theorists interested in archetypes, symbols, and synthetic thinking in their own work.

Lindsay A. Clark, Jan Elsasser

Kansas State University

Joseph S. Clark

Florida State University

Mobile Augmented Reality in Higher Education: Theory and Practice

This presentation begins by exploring augmented reality - its theoretical underpinnings, potential, and criticisms. Then it explores an in depth case study of one University's application of mobile augmented reality technologies. The contributors to this presentation include a theorist in the design of the built environment, a director of information technology at a major U.S. University, and a theorist in environmental communication with a focus on virtual environments. This presentation examines the promises and pitfalls of augmented reality in higher education, supplemented with the contributors' own experiences. Conference-goers will be invited to participate in the discussion by voicing their own experiences, questions, and concerns.

Kim Y. Hiller Connell, Ph.D.

Kansas State University

Revisiting Ecological Rationality: A Theoretical Examination of Its Nature and Process

This paper aims to increase the fundamental understanding of ecological decision making from the perspective of the consumer. It first elucidates the concepts of rationality and ecological rationality as presented in the literature (Bartlett, 1986; Diesing, 1976; Dryzek, 1983; Kurlfink & Harris, 2003) and demonstrates ecological rationality's lack of theoretical development within the context of consumer behavior. The paper then, from the perspective of apparel acquisition, explores how and when ecological rationality manifests itself through consumer behaviors, how consumers balance personal needs with environmental needs, and how consumers make decisions when trade-offs are necessary. Additionally, the paper questions whether ecological rationality is a distinct type of rationality or a more fundamental form of rationality that encompasses other forms. The paper draws on qualitative data from the semi-structured interview of 26 eco-conscious adults. Practical implications of the research are also explored.

Key Words: ecological rationality, ecological decision making, consumer behavior

Maria del Carmen Anaya Corona, Rafael Guzman Mejia

University of Guadalajara

Human Ecology: A Comparative Analysis of Two Regions of the State of Jalisco, Mexico.

Gray Cox, Don Cass, Davis Taylor

College of the Atlantic

Developing Our Energy Future: Residential Heating With Wood in Hancock County, Maine

This interdisciplinary research program, conducted members of College of the Atlantic and community, examines the problem of shifting from oil to wood fuels for residential heating. The project utilizes the unique strengths of the College, broadens our engagement with local communities, trains a cadre of COA students in SSI research, and aims at long term impacts on reducing carbon emissions and establishing a stable non-petroleum heating fuel supply in the County. The central question: To what extent should Hancock County shift to wood fuels for residential heating, and, to the extent it should, how should this shift happen?

Data and analysis will be presented from: 1.) a series of surveys aimed to determine much more precisely than previously known, who is and is not using wood for heat in Hancock County and why; and 2.) a systematic experimental study of wood heat related particle emissions in the county and an assessment of the implications for a risk analysis of increasing wood heating.

Very preliminary findings suggest wood already plays a greater role than expected in residential heating and its use could relatively easily and quickly be extended in ways that would be preferable, environmentally, to likely alternatives.

Robert Daniels

In-Harmony Foundation

Reversing Human Devastation Of The Earth Using The In-Harmony System

For years S.H.E. members have delineated the continuous disruption of human encroachment upon Nature. However, little success has been achieved at reversing this march of development. Now, the new friendlier word “Sustainable Development” has appeared, but in fact it is just as devastating. The problem is not in the identification of the onslaught, but rather in offering a viable alternative.

Attempts to change development have been tempered by environmentalists who view parts of the puzzle, but do not look at the holistic result of all human encroachment. The result has been a patchwork of quick solutions for sale. Everyone wants to profit off of Nature or from helping Nature. The real solution is total re-design of the human lifestyle.

The In-Harmony System changes 6,000 years of human living patterns and actions. It not only provides for a highly efficient eco-city with a balanced closed-loop, Sustainable Footprint; but it also offers a legion of trained Restoration Ecologists and Construction Recyclers to convert previous human devastation into a new ecologically balanced system.

Turning the tide of human malevolence takes the directed efforts of all humans and not just a few. We must discover new ways to use our technology for the good of All Life. To do this we need a new plan and a new attitude that changes homo-centric interests into a geo-centric orientation. We can only survive this Sixth Great Extinction we have created, if we benevolently heal the Earth.

Jessica DeShazo

Northern Arizona University

Steel Giant v. Adivasi: A Case Study of Orissa, India

This paper will provide a study of the current situation in Orissa, India regarding POSCO Steel Corporation’s desire to build a Rs 54,000-crore steel plant in the state. The proposed site is located on adivasi (tribal people) lands. The adivasi were granted rights over the land through the Forest Rights Act of 2006, and they have written proof that they have inhabited the land for over a century. According to the Act, land cannot be taken away without the consent of the people inhabiting it in the form of a resolution. In 2009, the state of Orissa granted POSCO permission to build the plant on the adivasi land. This permission has been overturned by one of Orissa’s high courts and it is currently before the Supreme Court. The state is trying to force the adivasi off of the land so the steel plant can be built.

This case study will examine the Forest Rights Act of 2006 along with the Mines and Minerals Act of 1957. It will also examine the community-based forestry management that has been occurring in the area and how overturning the Forest Rights Act of 2006 could threaten the livelihood of the adivasi and the health of the forest.

Judy Rosella Edwards

Greenspace Genealogy

Inheritable Commitments

The competition for funding is always a challenge, but it is especially so in the current economy. How do we attract new dollars and retain existing commitment to quality of life? Creating inheritable connections to ancestral commitments draws on a pool of supporters that has a unique connection to an organization. Connecting new donors with an inherited commitment can be applied to outdoor areas, using a technique that reconnects commitment to lands where our ancestors lived, laughed, loved, played, and worked. Each person who has ever spent time on a specific location has impacted that land. We leave behind our values, our dreams, and our life's work in some sense. Greenspace caretakers often report that they know nothing about the family of the donor who made the greenspace possible. While searching for new donors and stewards, the extended family of a donor has a connection to the greenspace. These are inheritable commitments, a means of having a life experience involving an appreciation for land that an ancestor owned, can impact land. For every greenspace, there are families who spent time on that land. Once it becomes a park, that appreciation and commitment is not absolved. Organizational development focuses heavily on the present and future. Inheritable commitments exist and inspire future practices. They provide a technique for tapping into support at a critical time in history in terms of not just the economy but in terms of creating a loyal commitment throughout the generations. It is not too late to tap into inheritable connections for municipal governments and preservation organizations. There are resources in place that could encourage inheritable commitments to existing projects via coordination, and create a tradition of inheritable commitments in the future

Isaac Kwasi Egyir

Using Environmental Communication and Leadership to Leverage Environmental Performance in Developing Countries: A Case Study of Ghana

Environmental degradation in developing countries has reached alarming proportions. The towns and cities are experiencing severe air pollution due to rapid urbanisation. The fringes of cities are experiencing unplanned development; the lack of proper sewerage systems is resulting in water pollution; and the over-exploitation of national resources is causing soil erosion, deforestation and desertification, and biodiversity loss. This therefore provides the impetus for examining the importance of environmental communication and leadership in leveraging environmental performance and standards in Ghana. This paper reviews the current environmental situation in Ghana, the various environmental policies, programmes and projects embarked upon to leverage the problem, the institutional framework in Ghana and explore the potential for the use of effective communication by the environmental leadership to improve the environmental performance and standards of this developing country, Ghana. The results and discussions are synthesised, key challenges to environmental leadership and communication identified and recommendations suggested.

Mohamed M .El-Shazly

Cairo University

Ecosystem Hierarchy Theory and Environmental Policy

The concept of ecosystem hierarchy theory has been developed since seventies of the last century. Spatio-temporal hierarchies of ecosystem functions could be achieved through the combination of time, space and functions to construct organizational units. In spite of the difficulty to find examples to support the spatio-temporal hierarchy concept, that is, examples to combine space, time and a function; the great challenge is to establish a dynamic environmental management policy to sustain and cope with our increasingly growing understanding of ecosystem hierarchy concept as well as other system theories. Consequently, the specific objectives of this paper are to discuss the spatio-temporal hierarchies of energy production function in the

ecosystem and the liability of environmental legalizations to accommodate the increasing knowledge concerning the ecosystem. The article gives a brief discussion of the following topics: First, the relationship between generation time and the body size (as independent variables), and the energy production, as a major function, in the ecosystem as a dependent variable. This could be achieved by assuming numerical values, based on the real estimates from previous publications, to construct a simple model combining the space, time and the function of energy production. Second, to discuss the conservation policy in respect of the function of energy transfer; that is, if it has proven that the r-selective grasshoppers contributed to a significantly higher quantity of energy flow than a k-selective grazing mammal in a natural ecosystem, the environmental policy should dictate that the community of the grasshoppers receives the priority of conservation program in the investigated ecosystem. Consequently the environmental conservation programs should rely upon environmental conservation policy including a “conservation-priority principle”. Third, the large gap between the environmental policy, as management procedures and ecosystem theories was discussed on the light of some articles from environment law of Egypt. Finally, It was concluded that environmental policy, legalization and management procedures should be quite dynamic and enough flexible to accommodate the rapid advances in our knowledge about ecosystem, and this would finally minimize the time-lag between legalization and irreversible human impacts on the global ecosystem.

Kirk Emerson, Tina Nabatchi, and Steve Balogh.

The University of Arizona

An Integrative Framework for Collaborative Governance

Collaborative governance draws from diverse realms of practice and research in democratic theory, federalism and intergovernmental cooperation, organizational development, network theory and conflict resolution. This paper synthesizes and extends a suite of theoretical frameworks, research findings, and practice-based knowledge into an integrative framework for studying collaborative governance. We specify a set of nested systems that encompass a larger systems context, a collaborative governance regime and its internal collaborative dynamics and actions that can generate impacts and responses across the systems. The framework provides a broad conceptual map for situating and exploring components of cross-boundary governance systems that range from policy or program-based intergovernmental cooperation to place-based regional collaboration with non-governmental stakeholders to public-private partnerships. The framework attempts to integrate knowledge about individual incentives and barriers to collective action, collaborative social learning and conflict resolution processes, and institutional arrangements for cross-boundary collaboration. It is presented as a general framework that could be applied usefully at different scales, in different policy arenas, and levels of complexity. The paper offers propositions about the dynamic interaction of the components within the framework and concludes with a discussion about the implications of the framework for theory development, research, evaluation, and practice.

Justin Ervin

Northern Arizona University

Beef as Unequal Ecological Exchange: Case Studies in Brazil, Uruguay, and Argentina

This paper examines the beef industries in Brazil, Uruguay, and Argentina through material flow accounting techniques in order to determine if they are operating as processes of unequal ecological exchange (UEE). UEE is characterized by the international transfer of environmental degradation and social injustice connected with consumption patterns characteristic of core and increasingly semi-peripheral countries. Observing trends in the production, domestic supply, and the export of beef, I argue that although beef consumption is an important social institution in the cases, evidence suggests beef production in the cases is increasingly supplying

international rather than domestic markets. Further, increased beef production is associated with increased environmental degradation and social injustice, particularly in Brazil's Amazon frontier. The analyses of Uruguay and Argentina provide more nuanced accounts, with evidence suggesting optimal environmental conditions coupled with traditional pastoral methods of cattle production limit environmental degradation. However, historical social injustice and conflict associated with cattle in Uruguay and Argentina resemble, though are not quite comparable, to current injustices observable in the Brazilian Amazon. Current trends suggest domestic beef supplies and environmental sustainability are threatened as beef production is increased to satisfy both domestic and global demand. Brazil is currently able to increase both domestic beef supplies as well as exports as it transforms Amazon rainforest into cattle pasture. Uruguay is increasing beef production for export as domestic beef supplies are in decline. In Argentina, protection of domestic supplies is pursued through government intervention, being a primary source of domestic political economic conflict. In all three cases, evidence points toward increased utilization of feed lot beef production methods. Maintaining domestic beef supplies, increasing exports, and the conversion of cattle pasture into soy crops intended for foreign livestock production systems are all drivers toward feedlot production.

