

INTRODUCTION

I INTRODUCTION

Biodiversity is crucial to the maintenance of the web of life, to human well-being and to the achievement of sustainable development goals. It is fundamental to the living world's capacity to change and is indispensable in the global response to climate change. The Global Biodiversity Outlook 3 reports that ecosystems are being pushed beyond ecological tipping points.¹ Once tipping points are reached there is a high risk of dramatic biodiversity loss and the corresponding degradation of a broad range of ecosystem services.² The impacts of climate change are expected to further raise extinction rates and threaten endangered species.³ It can be very difficult for societies to adapt to rapid and potentially irreversible shifts in the functioning and character of an ecosystem on which they depend.⁴

International border areas contain some of the most biologically intact ecosystems in the world. Many sites that merit conservation straddle land boundaries.⁵ Ecosystem components on each side of the boundary line are often subject to conflicting management and land use practices.⁶ Due to range shifts induced by climate change more than half of the world's species are in need of transboundary management.⁷ Global climatic change means that larger intact ecosystems and therefore transboundary approaches to biodiversity conservation are of increasing importance.⁸ Without an appropriate

¹ Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 3* (GBO3) (2010) 10, 72. A tipping point is defined for the purposes of the GBO 3 as a situation in which an ecosystem experiences a shift to a new state with significant changes to biodiversity. There is a threshold beyond which an abrupt shift of ecological states occurs. Once tipping points are reached the change becomes self-perpetuating e.g. deforestation reduces regional rainfall, which increases fire-risk, which causes forest dieback and further drying. Once the change in ecosystem state occurs the changes are long-lasting and hard to reverse.

² Ibid 10.

³ Braulio Dias, et al., 'Biodiversity and Linkages to Climate Change', in *Interlinkages Between Biological Diversity and Climate Change. Advice on the Integration of Biodiversity Considerations into the Implementation of the United Nations Framework Convention on Climate Change and its Kyoto Protocol* (CBD Technical Series No. 10, *Ad hoc* Technical Expert Group on Biological Diversity and Climate Change, 2003) 24.

⁴ Ibid 72.

⁵ Jaidev ('Jay') Singh, *Study on the Development of Transboundary Natural Resource Management Areas in Southern Africa - Global Review: Lessons Learned* (Biodiversity Support Program, 1999) 91-94; Andrew H Westing, 'Establishment and Management of Transfrontier Reserves for Conflict Prevention and Confidence Building'(1998) 19 *Environmental Conservation* 91.

⁶ Singh, above n 5.

⁷ Lee Hannah, 'A Global Conservation System for Climate-Change Adaptation' 24 *Conservation Biology* (2010) 70.

⁸ Stuart H M Butchart, et al., 'Global Biodiversity: Indicators of Recent Declines', 328 *Science* (2010) 1164; John. A. Wiens & Dominique Bachelet, 'Matching the Multiple Scales of Conservation with the Multiple Scales of Climate Change' (2010)24 *Conservation Biology* 51; Hannah Reid & Krystyna Swiderska, Biodiversity, Climate Change and

management regime for the whole ecological unit, there is a greater risk of conflict concerning the use of the shared resource.⁹

Though legal instruments remain central to biodiversity approaches they are insufficient in themselves to ensure effective biodiversity conservation. There has been a noticeable shift towards a focus upon implementation in the international environmental policy arena.¹⁰ This is reflected in the Plan of Implementation produced at the 2002 World Summit on Sustainable Development¹¹ and in the Outcome Document of the Rio +20 Conference.¹² Similarly, the Strategic Plan for Biodiversity 2011-2050 adopted at COP 10 of the CBD focuses on effective implementation.¹³

The aim of this thesis is to consider what is needed to create and implement effective laws and institutions for transboundary biodiversity conservation. I address transboundary conservation through the conceptual lens of instrumental and institutional effectiveness. I employ a mixed methods approach which combines traditional doctrinal research methods and an engaged research component. Two case-studies, supported by extensive desk research, were used to provide the real-world context within which to explore the issues of transboundary biodiversity conservation. I also compare the laws and practice of transboundary water resource management with that of biodiversity conservation to identify areas for trans-sectoral learning.

Despite increasing calls for more effective law and institutions, 'effectiveness' is often not defined. Distinguishing the relative effectiveness of laws and institutions is important for the design of more

Poverty: Exploring the Links (International Institute for Environment and Development. 2008); Lee Hannah, 'A Global Conservation System for Climate-Change Adaptation' (2010)²⁴ *Conservation Biology* 70; M. R. W. Rands, et al., 'Biodiversity Conservation: Challenges Beyond 2010', 329 (2010) *Science* 1298.

⁹ I L Griffiths, 'African Boundaries and National Parks' in G. Blake et al (eds.), *The Peaceful Management of Transboundary Resources*, (Graham & Trotman/Martinus Nijhoff, 1995) 357.

¹⁰ It has been suggested that the Tenth Special Session of the United Nations Environment Programme's Governing Council in 2000 was instrumental in shifting the focus to compliance, enforcement and liability as well as capacity building. See Carl Bruch and Elizabeth Mrema, 'UNEP Guidelines and Manual on Compliance with and Enforcement of Multilateral Environmental Agreements', *Proceedings of the Seventh International Conference on Environmental Compliance and Enforcement*, 1 (2005) 1 (available at: www.inece.org/conference/7/vol1/MremaBruch.pdf).

¹¹ Johannesburg Plan of Implementation of the World Summit for Sustainable Development, U.N. Doc. A/Conf.199/20 (2002). See James Gustave Speth & Peter M. Haas, *Global Environmental Governance*, Washington, DC: Island Press, 2006, p. 76 ("WSSD was to be about implementation"). See generally Kevin Gray, 'Accomplishments and New Directions' (2003) 52 *International and Comparative Law Quarterly* 256.

¹² *The Future We Want- Rio+20 Outcome Document*, UN Doc A/CONF.216/L.1 (2012).

¹³ COP10 Decision X/2, 'The Strategic Plan for Biodiversity 2011-2020', presented as an annex to the decision paper. Available at < <http://www.cbd.int/cop10/doc/>>.

successful instruments and institutions. There is not however consensus regarding the definition of the term.¹⁴ As Chambers points out the positivistic notion of effectiveness as an examination of what specific provisions of the treaty have been complied with is an overly narrow approach.¹⁵ Definitions of effectiveness based on a change in behaviour or environmental improvements compared to what would have happened without the institution¹⁶ are often infeasible due to the lack of sufficient data and challenges of establishing causal connections.¹⁷

These challenges call for a pragmatic approach. Effectiveness in the context of this thesis is defined in terms of whether the combination of laws, institutions and governance frameworks can reasonably be expected to achieve the stated policy objective of transboundary biodiversity conservation.

The terms transboundary,¹⁸ transfrontier¹⁹ and transborder²⁰ are used to denote interactions across a political boundary. Strictly speaking a boundary is a line with length but no width. Borders and frontiers

¹⁴ Daniel C Matisoff, 'Are International Environmental Agreements Enforceable? Implications for Institutional Design' (2010) 10 *International Environmental Agreements* 165, 167.

¹⁵ W Bradnee Chambers, 'Towards an Improved Understanding of Legal Effectiveness of International Environmental Treaties' (2003-2004) 16 *Georgetown International Environmental Law Review* 501, 530.

¹⁶ Helm, C., & Sprinz, D. 'Measuring the effectiveness of international environmental regimes' *Journal of Conflict Resolution*, 44 (2000) 630; Keohane, R., Haas, P., & Levy, M. 'The Effectiveness of International Environmental Institutions. In P. Haas, R. Keohane, & M. Levy (eds.), *Institutions for the Earth* Cambridge, MA: MIT Press; Ringquist, E. J., & Kostadinova, T. 'Assessing the Effectiveness of International Environmental Agreements: The Case of The 1985 Helsinki Protocol (2005), 49 *American Journal of Political Science* 8 in Daniel C Matisoff, 'Are International Environmental Agreements Enforceable? Implications for Institutional Design' (2010) 10 *International Environmental Agreements* 165,168.

¹⁷ Matisoff, above n 14; W Bradnee Chambers, 'Towards an Improved Understanding of Legal Effectiveness of International Environmental Treaties' (2003-2004) 16 *Georgetown International Environmental Law Review* 501.

¹⁸ Dorothy C Zbicz, 'The "Nature" of Transboundary Cooperation' (1999) 41 *Environment* 15; Dorothy C Zbicz, 'Imposing Transboundary Conservation: Cooperation Between Internationally Adjoining Protected Areas' in Uromi Manage Goodale et al (eds), *Transboundary Protected Areas - The Viability of Regional Conservation Strategies* (2003) 21; Graeme L Worboys, 'Mountain Transboundary Protected Area and Connectivity Conservation' (Paper presented at the International Mountain Biodiversity Conference, Dhulikhel (near Kathmandu), 2008); Harry van der Linde et al, *Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa* (2001); Marloes van Amerom, 'National Sovereignty & Transboundary Protected Areas in Southern Africa' (2002) 58 *GeoJournal* 265; Jaidev ('Jay') Singh, *Study on the Development of Transboundary Natural Resource Management Areas in Southern Africa - Global Review: Lessons Learned* (1999); Clare Shine, 'Legal Mechanisms to Strengthen and Safeguard Transboundary Protected Areas' (Paper presented at the Parks for Peace- International Conference on Transboundary Protected Areas as a Vehicle for International Cooperation, Somerset West, South Africa, 16-18 September 1997); Trevor Sandwith et al, *Transboundary Protected Areas for Peace and Co-operation*, Best Practice Protected Area Guidelines Series No. 7 (2001); Serge Bronkhorst, 'The Virunga Volcanoes and the Bwindi Impenetrable National Park: Cooperation in the Management of Shared Natural Resources and the Concept of Transboundary Protected Areas: Legal Analysis' (Institute for Environmental Security, 2005).

on the other hand are areas of indeterminate width which form the most outward parts of a country and are bounded on one side by the national boundary.²¹ In the context of biodiversity conservation there is no real distinction in practice or in its use in the literature. The terms are often used interchangeably sometimes by the same author.²² Due to the legal focus of this thesis I use the term 'transboundary' as issues of international law and cross-jurisdictional governance arise from the instance the boundary line is crossed. Equally convincing arguments could be made for the use of the terms 'transborder' and 'transfrontier'.

Recognizing that particular legal regimes regulate marine, wetland and freshwater species, the scope in this thesis restricted to terrestrial ecosystems. Transboundary biodiversity conservation in this thesis refers therefore to the conservation of biodiversity in a shared terrestrial ecosystem transacted by one or more international boundaries.

II APPROACH TAKEN IN THIS THESIS

This thesis is presented in 'Journal-Article Format'. A separate literature review section is therefore not included to avoid unnecessary repetition. Some repetition is however inevitable due to the need to provide background for the stand-alone papers. To address this issue, areas of overlap are noted on the cover page of each of the papers as are the contributions of each paper to the main thesis. Where necessary papers are prefaced by an explanation of where the particular paper fits within the wider body of work and the linkages between the papers are explained.

