



ACCARNSI 5TH NATIONAL ECR FORUM AND WORKSHOP PROGRAM

Day 1: Wednesday 11 May 2011

8.30



Day



Day 3: Friday 13 May 2011

9.00 *TEA AND COFFEE ON ARRIVAL*

Introduction: Node 1 Coastal Settlements

9.15 Professor Rodger Tomlinson

Past, Present and Future Landscapes: Understanding Alternative Futures for Climate Change Adaptation of Coastal Settlements and Communities

9.30 *Phil Morley, University of New England*

9.50

BUILT ENVIRONMENT,

BUILT ENVIRONMENT, INNOVATION AND INSTITUTIONAL REFORM

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OPERATIONALISING CLIMATE ADAPTATION

ABSTRA

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**COMMUNITY BASED FLOOD VULNERABILITY AND ADAPTATION ASSESSMENT
METHODOLOGICAL CONTRIBUTION IN ITS EVALUATION: A CASE STUDY FROM BANGLADESH**

IPCC (2007), in its contribution to the fourth assessment report of the intergovernmental panel on climate change, warned that the mega deltas in South Asia (e.g. the Ganges Brahmaputra Meghna River basin) will be at greatest risk due to increased flooding; the frequency and multi peak floods have increased over time, and the region's poverty would reduce the adaptation capacity. IPCC, United States Country Study Program and UNEP have formulated vulnerability and adaptation (V & A) to climate change guidelines where 'adaptation' is being emphasized; IPCC's adaptation chapter 17 has been published as a report. It is emphasized that adaptation efforts particularly in developing countries should be accelerated. Based on the above guidelines, the study has adopted V & A assessment steps.

The evaluation of V & A assessments is mainly accomplished in this study by a weighted matrix index value; this weighted matrix index value is derived from two participatory rapid appraisals (PRAs) in 2006. The vulnerable farmers, including their various professional associates expressed their opinions on categorized V & A assessment issues with various types of extreme flood events. The evaluation processes and their prioritization are based on the outcomes of a random questionnaire survey of over 140 households in seven Unions in the case study *Islampur (Thana on Jamuna River, located in north central Bangladesh)*.

The study has dealt with a range of V & A issues and methods: 1) the understanding of issues of vulnerability and adaptation techniques in response to three extreme flood events; 2) these issues were categorized on the basis of a weighted matrix index; 3) vulnerability issues were classified into four categories in accordance with degree of severity and these together offered a genuine picture of

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CLIMATE CHANGE VULNERABILITY ASSESSMENT (CCVA): CHALLENGES AND RESEARCH DIRECTIONS

Quantitative Climate Change Vulnerability Assessment (CCVA) can help in better allocating adaptation resources, identify “hot spots” and better understand systemic weaknesses in the ability to cope with climate hazards. The framework adopted by the Intergovernmental Panel on Climate Change (IPCC) includes three dimensions of vulnerability, namely the external, i.e. geophysical and climatic, determinants of risk, called “exposure”, and the internal dimensions of vulnerability (“sensitivity” and “adaptive capacity”). Furthermore, vulnerability is compounded by multiple climate stressors such as heat waves, forest fires, droughts etc. Proxy indicators are

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**INVESTIGATING ENERGY RELATED GHG EMISSION OF LOW COST HOUSING IN KUALA LUMPUR
USING UNEP SBCI'S COMMON CARBON METRIC**

Malaysia announced a voluntary commitment to reduce 40% of its greenhouse gas (GHG) emissions by year 2020 at the 2009 United Nations Climate Change Conference in Copenhagen (COP 15). This commitment has not been greeted with much optimism based on existing legislation, environmental awareness, and industrial demands. Currently, there is no legislation that holds environmental sustainability mandatory for

ABS

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SOUTH AUSTRALIAN FARMERS' MARKETS: IMAGINING A MULTIFUNCTIONAL FUTURE FOR AUSTRALIAN AGRICULTURE

This work critically examines the role of farmers' markets in South Australian agriculture using the theoretical framework of political ecology. All of the stallholders at three farmers' markets situated in Adelaide, Willunga and Berri were surveyed regarding their production and marketing techniques. Overall responses supported literature highlighting the extreme importance of farmers' markets to the producers who chose to exploit this marketing niche. A strong co reliance on 'wholesale sales' was also recognised, suggesting an important integration of productivist and post productivist approaches to agricultural development. Of most promise for long term agricultural sustainability was evidence that certain groups of farmers were found to be realising the potential of these and other alternative markets, in terms of their risk reducing capacity, and diversifying to include various conservation values into their agricultural enterprises. These groups were less concerned with market fluctuations and more concerned about: issues of social equity; adapting to climate change; environmental health; and having fun, which meant they epitomise the goals of political ecology, by challenging the dominant agricultural methods of production and marketing. It seems these groups also recognised that the direct nature of their transactions would sow beneficial social, environmental and economic 'seeds' for change. Finally, it was argued that policies to improve access to farmers' markets and reduce the cost of participation would assist an important component of Australian agriculture to evolve smoothly into a post productivist era and adapt to climate change.