Francisco Fellizar Jr.

Ritsumeikan Asia Pacific University

Climate Change And Island Water Governance: Adaptation Challenges and Options

Climate change poses serious risks and uncertainties to vulnerable societies and ecosystems. Fluctuations in temperature and their influences on the hydrologic cycle bring catastrophic consequences in terms of flooding, drought, water scarcity, water-related diseases and sanitation problems. Water governance amidst the threat of climate change is an urgent and critical concern in fragile, remote and poor, developing island ecosystems. How do these island ecosystems cope with climate change? What climate change adaptation reforms and changes in water governance are taken by islands? What options can be taken? Discussions center on the contents of existing policies, partners or actors, processes and structure, practices and perspectives of stakeholders (5 Ps) along the water supply and demand management continuum to determine adequacy of adaptation measures and to identify possible options for Marinduque Island, Philippines. Water policies are inter-related with the other sector policies of government. Hence, a comprehensive set of policies impinging upon the water supply and demand management interface have to be formulated. Strategies for integrating fragmented bureaucratic structures have to be effected based on the spatial dimension of water management such as the watershed or river basin. Basin-approach or the ridge-to-reef approach to water management requires a peculiar set of politico-administrative arrangements. Actors and participants in decision-making and implementation require new methods, capacities and awareness in dealing with issues and uncertainties brought about by climate change. Social networks must be strengthened leading to social capital formation in the water sector. A more innovative and flexible mechanisms or structure for decision-making and project implementation that allows greater participation from the stakeholders as well as mobilization of local resources in support of more sustainable policies and practices is imperative. Political will and a supportive policy environment are essential elements for a more adaptive and responsive island water governance amidst threats of climate change.

David Forest

Northern Arizona University

Climate Change as a Threat to Environmental Security

As the "debate" over climate change continues, the real question of how it will affect communities who inhabit vulnerable areas will be of prime concern for those interested in environmental justice. Communities threatened by the effects of climate change, many of which, for example, exist in low lying areas along coastal

areas, such as Bangladesh, which will be some of the first to see the effects of a rising ocean and weather extremes. At the same time, while these already marginalized cultures are threatened by rising oceans they are vulnerable to injustice in other ways, mainly from those inherent and institutionalized in the structure of the neoliberal/neocolonial world order and globalization. These institutional injustices threaten their way of life, culture, and very existence.

I argue that the impacts of climate change will have the most profound and devastating effect on the cultures of indigenous populations, those who are already at the margins of society and are faced with the consequences of the modern industrialized world's attack as witnessed through climate change and globalization. Whatever one's position is regarding climate change, its causes, impacts and likely consequences, those least able to adapt to or bounce back from the consequences are most likely to be poorer communities and indigenous people's whose unique cultures rely on certain methods and traditions for their identification and survival. As Schlosberg (2009, 63) explains "this defense of community is nothing less than a matter of cultural survival."

In this paper I intend to employ a capabilities approach to environmental justice by examining the capabilities of communities threatened by climate change. I ask the questions what are the capabilities that are threatened by climate change? What will climate change take away from their capabilities? How can we treat them in a just way?

I will address the final question of how we can treat them in a just way, and intend to lay the foundation for the conclusion which will examine issues for a basic human rights approach to cultural security.

John Freemuth
Boise State University

Science And Public Land Policy: Exploring The Conflict

There is renewed interest in the question of the proper role of science in federal land policymaking. Using the controversies over the possible listing of The Greater Sage-Grouse (*Centrocercus urophasianus*) under the Endangered Species act as a starting point, this paper explores questions over the role of science. Yet, the conflict over possible listing of the sage-grouse presents an opportunity to involve the public about what is known about the science of the sage-grouse and its sagebrush habitat, as well as promote public deliberation about possible solutions. That opportunity can perhaps raise public confidence in science, and make the blatant politicizing of science more difficult for this and other complex land management issues.

Ajibike Funmilade
Augustine Adebisi Tometi
Olabisi Onabanjo University, Nigeria

Health Education As Effective Machinery In The Prevention And Control Of Tuberculosis

Health education is essential in developing countries for it serves as a means of preventing and control of diseases because it increases the awareness of individual, families, groups and communities about the causes and implications of the health of man in Ogun State, Nigeria.

Health education is also known as information, Education and communication [I E C]. Health practitioners help to disseminate information to a group of people in Ogun State, Nigeria, about the causative agents and mode of transfer to individuals, families, group and communities; on the importance of health care in terms of prevention and control of diseases in general and tuberculosis particularly; in Ogun State Nigeria.

The study design used in this research was field survey and health education is very important in preventing and controlling tuberculosis in Ogun State, Nigeria. Simple descriptive statistics method was use to analyze the information. Based on the findings and results collected, this research concluded that it is possible to eradicate tuberculosis among the people in Ogun State, Nigeria; using Health Education as catalysis.

Key Words: Tuberculosis, Health Education, Health Practitioners, Causative Agents

Kelly Garbach and Mark Lubell
University of California-Davis

Pathways to Adoption of Management Innovations in Agriculture: the Effects of Payment for Ecosystem Services, Information Sharing, and Social Learning

Conservation of Ecosystem Services in agricultural landscapes has become a primary focus of agricultural and natural resource policy in Costa Rica and worldwide. The Millennium Assessment (2005) highlighted a pressing need to change patterns in agricultural land management, documenting global-scale trends to maximize production of crops, livestock and other goods have led to degradation of critical supporting and regulating services (e.g., carbon sequestration, climate regulation, erosion protection, biodiversity habitat). As a result, there is a growing call for approaches that encourage private land managers to adopt management innovations that sustain farm production and minimize loss of environmental benefits and decline of critical ecosystem services. Payment for Ecosystem Services (PES) approaches have emerged at the heart of this call. Pilot initiatives such as the Regional Integrated Silvopastoral Approaches to Ecosystem Management Project (RISEMP) have expanded the PES approach from the historical focus on forest protection to encourage change in management practices in cattle ranching systems in Costa Rica and other nations in Latin America.

We drew on diffusion of innovation literature to identify potential pathways to adoption and investigate the unique role of PES, information sharing, and social learning in stimulating adoption of silvopastoral practices in Esparza, Costa Rica. We interviewed 101 farmers and found that PES had the most detectable effect for practices in which public benefits outweigh benefits to individual farmers. Regression models revealed that social learning and information sharing were important elements for adoption of most practices, highlighting the importance of evaluating PES in the context of these pathways.

Cassidy Gayner
Chapman University

Does the Longevity of the Earth Depend on the Type of Government?

The purpose of this research is to explain the world's environmental degradation by comparatively analyzing the impact that the democratic G8 countries and the five communist (C5) countries have had on the world from 2000-2007. Global warming has been a major concern as recent studies have shown the immense amount of gas that countries have emitted, which depletes the Earth's O-zone layer and thus warms climate, endangers species, and leaves resources scarce. Scientists have often studied what causes environmental degradation and how countries can resolve the problem. With this issue in mind, there must be some political aspects that countries take into account when negotiating environmental policies to better the world. The G8 is the elite group that holds primary power when making international and national environmental policies. All eight countries are democratic governments and capitalism is a main product of democracy. Capitalism allows businesses to expand and, therefore, makes their carbon footprint even bigger. This expansion inadvertently hinders the world's environment as more energy is used that creates an abundance of detrimental gas emissions. Consequently, this research attempts to discover patterns within democracy and communism and methodologically induce a theory. Recorded measurable environmental data (i.e. detrimental gas emissions) from the G8 countries and the C5 countries in the years 2000-2007 is used to better understand contemporary policies that will help protect and preserve the Earth's environment. I hypothesize that there is a correlation between the G8 and C5 countries in accordance with how much money countries spend on environmental policies and their overall gas emission on the environment. I also hypothesize that the G8 has a bigger impact on the world's environmental degradation than the C5. To test these theories, data taken from the (2000-2007) Carbon Dioxide Information Analysis Center was compiled and comparatively analyzed in ArcGIS and SPSS.

Mariah Giardina

Northern Arizona University

Spring Ecosystem Management in the Arid Southwest: Challenges to Water Policy

The allocation, distribution, and supply of water resources in the southwestern United States is a highly charged and contentious arena in which every drop of water is accounted for, fought over, and employed to its greatest utility. As a growing population places increasing demand on a scarce water supply, the manner in which water is managed becomes paramount. Springs, although proportionally small in comparison to other types of water sources, are being faced with a unique predicament in the sense that they are subject to the demands placed upon all water resources in Arizona, however, they are not afforded the specific consideration needed when it comes to management practices.

Spring ecosystems are an integral aspect of surrounding landscapes as they offer distinctive qualities. Along with the unique attributes that spring ecosystems offer, there are also many factors that threaten to eradicate spring ecosystems. In order to protect these miniature oases in arid landscapes, water policy must adapt to incorporate specific legislation concerning the mitigation of mounting threats to spring ecosystems. With a political mandate to conserve these valuable ecosystems, management agencies would then be able to develop effective, comprehensive, and consistent management strategies for springs under their jurisdiction thus protecting their ecological integrity.

Lilián Godoy-Magaña Natalí Pech-Jiménez, , María Teresa Castillo-Burguete, Elda Ancona-Ricalde & Amada Rubio-Herrera

Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional

The Impact of Legal Changes in Land Ownership on Natural Resources Management in Ejidos on the Coast of Yucatan, Mexico

The Agrarian Reform Law of 1992 has led to major legal transformations in land ownership in Mexico. Over 75% of the country's forests are managed by ejidos and communities. These legal changes allowed ejidos to sell or rent their lands, promoting conversion from ejido ownership to private property and the consequent rise of a market in land. Ejidos on the coasts have experienced increasingly stronger pressure from tourist industry interests to sell their lands, changing ejido member perceptions about the potential use and value of natural resources. We studied ejido member perception of ejido lands and the uses given them in five ejidos adjacent coastal wetlands on the Yucatan coast. We applied a qualitative methodology with participant observation, semi-structured interviews of ejido commissaries and ex-commissaries, and review of official documents. Resource management and self-management were found to be linked to ejido member knowledge of land ownership legal aspects. Ejidos in which members lacked legal certainty as owners and had little knowledge of associated legal processes, also had fewer ecotourism projects and tended to sell their lands. In contrast, ejidos in which members understood the legal aspects of land ownership developed natural resources management and preservation strategies. Government and tourist industry pressure in the form of the Agrarian Reform Law compromises biodiversity -conservation on ejido lands and affects ejido member family assets by fomenting ignorance about legal aspects of land ownership and creating direct and indirect land markets.

Joy Hardy

University of New England

Environmental Values Education: Reconfiguring the Indoctrination Debate

Critiques of indoctrination can be traced from Plato, through Enlightenment thinkers such as Hobbes and Locke, to Marxist engagements with hegemony and poststructural engagements with discourse. Throughout this

long and varied philosophical history, the issue of indoctrination has been configured and appraised differently. This paper begins with a reading of the historical twists and turns within the indoctrination debate. This is followed by a reading of the indoctrination debate in contemporary environmental education, in which scholars are divided over the question of whether indoctrination is inherent or antithetical to education (Fien, 1997; Jickling, 1992).