¹⁹ Dorothy C Zbicz and Michael J B Green, 'Status of the World's Transfrontier Protected Areas' (Paper presented at the Parks for Peace -International Conference on Transboundary Protected Areas as a Vehicle for International Co-operation, 1997); Andrew H Westing, 'Establishment and Management of Transfrontier Reserves for Conflict Prevention and Confidence Building' (1998) 19 *Environmental Conservation* 91; Jim Thorsell (ed), *Parks on the Borderline: Experience in Transfrontier Conservation*, IUCN Protected Area Programme Series No.1 (1990);

²⁰ Amado S. Tolentino, 'A Call for a Legal Regime on Transborder Parks' (2001) 2 *International Review for Environmental Strategies* 43; Nurit Kliot, 'Transborder Peace Parks: The Political Geography of Cooperation (and Conflict) in Borderlands' in Clive Schofield et al (eds), (2002) ; Paul Chai, *Cross-border Protection in Borneo: Sarawak (Malaysia) and Kalimantan (Indonesia)*.

²¹ Victor Prescott and Gillian Triggs, *International Frontiers and Boundaries - Law, Politics and Geography* (2008).

²² See for e.g. Dorothy C Zbicz, 'The "Nature" of Transboundary Cooperation' (1999) *Environment* 15; Paul Chai, *Cross-border Protection in Borneo: Sarawak (Malaysia) and Kalimantan (Indonesia)*; Dorothy C Zbicz and Michael J B Green, 'Status of the World's Transfrontier Protected Areas' (Paper presented at the Parks for Peace - International Conference on Transboundary Protected Areas as a Vehicle for International Co-operation, 1997); Dorothy C Zbicz, 'Imposing Transboundary Conservation: Cooperation Between Internationally Adjoining Protected Areas' in Uromi Manage Goodale et al (eds), *Transboundary Protected Areas - The Viability of Regional Conservation Strategies* (2003) 21.

The thesis includes these papers:

Paper 1 '*International Law and Biodiversity Conservation in Terrestrial Transboundary Ecosystems - The Need for New Paradigms in International Environmental Law*'

Paper 2 '*Laws, Institutions and Transboundary Pasture Management in the High Pamir & Pamir-Alai Mountain Ecosystem of Central Asia*'

Paper 3 '*Transboundary Conservation of Mountain Biodiversity in a Climate Change Impacted World - Governance Perspectives from Central Asia and the Island of Borneo*'

Paper 4 '*Criteria for the Effective Transboundary Conservation of Terrestrial Biodiversity*'

Paper 5 '*Is Water Different From Biodiversity? Governance Criteria for the Management of Transboundary Resources*'

Paper 6 '*Strengthening the Legal and Institutional Effectiveness of Transboundary Biodiversity Conservation in the 'Heart of Borneo*'

Confidential Exegesis: Evaluation of PALM Project Against 12 +1 Criteria

Paper 7 '*Effective Governance Across Central Asian Boundaries - What Lessons Does the Central Asian Transboundary Watercourse Management Experience Provide for Mountain Biodiversity Conservation Across the Kyrgyz-Tajik Boundary?*'

Paper 2 has been published in a peer-reviewed journal. Papers 3 & 7 have been accepted for publication as peer-reviewed book chapters. The remainder have been submitted to academic journals and are under-review at the time of submission.

In addition to the papers I provide in the **Methods Section** a detailed description of the combination of doctrinal and non-doctrinal methods used to achieve the thesis aim. The iterative process of hypothesis development and testing in two-case studies is described. In this section I also provide an overview of the thesis and an explanation of where the papers fit as outcomes of the research process.

The thesis contains four appendices.²³ The appendices consist of a Country Report on the Kyrgyz Republic as well as training materials and project reports of the PALM project. These are included to provide additional context.

²³ Appendix I: Michelle Lim, 'Environmental Implications of the 2010 Constitution of the Kyrgyz Republic - Country Report' (2011) IUCN Academy of Environmental Law e-Journal; Appendix II: University of New England, Review of National Legal Task Force Reports (2010), Component 1.2 Legal, Policy and Institutional Aspects of Sustainable Land Management In The High Pamir And Pamir-Alai Mountain Environment; Appendix III: Australian Centre for Agriculture and Law University of New England, Training Manual - Additional Training Workshop for Legal Task Forces. GEF/UNEP/UNU Project: Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (PALM project) (2010); Appendix IV : University of New England Australian Centre for

In **Paper 1**, I highlight the gap in international law on the issue of transboundary biodiversity conservation. I suggest that doctrinal approaches and the creation of Multilateral Environmental Agreements are insufficient to achieve the objective of effective transboundary biodiversity conservation. This sets the scene for the discussion on legal and institutional effectiveness in the remainder of the thesis.

In **Paper 2**, I provide essential background to the main case-study of this thesis and examine the legal and institutional requirements for effective transboundary pasture management in the Pamir Mountains of Central Asia. In **Papers 3 & 4** I propose criteria to evaluate the effectiveness of transboundary biodiversity conservation initiatives. The criteria incorporate transdisciplinary considerations for transboundary management. **Paper 3** focuses on transboundary mountain ecosystems and **Paper 4** reveals the influence that the 'real-world' component of the case-studies has had in shaping the criteria. In **Paper 5**, I compare the conservation of biodiversity across international boundaries with the law and practice of transboundary watercourse management. This comparative discussion identifies synergies in the management of the different transboundary resources and recommends areas for trans-sectoral learning.

The assessment of the case-studies in **Papers 6 & 7** and the **Confidential Exegesis of the PALM Project** test the exhaustiveness of the criteria and provide an objective evaluation of the likelihood of conservation success. Areas for intervention in each of the case-studies are also identified.

Agriculture and Law, 'Final Mission Report Sub-Component 1.2 GEF/UNEP/UNU Sustainable Land Mangement in the High-Pamir and Pamir-Alai Mountains' (2010).

METHODS SECTION

I INTRODUCTION

The aim of this thesis is to consider what is needed to create and implement effective laws and institutions for transboundary biodiversity conservation. I propose that environmental law scholars should more consciously address the issues of implementation effectiveness as part of the development of legal instruments and traditional *lex lata* considerations if the law is to address the pressing environmental issues of our times.

Implementation depends on many things: the quality of the legal instrument, the effectiveness of the government agencies concerned, the degree of receptivity of the community to the instrument and its implementation, and the interaction between various social, economic and institutional factors. For this reason, multiple perspectives are relevant to task of designing legal arrangements for successful implementation.

There is no unified theory (either within law, or from other disciplines) within which to encompass all of the dimensions of the implementation of legal arrangements. As a result I have adopted a strategy of triangulation, drawn from the social science methods literature. This strategy uses comparisons to a range of 'reference points' to address the aim of the thesis. This requires a mixture of methods including traditional legal methods and an 'engaged research' component. Two case-studies, supported by extensive desk research, were used to provide a real-world context within which to explore the issues of transboundary biodiversity conservation. The first case-study is the Pamir Alai Land Management (PALM) project which includes the two former Soviet states of Tajikistan and the Kyrgyz Republic. The second is the 'Heart of Borneo' Project which involves the three Bornean nations of Malaysia, Indonesia and Brunei.

The PALM project was the main case-study and the starting point for this research. This research formed part of a larger joint project of the United Nations Environment Program (UNEP), the Global Environment Fund (GEF), the United Nations University (UNU) and the national governments of the former Soviet states of Tajikistan and the Kyrgyz Republic whose purpose was to develop new legal and institutional arrangements for the PALM area. This in part dictated the composition of the action research component of this case study. Though the PALM project was the starting point, the aims of the PhD research are distinct from those of the project. Engaged research methods were used within this case study. These methods were structured towards meeting the goals of legal and institutional development and analysis for the purposes of the PALM project. Qualitative methods in the form of semi-structured interviews were used in both case studies.

The project drew on an extensive transdisciplinary literature review which included legal doctrinal analysis. From this a set of hypotheses were developed regarding what might be needed for effective transboundary conservation of mountain biodiversity. The iterative process of desk-based analysis of the literature, tested and compared in the two case-studies resulted in the development of a set of governance criteria for effective transboundary biodiversity conservation. These criteria were used to evaluate the two case-studies to identify possible interventions.

A final component of the research involved comparative evaluation of transboundary watercourse management and transboundary biodiversity conservation. The results of this comparative evaluation were then applied to the Central Asian context to identify synergies to enhance transboundary natural resource governance in this region.

II DETAILED DESCRIPTION OF METHODS

A Triangulation

Triangulation refers to the combination of methodologies in the study of the same phenomenon.¹ The triangulation metaphor is derived from navigation and military strategy where the use of multiple reference points is used to locate an object's exact position.² The rationale is that by the application of simple geometry, multiple viewpoints will allow for greater accuracy. In the research context the concept of triangulation is borrowed to enhance the accuracy of judgments by collecting different kinds of data bearing on the same phenomenon.³

In social science triangulation refers to the mixing of data or methods (often combining qualitative and quantitative methods) so that diverse viewpoints cast light upon a topic.⁴ Within social science there is ongoing debate regarding the distinction and interaction between triangulation and mixed-method approaches.⁵ For the purposes of this thesis I adopt the approach of Wolf⁶ and Hammersley⁷ and define triangulation simply as using a combination of methods to look at the same topic from different angles at different stages of the research process for the purpose of checking the validity of different assumptions.

¹ Norman K Denzin, *The Research Act* (2nd ed, 1978) 291.

² Herman W Smith, *Strategies of Social Research: The Methodological Imagination* (Prentice-Hall, 1975) 273.

³ Todd D Jick, 'Mixing Qualitative and Quantitative Methods: Triangulation in Action' (1979) 24 *Administrative Science Quarterly* 602, 602.

⁴ Wendy Olsen, 'Triangulation in Social Research : Quantitative and Qualitative Methods Can Really Be Mixed' in M Holborn (ed), *Developments in Sociology* (2004) , 3.

⁵ See for e.g. Jick, above n 3; Olsen, above n 4; Frieder Wolf, 'Enlightened Eclecticism or Hazardous Hotchpotch? Mixed Methods and Triangulation Strategies in Comparative Public Policy Research ' (2010) 4 *Journal of Mixed Methods Research* 144.

⁶ Wolf, above n 5, 146.

⁷ Martyn Hammersley, 'Troubles with Triangulation', in M. Bergman (ed.), *Advances in Mixed Methods Research: Theories and applications* (Sage, 2008) 23.

B Doctrinal Legal Research

Doctrinal legal research methods are familiar to the legal scholar and practitioner. They involve the systematic analysis of specific rules and principles and the relationships between these existing rules.⁸ Research questions take the form of asking 'what is the law?' in particular contexts⁹ Chynoweth describes doctrinal legal analysis as involving "an exercise in reasoning, often at a subconscious level, with the aim of constructing an argument which is convincing according to accepted, and instinctive, conventions of discourse within the discipline."¹⁰

In this thesis I examine the customary rules of international law and applicable treaties to determine whether legal obligations exist for the conservation of biodiversity across a shared ecosystem.