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ADAPTING TO CHANGES IN TRANSPORT ACCESS – A FOCUS ON BUSINESS OWNERS IN TOWN CENTRES

Reducing the amount of car based travel is a strategy for transitioning urban societies to one that can better adapt to a climate change future. It is a significant challenge. Convincing people to reduce their car based travel not only requires a change in traveller behaviour and transport choices, but also a change in how transport modes are valued. Business owners who rely on customers making trips to their stores by car, are a case in point. Car parking matters to business owners. Irrespective of the benefits that a pedestrian and bike friendly, transit connected town centre offers, observations about the level of business owner resistance suggests it is perceived as less than adequate compensation for the loss of car parking. Local business resistance is politically difficult for local government, but a local centre experiencing rapid economic decline is even less desirable.

This PhD research aims to understand the business owner perspective to changes to transport access. Unlike other studies that focus on economic impacts, this study focuses on what business owner orientated goals are perceived to be threatened. A goal focused approach differentiating between protective and opportunity creating goals is hypothesized as having an influence on the choice and efficacy of strategies used to cope with change. For those such as local government, who want to reduce car dependency whilst maintaining vibrant local economies, this research will offer new understanding of an important group of stakeholders, as well as strategies for seeking business owner co operation.

URBAN PLANNING, TRANSPORT

INFRASTRUCTURE

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THE ASSESSMENT OF CLIMATE AND LAND USE CHANGES ON FLOOD RISK IN SEQ

Flooding can result in damage to properties, health problems and loss of life. For example, in 2011, summer floods caused many people homeless in SEQ. Projected rapid land use change over the coming decades, when coupled with climate change, could potentially lead to increased risk of flooding in urban catchments. Urbanization has resulted in a significant boost to the impervious surfaces, thereby increasing surface runoff and, consequently, increasing flood risk. It is therefore of

INFRASTRUCTURE

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CLIMATIC DRIVERS AND THEIR EFFECTS ON FUTURE WATER AVAILABILITY IN THE MURRAY DARLING BASIN

The aim of this research is to assess various climatic drivers and their sensitivity using regression techniques. The climatic indices are functions of sea surface temperature and sea level pressure differentials. In this study, there are six Pacific Ocean indices, three Atlantic Ocean 2/TT61Tf5.6448Ocean

INFRASTRUCTURE

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CLIMATE CHANGE IMPACTS ON THE DURABILITY OF STRUCTURAL MATERIALS

The presentation outlines the impact of climate change on the durability of the most common structural materials that are used in council hard infrastructure. Firstly, factors that cause material deterioration are identified. Secondly, climate change impacts on those factors are determined. And thirdly, based on the results from the first two stages, conclusions for changes to processes of material deterioration are drawn. The adopted methodology includes literature review to identify available studies and best practice worldwide that consider physical, climate induced impacts on the performance and physical integrity of concrete, timber, steel and bitumen.

The study concludes that in many cases Australian standards provide satisfactory protection against climate change. The most significant threats from climate change could arise in circumstances where assets will be exposed to hazardous environments that they are not designed and planned to sustain. The research reveals that quantification of climate change impact is challenging and subject to many assumptions. Despite this limitation, the study provides useful new knowledge to councils by identifying areas in asset management that might require alterations in the future.

The presented research is funded by NCCARF and the Local Government Association (LGA) Australia, and it is part of the project "Development of tools that allow local governments to translate climate change impacts on assets into strategic and operational financial and asset management plans". The reported results will be utilised to determine vulnerability of council assets. This will assist councils to translate key climate change impacts on council assets into financial and asset management plans based on a rigorous methodology that can be adopted.