The paper then cross-reads Bakhtin's work to reconceptualise the debate. It is argued that Bakhtin's denunciation of 'authoritative discourse' (1981) and his support for 'answerability' (1993) resonate with the tension in environmental education between indoctrination and environmental values education. The chapter then draws on Bakhtin's notions of heteroglossia, polyphony and dialogism, as well as secondary literature that explores dialogic pedagogy, to re-configure and re-present the indoctrination debate in environmental education.

Kim Y. Hiller Connell
Kansas State University

Revisiting Ecological Rationality: A Theoretical Examination of the Nature and Process

This paper aims to increase the fundamental understanding of ecological decision making from the perspective of the consumer. It first elucidates concept of ecological rationality as presented in the literature (Bartlett, 1986; Diesing, 1976; Dryzek, 1983; Kurlfink & Harris, 2003) and demonstrates its lack of theoretical development within the context of consumer behavior. The paper then, from the perspective of apparel consumption, explores how and when ecological rationality manifests itself through consumer behaviors, how consumers balance personal needs with environmental needs, and how consumers make decisions when trade-offs are necessary.

Zhou Hong, Lin Jin-ping
Yunnan University

Rural Ecotourism and Traditional Ecological Cultural in China

Ecotourism, as a sustainable tourism industry, focuses on ecological education. Future generation should enjoy equal rights with contemporary to access to natural and human landscapes, even better. Meanwhile, local people should involve in ecotourism and get benefit from it. Certain part of tourism incomes should be returned to ecological construction of scenic areas.

As a highlight of recent international tourism development, rural tourism is a new form of ecotourism suitable for conditions in China. It has great significance for Chinese sustainable economical and cultural development.

Geomantic (Feng-Shui) culture in Chinese villages contained extensive knowledge of traditional ecological cultural, which is the background and foundation of resources, environment and culture of rural ecotourism. This paper discussed traditional 'Holy Mountain' culture of mountainous minority in Southwest China and its significance for rural ecotourism.

Key words: Rural Ecotourism, Traditional, Ecological Cultural, Geomantic culture

Jasmin Honold, Elke van der Meer, Reinhard Beyer & Tobia Lakes
Humboldt-Universität zu Berlin

Adverse and Favorable Urban Neighborhoods - Towards a More Holistic Perspective on the Effects of Multiple Environmental Factors on Human Well-Being

Empirical evidence shows that urban environmental factors such as air pollution and noise may have impacts on the physical and psychological health of city dwellers. Among the few published studies addressing such effects on mental well-being, most have only investigated exposure to a single stressor. However, as suggested by literature, it is hypothesized that the accumulation of multiple ambient stressors with a simultaneous lack of environmental resources is a key aspect of mental health consequences on a neighborhood level. The aim of this research project is to investigate the effects of concurring adverse factors on city dwellers' well-being and to identify measures to counteract such consequences. In a first step relevant environmental stressors had been determined by an online survey completed by 780 Berlin residents. A spatial analysis using a Geographical Information System (GIS) was then applied to select socially and structurally comparable study sites with low vs. high levels of traffic noise, air pollution, and availability of public green space. Among residents of these sites a household questionnaire survey (n = 420) was conducted and combined with a follow-up qualitative interview study (n = 33). Results from statistical analyses suggest that residents from neighborhoods with a high level of critical conditions differ from residents living in low-level areas in regard to perception and appraisal of the objectively varied factors, in neighborhood satisfaction and in health behavior. Predicting neighborhood satisfaction from the varied factors, the perception of air quality and availability of public green space concur in an additive way. The follow-up study provides data on hair cortisol levels as an indicator of chronic physiological stress, on habituation to and coping with environmental stress, and highlights the importance of greenways and vegetation for mental well-being in urban neighborhoods.

Faina Ingel

A.N. Sysin State Research Institute for Human Ecology and Environmental Hygiene of RAMS,
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Nadezhda Antipanova

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How Can Family's Lifestyle Modify Genomic Instability of Young Children in Polluted Town

“Genomic instability” is the term for description of complex of changes leading stable genome of normal cell into instable, characteristic for tumor. The WHO data testifies growth of tumors among children, therefore analysis of reasons of children's genomic instability is very important problem.

We evaluated in vitro genomic instability and susceptibility of 166 healthy children of 5-7 years old from two different districts of Magnitogorsk-town (very polluted Russian city), considering their anxiety, lifestyle, social-economic status and emotional climate of their families.

As a result we detected direct correlation between children's genomic instability and susceptibility with emotional status, alcoholism and smoking of their parents.

At the same time in the two surveyed districts of the city we found out different lifestyles, despite of close social status and absence of statically significant distinctions in income, number of members of family as well as in housing quality. It is important that in each district we detected different correlations of lifestyle of family with genomic instability and susceptibility of their children. So, in families focusing on money and material assets, frequency of 2-nuclear cells with plural micronuclei in children's blood (very serious signal of depth of genetic damage) negatively correlate with monthly income on 1 family member. In higher educated families, oriented to good interpersonal relations, the number of family members directly correlate with frequency of cells with genomic instability and negatively – with DNA-replication of blood lymphocytes in children' blood.

Thus, our data testify that lifestyle and emotional climate of family are a potential source of children's genomic instability, what in future may be the reasons of different diseases, including tumors.

This conclusion shows the necessity to think about change our educational system in direction to more spirituality for preservation of health of our children and future generations.

Howard Ingle

Salt Lake Community College

Ten Years of Eco-Psychology: Classroom to Field School

Ten years ago I developed a course called, Eco-psychology, initially this course was developed as an interdisciplinary course taught in conjunction with a field school course in Archeology. Since that time the course has evolved in many ways. I would like to share my experience in developing an Eco-Psychology course with other educators.

I would also like to present baseline and outcome data focusing on change in students using both academic and field school practicum in the student's experience.

The analysis includes:

3. How service learning projects enhance student experience.
4. Service learning includes:
 5. 1. organizing an earth day activity
 6. 2. Assisting rangers at Grand Gulch wilderness area with trail maintenance.
 7. The impact of a five day field school in southern Utah studying the concepts of sustainability adaptation, and the use of metaphor for psychological healing in the wilderness.
 8. Reflective and critical thinking practices by students.
 9. Incorporating democratic principles in the classroom and field school.

Beth Karlin

University of California, Irvine

Technology to the Rescue? The Potential and Pitfalls of Feedback in Energy Conservation

Feedback is widely promoted as a promising strategy for energy conservation (e.g. Darby, 2006; Fischer, 2008) and dozens of devices providing energy feedback have emerged on the market in recent years (Bornstein & Blackmore, 2008). However, these devices have not taken a strong hold in the marketplace and are used primarily by commercial entities such as universities and "extreme users" (Liikkanen, 2009). It is not clear whether this is due to device usability or simply a slow adoption curve. Using results of three recent studies (a survey, meta-analysis, and device pilot study), I will discuss key findings about the promises and pitfalls of providing feedback to residential energy users. Implications for policy, including integration with smart meter technology, will be discussed.

Michelle Kawamura
Colorado State University

Implementing Strategies to Encourage Integration among Intergenerational and Mixed-Ability Users that Result in Increased Health and Environmental Benefits

The built environment has the ability to either isolate or integrate populations, especially those that are underserved, economically disadvantaged or have mobility challenges. Further, these populations may be at a greater risk for exposure to unhealthy conditions in the built environment since it has been shown that they spend a higher percentage of their time indoors. The trend toward urbanization and changing demographics in modern societies over the past 100 years has imposed environmental threats, compromised healthy aging processes and further alienated those with disabilities and mobility challenges. A growing body of research suggests that social isolation and unhealthy environmental conditions may result in decreased physical and mental health, poor quality of living and shorter life expectancy rates. Making strategic changes to neighborhoods, communities and assisted care facilities can help to increase the health and well-being of people of all ages and abilities. With proper planning and implementation, these same tactics may also result in environmental benefits and help to curb climate change, while supporting environmental justice. This presentation will highlight development trends over the past 100+ years and will provide examples of successful developments and design strategies that have proven to integrate people of all abilities and ages. These strategies will be discussed relative to their potential for reducing resource use, environmentally damaging chemicals and mitigating carbon emissions and climate change.

T. I. Khan
University of Rajasthan

Biodiversity In Thar Desert: Current Scenario

This paper describes the results of a study carried out in Indian Thar Desert pertaining to current scenario of Biodiversity. The area of Thar desert is about 3.0 lacs sq. km. It is the most populated hot desert in the world. It has high human and livestock density. It is situated in the north western part of India, with the main part (61%) in the state of Rajasthan. It extends to Haryana and Punjab in the north (9%) and to the state of Gujarat in the south (20%). It is essentially a sandy desert enclosed in the eastern side by the rocky Aravalli Hills. Characteristically the biodiversity of the desert ecosystem in the Indian Thar desert is intimately associated with the habitat diversity. There are 682 plant species identified and well documented in the Thar desert of India. A large number of species are of economic and medicinal importance. But many of these species have already become endangered, such as *Anogiessus sericea*, *Commiphora wightii*, *Zizyphus truncate* and *Tecomella undulate*. In this study an attempt has been made to find out the number of species of endangered nature and the causes of their becoming endangered. The study reveals that the number of species becoming endangered is as high as forty five. The number of endangered species may be still higher, further investigation is needed. Author suggests that to arrest the process of increasing number of endangered species, we need to apply methods of In-situ and Ex-situ Conservation of Biodiversity in the Thar desert.

Shashi Kumar, Shashi Saxena
Delhi University

Human Ecological Approaches to Food Security And Safety for Human Eco-System: The Theme - Green Chemistry To Human Biology

Community based interventions for consumption in human ecosystem with special reference to the toxicity in fruits and vegetables, the Pesticides are toxic by design, kill bugs, weeds, fungi, rodents and other pest. When we eat these pesticides, they can change the human body, depending on a number of factors, like the toxicity of the pesticide, degree and form of exposure, age, genetic susceptibility, and exposure to other toxics pesticides. Today the scientists know much more about how pesticides can change critical hormone signals in the human body. The contamination of the product can occur in the field situations to fecal contamination of the soil, due to grazing animal or human waste, Contamination from un-composed manure used as fertilizer, used as fertilizer' Irrigation water contaminated from runoff from areas grazed by animals' Handling by field workers or practicing poor personal hygiene It requires theme based studies through a case study research on the Contamination of products. It can occur in the field, during harvesting, post harvest handling, processing, storage or marketing. The scientific programs & the scientific expertise will guide to demonstrate the educational program effectiveness with the focus in partnership to sustainable solution. Yet in spite of these advances, there is little agreement on how much is too much. To study the Toxicity in fruits and vegetables needs the support of under graduate courses.

To enhance the principles of both gender equity and gender equality, the emerging strategy needs it's focus on the BONDING RELATIONS for innovations, through research & educational institutions & industry in symbiotic mode of conversion of research findings into products processes & technologies for Human Resource Development. However, to study the toxicity in fruits and vegetables & to the availability of safe healthy food the education process, should emphasize the empowerment of women and development of children, to bring in process the policy into the planning process for building and sustaining a productive sustainable and safe future to mankind. Human intellect is most important resource & an intellectual property right seeks to protect innovations. The industrial designs that cater to the protection of plant varieties must work in the field situation under the preview of IPR as Human Responsibility and Environmental Change –Planning process and Policy.