C Case Studies

A case study is a holistic research strategy that employs an iterative process of examining one or a few strategically selected cases. These cases are observed in their natural context, in an open-ended way so as to describe and explain complex and entangled group attributes, patterns, structures or processes.¹¹ A general premise is that the case or cases will be studied in detail using whatever methods seem appropriate. The objective is to develop as full an understanding of the case as possible.¹²

Tight argues that the case study is not a very useful way to categorizing and differentiating the outputs of research as 'most pieces of research can be described as being, in some sense, case studies.'¹³ He refers to Atkinson & Delamont¹⁴-who state that the 'case' as the unit of analysis can in practice mean just about anything; Punch¹⁵- who declares that 'almost anything can serve as a case'; and Stake¹⁶-who claims that 'researchers will call anything they please a case study'.¹⁷

⁸ See Pearce D, Campbell E and Harding D, *Australian Law Schools: A Discipline Assessment for the Commonwealth Tertiary Education Commission, A Summary* (Canberra: AGPS,1987) 6 cited in Terry C M Hutchinson, *Researching and Writing in Law* (2nd ed, 2006) 7.

⁹ Paul Chynoweth, 'Legal Research' in Andrew Knight and Les Ruddock (eds), *Advanced Research Methods in the Built Environment* (2008) 29.

¹⁰ *Ibid*, 34-5.

¹¹ Piet Verschuren, 'Case Study as a Research Strategy: Some Ambiguities and Opportunities' (2003) 6 *International Journal of Social Research Methodology* 121, 137.

¹² Keith Punch, *Introduction to Social Research: Quantitative and Qualitative Approaches* (2nd ed., 2005)144.

¹³ Malcolm Tight, *Researching Higher Education* (2003), 9; Malcolm Tight, 'The Curious Case of Case Study: A Viewpoint' (2010) 13 *International Journal of Social Research Methodology* 329, 336.

¹⁴ Paul Atkinson and Sara Delamont, 'Bread and Dreams or Bread and Circuses? A Critique of 'Case Study' Research in Education in M Shipman (ed.), *Educational research: Principles, policies and practices*, (Taylor & Francis, 1985) 26, 29.

¹⁵ Punch, above n 12, 144.

These criticisms stem from the fact that the use of a case-study does not conform to a particular method or set of methods. Though the case-study approach may not prescribe a particular method it is a useful strategy for studying phenomena in context. The case-studies in my thesis provide 'real-world' opportunities to understand the legal, institutional and governance requirements for transboundary biodiversity conservation within the bounded contexts of the two transboundary projects. A community engaged/action research approach was used within the main case study and semi-structure interviews and site visits were used within both case-studies.

1 Action-oriented research

Engaged and action research methods are closely aligned, the former focused upon the nature of the relationships and the latter on the nature of the purpose and outputs of the engagement. The purpose of action-oriented research is to address practical concerns of local communities, organizations, and groups and incorporate local understandings of specific practices and issues. The method connects social science knowledge production and its potential public role.¹⁸ The action-research methodology provides a way of combining social and organizational change with the generation of knowledge and theory.¹⁹

Common to nearly all action-oriented research approaches is that they involve collaboration between researchers and community partners.²⁰ Action-oriented research assumes that valid knowledge comes from a variety of sources and that academic and community partners each possess unique and valuable knowledge, practices, and insights.²¹ The assumption that valid knowledge comes from varied sources forms a good fit with the overarching triangulation strategy adopted in this research.

Action-oriented research uses a wide variety of research methodologies, the choice being largely dictated by pragmatic considerations such as the nature of the outcome sought and the sources and

¹⁶ Robert Stake, 'Qualitative Case Studies' in N Denzin & Y Lincoln (eds.), *The Sage Handbook of Qualitative Research* (3rd ed., 2005a) 443, 445

¹⁷ Tight (2010), above n 13, 336.

¹⁸ Stephen A Small and Lynet Uttal, 'Action-Oriented Research : Strategies for Engaged Scholarship' (2005) 67 *Journal of Marriage and Family* 936, 937.

¹⁹ Kurt Lewin, 'Action research and minority problems', *Journal of Social Issues* 2 (1946) 34 in Nita Cherry, *Action Research: A Pathway to Action, Knowledge and Learning*, Qualitative Research Methods Series (RMIT University Press, 1999) 4.

²⁰ Small & Uttal, above n 18, 937.

²¹ Kerry Strand, Sam Marullo, Nick Cutforth, Randy Stoecker & Patrick Donohue, *Community-Based Research and Higher Education* (John Wiley & Sons, 2003).

types of resource available.²² Interviews and interactive workshops where data was collected through group discussion were the methods used within this research.

D *Transectoral Comparative Legal Research*

Burns and Hutchinson describe the comparison of laws across jurisdictions as a relatively 'safe' extension of traditional 'black letter law' research methods. Internationalization and the advent of transnational legal contexts have resulted in the popularization of this method over the last decade.²³

Comparative law is a useful extension of traditional doctrinal scholarship as the institutional features of the law are well acknowledged in comparative law.²⁴ Bell points out that while questions concerning the justifiability of legal rules or principles and their efficacy in achieving the goals of law are part of the research into any aspect of law, they are more often consciously raised in comparative law research.²⁵ In relation to a foreign system, the researcher needs to acquire more explicit knowledge, and also has to define more precisely assumed knowledge of his or her own system.²⁶ Comparative legal research often demonstrates that the goals of law can be achieved by different rules and institutions in different social contexts.²⁷

Though the comparison of laws across jurisdictions is now common, less has been done to compare the approaches to regulation of different types of natural resources. In line with the triangulation strategy I compare the conservation of biodiversity across international boundaries with the law and practice of transboundary watercourse management. Comparison across jurisdictions brings to the surface questions about the justifiability of differences and whether these differences achieve the purposes of the law equally effectively.²⁸ Similarly, the comparison across sectors forces the clear definition of prior assumptions and the identification of lessons and strategies for reform.

III THE RESEARCH PROCESS

This thesis is made up of seven papers. One has been published in a peer-reviewed journal; two have been accepted as peer-reviewed chapters in books. The remaining four are under-review by peer-

²² Small & Uttal, above n 18, 938.

²³ Kylie Burns and Terry C M Hutchinson, 'The Impact of 'Empirical Facts' on Legal Scholarship and Legal Research Training' (2009) 43 *The Law Teacher* 153, 164-5.

²⁴ John Bell, 'Legal Research and the Distinctiveness of Comparative Law' in Mark van Hoecke (ed), *Methodologies of Legal Research : What Kind of Method for What Kind of Discipline?*, *European Academy of Legal Theory Series* (2011) 155, 169.

²⁵ *Ibid*, 158.

²⁶ *Ibid*, 175-6.

²⁷ *Ibid*, 158.

²⁸ *Ibid*..

reviewed environmental law journals. In addition to describing the research process this section indicates the papers that have resulted from this research and thus provides a preliminary overview of the structure of the thesis.

A Literature Review

Prior to the first PALM project visit I conducted an extensive interdisciplinary literature review addressing transboundary biodiversity conservation; transboundary natural resource management; conservation management; mountain biodiversity; natural resource governance; development and livelihoods; livelihood issues in mountain communities; country specific issues including Central Asian history and post-Soviet challenges; mountain law including the *Alpine Convention*;²⁹ climate change adaptation and mitigation; and the impacts of climate change on human and wildlife communities in mountain ecosystems. Alongside this I conducted extensive doctrinal investigation (detailed below).

The iterative literature review/case-study analysis process continued throughout the course of the research.

From the literature I developed preliminary hypotheses about what would be required for effective transboundary biodiversity conservation in the PALM context. I used the results of the literature review to develop four training modules for the Additional Training Workshop for the national legal teams of the PALM project during the second visit to the PALM project.³⁰

B Doctrinal Analysis

I examined the international law rules relevant to transboundary biodiversity conservation and potential challenges that legal rules for sovereignty and *uti possidetis* might pose for effective collaboration across an international boundary line.

Outcomes

Paper One *International Law and Biodiversity Conservation in Terrestrial Transboundary Ecosystems - The Need for New Paradigms in International Environmental Law*³¹ addresses the gap in international law on the issue of transboundary biodiversity conservation; the protracted process of international law making; and the questions of implementation and enforcement that remain unresolved in the wider sphere of international environmental law emphasized the need for approaches and methods that go beyond traditional doctrinal research.

²⁹ Convention on the Protection of the Alps (*Alpine Convention*), opened for signature 7 November 1991, 1917 UNTS 315, (entered into force March 1995).

³⁰ See Appendix III, Australian Centre for Agriculture and Law University of New England, *Traning Manual - Additional Training Workshop for Legal Task Forces. GEF/UNEP/UNU Project : Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (PALM project)* (2010), Modules 1, 4, 6 & 7.

³¹ See Paper 1 in this thesis Michelle Lim, 'International Law and Biodiversity Conservation in Terrestrial Transboundary Ecosystems - The Need for New Paradigms in International Environmental Law' (Forthcoming) *submitted to Transnational Environmental Law at time of thesis submission*

The results of the doctrinal analysis were shared with the national legal teams from the PALM project during both project visits, forming the basis for a rich dialogue (including during extended team meetings).

C PALM Project: Visit I

The Australian Centre for Agriculture and Law (AgLaw Centre) at the University of New England was engaged to lead research in Component 1.2 of the PALM project. The aim of Component 1.2 is to develop a legal and policy framework that outlines concepts, principles and regulatory requirements to improve the enabling environment for sustainable land management at transboundary, national and local levels within the PALM project area.³² I worked closely with National Legal Task Forces (LTFs) in Tajikistan and the Kyrgyz Republic to achieve the aims of Component 1.2.

An initial scoping study commenced with a workshop held in Varzob, Tajikistan from 8-12 June 2009. This was followed by a total of three months in Tajikistan and the Kyrgyz Republic. I conducted interviews with experts associated with the project and visited project sites in the Pamirs on both sides of the Tajik-Kyrgyz boundary.

The June workshop in Varzob involved people with responsibilities under the strategic planning (Component 1.1) and Legal and Institutional (Component 1.2) components of the PALM project. Component 1.1 of the PALM project involves the development of the Pamir-Alai Transboundary Strategic Action Plan (PATSAAP). 5 experts in the following areas made up each of the Tajik and Kyrgyz strategy teams:

- i) Mountain ecosystems/natural resources/park management specialist;
- ii) Economist;
- iii) Social science/poverty specialist;
- iv) Mountain agronomist/farming systems specialist;
- v) Mountain livestock/grassland management specialist.

National Legal Task Forces (LTFs) were appointed to implement project Component 1.2. Each national team was to comprise of a:

- i) Legal Expert;
- ii) Institutional Expert; and
- iii) Policy Expert.

The aim of the PALM project's Legal Task Forces (LTFs) was to develop approaches, principles, and regulatory requirements to create an enabling environment for SLM in the High Pamir and Pamir-Alai

³² United Nations Environment Programme Global Environment Facility (GEF) Grant Request, *Draft Full Project Brief* (2006); *Inception Report*, June 2008, GEF/UNEP/UNU, Sustainable Land Management (SLM) in High Pamir and Pamir-Alai Mountains (PALM), An Integrated and Transboundary Initiative in Central Asia, Phase I: Strengthening of the Enabling Environment for SLM.

region at the transboundary, national, and local levels. *Methodological Research Guidelines (MRGs)*³³ developed by Ian Hannam were the support tool for the LTFs. From this the LTFs from Tajikistan and the Kyrgyz Republic conducted in-depth analysis of the legal, policy, and institutional basis for sustainable land management in the region with the input from the strategy teams.