INFRASTRUCTURE

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CLIMATE CHANGE IMPACT ON INFRASTRUCTURE COST APPRAISAL

The effects of climate change, including higher temperatures, more frequent extreme weather events, altered rainfall and rising sea levels, will lead to changed construction standards and changed maintenance practices. The uncertainty in costs related with infrastructure has increased because of uncertain climate change predictions. This leads to a greater need to treat such costs probabilistically, rather than deterministically, as may have been the case in the past. This research discusses infrastructure cost risk by analysing the probability of cost change, and provides business decision support information. It highlights the uncertainty of cost evaluation with climate change, and focuses on the relationship between climate change projections and cost change assessment.

This research firstly summarizes information on weather predictions including sea level rises, temperature rises, extreme weather event occurrences and rainfall changes. Then it considers what climate change does to infrastructure: roads, seawalls, buildings, ports etc and how climate change impacts on lifetime benefits and maintenance costs. Real options, review technique ideas and the second order moment approach are applied to establish cost probability distributions based on climate change projections. Finally, the option value of the investment, rather than net present value (NPV) can be obtained, which assists in investment decision making.

COASTAL SETTLEMENTS

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PAST, PRESENT AND FUTURE LANDSCAPES: UNDERSTANDING ALTERNATIVE FUTURES FOR CLIMATE CHANGE ADAPTATION OF COASTAL SETTLEMENTS AND COMMUNITIES

Current climate change vulnerability and adaptation studies tend to examine future climate change induced disturbance and impacts on present day landscape patterns of ecosystems, settlements and other land uses. Such approaches are likely to compound uncertainty. History demonstrates that future landscape patterns will be very different; particularly due to rapidly changing human settlement areas and communities. Though shaped by past elements, the effects of climate change in the future will be impacting on quite different landscapes. How those landscapes will be different from today will be examined in the Past, Present and Future Landscapes: Understanding Alternative Futures for Climate Change Adaptation of Coastal Settlements and Communities project funded by a Climate Change Adaptation Research Grants Program.

Although still in early stages the project will build upon methods of mapping past and current land use trends, to predict the future trajectory of settlement patterns. The spatial patterns of likely future settlements and other landscape elements will be analysed to quantify areas of land use affected by climate change impacts such as increased flood events, sea level rise and storm surges. Alternative landscape futures scenarios will be designed and analysed to provide a quantifiable understanding of adaptation towards more resilient landscape futures to avoid or minimise future climate event impacts.

COASTAL SETTLEMENTS

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CLIMATE CHANGE ADAPTATION: MEASURING INDIVIDUAL COMMUNITY RESPONSE IN COASTAL AUSTRALIA

With climate change and its impacts accepted by the scientific community and majority of society alike (Philp *et al.* 2011, Nelson *et al.* 2007), focus is now shifting toward action. One approach to attenuating the impacts of climatic change is to impact

COASTAL SETTLEMENTS

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COASTAL SETTLEMENTS

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A RISK BASED APPROACH TO PREDICTION AND PLANNING FOR CLIMATE CHANGE IMPACTS ON THE NSW COAST

Over the course of the next century projected climate change impacts on NSW beaches and coastal settlements are expected in response to changes in sea levels, wave climates and sediment budgets. In terms of impacts, prediction of coastal response is routinely undertaken for planning purposes, engineering design and management of large scale problems, which most commonly concerns the systematic recession of beaches and coastal foreshores. In a predictive context, estimates of coastal response pose a number of significant challenges for both coastal planning and management in NSW. These challenges arise due to uncertainty associated with three sources; Uncertainty about how the climate will change, uncertainty about its effects on sea levels and coastal processes, and uncertainty associated with how the coastal environment will respond to these changes. To circumnavigate these issues a risk based approach to coastal response has been developed which takes into account the above uncertainties. In short, the procedure involves approximating an envelope of response to provide more meaningful estimates than of a single prediction.

Application of these principles is illustrated



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AN ENERGY BASED EMPIRICAL MODEL OF STORM INDUCED SHORELINE EROSION – GOLD COAST, AUSTRALIA

Quantification of storm induced shoreline erosion is an integral part of coastal zone planning for coastal settlements. Anticipating potential increases in risk to coastal infrastructure due to a non stationary climate remains an important subject of investigation.

The empirical model compares shoreline position change with cumulative wave energy, which is a function of wave height, wave angle and storm duration. Wave data was collected from

COASTAL SETTLEMENTS

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COAST PROTECTION BOARD ADVICE AND UPTAKE INTO COASTAL DEVELOPMENT DECISION MAKING IN SOUTH AUSTRALIA

The Australian coast is at risk of serious degradation due to the cumulative impacts of poor coastal management and planning practice, which are being intensified by the threatening impacts of climate change and increasing

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