Yolanda López-Maldonado, María Teresa Castillo-Burguete

Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional, Unidad Mérida, Departamento de Ecología Humana.

Women in Community Management of Historic Heritage on the Coast of Yucatan, Mexico. A Human Ecology Perspective

Social, ecological and cultural factors have a complex link to and influence the management of historic heritage. Evaluation of the tourist potential of towns and regions should consider this dynamic in an effort to allow local populations to manage their historic resources, benefit from them and preserve them. We studied the challenges and accomplishments of a group of women involved in historic heritage preservation in Sisal, Yucatan. Located on the coast, this small port town was the main commercial port for the Yucatan Peninsula until approximately 1871. Current economic activities are fishing and low-impact seasonal tourism. Sisal's historic heritage includes a number of colonial structures, particularly the highly significant former Customs House. Our study used a human ecology approach with a qualitative focus, participant observation techniques and semi-structured interviews with community members, municipal officials and the women of the historic heritage preservation management group. The main challenges faced by the group were that it was small, had no communication with or support from the municipal authorities, lack of funding, no specialized management assistance, and no continuity in agreements with municipal authorities. They restored the former Customs House and converted it to a multiple-use space to which they have access for different activities. They used their skills to prepare food for sale, the funds from which they used to cover management expenses and furnish the space. The women stated that community participation is vital to heritage management. Their successful rescue of the former Customs House is an example to follow for preserving historic heritage and positively affecting community memory.

Shakeel Ahmed Ibne Mahmood

Member, BAPA, Bangladesh and Bangladesh Environmental Society, BES

Air Pollution in Bangladesh: The Role of Public Administration and Governments Integrity

Objective: Explore the susceptibility of the urban population of Bangladesh to air pollution, recommend measures to be adopted for prevention of air pollution. The large number of street children, local streetwalker and rickshaw puller in our country pose a definite threat to this air pollution. Young children are mostly exposed to cadmium (Cd) through inhalation of smokes and contaminated soils and dust from industrial emissions and sewage sludge. The high lead (Pb) in the environment from gasoline, paints, ceramics, batteries, etc has also been factor to increase the risk of polluted air.

Method: The study was done through internet, seminar and literature survey on global and regional information on Environment, analysis of the existing situation in Bangladesh.

Result: Air pollution kills 15,000 Bangladeshis each year, according to a World Bank report released recently. The report says Bangladesh could save between \$200 million and \$800 million per year, about 0.7% to 3.0% of its gross national product, if air pollution in the country's four major cities was reduced. The report adds that 6.5 million people in those cities suffer each year. Air pollution kills an estimated 2.7-3.0 million people every year throughout the world, and 6% of all annual deaths. About 9 deaths in every 10 due to air pollution take place in the developing world, where about 80% of all people live. In 1995, the average ozone concentration in Mexico City was about 0.15 parts per million, 10 times the natural atmospheric concentration and twice the maximum permitted in Japan or the US. The density of lead in the air of Dhaka is 463 nanograms per cubic metre, which is ten times more than the acceptable standard and several times more than the above-mentioned cities, even than the most polluted city of Mexico.

Conclusion: The level of lead poisoning is a major factor responsible for decreasing the mental abilities of the children as a result of which the country will have acute shortage of intellectuals in the long run. Let us make all possible steps to make people understand of the environmental situation of the country and make them swear to vote for them who will swear to save the environment of our country for us as well as for our next generations. The only way to enhance the ethical accountability of public administration is, Bangladesh Government should immediately translate its National Environmental Policy, transport policy into action to benefit the people of this country.

T.S. McMillin

Oberlin College

Strange Waters: Paradox on the Los Angeles River

The Gabrielinos, who lived near the Los Angeles River for centuries before the Spanish arrived in the 18th century, knew well that it had two natures: “a small gentle stream flowing through a small sandy bed most of the year and a large turbulent, unpredictable river for a few days every winter.” Although the city of Los Angeles “would not exist had it not been for the river,” explosive growth in the 19th century led to diversion of the river’s flow, clearing of the floodplain, paving of surfaces, and depletion of underground sources—meaning the river no longer served its perceived purpose. In the early 20th century, floods destructive to the city’s residents and their structures resulted in the re-engineering of the river into the Los Angeles County Flood Control Channel. But from the late 20th century to the present, a wide variety of writers—poets, essayists, nature writers, bloggers, historians, other scholars—have set about re-rivering Los Angeles.

By heightening readers’ awareness of the different meanings of the river, writers and other artists have contributed actively and extensively to the remembering or even resuscitation of the L.A. River. In a way, they have found what was lost: in 2010, the EPA declared the river’s waters officially navigable, overturning prior rulings by the U.S. Army Corps of Engineers and other entities, thus granting the river and its tributaries

protection under the Clean Water Act. In this paper, I explore literary treatments of the strange waters of the L.A., giving special attention to the role of vortex, paradox, and oxymoro in the rethinking of place. My goal is twofold: 1) to understand better the nature of the river by considering how writers figure and refigure it; 2) to speculate on the role that the Humanities might play in ecological studies more generally.

Álvaro de Oliveira D'Antona

Universidade Estadual de Campinas, Brasil

Anthony Cak

National Science Foundation, Arlington, VA

Roberto Donato da Silva Júnior

Universidade Estadual de Campinas, Brasil

Distant versus Local: Assessing Two Perspectives of Land Use and Land Cover for Sustainability Assessment of Rural Areas of the Amazon

We analyzed how two different perspectives of land use and land cover (LULC) of socio-ecological systems contribute to the development of sustainable participatory strategies in an area of the rural Brazilian Amazon. We examined the similarities and differences of these two points of view: 1) a 'technical-scientific' perspective that incorporated analysis of LULC using remote sensing technology, and 2) a 'local' perspective of LULC using maps and interview-derived sketches and descriptions developed by small family farmers living along the Transamazon Highway, in the state of Pará, Brazil. We discuss how different perspectives of the viewpoint need to be incorporated into guidelines for sustainable land use.

In this work, we used digitized-georeferenced sketch maps that were developed as part of a survey of household dynamics and land cover change of small family farmers in 2005. These sketch maps aided in capturing information about the location and spatial organization of land use and land cover within the property. We aimed to identify how accurately information about land use and land cover in sketch maps related to categories of land cover (i.e., forest, several levels of secondary forest regrowth, bare soil, urban areas, pasture, and water) that were identified in two classified satellite images acquired at a similar time period as the study (a 2005 Landsat ETM+ image and a 2008 Landsat TM image).

In analysis using geographic information systems (GIS) technology of 207 property sketch maps, we identified 249 different and unique ways of describing land use or land cover described mentioned by farmers during the survey. These 249 classes subsequently were reclassified into a system of 50 classes and were subsequent digitized and overlaid on the classified satellite images. We extracted information about the corresponding land cover types from both the sketch maps and satellite images to compare the two systems of classification. A table matrix of acceptable error was used to identify the amount of correspondence between the sketch maps and the satellite image. Additionally, we used auxiliary information, such as other survey data, geotagged photographs of land cover in the area, and general experiences and knowledge in the field, to identify consistencies and inconsistencies between the two different data sets on a case-by-case basis, in order to further refine our results.

In our results, we found that a wide range of land cover classes identified through traditional methods of satellite image classification were ascribed to different types of land cover identified by respondents. Approximately 58% of the land use area identified in the sketch maps "correctly" or positively matched with the corresponding land cover described in the classified satellite image, while approximately 17% was fairly similar to the land cover categories. Twenty-five percent of the land use area identified in the sketch maps did not match correctly to similar land cover types in the satellite image.

Analysis of the inconsistencies between the two different classification systems showed that these differences were largely caused by 1) limitations in scale of the two different data sets and 2) distinct and different ways of classifying characteristics of landscapes. Inconsistencies caused by scale differences were largely due to the high detail described by respondents in sketch maps, especially when compared to the more

aggregated detail of satellite images, which, in the case of our study, was limited to a 30 x 30m area (i.e., the size of one satellite image pixel). Sketch maps revealed a classification system that was rich in detail and information about how local residents perceived the landscapes in which they lived (i.e., if certain areas were described with greater detail than other areas).

While we found distinct differences between these two data sets, we also found that incorporation of these two data sets, social surveys and satellite images, together in analyses of LULC can give researchers a more nuanced and detailed description of land cover (e.g., forest, secondary succession) and land use (e.g., pasture, agriculture) change at both a small spatial scale (i.e., individual properties) and a large spatial scale (i.e., landscapes). In this paper, we further identify ways in which these two methods can be successfully combined in order to overcome each method's individual limitations. We propose a symmetrical analysis of the different forms of interpretation and identify the theories that play a fundamental role in describing how these methods can be analyzed together in order to broaden the dialogue between two distinct and different academic disciplines and forms of knowledge. As a result, this analysis will show how strategies for sustainable development and occupancy need to incorporate cross-scale and multidimensional aspects of complex socio-ecological systems, not only the results identified by researchers and governments, but also local perspectives that are directly influenced by and influencing changes on the ground.

Olubayo Oluduro
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Abstract: Oil Exploration And Ecological Damage: The Compensation Policy In Nigeria

Oil exploration, prospecting and marketing have been with Nigerians for several years now. The impact of these activities on the ecology and the local inhabitants of the Niger Delta region- the bedrock of Nigeria's oil production- have been phenomenal. Oil spills, gas flaring, etc are some of the effects of the unregulated exploratory activities of the multinational oil companies that have contributed immensely to the deprivation of the local inhabitants of the region, mostly poor, of their life-sustaining productive resources, homes, lands, jobs, shrines, etc. These activities have greatly led to loss of biodiversity and imbalance in the ecosystem of the region. Paradoxically, the only allocations which the local inhabitants receive are the compensations, which are either not paid, inadequate, delayed or contentious, thus leaving them poorer. Although there are several Nigerian laws protecting the environment, there is presently no comprehensive legislation that can be used to adequately address the issue of compensation and liability for environmental damage. This paper reveals the weaknesses and inadequacies in the Nigerian laws on compensation and suggests the need for an acceptable compensatory and remediation regime to cater for the interest of the environment and the victims of environmental harm. It argues that for there to be a successful implementation of the current amnesty programme and lasting peace in the region, there is need for a more comprehensive relevant regulatory framework which must be effectively implemented.

Keywords: Oil, ecology, Niger Delta, compensation, policy

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Education for Sustainable Development and Civic Engagement: A Developing Country Perspective

Education is an essential tool for achieving sustainability. People around the world recognize that current economic development trends are not sustainable and that public awareness, education, and training are key to moving society toward sustainability. Officially, and since Agenda 21, education and capacity building have been considered as critical to help shift societies towards sustainability. These processes are vital to enhance

people's abilities to find solutions to unsustainable practices. Critical to education for sustainable development (ESD) is learning how to motivate and manage change towards sustainability within organizations or institutions. It differs from the traditional environmental education approaches in that it goes beyond addressing values and attitudes of the individual to build their capacity for instigating and managing change. Nonetheless, the relationship between education and sustainable development is still complex. Generally, research shows that basic education is key to a nation's ability to develop and achieve sustainability targets. However, the most educated nations leave the deepest ecological footprints, meaning they have the highest per-capita rates of consumption. This consumption drives resource extraction and manufacturing around the world. In the case of many developed countries, more education has not led automatically to sustainability. Undoubtedly, simply educating public to higher levels is not sufficient for creating sustainable societies. The challenge is to raise the education levels without creating an ever-growing demand for resources and consumer goods and the accompanying production of pollutants. Meeting this challenge depends on reorienting curricula to address the need for more-sustainable production and consumption patterns. ESD invites us as educators to question the assumptions of dominant discourses in education, particularly those objectives, content and teaching methods which favor initiating people into the concepts and skills needed for finding scientific and technological solutions to environmental problems without addressing their social, cultural, political, and economic roots. This paper tries to show how education for sustainable development, via civic education and engagement, can involve people in questions about the ownership of common property resources, gender mainstreaming, issues of international and intergenerational equity, investigations into regional and national ecological footprints and, most importantly, engagement in debates about qualitative versus quantitative growth. The paper also highlights the different constraints facing most developing countries' education systems to engage in this process given the huge deficiencies in terms of democratization, sustainability awareness, civic values and practices, technical and human capacities, etc.