I presented my preliminary hypotheses developed from the literature review and provided an overview of the operation of the *Alpine Convention*.³⁴ During the workshop I observed and identified relevant issues touching upon both doctrinal and implementation issues relevant to my thesis.



Fig. 1 Tajik and Kyrgyz Legal Task Forces analyzing national legal frameworks at the Varzob workshop (Photo: Murod Ergashev).

I spent 6 weeks in Tajikistan in the capital Dushanbe. I conducted interviews with legal and strategy experts. I visited project sites on the Tajik side of the border and conducted semi-structured interviews with stakeholders.

³³ University of New England (2009). *Methodological Research Guidelines for Legal Task Forces, for Analysing the Capacity of Legal, Policy and Institutional Aspects of Sustainable Land Management in the High Pamir and Pamir-Alai Mountain Environment*, GEF/UNEP/UNU Sustainable Land Management in the High Pamir and Pamir-Alai Mountains.

³⁴ *Convention on the Protection of the Alps (Alpine Convention)*, opened for signature 7 November 1991, 1917 UNTS 315, (entered into force March 1995) .



Fig.2 Visits to project areas and interviews inTajikistan.

I visited project sites in the Kyrgyz Republic with the Kyrgyz Strategy Team. The strategy teams conducted structured interviews with community leaders and community members on the transboundary and land management issues in the area. In addition to observing the research process of the strategy teams I was able to further discuss issues relating to my research.



Fig.3 Visits to project areas and interviews in the Kyrgyz Republic.

Outcomes

The scoping study allowed the hypotheses developed from the literature to be considered in the practical context of the PALM project. I developed extensive background knowledge on the region and key issues. This resulted in a refinement of the hypotheses.

The workshop and field visits revealed that transboundary pasture management is an important livelihood issue in the Pamirs. This provided the impetus to develop **Paper 2: Michelle Lim, 'Laws, Institutions and Transboundary Pasture Management in the High Pamir & Pamir-Alai Mountain Ecosystem of Central Asia ' (2012) 8(1) *Law, Environment and Development Journal* 43**

<http://www.lead-journal.org/content/12043.pdf>.

The initial PALM visit also provided insights for the development of a country report on the Kyrgyz Constitution (See Appendix I: Michelle Lim, 'Environmental Implications of the 2010 Constitution of the Kyrgyz Republic - Country Report' (2011) *IUCN Academy of Environmental Law e-Journal*, <http://www.iucnael.org/en/e-journal/previous-issues/157-issue-20111.html>.) This country report provides further background on the political situation in the Kyrgyz Republic and the implications for environmental management in the region.

D Heart of Borneo

The Heart of Borneo (HoB) transboundary project initiated by the Worldwide Fund for Nature (WWF) involves the three ASEAN countries of Malaysia, Indonesia and Brunei. In February 2007, the three Bornean countries signed The *Declaration on the Heart of Borneo Initiative*. In the Declaration country parties pledged to 'cooperate in ensuring the effective management of forest resources and conservation of a network of protected areas, productive forests and other sustainable land-uses' within the HoB.³⁵

Following the first visit to the PALM project the Heart of Borneo project was identified as a second case study, as it addressed comparable governance issues but in a different legal and cultural context,

³⁵ *Declaration on the Heart of Borneo Initiative*, 12 February 2007, Brunei Darussalam - Republic of Indonesia - Malaysia

facilitating ‘triangulation’ from different case study perspectives. Semi-structured interviews were conducted with government officials and NGOs. I also visited Batang Ai National Park and Kinabalu Park within the Malaysian states of Sarawak and Sabah respectively.

E PALM Project: Visit II

In 2009 the LTFs from both countries reported on the capacity of the legal and policy instruments and related institutions within the respective countries. I reviewed these reports in collaboration with Ian Hannam.³⁶ The analysis revealed the need for further capacity-building and reform in the region and for specialized training for the LTFs to meet the objectives of the project.³⁷

An additional workshop was held in Dushanbe, Tajikistan in April 2010 to provide LTFs more background in environmental law relevant to the PALM region, including environmental planning, biodiversity, pasture management, soil and water conservation, protected areas management, mountain law and transboundary law.³⁸ I was responsible for four modules of the training.³⁹ This work formed a necessary part of the ‘action’ and ‘engagement’ aspects of my research program.

Group discussions were integrated into the workshops. These enabled collection of data within the group setting. This resulted in answers to key research questions quickly, drawing on the expertise of local participants. The data also helped the participants to address the project objectives. LTFs were divided into national teams to discuss defined issues related to the subject matter of each module in their respective jurisdictions. Conclusions were recorded on butcher’s paper and presented to the other national team. This was an efficient means of obtaining information from each group on particular research questions such as issues in the Pamirs, ratification and implementation of treaty obligations. It also allowed for on-site discussion and comparison and the identification of issues, common problems and areas for learning.

³⁶ See Appendix II, University of New England, Review of National Legal Task Force Reports (2010), Component 1.2 Legal, Policy and Institutional Aspects of Sustainable Land Management In The High Pamir And Pamir-Alai Mountain Environment.

³⁷ See Appendix III, University of New England, Additional Training Workshop For Legal Task Forces Developing Skills to Undertake Legal and Policy Reform for SLM (2010), Component 1.2 Legal, Policy and Institutional Aspects of Sustainable Land Management In The High Pamir And Pamir-Alai Mountain Environment.

³⁸ University of New England, *Additional Training Workshop for Legal Task Forces – Developing Skills to Undertake Legal and Policy Reform for SLM* (2010), GEF/UNEP/UNU Sustainable Land Management in the High Pamir and Pamir-Alai Mountains.

³⁹ *Ibid*, Appendix III, see Module 1 International Environmental Law; Module 4 Biodiversity Law; Module 6 Mountain Law; Module 7 Transboundary Arrangements.



Fig 4. Group discussions during the training workshop in Dushanbe, April 2010.

Outcome

The new data collected through the workshop combined with additional analysis of the literature led to further refinement of the hypotheses.

F Synthesis

The synthesis of findings from the case-studies combined with the analysis of the literature resulted in the development of a set of governance criteria for the effective transboundary conservation of biodiversity. The criteria set out the governance elements needed to give transboundary conservation initiatives the best chance of success. Once the criteria were defined each case-study was evaluated against these criteria to recommend action and determine where interventions are needed in each project.

Functionally, these criteria were found by the local teams and the PALM project leadership to be useful and efficient ways of adding depth to the evaluations being undertaken. As an action outcome, the work proved to be applicable and useful to the relevant stakeholders.

Outcomes

The outcomes of the synthesis are presented in these papers:

Paper 3: Michelle Lim, 'Transboundary Conservation of Mountain Biodiversity in a Climate Change Impacted World - Governance Perspectives from Central Asia and the Island of Borneo' in An Cliquet

and Frank Maes (eds), *Linkages Between Biodiversity and Climate Change*, IUCN Academy of Environmental Law Series (forthcoming 2012).

Paper 4: Michelle Lim, 'Criteria for Effective Transboundary Biodiversity Conservation' (forthcoming) *under review Harvard Environmental Law Review*.

Paper 6: Michelle Lim, 'Strengthening the Legal and Institutional Effectiveness of Transboundary Biodiversity Conservation in the 'Heart of Borneo'' (Forthcoming) *Submitted to Asia- Pacific Journal of Environmental Law at time of thesis submission*.

Confidential Exegesis: Evaluation of the PALM Project Against the 12+1 Criteria

G Comparative Evaluation of Transboundary Biodiversity Conservation and Transboundary Watercourse Management

In contrast to transboundary watercourse management transboundary biodiversity conservation is a relatively new area. The desk-based analysis of transboundary watercourse management opened up the exploration of far more extensive literature pertaining to the management of transboundary resources. Reflecting the triangulation strategy this allowed for evaluation of the criteria developed against a further set of reference points. The comparative study illustrated the interlinked nature of natural resources and their management and the importance of learning across sectors.

Outcome

Paper 5: Michelle Lim (forthcoming) 'Is Water Different From Biodiversity? Governance Criteria for the Effective Management of Transboundary Resources'. *Submitted to Transnational Environmental Law at time of thesis submission*.

H Trans-sectoral Comparison in the Central Asian Context

The final component of the PhD compared the more mature regime of transboundary watercourse management in Central Asia and transboundary biodiversity conservation in the PALM project. This comparison was conducted to further evaluate the transboundary governance criteria in a practical context. The comparative study also demonstrated how lessons learnt in the management of one transboundary resource could provide insights to the management of other transboundary resources within the same jurisdiction. The analysis of transboundary watercourse management in Central Asia enabled the identification of challenges and lessons specific to transboundary resource management in the Central Asian region which could benefit transboundary biodiversity conservation in the PALM context.

Outcome

Paper 7: Michelle Lim, 'Effective Governance Across Central Asian Boundaries - What Lessons Does the Central Asian Transboundary Watercourse Management Experience Provide for Mountain Biodiversity

Conservation Across the Kyrgyz-Tajik Boundary?¹ in Robin Warner and Simon Marsden (eds), *Transboundary Environmental Governance of Inland, Coastal and Marine Areas* (2012).

INTERNATIONAL LAW AND BIODIVERSITY CONSERVATION IN TERRESTRIAL TRANSBOUNDARY ECOSYSTEMS – THE NEED FOR NEW PARADIGMS IN INTERNATIONAL ENVIRONMENTAL LAW

Paper 1

At time of thesis submission under review: *Transnational Environmental Law*

- **Main Contributions of Paper 1**
 - Highlights the gap in international law on the issue of transboundary biodiversity conservation;
 - Provides legal arguments for overcoming the obstacles that international law creates for the conservation of biodiversity within a shared ecosystem;
 - Underlines the need for contemporary environmental law scholarship to go beyond legal interpretation.
- **Where this paper fits in the whole thesis**
 - Examines the international law rules relevant to transboundary biodiversity conservation;
 - Provides the rationale for the focus on non-doctrinal methods in this thesis.

LAWS, INSTITUTIONS AND TRANSBOUNDARY PASTURE MANAGEMENT IN THE HIGH PAMIR & PAMIR- ALAI MOUNTAIN ECOSYSTEM OF CENTRAL ASIA

Paper 2

Michelle Lim (2012) 8(1) *Law, Environment and Development Journal* 43
<<http://www.lead-journal.org/content/12043.pdf>>.

- **What's New?**
 - Historical, political and ecological background for the main case-study;
 - Consideration of transboundary management issues in the PALM project area with a focus on transboundary pasture management.
- **Which parts appeared earlier**
 - Description of PALM project appeared in introduction and methods section.
- **Main Contributions of Paper 2**
 - Analysis of the legal and institutional framework and contemporary issues facing the former Soviet Central Asian states within the PALM case study;
 - Identification of ways forward for effective transboundary mountain pasture management in the Pamirs and beyond.
- **Where this paper fits in the whole thesis**
 - Provides the necessary background for the main case-study of the thesis;
 - The recommendations for transboundary pasture management feed into the development of governance criteria for transboundary biodiversity conservation in the papers that follow;
 - The exploration of pasture management issues provides the foundation for exploring biodiversity conservation issues in Tajikistan and the Kyrgyz Republic.