Keywords: Education for Sustainable Development, Civic engagement, Ecological Footprints.

Maria Pekhova

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European Energy Policy in the Context of Energy Resources Shortage

Global stability and prosperity are critically dependent upon the availability of secure, reliable and affordable energy supplies. Though coal deposits occur in many parts of the world, their use for energy generation has serious environmental and climate change impacts. Oil use is much less polluting, but oil and natural gas resources are concentrated in a small number of countries¹. For these reasons, reduction in the dependency on natural resources is the key energy policy target of many countries.

Technocratic development that started to take place on the Earth in the beginning of the twentieth century hides a lot of destruction, especially in terms of the capacity of our planet to generate energy resources. Globalist theory, which was established by the members of Roman club suggest that soon mankind is going to face the problem of limits of growth. The world can never solve this problem; however we can maximize our efforts in order to control the situation. The EU energy policy shows how political instruments can be used to manage energy shortage and decrease import dependency among its member states. At the beginning of the twenty-first century, most sectors of the energy industry are undergoing reform throughout the developed and the developing world. For many years, energy was regarded as too important to be left to the markets and was subject to extensive government intervention.

Chantelise Pells

University of California-Davis

The Role of Social Heterogeneity and Collective Action: Groundwater Governance in Guadalupe Valley, Mexico and Sonoma Valley, USA

Understanding how inequities factor in to and can be resolved at a local level is critical to assessing the effectiveness of international aid programs that incentivize collaborative and local resource management. The paper will discuss preliminary findings concerning the role of social heterogeneity and collective-action in a comparative analysis of two local groundwater user's associations in Mexico's largest viticulture region, Guadalupe Valley, Northern Baja California and one of California's most prominent wine producing regions Sonoma Valley, California, USA.

The study contributes to literature that examines Integrated Water Resource Management (IWRM) outcomes.

In socially heterogeneous communities, like Guadalupe Valley and Sonoma Valley, governance arrangements that effectively account for both the diversity of attributes of the resource user and the environmental resource may be difficult to craft, resulting in inadequate cooperation and institutional failure. Others find that social diversity can enhance innovation and thus improve institutional and environmental resiliency through the availability of a variety of knowledge forms and experiences. Previous research on social inequity and community-based environmental management have been mostly empirical evaluations and therefore cannot indicate the degree of influence of diverse societies on collective-action or identify the most relevant dimensions. This study attempts to address this gap by combining qualitative and quantitative data using a common framework of Social-Ecological Systems (SES) to organize and measure findings

Alejandro Pérez Flores, María Teresa Castillo Burguete

Centro de Investigación y de Estudios Avanzados del Instituto Politécnico Nacional

Perception, Use and Management of Springs and Sinkholes in San Crisanto, Yucatan, Mexico

Water is a vital resource for humans worldwide, including on the Yucatan Peninsula. There is no flowing surface water on the Peninsula although there is an immense freshwater aquifer. At the coast, this subterranean water upwells in springs and sinkholes (locally known as cenotes), which are managed and exploited by local human populations. We studied the perceptions these populations have of these springs, their water resources and how they use them and the benefits they receive. The study site was the small fishing port of San Crisanto, Yucatan state, Mexico, a town of about 600 inhabitants with access to 1020 hectares of mangrove wetlands including 45 springs. A community group implements controlled extraction of mangrove and crocodiles, and offers ecotourism services. Understanding community member perceptions of their water resources is important to describing the sociocultural characterization they give to this resource and the environment in general. We applied a qualitative methodology including semi-structured interviews of key local figures and a survey of those who use the springs and those who do not. These generated a vital body of data on this vital resource, such as its use, management and benefits, and a history of water resource use provided by local elders, all of which will aid in more deeply understanding the dynamic between local users and this resource and be useful in developing effective future use strategies.

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IBS Bangalore

Anil Kumar

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Environmental Sustainability Through Human Resource Initiatives

The bottom line of sustainability is the economic, environmental and social performance of an organization. Among the three it is quite evident to see organizations focusing on the economic aspect with more rigors to increase economic performance. It is but obvious for organizations to maximize their profits rationally to help them carry on their operations without the threat of solvency. Environmental performance of any organization is

seen on two fronts. Either on a voluntary basis or as an impact of policy, fee levied by Government agencies or regulatory boards.

Citizens are now aware of issues of environmental performance, thereby voluntary organizations, and forums' of environmentalist influence organizations to abide by the rule and also show initiatives of being environmentally sensitized. The most commonly used measures are to levy a Hefty fine on high level of emissions and incentive of subsidies on lower level of emissions. The focus is on emissions being a reactive action to the program of environmental performance, but, the shift had to be pro-active looking into the energy reductions as an opportunity of performance. During the past two decades, a world wide consensus has been emerged around the need for proactive environmental management goals. The responses from organizations are seen to be involving strategic decisions and behavior modification for organizations employees. It is not only the management but also the employees who are benefited by the green practices in the organizations.

The paper would like to analyze the initiatives taken by the organizations towards environmental performance for sustainability. The study would collect data using a snowball sampling method from a sample of 60 organizations located in Bangalore. The data would examine the human resource initiatives implemented by the organizations as understood by the employees of the organization.

The authors explore how human resource green initiatives of organizations are aligned to gain an advantage of organizations moving ahead on the lines of environmental sustainability.

Gertjan Plets, Jean Bourgeois
Ghent University

Sustainable Development of the Cultural Landscape of the Altay Mountains – a Community Based Approach

Since the rise of the Soviet Union in the 1920s, the Altay mountains (Western Siberia) underwent large scale economic, politic and social changes. As a consequence, these changes had serious implications on the once pristine landscape of the Altay mountains. New economic activities like tourism and pipeline transport is putting even more pressure on the environment and the heritage it contains. Recently, the Altay is characterized by an explosive growth of the tourist sector. The region is very popular among tourists because of its cultural diversity, unique archaeological heritage and breathtaking landscapes. Activities like hunting, hiking and wild camping are among the most popular activities. It is generally believed that tourism could boost the local economy and generate an income for conservation projects. However, recent fieldwork has shown that the expansion of tourism has irreversible implications on both nature and culture. Regarding the environment, large parts of the Altay is being completely built-up and both the ecology and view of the landscape is affected. Furthermore, tourism also brings the culture and heritage of the indigenous population under increasing pressure; there are numerous examples of destroyed rock art panels, conflicts between the ethnic communities and tourists, and alienation from local traditions. The main aim of our research is to develop and maintain a sustainable heritage¹ management for some ethno-natural parks of the Altay mountains. Firstly this management is community based - thus in respect to the cultural and economic interests of the local population. Secondly, the possibilities and restrictions of sustainable tourism are also implemented in the management plan. The plan is based on a thorough study of the stability of the landscape and land-use (using remote sensing techniques) and an anthropological study of the indigenous Altay people, studying their perception of tourism and heritage.

Anna Post
University of Gothenburg

“System Thinking”- Make Different Stakeholders' Perspective Visible

Sustainability deficit of modern food system is widely reported and changes in food habits towards more sustainable eating patterns, including eating seasonally and locally, have been suggested to minimize the environmental impacts of food consumption and production. The Nordic countries have through national programmes and recommendations initiated public catering to use local, organic and seasonal food in the attempt to create a healthier and more sustainable catering sector. But the problem is obvious that sustainability action is not prioritized or sufficiently carried out everywhere and although the 'eating out phenomenon' is increasing every year very little research have focused on sustainability action within the catering sector. The aim of this paper is to present important factors for sustainable thinking and action among Nordic stakeholders within the food system and to visualize the explicit difficulties related to this action experienced by the stakeholders. Based on a system thinking analysis of a Swedish survey and telephone interviews with stakeholders within the Nordic countries deficiencies to sustainable thinking and acting can be connected to insufficient environmental communication, ideological dilemmas due to conflicting messages but also to language deficiencies between stakeholders and other actors within the food system. System thinking facilitates the possibility to boost different stakeholders' views concerning sustainability thinking but also to better understand the whole picture.

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Departamento de Ecología Humana

Human Ecology Research Results Communication to Participating Groups on the Coast of Yucatan, Mexico.

Research into the society-nature relationship has demonstrated that management/use of natural resources by humans is based on social constructions mediated by age, gender and ethnicity, among other factors. On the north coast of Yucatan state, Mexico, resource use is implemented within a land ownership system called ejido. Groups of men and/or women are given lands to work, although in this region they are hardly apt for agriculture. However, they are near the coastal lagoon ecosystem and ejido members thus use life strategies based on small-scale fishing and use and extraction of resources from the natural vegetation. These groups have expressed the need to engage in economic activities (e.g. ecotourism) which take pressure off fishing and natural vegetation resources. We propose a research results communication method for data collected from four of the 13 ejidos on the Yucatan coast through interviews with those who have been ejido representatives since 1992. Conventional means of communicating research results are chosen by researchers and usually include congress papers, articles, chapters and books. Another facet of results communication is feedback to groups or communities which participated in the research and results analysis to determine how best to use these data in group processes. This ensures that the scientific research paid for by their taxes serves their needs by helping them to make more participative natural resource management decisions.

Sanjoy Sarkar

Sudhi Ranjan Lahiri Mahavidyalaya

Water Pollution is an Emerging Threat to Practicing Religions: A Case Study on Hermitage of Satima

Water pollution has been defined as the presence of harmful and objectionable material in water - obtained from sewers, industrial wastes and rainwater run-off. The purified water is the sign and symbol of hygiene for seeking of good health. Most of times most of the religious groups use water from river, ponds and many other sources for self purification before entering into their religious performances and the ritual of purification is a mandatory feature of many religions. Again water, sanitation and hygiene have important impacts on both health and disease. Water related diseases kill a child every eight seconds and are responsible for 80% of all illnesses and deaths in the world. The paper highlighted such a popular area of environmental science and tried

to correlate with the spiritual belief of the society with the effect of water pollution on health or waterborne diseases. We have to choose for ourselves waterborne diseases or healthy performing religious activities. Who will initiate our choice to keep alive from any kind of waterborne threats?

Randolph E. Schwering
Rockhurst University

Emergence in Planning and Policy Formulation Processes: Lessons from Complex Adaptive Systems

This presentation/paper will describe planning methodologies that are designed to take advantage of the dynamics of systems emergence most appropriate in conditions of high environmental turbulence and uncertainty. Complexity concepts such as self organization, requisite variety, minimal system specifications, and double loop learning will inform this conceptualization. These more emergent planning methods will be contrasted with conventional planning and policy formation approaches characterized by highly specified goals and implementation tactics that are used to drive action sequences according to a predetermined plan. A model is forwarded that helps the planner select planning processes best suited for a given planning and problem solving context. Case examples will be provided illustrating corporate environmental sustainability initiatives. Leadership implications will also be explored.

Narjes Seighali, Saeed ZakerBostanabad, Mohammad GhomiC
Islamic Azad University

Flora Medicine, Industrial and Nutrition of Plants in IRAN

This paper presents the result of a study on the uses of plants in connections of Medicine, Industry and Nutrition in Langroud. The study was carried out in this district between March 2008 and May 2009. Ethnobotanical data were collected using semi structured interviews, field observations, sciences articles, preference and direct matrix ranking with traditional medicine practitioners. A total of 322 species belonging to 80 families were investigated and the samples were listed with their uses and Latin names. The investigation includes cross-checking the disorders and their herbal cures and their recommended use stated by the local herbalists, by the parts used, and by the preparations. The cultivated species and their ethno botanical uses, are documented and extensive inventory is presented.

As a result, we observed that these plants are used especially in Medicine (48.44%), Nutrition (26.70%), and Industrial (18.94%). Documenting the eroding plants and associated indigenous knowledge can be used as a basis for developing management plans for conservation and sustainable use of medicinal plants in the area.

Miriam Nassozi Sekandi
University of Alberta

Cloth That Grows on Trees: An Exploration of Bark Cloth in Buganda, Central Uganda

From the bast fibers of various tree species around the world is crafted a non woven textile known as bark cloth. Evidence from the tropical equatorial regions around the world shows that bark cloth has been used as a traditional textile in similar ways and rituals. For hundreds of years, the people of Buganda, the largest of the ancient colonial kingdoms in central Uganda, have skilfully crafted cloth from the bark of the mutuba tree. Actually, they have come to be known as the best bark cloth makers in Africa. In this paper, I will explore the cultural and environmental contexts of bark cloth and bark cloth activity in Buganda through a human ecological lens.

Drawing from the human ecological framework, I will discuss the place and meaning of bark cloth in the lives of the people of Buganda – the Baganda. I will then explore the challenges faced by the Baganda as they

try to balance the traditional life involving bark cloth and the contemporary life of modern textiles in these global times. Furthermore, I will explore the environmental issues around bark cloth and suggest ways in which bark cloth can be used not only as a cultural marker but also an environmental resource. The aim of this paper thus, is to foster the need to reconceptualise traditional material culture from which knowledge can be drawn and used to imagine future possibilities for human, cultural and environmental responsibility and sustainability.

This paper is drawn from a larger study in which I explored Baganda's experiences with traditional bark cloth in the wake of the current wave of globalization. The cultural narratives of various individuals who used and interacted with bark cloth in various ways were collected, with the aim of demonstrating the interconnectedness between tangible and intangible material culture.

Wolfgang H. Serbser

German Society for Human Ecology (DGH)

The College of Human Ecology for Europe – Concept Building and Regional Accommodation of a Core Curriculum

The presentation sketches the recent development of the College of Human Ecology an Liberal Arts in south Germany.

It presents the course and results of two charrettes hold in Emmendingen (a town near Freiburg in the south of Baden-Wurttemberg) and Weissenburg (a town in the middle of Bavaria). It sketches - the process to accommodate the college in one of these locations, - to find project links to regional activities and companies, - to assure financial support, - to find a sustainable model of organization and - it reports the decision making process inside the German Society for Human Ecology and the initiative group to establish a College of Human Ecology and Liberal Arts in Germany.

Finally the recent concept and core curriculum of the College of Human Ecology for Europe will be presented and forwarded for discussion.

Samvel M. Shahinyan

President of National State party

Kristine Siradeghyan

Speleological Center of Armenia

Risky Geocological Zones In The Armenian Highland and The Geography of the Human Population Accumulation in Anthropogene

The current relief of the Armenian Highland has been formed in the end of pleistocene. It was combined by active tectonic, plutonic and volcanogene processes. All volcanic centers of the anthropogene of the Armenian Highland are located towards the direction of the modern volcanic (neovolcanic) bow of Asia Major, from Marble Sea up to the Armenian Highland and then to the south-east, the area of Lake Urmio, stretching overall about 2000 km. The volcanicity outcomes are presented by andesites, andesite-basalts, partially by dacites and rarely by extrusive perlites. (Aslanyan, 1977, Balyan 1972, Vehuni 2001). The absolute age of these rocks is assessed to be 3.5 million years (IG SAA1978).

This zone of volcanic activity is directly linked with large-scale, in-depth geotectonic processes that are still going on currently (Balasanyan 2005, Karakhanyan 2004, Shahinyan). Based on the written testimonies by Armenian and foreign authors, excavated archeological material, paleo-planning ancient settlements, and speleological and geological research, we have come to a paradoxical conclusion: human populations used to be denser in areas of more seismic and volcanic danger than the paleogeographical areas with less danger from the georisk standpoint (Xenophon, Strabo, Khorenatsi, Gosh, Davrizhetsi and others).

In the historical ancient time the accumulation of the human populations in areas of more seismic and volcanic danger is the fact and it has a necessity to be researched scientifically.

Samvel M. Shahinyan
President of National State party
Ashkhen S. Shahinyan
Board of the National State party

Different Interpretations Of Human Rights Among Different Ethnogenetic Groups In The Age Of Globalization

Human rights are unarguably intact should be protected both by law and in reality. Different ethnic groups, whose customs and traditions have been formed under the continuous impact of ethno system factors, perceive human rights differently as compared with those in Europe and the U.S. As a comparison, we can observe the U.S. Constitution that declared also the right for freedom given by the nature. For many years the freedom right was meant only for white people. Since customs in different ethno systems have been formed over centuries and are directly linked with ecosystem factors, it is difficult to expose them to changes. To compare, let's bring up the example of ecotypes existing in different ecosystems; these ecotypes are likely not to survive and collapse in another ecosystem.

This problem is there and definitely presumes to find a solution and this is something not to be ignored.

In the conditions of urban systems, information, and unification of relationships, problems of protecting human rights, gender rights and children's rights are becoming easier to resolve; on the other hand, however, serious problems occur (they actually already exist) in gaining stability in families, children's education, and identification of women's commitments.

Nooraddin Sharify, Parvin Madani
Mazandaran University

An Investigation on Urban and Rural Households' Energy Consumption in Different Income Groups in Iran: An Input-Output Analysis

This paper investigates in the energy consumed by different income groups of households in Iran. To this end the direct and the indirect energy that is required by these households' groups are estimated by means of the Input-Output (I-O) model. Our analysis is mainly based on the IO table for 2001 of Iran. It is expected the results of the research can demonstrates a relationship between the energy consumption of households' income and their location in rural or urban area.

Karl-Heinz Simon
University of Kassel, Germany

Climate Adaptation - Responses to Climate Change or Adaptation to Societal Demands?

Adaptation to environmental and climate conditions is one of the pillars of human ecology. A vast amount of theories were formulated, and numerous case studies have been undertaken from the 1950s on, based in part on a sociology of the culture-environment relationships that later on was criticized as "natural fallacy". In present times, human ecologists are faced with climate adaptation as an actual complex of problems and scientific responses mainly triggered by processes of climate change, due to the release of greenhouse gas emissions into the atmosphere and land cover changes.

With the present state of knowledge about the interplay between social (societal) and natural / climatic factors the adaptation question can be subdivided into two sub-questions: (1) How to conceptualise the relationship? (2) What are the causes influencing the relationship?

The relations are classified according to cybernetic principles. A shift from strict couplings towards looser structural couplings is recognized.

The causes are classified according to their origins. The dominant causes have their basis in social change processes, especially in an increase of security needs and changes in economic and life-style patterns.

However, we have to discuss critically both answers with a view to general applicability: is the diagnosis restricted to industrialized countries only? Or is it applicable in general without such restrictions?

Keywords: Climate Change; Socio-ecological Interactions; Structural Couplings; Social Change

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Further Steps in Defining the Role of Systems Theory in Human Ecology Theory and Methodology

Nawal Prasad Singh
University of Delhi

Space, Water and Its Management Problem in Delhi

Spatial water problem is explained by water, air, and land. Space of water is the one and much more serious problem in Delhi. Water problems are experienced in Delhi. It differs from space to space due to management. Delhi is the third largest metropolitan city of the country and the third leading populous city. There are three source of water in Delhi, Yamuna River (surface water) and ground water and rain water. It is a policy that needs to extract ground water is to inform district commissioner ten days in advance but deputy commissioner has no powers to refuse or scrutinize applications. Every built-up structure should have rainwater harvesting facilities is another policy. Throwing garbage and pollutant is not allowed in Yamuna River. These policy and management does not move together in Delhi. 200 tube wells have already been installed after new rules were notified. Earlier stance, Extraction of ground water in notified areas was an offence. Rainwater harvesting is not implemented in proper direction. The main aim and objectives of this work is to come across the spatial issue of water in Delhi and specifically to examine the affordability of water to get connected, the customers' ability to pay for the government or private water supplies, accessibility of the lines to customers to get connected, availability of water even after connection, and the seasonal effect on water availability. These consumptions have included bathing, cleaning and household use. People life is highly unhygienic as well people suffers serious health problem due to water problem in slum as well as urban village. Delhi has relation with water, poverty, management and management policy. There is affordability issue; many households do not have the financial capacity to have their own private taps, because 40 percent people live in slum, urban village and unauthorized colony, which are not officially allowed for water supply connection. The water scarcity seriously prevails in Delhi. Critical water problem is in Delhi with small space in compare to big space.

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Université Abdelmalek Essaâdi.

Eduardo Seva
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Gestión Medio-Ambiental

Contribution to the Conservation Prospects of Sacred Natural Sites in Southern Part of Mediterranean

The southern Mediterranean landscapes are an eco-cultural heritage that has been shaped by local people interacting with different historical Mediterranean influences. Among the green features of these landscapes, sacred sites maraboutic have symbolic value of great ecological and cultural significance.

From the ecological point of view, these sites are sacred natural reserves to protect traditional vestiges of Mediterranean ecosystems characterized by impenetrable vegetation, physiognomic dimensions, exceptional wild structures and very old and unusual blends and single heterogeneous groups. Often lost in the agricultural matrix and occupying strategic points of the territory, they are typical elements of traditional southern Mediterranean landscape. These pockets of natural vegetation containing considerable biological diversity studied by botanists, but largely ignored in terms of fauna. The sustainability of these sacred natural sites is important for biological conservation, ecological restoration and environmental protection of the traditional landscape.

These sacred sites are a natural bridge between nature and culture gold meeting between the biosphere and noosphere. They are associated with various religious functions and socio-cultural patronage, arbitration, commemorative and healing. They symbolize since the medieval mystic religiosity and cultural identity of local populations. However, current processes of modern socioeconomic development threaten the historical and traditional ecological knowledge associated with these sites. Tests conducted in northern Morocco have shown that the density of natural sacred sites is negatively correlated with certain indices of social development. Sacred natural sites are in fact central to the issue of sustainability of landscapes and societies of the southern Mediterranean.