TRANSBOUNDARY CONSERVATION OF MOUNTAIN BIODIVERSITY IN A CLIMATE CHANGE IMPACTED WORLD- GOVERNANCE PERSPECTIVES FROM CENTRAL ASIA AND THE ISLAND OF BORNEO

Paper 3

Michelle Lim (forthcoming 2012), book chapter in An Cliquet and Frank Maes (eds), *Linkages Between Biodiversity and Climate Change*, IUCN Academy of Environmental Law Series

- **What's New?**
 - Governance criteria for effective transboundary conservation of mountain biodiversity;
 - Identification of complementary reforms that will be needed in addition to legal instruments to achieve effective transboundary biodiversity conservation.
- **Which parts appeared earlier**
 - Restates the importance of transboundary biodiversity conservation;
 - Description of case-studies and methods used.
- **Main Contributions of Paper 3**
 - Provides objective criteria for transboundary biodiversity conservation with a focus on mountain ecosystems in the climate change context;
 - Recognition of the particular importance of mountain ecosystems as a 'field laboratory' for exploring the impacts of climate change on biodiversity;
 - Provides a preliminary assessment of the case-studies against the 11+1 criteria.
- **Where this paper fits in the whole thesis**
 - Provides the first iteration of the transboundary biodiversity conservation criteria.

CRITERIA FOR EFFECTIVE TRANSBOUNDARY BIODIVERSITY CONSERVATION

Paper 4

At time of thesis submission under review: *Harvard Environmental Law Review*

- **What's New?**
 - Revised criteria which include further analysis and additional literature;
 - Articulation of how the examination of the case-studies have informed the development of the criteria.
- **Which parts appeared earlier**
 - Issues related to and importance of transboundary biodiversity conservation;
 - Description of case-studies;
 - Initial iteration of transboundary conservation criteria.
- **Main Contributions of Paper 4**
 - Further analysis of the criteria presented in Paper 3 supplemented by additional literature;
 - Transboundary biodiversity conservation criteria beyond the mountain context.
- **Where this paper fits in the whole thesis**
 - The revised biodiversity criteria are the core component of the thesis and the reference point for the comparisons in later papers.

IS WATER DIFFERENT FROM BIODIVERSITY? GOVERNANCE CRITERIA FOR THE MANAGEMENT OF TRANSBOUNDARY RESOURCES

Paper 5

At time of thesis submission under review: *Review of European Community and International Environmental Law (RECIEL)*

- **What's New?**
 - Analysis of transboundary watercourse law and issues in transboundary watercourse management;
 - Comparative study of transboundary watercourse management and transboundary biodiversity conservation;
 - An additional dispute resolution criterion.
- **Which parts appeared earlier**
 - The transboundary biodiversity conservation criteria.
- **Main Contributions of Paper 5**
 - Identifies synergies for the governance of water and biodiversity resources;
 - Highlights the importance of intersectoral learning in the governance of shared natural resources.
- **Where this paper fits in the whole thesis**
 - Demonstrates the transferability of the biodiversity criteria to other resource types;
 - Provides further justification for the choice of biodiversity criteria.

STRENGTHENING THE LEGAL AND INSTITUTIONAL EFFECTIVENESS OF TRANSBOUNDARY BIODIVERSITY CONSERVATION IN THE 'HEART OF BORNEO'

Paper 6

At time of thesis submission under review: *Asia Pacific Journal of Environmental Law*

- **What's New?**
 - Detailed evaluation of the 'Heart of Borneo' against the governance criteria;
 - Discussion of transboundary biodiversity conservation in the ASEAN context.
- **Which parts appeared earlier**
 - A summarized version of the transboundary biodiversity criteria seen in Papers 3 & 4 is presented here;
 - A brief assessment of the Heart of Borneo project was included in Paper 3.
- **Main Contributions of Paper 6**
 - In-depth discussion of transboundary biodiversity conservation in the legal and political context of Borneo and the wider ASEAN region;
 - Recommendations for addressing the challenges facing transboundary initiatives in ASEAN.
- **Where this paper fits in the whole thesis**
 - The use of the criteria in the evaluation of the second-case study illustrates the utility of the criteria and provides a further reference point for assessing whether the criteria has considered the main issues for effective transboundary biodiversity conservation.

CONFIDENTIAL EXEGESIS: EVALUATION OF THE PALM PROJECT AGAINST THE 12+1 CRITERIA

- **What's New?**
 - Detailed assessment of the PALM project against all 13 criteria.
- **Overlaps**
 - An assessment of the PALM project against some of the criteria appears in Paper 7.
- **Main Contributions of exegesis**
 - Provides a comprehensive identification of areas for intervention in the PALM project.
- **Where this fits in the whole thesis**
 - A further component of the iterative process of hypothesis development and testing.

EFFECTIVE GOVERNANCE ACROSS CENTRAL ASIAN BOUNDARIES - WHAT LESSONS DOES THE CENTRAL ASIAN TRANSBOUNDARY WATERCOURSE MANAGEMENT EXPERIENCE PROVIDE FOR MOUNTAIN BIODIVERSITY CONSERVATION ACROSS THE KYRGYZ-TAJIK BOUNDARY?

Paper 7

Chapter 5 in Robin Warner and Simon Marsden (eds), *Transboundary Environmental Governance of Inland, Coastal and Marine Areas* (forthcoming 2012).

- **What's New?**
 - Analysis of governance issues in the management of Central Asian waters;
 - Further background on the transboundary biodiversity conservation issues in Central Asia.
- **Which parts appeared earlier**
 - Background to the PALM project;
 - The transboundary biodiversity conservation criteria and the transboundary water resource management criteria;
 - The assessment of the PALM project against the biodiversity criteria.
- **Main Contributions of Paper 7**
 - Demonstrates that integrated approaches and intersectoral learning is possible and desirable;
 - Draws from issues in the wider Central Asian political context to identify challenges, lessons learnt and ways forward for the management of transboundary resources in the region.
- **Where this paper fits in the whole thesis**
 - Considers the conclusions from the comparative study in Paper 5 in a 'real-world' context;
 - Provides further strategies for addressing the transboundary issues in the main case-study.

CONCLUSIONS

In this final section I synthesize the conclusions reached in each paper. I highlight the significance of the work presented and identify the limitations of this research. I conclude by proposing directions for further research.

I MAIN FINDINGS OF THE RESEARCH

Legal rules and instruments are an important component of effective environmental management. To achieve their purposes a variety of strategic, institutional and policy elements that fit the social and economic context are required. The fundamental purpose of this research is to create and test a framework for identifying what these complementary requirements are, and for assessing the degree to which they are conducive to effectiveness of the legal instrument. Determining what this means in practice creates a challenge of methods, and particularly in the case of the first case study political, financial, capacity and governance challenges. The comparative discussion of water and biodiversity highlights the importance of interdisciplinarity and the transferability of lessons across sectors.

A Strategies Complementary to Doctrinal Research

In the first paper,¹ I underline the need for contemporary environmental law scholarship to add new approaches to the traditional doctrinal armoury of the law. I identify the obstacles that international law creates for transboundary collaboration, provide legal arguments for addressing these, and highlight the lacuna in international law on the issue of transboundary biodiversity conservation. The protracted process of international law making and the questions of implementation and enforcement that remain un-addressed in conventional international environmental law discourse emphasize the need for approaches that can complement traditional doctrinal research. Neither doctrinal developments independent of the social, institutional and economic context; nor the development of yet another Multilateral Environmental Agreement will be sufficient to achieve effective transboundary biodiversity conservation. What is needed are new approaches that will enhance environmental regulation by providing a deeper understanding of the larger suite of interventions that may be needed for effective transboundary conservation. The conclusions reached in Paper 1 support the focus on effectiveness and the use of non-doctrinal methods to address this challenge.

B Governance Criteria for the Effective Management of Transboundary Resources

I have extended the good-practice guidelines contained within the transboundary conservation literature and incorporated transdisciplinary considerations for transboundary management to produce a set of criteria to evaluate the potential effectiveness of legal and institutional systems for transboundary conservation in terrestrial ecosystems. This evaluation approach provides the framework

¹ See Paper 1 in this thesis: Michelle Lim, 'International Law and Biodiversity Conservation in Terrestrial Transboundary Ecosystems - The Need for New Paradigms in International Environmental Law' (Forthcoming) *submitted to Transnational Environmental Law at time of thesis submission*

for determining what complementary reforms may be needed, in addition to suitable legal instruments, to achieve effective governance across national boundaries.

The analysis of the transboundary water management literature and practice reinforces the choice of elements that are contained in the governance criteria for transboundary biodiversity conservation. The comparison between the two transboundary resources suggests that the principles contained within the criteria can guide the management of other shared resources, beyond land based biodiversity. This comparative study also highlighted the opportunities for further learning about ways to assess governance regimes, across the two resources. The comparative discussion also reinforced the nature of the many difficulties of transboundary management.²

While the governance principles remain largely unchanged for each resource, meeting each criterion faces different challenges due to the distinct natural and management environments of each resource. The consideration of transboundary pasture management issues in Paper 2³ emphasizes further the value of transectoral comparisons and the synergies that can arise in the management of different transboundary resources.

C Lessons from the Case-Studies

The assessment in Papers 6⁴ & 7⁵ of the two case-studies against the criteria and the examination of transboundary pasture management in Paper 2⁶ demonstrate the usefulness of the criteria. At the same time the reflection on issues in the 'real-world' situation of the case-studies suggests the importance of context. This finding also cautions against transplanting laws and institutions that have been successful in one jurisdiction to a new context without careful customization. Though important lessons can be

² Paper 5 in this thesis :Michelle Lim, 'Is Water Different From Biodiversity? Governance Criteria for the Effective Management of Transboundary Resources' (forthcoming) *submitted to Review of European Community and International Environmental Law at time of thesis submission*

³ Paper 2: Michelle Lim, 'Laws, Institutions and Transboundary Pasture Management in the High Pamir & Pamir-Alai Mountain Ecosystem of Central Asia ' (2012) 8(1) *Law, Environment and Development Journal* 43
<<http://www.lead-journal.org/content/12043.pdf>> .

⁴ Paper 6 Michelle Lim, 'Strengthening the Legal and Institutional Effectiveness of Transboundary Biodiversity Conservation in the 'Heart of Borneo'' (Forthcoming) *Submitted to Asia- Pacific Journal of Environmental Law at time of thesis submission*

⁵ Paper 7 Michelle Lim, 'Effective Governance Across Central Asian Boundaries - What Lessons Does the Central Asian Transboundary Watercourse Management Experience Provide for Mountain Biodiversity Conservation Across the Kyrgyz-Tajik Boundary?' in Robin Warner and Simon Marsden (eds), *Transboundary Environmental Governance of Inland, Coastal and Marine Areas* (2012) .

⁶ Paper 2: Michelle Lim, 'Laws, Institutions and Transboundary Pasture Management in the High Pamir & Pamir-Alai Mountain Ecosystem of Central Asia ' (2012) 8(1) *Law, Environment and Development Journal* 43
<<http://www.lead-journal.org/content/12043.pdf>> .

learnt from other transboundary initiatives, success in one context will not automatically translate to the new context. Care must be taken to design laws and institutions for the specific context.