Mihnea Tanasescu

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Nature as Subject: the Problem of Rights

In 2008 Ecuador became the first country to recognize rights for nature in its constitution. Since then, others have tried to follow the example while others have tried to make good use of these historic provisions. This paper analyzes the case of Ecuador: what led up to the new constitutions, what the reasons for giving nature rights have been, how it has been implemented so far, and what the philosophical and political implications of such a move are. After presenting the constitutional process and its aftermath, the paper focuses on the political and philosophical implications of the constitution, problematizing the idea of nature as a subject of rights and trying to understand both what it means and how it could be bettered. The very idea of rights for nature is very contested, and the paper will analyze what exactly 'rights' means in this connection and how they are to be specified and used. The author argues for an enhanced role of ecology in any project of rights for nature, and signals several difficulties that need to be overcome in order to make this model a viable one for environmental responsibility. Political and human ecology need to better ground the idea of natural rights, and this paper is in part intended as a contribution.

Keywords: rights of nature; representation of nature; ecuador constitution; political ecology.

Davis F. Taylor

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The Economics of Community Supported Fisheries: Implications for Communities and Sustainable Management

Community Supported Fisheries (CSFs) are emerging as a new means of marketing seafood. Loosely modeled after Community-Supported Agriculture (CSAs), CSFs are said to provide better returns to fishers, support local fishing communities, and potentially aid in sustainable fisheries management. This paper models the economics of CSFs, focusing on fishers' decisions to form a CSF that markets to consumers rather than sell

caught fish to a wholesale dealer. The representative fisher has a choice of entering several fisheries based on returns to fishing and marketing efforts. Returns to fishing are based on fish stocks, while returns to marketing efforts are affected by regulations, the number of fishers who agree to form a CSF, and the presence of nonprofit organizations and other forms of social capital that can assist in the formation of the CSF. The paper shows how marketing effects can impact the distribution of fishing effort across different fisheries, and thus impact fisheries sustainability. A key finding is that the opportunity to market fish directly, via CSFs, now links heretofore unrelated marketing regulations and community social capital with fisheries sustainability.

Key words: community supported fisheries, fisheries management, marketing, social capital

Parto Teherani-Kronner

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Engendering Human Ecology – Responsibility for Gender Justice and Global Sustainability

The human-ecological triangle offers an orientation frame for sustainable development. As this and many other models of environment of human and cultural ecology can be traced back to a time where the male dominated concept existed; here is an important issue with respect to the present and future. It is to engender human ecology as a supplement and necessary differentiation. With it we enrich our developing orientation: To keep an eye on environmental protection and on gender justice. In addition, we have to take into account the vital needs of human beings in the global system – world society. Looking at the progress, we need to recognize the shadow sides as well. They are important subjects of sustainable development with local and global orientation; which need to be analysed and we are urged to act as part of our human responsibility, because many people are still suffering from poverty and mal-nutrition.

This is a challenge to the science of human ecology, which takes into account, on the one hand, the interrelations between the different cultures, as well as the interdependence – or the intersectionality - of our social systems and communication structures in the process of globalization. We will refer to the debates on environmental changes with a gender and global perspective.

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Food Security or Meal Security? A Human Ecological and Gender Sensitive Approach

All living species need food for survival, but human beings are governed by cultural norms and taboos regulating this process of incorporation of natural products. Even under difficult circumstances, human beings will not accept and eat anything just to supply their need for calories, vitamins, proteins and minerals, even if they are hungry.

Thus food security & safety includes more than just production, marketing, food supply, distribution, and consumption. If a safe household and family nutrition is the aim, the process of food preparation cannot stop at a household's "front door". Food and meals are indeed the materialized symbols of social networks. Because they are so vital to the maintenance of human beings, the "behind-the-door" processes are as important as the marketing and distribution of commodities. Cooking customs as well as changes in food and nutritional habits must also be considered in terms of the reciprocal impacts between ecological conditions, symbolic items and social interaction, stratification and gender relations. Household constellations in terms of age, gender, the distribution of goods, workload, and time allocation are important elements in the equation.

If the food security debate and the agricultural policy and economy would focus more on food culture and not just on some particular market-oriented food or cash crop, then the whole socio-cultural process of food preparation, sharing and eating can become an important part of scientific reflection on nourishment. Not raw products, but meals people eat should be at the centre of food security & safety discussion. This process is highly gendered.

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Introduction of and Exposure to Chemicals in Asian Developing Countries

Many Asian countries have been undergoing the process of drastic changes in their lifestyle, which we termed “subsistence transition”, entailed by changes in infrastructure, subsistence activities, diet and nutrition, and hence, the health conditions. During this process, many man-generated chemicals are introduced into local communities, the potential impact of which could be both beneficial and hazardous. Little is known, however, about the exposure status of people to various chemicals brought into such rural communities.

In a multinational survey, ENVRERA, which was conducted in communities of various Asia-Pacific communities, urine samples collected from the residents of these communities were screened for approximately 600 synthetic agrochemicals and chemicals in commercial products. For this “explorative” analysis, GC-MS coupled with a chemical database, which enables semi-quantitative determination, was used. Chemicals were defined as “detected” when the urinary concentration exceeded 10 ng/mL.

Approximately 400 samples collected from the communities in Indonesia, Nepal and Vietnam were analyzed. Agrochemicals, medical drugs were among the chemicals detected. Distinct overlaps were found for the chemicals found even in different countries, which could be either due to “globalization” of material flow or to common needs for such chemicals. Including this point, the implication of the finding will be discussed.

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Unleashing the Potential of Collaborative Governance Arrangements: Getting to Robust Durability in the Blackfoot Valley

Collaboration is hard to do and, at least in the U.S. setting, many, if not most collaboratives struggle to maintain problem solving effectiveness and viability over time. How then to explain the case of the award winning, highly successful Blackfoot Challenge (BC) watershed collaborative in Montana? The BC not only is still alive

and kicking after 17 years despite the fact that the group has never employed a professional facilitator, but displays what we might call *robust durability* given its significant increase in problem-solving capacity over time. In this sense, understanding the BC's success involves more than just institutional design, appropriate antecedent conditions, and a supportive external environment. Instead there are a series of variables wrapped up in the decision-making and operational dynamics inside the collaborative that appear to matter most. Early on the BC purposively sought to "go slow and be pragmatic" as a way to build a foundation grounded in restored trust and an integrative culture capable of fomenting the kind of change in existing social structures that, in this particular case, accepts and focuses on a cooperative, holistic, interconnected, watershed-wide approach to management (Khademian 2002, 20-21; LaPorte 1996; Selznick 1957). Building this foundation in the Blackfoot watershed necessitated the adoption of new ideas crucial to changing the social structure and a strategic, common sense approach to early problem solving challenges. Yet, once the foundation was built, getting to robust durability relied on other key variables--the character of the organization, continuity of leadership, a particular managerial strategy and a particular systematic fiscal approach.

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Advancing the Utility of Ecological Economics: An Interdisciplinary Perspective

The interdisciplinary perspective of Ecological Economics is useful in identifying and understanding the concrete and conceptual interrelationships that exist among neoclassical economics, culture, and sustainable economies and ecosystems. Against the backdrop of inextricably imbedded market-driven economic valuation mechanisms used to inform environmental policy, this emerging discipline (ecological economics) proposes positive and normative development of institutions and behaviors that show promise in leading us to the formulation of more comprehensive environmental policies. This paper addresses the conventional aspects of ecological economics and explores some of the limits and possibilities of the discipline. We argue that a better understanding of the discipline's limitations can help policy makers address environmental issues in a more comprehensive way.

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Cosmology, Epistemology, Human Agency and Ecological Wellbeing: Critical Questions for Crucial Times

We humans are part of a deeper Life-World that is alive, participatory and profoundly relational. However many of us have forgotten how to belong and how to listen. In a world where materialism and Western Science have come to dominate, colonization is not only about people and lands but ultimately about human consciousness and perception. As a person whose psycho-spiritual history is both colonizer and colonized, Lewis will draw on her own experiences, and work with indigenous (Ngai Te Rangi, and Cree peoples) and immigrant communities in Aotearoa and Canada which relate to the recovery of this deeper Life World of interconnectedness – this is ultimately a story of hope. Drawing on intuitive inquiry and related qualitative research methodologies, this presentation will also discuss the significance of these findings in relation to 'epistemology and human agency' in terms of the 'how' we address ecological issues. She will then apply this to the work of K.I.N.; a growing international movement whose aim is human cultural diversity for bio-diversity through the recovery of indigenous worldviews within all cultures.

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Using Creative Arts to Connect Kids to Nature

People in industrialized countries are losing their connection with nature. To address this issue, a number of organizations are actively working to develop programs and activities that foster connections between youth and nature. One such activity is the Robert Bateman Get to Know art contest in which children are encouraged to “get to know” their wild neighbors and share their experiences by creating an original work of art, photography, or writing. The reported study examined the impact of contest participation using a game version of the Implicit Association Test, FlexiTwins, to measure connectedness with nature. Two schools participated in this study. Students were invited to play the FlexiTwins game on school computers prior to working on their entries and again at the end of the contest. One hundred and seventy-four 3rd through 6th grade students participated in both rounds. Statistical analyses comparing pre-post change in connectedness for students who entered the contest with students who did not revealed a significant positive effect for entering the contest. Findings suggest that the art contest may be an effective vehicle for connecting kids with nature.

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In Charge or in the Lead? Reflections on Community Residents’ Perspectives on Fire Management as an Example of Citizen Response to Risk

Fire represents a significant risk to some communities across the United States. That risk is managed cooperatively among an assortment of agencies at all levels. In addition, direct involvement of communities is key to effectively mitigating risk. Communities surrounding the Sequoia National Forest were the focus of the study reported on in this paper. Five focus group sessions were held in which community residents (n=49) completed self-administered surveys and participated in facilitated discussions surrounding fire management and risk. The vast majority was age 55 or older and more than one-third had completed some graduate education. On average, participants had been in their current home about 16 years. Respondents were mostly concerned about fire and saw themselves as fairly knowledgeable. Feelings surrounding fire risk tended more towards pessimism than optimism, and greater frustration than satisfaction was expressed. Personal experiences with fire risk and with the Forest Service as a managing agency varied widely among participating communities. However a recurrent theme in discussions was the importance of the community role in managing fire, pointing to the collaborative relationship between agency and residents among our participants. Rather than the managing agency being in charge, it became clear that our participants viewed the agency as in the lead, with community members having a key partnership role. Of particular interest were the local ecological knowledge described by participants paired with perceived personal and community responsibility that provided insights into dimensions of this partnership. The perceived quality and nature of the partnership seemed strongly associated with participants’ ratings of performance of the agency and levels of trust or distrust afforded to it.

POSTERS

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Model-Based Monitoring Of The Holistic Health Status of the Urban Environment System: A Pilot Study In Verona City (Italy)

In recent decades the global health paradigm has gained an increasing systemic characterization. The ecosystem health theory states that a healthy ecosystem, whether natural or artificial, significantly contributes to the good health status of a human population. The present study describes an interdisciplinary monitoring model that retrospectively analyzes the main juxtaposed reciprocal interactions connecting the environment to human beings. A monitoring model that encompasses both the biophysical environment and the human population health is suggested: biophysical and socioeconomic subsystems are characterized on the whole through landscape ecology and environmental quality indexes, along with classic epidemiological parameters. Verona municipality (Northern Italy) has been chosen as study area to test the monitoring model efficiency. Territory was split into two superimposed layers of land units, following the partitioning in districts and quarters. Land units were further geo-referentiated combining environmental spatial features and collected data with GIS technology. Landscape pattern ecological quality, atmospheric pollution, outdoor noise levels and local epidemiology were assessed by considering a total of 23 specific quality indexes. The percentile distribution was then processed for every parameter in order to assign a global quality class to each land unit. Statistical analysis also involved the application of the one-tailed Fisher exact test of independence to investigate any linkage between human health and the ecological quality determining factors. Overall the main effort of the proposed monitoring model is that of pointing out the crucial importance of achieving a proper holistic health status of the urban ecosystem in order to ensure the good health and life quality of the citizens.