Examination of the case studies suggests that communities need to be convinced of economic and other benefits before changes in current resource-use practices could be expected. Institutional and other capacity building and adequate funding are fundamental to ensuring the effectiveness of any legal instruments that are developed and any strategies that are employed. Any action needs to consider the limitations of the country systems. When introducing new laws and agreements and amending existing laws the ability of existing administrations to implement these new rules has to be taken into account.

The analysis of governance criteria in the context of the PALM project and Central Asian transboundary water resource management emphasized the interconnected nature of the criteria. Fulfilling one criterion often depended on the simultaneously meeting one or more of the other governance criteria. The analysis underscored the essential nature of political will and commitment. In both the PALM and transboundary water contexts integrated approaches which identify shared benefits have the potential to improve political support for the project and contribute to more equitable distribution of the costs and benefits of transboundary collaboration. Without other governance components in place agreements and institutions are insufficient. The lack of meaningful legal instruments in the HoB illustrates however the importance of a legal framework in defining objectives. Both legal instruments and complementary governance requirements are needed to ensure effectiveness.

The interventions I recommend emphasize the importance of independent oversight and clear and simple rules which consider the operating context and are backed up by appropriate institutional support. Transboundary resource management involves resources and expertise additional to what is required for management solely within national boundaries. Designated institutions are required to coordinate the enforcement of transboundary laws and the implementation of transboundary strategies. These additional requirements are made necessary by the legal principles establishing state sovereignty.

II SIGNIFICANCE OF THE WORK

A Contribution to Scholarship

This thesis contributes to filling the gap on legal analysis of transboundary biodiversity conservation. The borrowing of the social science concept triangulation is a unique approach to legal research and suggests a model for non-doctrinal scholarship. Transboundary strategies are needed in many parts of the world to effectively manage shared natural resources. The development of such strategies is particularly urgent in post-Soviet Central Asia. The governance criteria point to the necessity of aligning a variety of legal, institutional and managerial factors to create effective transboundary management. In this thesis I have demonstrated the utility of the proposed governance evaluation criteria in the assessment of transboundary initiatives and to facilitate the identification of solutions and trans-sectoral synergies.

The criteria for evaluating transboundary biodiversity conservation could assist in the evaluation and design of effective legal governance regimes, regardless of transdisciplinary considerations. The

transboundary context however introduces an additional layer of complexity. The use of the criteria as an evaluation tool has provided the basis for a reasonably objective set of insights into where capacity building and investment in governance may be required if the broader aims of the legal instruments are to be achieved.

I do not propose that these criteria are the ultimate or only tests for the potential of trans-boundary legal governance arrangements. Rather, they offer a starting point for further development of method and practices for allow legal scholars and policy makers. The contribution of this work has been to integrate approaches and concepts from other disciplines, to test in the field their relevance and applicability, and to pose them in a form that crystallises the issues to aid application to specific situations.

B Reception of the Work

The timeliness of this work and the contribution it makes to environmental law scholarship, particularly in the area of transboundary biodiversity conservation, is suggested by how the work has been received. The key components of this thesis are the transboundary governance criteria for biodiversity conservation⁷ and water resource management.⁸ Initial versions of Paper 3 and Paper 6 (which contain the key components of this thesis) received the 'Best Graduate Student Paper Prize' at consecutive colloquia of the IUCN Academy of Environmental Law.⁹ In addition, my paper on the interdisciplinary approach of my thesis received the Best Candidate Scholarship of the National Graduate Law Conference in 2010.¹⁰

⁷ See Paper 3 (Michelle Lim, 'Transboundary Conservation of Mountain Biodiversity in a Climate Change Impacted World - Governance Perspectives from Central Asia and the Island of Borneo' in An Cliquet and Frank Maes (eds), *Linkages Between Biodiversity and Climate Change*, IUCN Academy of Environmental Law Series (forthcoming 2012) and Paper 4 (Michelle Lim, 'Criteria for Effective Transboundary Biodiversity Conservation' (forthcoming) *under review Harvard Environmental Law Review*).

⁸ See Paper 6 (Michelle Lim, 'Is Water Different From Biodiversity? Governance Criteria for the Effective Management of Transboundary Resources' (forthcoming) *submitted to Review of European Community and International Environmental Law at time of thesis submission*).

⁹ 'Transboundary Conservation of Mountain Biodiversity in a Climate Change Impacted World: Governance Perspectives from Central Asia and the Island of Borneo' (Awarded Best Graduate Student Paper at the 8th Annual Colloquium of the IUCN Academy of Environmental Law, Ghent University- Ghent, 2010); 'Is Water Different From Biodiversity- Governance Criteria for the Effective Management of Transboundary Resources' (Awarded Best Graduate Student Paper at the 9th Annual Colloquium of the IUCN Academy of Environmental Law, Eastern Cape, South Africa 3-8 July, 2011).

¹⁰ Michelle, Lim, 'Transboundary Law for Biodiversity Conservation: Advancing Cooperation Across International and Disciplinary Boundaries' (Paper presented at the National Graduate Law Conference, Australian National University – Canberra, 2010).

C Practical Impact

In addition to its academic significance this work also has had practical impact. The Final Mission Report for Component 1.2 (the legal and institutional component) of the PALM project indicates that my research “provided a significant amount of transboundary law and policy information to the national Legal Task Forces during the Component 1.2 period.”¹¹ The conclusions reached in the PhD research have informed the development of a legal concept paper for transboundary conservation for the Transboundary Conservation Specialist Group (TBC SG) of the World Commission on Protected Areas (WCPA).

The Final PALM project Mission Report indicates that by highlighting the necessity of marrying improved legal instruments with effective institutional arrangements and community capacity adds new dimensions to the scholarship and practice of environmental law and sustainable land management.¹² The Final Mission Report also states that my work on the requirements for successful transboundary laws provides “useful criteria that can be applied to support the design and implementation of more effective legal instruments and institutions.”¹³

The Transboundary Conservation Specialist Group (TBC SG) of the World Commission on Protected Areas (WCPA) aims to develop a legal concept paper which will present an agenda for legal scholarship for transboundary conservation. With a colleague I have used the findings of my thesis to develop a survey to identify globally relevant legal and institutional issues and challenges for transboundary biodiversity conservation and highlight regional nuances. The results of this survey are being used as the basis for the legal concept paper for the TBC SG. In addition to identifying the legal issues for transboundary collaboration the paper will also address associated institutional and governance concerns for ‘making the law work’.

The legal concept paper will form the basis for the development of the Transboundary Legal Resource Centre. The legal centre will form part of the TBSG’s Global Transboundary Conservation Learning Network. The network will collate available knowledge and develop new tools for transboundary conservation and transboundary protected area governance. The Legal Resource Centre will enable the sharing of knowledge and development of effective tools on the legal front.¹⁴

¹¹ See Appendix IV, University of New England Australian Centre for Agriculture and Law, 'Final Mission Report Sub-Component 1.2 GEF/UNEP/UNU Sustainable Land Mangement in the High-Pamir and Pamir-Alai Mountains' (2010) 9-10.

¹² Ibid, 48.

¹³ See Appendix IV, University of New England Australian Centre for Agriculture and Law, 'Final Mission Report Sub-Component 1.2 GEF/UNEP/UNU Sustainable Land Mangement in the High-Pamir and Pamir-Alai Mountains' (2010) 18-21. See further pp 13-14 and 38-40 of Appendix IV.

¹⁴ The synthesis of results from the legal concept paper survey can be found at:
http://www.tbpa.net/additionaldocs/Results%20of%20Legal%20Concept%20Paper%20Survey_May%202012.pdf

III RECOMMENDATIONS FOR FUTURE RESEARCH

A Testing of Criteria in Other Contexts

The criteria for transboundary water resource management were used to assess transboundary water resource management in Central Asia. This analysis was however desk-based only. Testing of these criteria in the field would therefore be valuable.

The use of the transboundary management criteria in additional case-studies and for other transboundary resources could further test the applicability of the criteria across a range of situations, determine the relative importance of political and cultural contexts, and allow for further assessment of whether the criteria can be applied more universally in the management of transboundary resources. Another valuable analysis would be an evaluation of the criteria by transboundary planners and 'implementers'. This would provide insight into the utility of the criteria from practicality and ease of use perspectives.

B More In-depth Analysis of Both Case Studies

This research was limited by time and financial constraints. Mulligan & Nadarajah suggest that community-engaged research requires a commitment on the part of the researchers to work in the communities concerned for a matter of years, not weeks.¹⁵ This was not feasible given the time frame and budget. There therefore remains scope for further research in each of the case-studies and further follow-ups to observe changes over time.

C Further Research on the Types of Transboundary Instruments and Institutions

Additional research is required for a greater understanding of the type of transboundary legal instruments (e.g. binding v non-binding) and institutions (e.g. new institution v working within existing bodies) that are likely to be the suitable in particular circumstances. Further examination of the success or otherwise of existing regional agreements and implementation at the regional and transboundary level would also prove instructive.

D Scholarship on Non-Doctrinal Methods in Environmental Law

Further research is needed on the use of non-doctrinal methods in environmental law. Fisher et al. argue that environmental law scholarship fails adequately to explore, or to provide methodologies for

have also compiled transboundary resolutions and motions for the Transboundary Conservation Specialist Group (TBCSG) of the World Commission of Protected Areas (WCPA). See: <http://www.tbpa.net/page.php?ndx=69>.

¹⁵ Martin Mulligan and Yaso Nadarajah, 'Working on the Sustainability of Local Communities with a "Community-Engaged" Research Methodology' (2008) 13 *Local Environment* 81, 92-93.

exploring, environmental laws across jurisdictions.¹⁶ They also suggest that environmental law does not yield easily to a single paradigm, methodology or explanation.¹⁷

The science-based nature of environmental law suggests the use of interdisciplinary methods to address questions of implementation effectiveness. Advocates of interdisciplinary research argue that it can address problems that cannot be adequately dealt with by single disciplines.¹⁸ Social scientists who are not lawyers for example are perhaps less likely to recognize the important role of law in the social and economic phenomena they are attempting to analyze, suggesting that having lawyers conduct such research may result in different insights than would be arrived at from other perspectives.¹⁹

Complex real-world environmental issues require the development of toolkits which provide those involved in various kinds of interdisciplinary research with the best available information, allowing them to choose options that are most relevant to their situation.²⁰ As Bammer suggests the best way to gather the array of options is through close examination of a large range of cases of interdisciplinary research which have been conducted under a variety of circumstances.²¹ Further research is needed to identify the interdisciplinary tools that will benefit environmental law scholarship.

Communication between disciplines is one of the great challenges to achieving genuine interdisciplinary rigour.²² Not only is further research needed but also the development of the practices within the various disciplines that make up a particular field such as environmental management.²³

IV CONCLUSION

The aim of this thesis is to consider what is needed to create and implement effective laws and institutions for transboundary biodiversity conservation. The governance criteria developed suggest key components that should be necessary for achieving this aim. The evaluation of the criteria in the 'real-world' context of the case-studies suggests that the components that are most important for effective

¹⁶ Elizabeth Fisher et al, 'Maturity and Methodology: Starting a Debate About Environmental Law Scholarship' (2009) 21 *Journal of Environmental Law* 213, 243.

¹⁷ *Ibid*, 225.

¹⁸ Gabriele Bammer, *Strengthening Interdisciplinary Research - What It Is, What It Does, How It Does It and How It Is Supported* (2012), 15.

¹⁹ Christopher McCrudden, 'Legal Research and the Social Sciences' (2006) 122 *Law Quarterly Review* 632, 648.

²⁰ Bammer, above n 18, 15.

²¹ *Ibid*.

²² Paul Chynoweth, 'Legal Research' in Andrew Knight and Les Ruddock (eds), *Advanced Research Methods in the Built Environment* (2008), 37.

²³ *Ibid*.

transboundary biodiversity conservation will be dependent on context. However, if the two case-studies are indicative it appears that capacity, financial resources, good governance and above all political will would probably be the most important predictors of the potential success or failure of transboundary biodiversity conservation initiatives.

There is a need to further develop non-traditional research methods for environmental law. The science-based nature of environmental law means that the types of methods used are likely to differ from the methods needed for non-doctrinal scholarship in other areas of law. The findings of this research suggest the importance of integrated responses to transboundary management and the value of learning across sectors.

Climate change in combination with the continued growth of human populations will result in larger numbers of people placing greater stress on increasingly scarce resources. This work will potentially be of increasing significance as decision makers seek to adapt to climate change and manage natural resources across boundaries at all scales of political organization.

CONSOLIDATED LIST OF REFERENCES

A Articles/Books/Reports

- A-Khavari, A and Rothwell, Don 'The ICJ and the Danube Dam Case: A Missed Opportunity for International Environmental Law?' (1998) 22 *Melbourne University Law Review* 507
- Akhmadov KM et al., 'Effects of Grazing on Biodiversity, Productivity and Soil Erosion on Alpine Pastures in Tajik Mountains' in E M Spehn, M Liberman and C Körner *Land Use Change and Mountain Biodiversity* 239 (Taylor & Francis, 2006)
- Andersson, Krister P and Ostrom, Elinor, 'Analyzing Decentralized Resource Regimes from a Polycentric Perspective' (2008) 41 *Policy Science* 71
- Ardiansyah, Fitriani and Putri, Desak Putu Adhityani, *Risk and Resilience in Three Southeast Asian Cross-Border Areas: The Greater Mekong Subregion, the Heart of Borneo and the Coral Triangle*, (Asia Security Initiative Policy Series, 2011)
- Bammer, Gabriele, *Strengthening Interdisciplinary Research - What It Is, What It Does, How It Does It and How It Is Supported* (Australian Council of Learned Academies, 2012)
- Baas, Stephen *Pastoral Livestock Development in Central Asia* (FAO,1996)
- Barrett, Scott, *Environment and Statecraft: The Strategy Of Environmental Treaty-Making* (OUP, 2003)
- Badenkov, Yuri P, 'Sustainable Development of the Mountain Regions of the USSR. The Realities, the Role of Science, and Research Orientations ' (1990) Vol. 10(2) *Mountain Research and Development*, 129
- Badenoch, Nathan, *Transboundary Environmental Governance - Principles and Practice in Mainland Southeast Asia* (World Resources Institute, 2002)
- Baldwin, Elizabeth A. , 'Twenty-Five Years Under the Convention on Migratory Species: Migration Conservation Lessons from Europe' (2011) 41 *Environmental Law* 535
- Barrow, Edmund, Gichohi, Helen and Infield, Mark, *Summary and Key Lessons from a Comparative Review and Analysis of Community Conservation in East Africa* (IUCN, 2000)
- Bell, John, 'Legal Research and the Distinctiveness of Comparative Law' in Mark van Hoecke (ed), *Methodologies of Legal Research : What Kind of Method for What Kind of Discipline?* (European Academy of Legal Theory Series, 2011) 155
- Benvenisti, Eyal, 'Collective Action in the Utilization of Shared Freshwater: The Challenges of International Water Resources Law' (1996) 90 *The American Journal of International Law* 384
- Berg, Gail, 'Strategies and Actions for Improving Rangeland Management in Tajikistan - Final Report to CAWMP' (2009)

- Berkes, Fikret, 'Community-Based Conservation in a Globalized World' (2007) 102 *Proceedings of the National Academy of Sciences of the United States of America* 15188
- Beyerlin, U, 'Policies, Principles and Rules' in D. Bodansky, J. Brunnée and E. Hey (eds.), *The Oxford Handbook of International Environmental Law* (OUP 2007)
- BirdLife International, *Instituting Standardised Sustainable Biodiversity Monitoring in the Eastern Arc Mountains and coastal Forests of Kenya and Tanzania Region* (BirdLife Africa Partnership Secretariat, 2005)
- Birnie, Patricia W, Boyle, Alan E and Redgwell, Catherine, *International Law and the Environment* (OUP, 3rd ed., 2009)
- Blake, Gerald, 'The Depiction of International Boundaries on Topographic Maps ' (1995) *IBRU Boundary and Security Bulletin* 44
- Bodansky, Daniel, 'Customary (and Not So Customary) International Environmental Law' (1995) 3 *Indiana Journal of Global Legal Studies* 105
- Borgerhoff Mulder, Monique and Coppolillo, Peter, *Conservation: Linking Ecology, Economics, and Culture* (Princeton University Press, 2005)
- Bourne, C, Dissenting opinion on the Berlin Rules. Paper submitted to the International Law Association (2004)
- Bowman, Michael J, 'International Law and the Conservation of Biological Diversity in Mountain Ecosystems' in T Treves, L Pineschi and A Fodella (eds), *Sustainable Development of Mountain Areas - Legal Perspectives Beyond Rio and Johannesburg* (Giuffrè, 2004)
- Breckle S W and W Wucherer, 'Vegetation of the Pamir (Tajikistan): Land Use and Desertification Problems' in E M Spehn, M Liberman and C Körner, *Land Use Change and Mountain Biodiversity* (Taylor & Francis, 2006)
- Brels, Sabine, Coates, David and Loures, Flavia, *Transboundary Water Resources Management: The Role of International Watercourse Agreements in Implementation of the CBD* (CBD Technical Series No. 40, 2008)
- Breu, Thomas, Maselli, Daniel and Hurni, Hans, 'Knowledge for Sustainable Development in the Tajik Pamir Mountains' (2005) 25 *Mountain Research and Development* 139
- Breu, Thomas and Hurni, Hans, *The Tajik Pamirs - Challenges of Sustainable Development in an Isolated Mountain Region* (Centre for Development and Environment, 2003)
- Brosius, Peter J., Anna Lowenhaupt Tsing and Charles Zerner (eds), *Communities and Conservation: Histories and Politics of Community-Based Natural Resource Management* (AltaMira Press, 2005)

- Bronkhorst, Serge, *The Virunga Volacanoes and the Bwindi Impenetrable National Park: Cooperation in the Management of Shared Natural Resources and the Concept of Transboundary Protected Areas: Legal Analysis* (Institute for Environmental Security, 2005)
- Bruch, Carl and Elizabeth Mrema, 'UNEP Guidelines and Manual on Compliance with and Enforcement of Multilateral Environmental Agreements', (2005) 1 *Proceedings of the Seventh International Conference on Environmental Compliance and Enforcement* 1 (available at: www.inece.org/conference/7/vol1/MremaBruch.pdf)
- Brunnée, Jutta and Toope, Stephen J, 'Environmental Security and Freshwater Resources: Ecosystem Regime Building' (1997) 91 *American Journal of International Law* 26
- Burns, Kylie and Hutchinson, Terry C M, 'The Impact of 'Empirical Facts' on Legal Scholarship and Legal Research Training' (2009) 43 *The Law Teacher* 153
- Butchart, Stuart H M et al, 'Global Biodiversity: Indicators of Recent Declines' (2010) 328 *Science* 1164
- Caddell, Richard, 'International Law and the Protection of Migratory Wildlife: An Appraisal of Twenty-Five Years of the Bonn Convention' (2005) 16 *Colorado Journal of International Environmental Law and Policy* 113
- Chambers, W Bradnee, 'Towards an Improved Understanding of Legal Effectiveness of International Environmental Treaties' (2003-2004) 16 *Georgetown International Environmental Law Review* 501
- Chai, Paul P K and Manggil, Penguang, 'Thinking Outside the Box' (2003) 13 *ITTO Tropical Forest Update* 15
- Chai, Paul, (n.d.) *Cross-border Protection in Borneo: Sarawak (Malaysia) and Kalimantan (Indonesia)*
- Cherry, Nita, *Action Research: A Pathway to Action, Knowledge and Learning*, Qualitative Research Methods series (RMIT University Press, 1999)
- Childress et al., Rapid appraisal of land reform in the Kyrgyz Republic (Report ARD/Checchi Development of Commercial Law Project, 2007)
- Chun Hung, Lin, 'ASEAN Charter: Deeper Regional Integration under International Law?' (2010) 9 *Chinese Journal of International Law* 821
- Chynoweth, Paul, 'Legal Research' in Andrew Knight and Les Ruddock (eds), *Advanced Research Methods in the Built Environment* (Wiley- Blackwell, 2008)
- Cockerham, Geoffrey B, 'Regional Integration in ASEAN: Institutional Design and the ASEAN Way' (2010) 27 *East Asia* 165
- Cukwurah, A O, *The Settlement of Boundary Disputes in International Law* (Oceana Publications, 1967)

- Curran, L. M. et al, 'Lowland Forest Loss in Protected Areas of Indonesian Borneo' (2004) 303 *Science* 1000
- Dellapenna, Joseph W, 'The Customary International Law of Transboundary Fresh Waters' (2001) 1 *International Journal of Global Environmental Issues* 264
- DeSombre, Elizabeth, *The Global Environment and World Politics* (Continuum International Publishing Group, 2nd ed, 2007)
- Di Leva, Charles, 'Transboundary Management of Natural Resources : A Brief Overview of World Bank Policies and Projects' in Sharelle Hart (ed), *Shared Resources: Issues of Governance* (IUCN,2008)
- Dinar, Ariel et al, 'Case Study 4: The Aral Sea Basin' in Ariel Dinar et al (eds), *Bridges Over Water- Understanding Transboundary Water Conflict, Negotiation and Cooperation, World Scientific Series on Energy and Resource Economics* 3 (World Scientific Publishing, 2007) 291
- Eckstein, Gabriel E, 'Development of International Water Law and the UN Watercourse Convention' in Anthony Turton and Roland Henwood (eds), *Hydropolitics in the Developing World: A Southern African Perspective* (African Water Issues Research Unit, 2002)
- Elliott, Lorraine, 'ASEAN and Environmental Governance: Rethinking Networked Regionalism in Southeast Asia' (2011) 14 *Procedia Social and Behavioral Sciences* 61
- Esengulova, Nazgul, Japarov, Amuntur and Mamybetkov, Edil, 'Community Management of High-Alpine Grasslands in the Kyrgyz Republic: Social, Economic and Ecological Implications' (Paper presented at Governing Shared Resources: Connecting Local Experience to Global Challenges- The 12th Biennial Conference of the International Association for the Study of Commons, University of Gloucestershire, Cheltenham, July 14-18 2008)
- Farrington, J. D. 'De-development in Eastern The Kyrgyz Republic and Persistence of Semi-nomadic Livestock Herding' 9 *Nomadic Peoples* 171, (2005).
- Faure, Michael, Goodwin, Morag and Weber, Franziska, 'Bucking the Kuznets Curve: Designing Effective Environmental Regulation in Developing Countries' (2010) 51 *Virginia Journal of International Law* 95
- Fisher, Elizabeth et al, 'Maturity and Methodology: Starting a Debate About Environmental Law Scholarship' (2009) 21 *Journal of Environmental Law* 213
- Fodella, Alessandro and Pineschi, Laura, 'Environmental Protection and Sustainable Development of Mountain Areas' in T Treves, L Pineschi and A Fodella (eds), *International Law and Protection of Mountain Areas* (Giuffrè ,2002) 15
- Fuller, D. O., Jessup, T. C. and Salim, A., 'Loss of Forest Cover in Kalimantan, Indonesia, Since the 1997-1998 El Niño' (2004) 18 *Conservation Biology* 249