Lucy Atkins

College of the Atlantic

Connecting Self, Community, and Environment: a Sketch of an Education Center

The intersection of human ecology and experiential, outdoor, and environmental education provides fertile ground for developing innovative and holistic educational pedagogies. Inspired by research on existing programs, I propose an educational center and school that strives to create a learning community that encourages students to better appreciate and connect with their natural surroundings, their communities, and themselves. This school will provide programs for children from preschool to high school that emphasize self-discovery, team and community building, and natural history and ecology. Specific activities will range from wilderness expeditions and ropes course initiatives to solo time and natural history lessons. In a time when community, connection, compassion, and creativity are increasingly pushed aside in traditional education systems, a school like this will emphasize these values and engage learners' entire selves. This kind of education is essential, not only to give young people the tools that they need to face the pressing social and environmental problems that exist today, but to help them cultivate a lifelong love for learning and create connections among both the methods and topics of learning. This sketch is intended to be a map of ideas that could be distributed to potential collaborators and funders to stimulate and gauge interest in implementing this kind of school.

Alice Brites

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Monitoring the Ecological and Socioeconomic Effects of the Commercialization of Non-timber Forest Products

Trade in non-timber forest products (NTFPs) has become in the last two decades a popular strategy for improving the well-being of traditional communities, while minimizing environmental impacts. Despite that, there is accumulated evidence that harvesting NTFPs can produce negative ecological and socioeconomic effects, which has resulted in the increased popularity of monitoring practices. Putting monitoring into practice is however difficult because trade in NTFPs, particularly in the Amazon, takes place in remote areas and in poverty contexts. Because of that, it is compulsory to restrict monitoring to those parameters identified as more relevant in previous evaluations. In order to do that, this study summarizes the empirical evidence on the ecological and socioeconomic effects of NTFP harvesting and, thereafter, suggests which parameters should be monitored. The study also raises the extent to which monitoring of NTFP trade is implemented in the context of the Brazilian Amazon, and evaluates which are the most important and feasible parameters to follow in this particular case. To do so, we adopted a twofold methodology. First, we carried out a systematic review of the published literature to evaluate the most relevant parameters. Second, to evaluate the viability of implementing monitoring practices in the Amazon, we conducted an expert panel consultation through the Delphi method. Results indicate negative ecological effects are common, especially when harvesting leaves or barks. Changes in organs or physiological processes, as well as the survival rate of harvested specimens are parameters which should be monitored, particularly when harvesting fruits and vegetative parts. For all types of NTFPs, population size and population structure are parameters which should be prioritized. Community species richness also deserves attention when harvesting fruits. As regards socioeconomic effects, positive outcomes were more frequently observed than negative. The contribution and regularity of monetary income from NTFP trade, as well as the safeguard role of NTFPs are parameters from the financial capital domain that should be monitored. Women empowerment, group cohesion and access to the benefits generated by trade are important social capital parameters which deserve monitoring. As regards the context of the Brazilian Amazon, although monitoring is considered important by experts, there are only a few monitoring initiatives due to the absence of institutional support, policy incentives and financial resources. The Delphi panel experts consider the size and structure of the harvested population, the mortality rate, the amount of resources harvested and the harvesting technique employed as the most important parameters to monitor. Within economic parameters, the ones that should be followed are market aspects such as the price paid to gatherers and monetary income received, market demand and product quality. Finally, for the social aspects, the effects on culture, well-being and to the internal organization of the community were prioritized. The experts judged that it is feasible to monitor all these parameters.

Keywords: *Amazon, non-timber forest products, ecological effects, socioeconomic effects, monitoring.*

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A Community-Level Climate Change Vulnerability Assessment For Point Reyes National Seashore Managers

Global climate change is expected to have significant impacts on natural communities, and these impacts will likely pose major challenges to conservation management. Assessing the vulnerability of natural communities to climate change involves predicting the degree to which natural communities will be exposed to environmental changes as well as identifying communities' sensitivity to those environmental changes they will experience. Working with managers at Point Reyes National Seashore (PRNS), our team of four graduate students from U.C. Davis addressed this challenge with a site-specific climate change vulnerability assessment.

In order to fully understand how climate change may affect communities at PRNS, we took a multi-faceted approach: 1) we surveyed scientific experts regarding how climate changes threatens 14 communities in the park; 2) we quantitatively compared vegetation community distribution predictions of community niche models

and dynamic vegetation models; 3) we mapped predicted sea level rise onto vegetation communities at the park and analyzed the potential impacts to the park's communities; and 4) we assessed the vulnerabilities of individual species to climate changes using NatureServe's Climate Change Vulnerability Index. Using our compiled results, we have developed an important management tool for the park, which will be used to guide management decisions and priorities within the park. In addition, our methods and results can be considered a road map for other conservation managers seeking to incorporate the implications of climate change in management decisions.

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Perception, Use and Management of Springs and Sinkholes in San Crisanto, Yucatan, Mexico

Water is a vital resource for humans worldwide, including on the Yucatan Peninsula. There is no flowing surface water on the Peninsula although there is an immense freshwater aquifer. At the coast, this subterranean water upwells in springs and sinkholes (locally known as cenotes), which are managed and exploited by local human populations. We studied the perceptions these populations have of these springs, their water resources and how they use them and the benefits they receive. The study site was the small fishing port of San Crisanto, Yucatan state, Mexico, a town of about 600 inhabitants with access to 1020 hectares of mangrove wetlands including 45 springs. A community group implements controlled extraction of mangrove and crocodiles, and offers ecotourism services. Understanding community member perceptions of their water resources is important to describing the sociocultural characterization they give to this resource and the environment in general. We applied a qualitative methodology including semi-structured interviews of key local figures and a survey of those who use the springs and those who do not. These generated a vital body of data on this vital resource, such as its use, management and benefits, and a history of water resource use provided by local elders, all of which will aid in more deeply understanding the dynamic between local users and this resource and be useful in developing effective future use strategies.

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The Impact of Legal Changes in Land Ownership on Natural Resources Management in Ejidos on the Coast of Yucatan, Mexico

The Agrarian Reform Law of 1992 has led to major legal transformations in land ownership in Mexico. Over 75% of the country's forests are managed by ejidos and communities. These legal changes allowed ejidos to sell or rent their lands, promoting conversion from ejido ownership to private property and the consequent rise of a market in land. Ejidos on the coasts have experienced increasingly stronger pressure from tourist industry interests to sell their lands, changing ejido member perceptions about the potential use and value of natural resources. We studied ejido member perception of ejido lands and the uses given them in five ejidos adjacent coastal wetlands on the Yucatan coast. We applied a qualitative methodology with participant observation, semi-structured interviews of ejido commissaries and ex-commissaries, and review of official documents. Resource management and self-management were found to be linked to ejido member knowledge of land ownership legal aspects. Ejidos in which members lacked legal certainty as owners and had little knowledge of associated legal processes, also had fewer ecotourism projects and tended to sell their lands. In contrast, ejidos in which members understood the legal aspects of land ownership developed natural resources management and preservation strategies. Government and tourist industry pressure in the form of the Agrarian Reform Law

compromises biodiversity -conservation on ejido lands and affects ejido member family assets by fomenting ignorance about legal aspects of land ownership and creating direct and indirect land markets.

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When Planting Is Not Enough. A Case of Active Management of Invasive Rodents for the Restoration of *Cyanea superba* subsp. *superba* (Campanulaceae), a Critically Endangered Hawaiian Plant

Active management of invasive species is an important tool in the restoration of critically endangered species in human modified habitats. Invasive rats are believed to have significantly impacted the native Hawaiian flora since human colonization. One such species is the critically endangered Hawaiian lobeliad, *Cyanea superba* subsp. *superba*, whose seeds are killed when consumed by rodents. In the first attempt at large scale rat control in Hawaii, a grid of rat traps was established in 2009 at the 26ha Kahanahaiki Reserve on the Island of Oahu by Oahu Army Natural Resources. To understand the benefit of this measure for *C. superba*, pre and post dispersal fruit consumption was compared between 36 plants at Kahanahaiki and 45 plants at the adjacent Pahole Natural Area Reserve, where no rat control has been undertaken. Rat trapping significantly reduced rat populations at Kahanahaiki, resulting in significantly lower pre and post dispersal *C. superba* fruit destruction at Kahanahaiki when compared to Pahole. The population level benefits of this management measure are still being assessed. However, preliminary evidence suggests that large scale rodent control may significantly benefit the restoration of this, and potentially other, endangered Hawaiian plant species.

Keywords: Hawaiian flora, rodents, invasive species, restoration, threatened plants.

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How Do the Missions of Different Land Management Agencies Affect Conservation of Biological Diversity Across a Tropical Mountain Landscape?

Typically large landscapes are divided into smaller units that are managed by different agencies with a wide variety of goals, rather than managing such landscapes in their entirety across management and ecosystem types. The east slope of Mauna Kea Volcano, Hawaii ranges from alpine in its upper reaches, to subalpine mamane-naio forest, to koa-ohia tropical montane forest, and is home to many endangered and endemic plants and animals. Collectively, five agencies manage this majority of the area. The goals and activities of these agencies are quite different, and include a variety of management strategies and target management species. By assessing the combined effects of natural drivers and management decisions on the distribution of native and introduced species, conservation and restoration efforts, and landscape sustainability, a better understanding of this paradigm of management affects on landscape-level sustainability and capacity to adapt to external factors impacting habitat quality may be attainable. Biodiversity is a key benchmark of ecosystem structure and function, yet little is known about how biodiversity management can be maximized in a larger spatial context where multiple land management agencies interact (or not). This is a relatively unexplored area of research which stands to further understanding of the challenges inherent in balancing variable management goals, but more importantly may also help inform agencies as to the best management practices for achieving variable objectives. The proposed research will measure plant and avian biodiversity to assess the effectiveness of different management practices in conserving and restoring native species and reducing the detrimental impacts of invasive species, so that lessons learned may be shared and applied over the wider landscape.

Key Word: Biodiversity, conservation, ecosystem services, management, native species, restoration

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“Cave Policies” As Ethno-Cultural Phenomenon in The Historic Past of The Armenian People

Conclusions made as a result of comparative analysis of research works and accumulated scientific materials in the Speleological Center of Armenia over the recent 50 years enable us to strongly claim that underground cave structures are common throughout the entire historic Armenia.

The technical approaches of the concept and implementation of engineering structures of residential cave systems in Kapadokya, Ani, Goris and other places, commonalities in rocks and layers in their locations, as well as in geomorphologic peculiarities enable us to claim that we are facing the same ethno-cultural fact. Commonalities in building and architectural details in rock-carved churches, sanctuaries, and tombs confirm and support this standpoint.

The existing material on artificial caves pointed out by Armenian and other sources, in particular by Xenophon, Stepanos Orbelyan, Davrizhetsi and others, as well as modern researchers Ghipshidze, Toramanayan, Shahinyan, Biksio, Pan, Suchiareli and others, directly and indirectly point out the rock-carved structures and systems as outcome of the same culture. However, as an ethno-cultural phenomenon, this is the first attempt in the Armenian and the world speleology.

Study of the thousand years of experience of the relationships between humans and the nature is of great importance, especially in current conditions of the deep climate changes and global ecological crisis.