- Gareeva, Aida et al, *Natural Resource Management for Sustainable Livelihoods - Challenges and Trends in Central Asian Mountain Regions* (CAMP, 2008)
- Glowka, Lyle et al, *A Guide to the Convention on Biological Diversity*, Environmental Policy and Law Paper No. 30 (IUCN, 1994)
- Graham, John, Amos, Bruce and Plumptre, *Governance Principles for Protected Areas in the 21st Century* (Institute on Governance, 2003)
- Greenwood, Gregory, 'Why Mountains Matter', *IHDP Update - Magazine of the International Human Dimensions Programme on Global Environmental Change* (October 2008) 4
- Hammill, Anne, Crawford, Alec and Besançon, Charles, *Gorillas in the Midst: Assessing the Peace and Conflict Impacts of International Gorilla Conservation Programme (IGCP) Activities* (IISD, 2008)
- Hannah, Lee, 'A Global Conservation System for Climate-Change Adaptation' (2010) 24 *Conservation Biology* 70
- Harris, David J, 'The Law of Treaties' in *Cases and Materials on International Law* (Sweet & Maxwell, 7th ed, 2010)
- Harrop, Stuart R and Pritchard, Diana J, 'A Hard Instrument Goes Soft: The Implications of the Convention on Biological Diversity's Current Trajectory' (2011) 21 *Global Environmental Change* 474
- Heinen, Joel T., Shukurov, Emil and Sadykova, Chinara, 'Legislative and Policy Initiatives in Biodiversity Conservation in Kyrgyzstan' (2001) 42 *Post-Soviet Geography and Economics* 519
- Hitchner, Sarah L., 'Heart of Borneo as a 'Jalan Tikus': Exploring the Links Between Indigenous Rights, Extractive and Exploitative Industries, and Conservation at the World Congress 2008' (2010) 8 *Conservation and Society* 320
- Hoeck T, Breu T, Stillhardt B, Schwilch G, Herweg K, *Baseline Survey on Sustainable Land Management in the Pamirs* (Report for the United Nations University, 2007)
<http://www.palm.unu.edu/publication/Synthesis%20Reports>; accessed on 2 March 2008
- Hoffmann, Michael et al, 'The Impact of Conservation on the Status of the World's Vertebrates' (2010) 330 *Science* 1503
- Homewood, Katherine et al, 'Long-term Changes in Serengeti-Mara Wildebeest and Land Cover: Pastoralism, Population or Policies?' (2001) 98 *Proceedings of the National Academy of Sciences of the United States of America* 12544
- Howlett, Michael and Ramesh, M, 'Policy Evaluation: Policy Analysis and Policy Learning' in *Studying Public Policy - Policy Cycles and Policy Subsystems* (OUP, 2nd ed, 2003) 207
- Hutchinson, Terry C M, *Researching and Writing in Law* (Thomson Lawbook Co., 2nd ed, 2006)

- International Law Association Committee on the Law of Sustainable Development, Third Report (2008)
- Ives, Jack D, Messerli, Bruno and Spiess, Ernst, 'Mountains of the World - A Global Priority' in Jack D Ives and Bruno Messerli (eds), *Mountains of the World - A Global Priority* (Parthenon Publishing, 1997)
- Jacquesson, Sarah 'Reforming Pastoral Land Use In The Kyrgyz Republic: From Clan And Custom To Self-Government And Tradition' (2010) 29 *Central Asian Survey* 103
- Jick, Todd D, 'Mixing Qualitative and Quantitative Methods: Triangulation in Action' (1979) 24 *Administrative Science Quarterly* 602
- Katerere, Yemi, Hill, Ryan and Moyo, Sam, *A Critique of Transboundary Natural Resource Management in Southern Africa*, IUCN Series on Transboundary Natural Resource Management (IUCN, 2001)
- Kerven, Carol et al, 'Pastoralism and Farming in Central Asia's Mountains: A Research Review' (Mountain Societies Research Centre, University of Central Asia, 2011)
- Kilot, Nurit, Shumeli, Deborah and Shamir, Uri, 'Development of Institutional Frameworks for the Management of Transboundary Water Resources' (2001) 1 *International Journal of Global Environmental Issues* 306
- Kim, J.-O, Steiner, F and Mueller, E., 'Cranes, Crops and Conservation: Understanding Human Perceptions of Biodiversity Conservation in South Korea's Civilian Control Zone' (2011) 47 *Environmental Management* 1
- Koh, Kheng-Lian and Robinson, Nicholas A, 'Regional Environmental Governance: Examining the Association of Southeast Asian Nations (ASEAN) Model' in D.C. Esty and M.H. Ivanova (eds), *Global Environmental Governance: Options and Opportunities* (2002)
- Kohen, Marcelo G 'Is the Notion of Sovereignty Obsolete?' in Martin Pratt and Janet Allison Brown (eds), *Borderlands Under Stress*, International Boundary Studies Series (2000) 35
- Kliot, Nurit, 'Transborder Peace Parks: The Political Geography of Cooperation (and Conflict) in Borderlands' in Clive Schofield et al (eds), *The Razors Edge- Political Geography, International Law and International Boundaries* (Frank Cass, 2002) 407-438
- Kraska, James 'Sustainable Development is Security: the Role of Transboundary River Agreements as Confidence Building Measure (CBM) in South Asia' (2003) 28 *Yale Journal of International Law* 465
- Kunich, John Charles, 'Fiddling Around While the Hotspots Burn Out' (2001-2002) 14 *Georgetown International Environmental Law Review* 179
- Kyrgyz Ministry of Environmental Protection (MEP), 'Kyrgyz Republic Biodiversity Strategy and Action Plan' (November 1998) 7 < <http://www.cbd.int/doc/world/kg/kg-nbsap-01-en.pdf>>.

- Lake, P. Sam, Likens, Gene E and Ryder, Darren S, 'Integrating Science, Policy and Management of Rivers: Peter Cullen's Legacy' (2010) 61 *Marine and Freshwater Research* 733
- Lakes, Economic Commission for Europe - Convention on the Protection and Use of Transboundary Watercourses and International, River Basin Commissions and Other Institutions for Transboundary Water Cooperation - Capacity for Water Cooperation in Eastern Europe, Caucasus and Central Asia (2009)
- Langner, Andreas, Miettinen, Jukka and Siegert, Florian, 'Land Cover Change 2002-2005 in Borneo and the Role of Fire Derived from MODIS Imagery' (2007) 13 *Global Change Biology* 2329
- Laurance, William F, 'The Perils of Payoff: Corruption as a Threat to Global Biodiversity ' (2004) 19 *Trends in Ecology and Evolution* 399
- Lockwood, Michael et al, 'Governance Principles for Natural Resource Management', (2009) 23 *Society & Natural Resources* 1
- López-Hoffman, Laura et al, 'Ecosystem Services Across Borders: A Framework for Transboundary Conservation Policy' (2010) 8 *Frontiers in Ecology and the Environment* 84
- Lundquist, Carolyn J and Granek, Elise F, 'Strategies for Successful Marine Conservation: Integrating Socioeconomic, Political and Scientific Factors ' (2005) 19 *Conservation Biology* 1771
- Lynch, Owen J and Maggio, Gregory F, *Mountain Laws and Peoples: Moving Towards Sustainable Development and Recognition of Community-Based Property Rights: A General Overview of Mountain Laws and Policies with Insights from the Mountain Forums's Electronic Conference on Mountain Policy and Law* (Centre for International Environmental Law, 2000)
- Majchrzak, Ann, 'Focus of Information Inquiry' in *Methods for Policy Research* (Sage, 1984) 24
- Malaysia, Paper from Malaysia: Institutional Arrangement for HoB, *Report of the 2nd Heart of Borneo Trilateral Meeting (4-5 April 2008, Pontianak, Indonesia)*
- Martin, Adrian et al, 'Linking development interventions to conservation: perspectives from partners in the International Gorilla Conservation Programme' (2011) 24 *Society and Natural Resources* 626
- Martin, Adrian et al, 'Understanding the co-existence of conflict and cooperation: Transboundary ecosystem management in the Virunga Massif' (2011) 48 *Journal of Peace Research* 621
- Martin, Paul V et al, *Developing a Good Regulatory Practice Model for Environmental Regulations Impacting on Farmers* (Australian Farm Institute, 2007)
- Matisoff, Daniel C, 'Are International Environmental Agreements Enforceable? Implications for Institutional Design ' (2010) 10 *International Environmental Agreements* 165

- McCaffery, Stephen C, 'The Obligation to Utilize an International Watercourse in an Equitable and Reasonable Manner' in Stephen C McCaffery (ed), *The Law of International Watercourses* (OUP, 2001)
- McCrudden, Christopher, 'Legal Research and the Social Sciences' (2006) 122 *Law Quarterly Review* 632
- Mulligan, Martin and Nadarajah, Yaso, 'Working on the Sustainability of Local Communities with a "Community-Engaged" Research Methodology' (2008) 13 *Local Environment* 81
- McKinney, Daene C. 'Cooperative Management of Transboundary Water Resources in Central Asia' in D Burghart and T Sabonis-Helf (eds), *In the Tracks of Tamerlane- Central Asia's Path into the 21st Century* (National Defence University Press, 2003) 187
- McIntyre, Owen, *Environmental Protection of International Watercourses Under International Law* (Ashgate Publishing, 2007)
- McIntyre, Owen, 'The Role of Customary Rules and Principles of International Environmental Law and the Protection of Shared International Freshwater Resources' (2006) 46 *Natural Resources Journal* 157
- Megoran, Nick, 'For Ethnography in Political Geography: Experiencing and Re-imagining Ferghana Valley Boundary Closures' (2006) 25 *Political Geography* 622
- Menzies, Nicholas K, "'Nice View Up There" : Discordant Visions and Unequal Relations Between the Mountains and the Lowlands' (Paper presented at the Landscapes of Diversity : Indigenous Knowledge, Sustainable Livelihoods and Resource Governance in Montane Mainland Southeast Asia, Proceedings of the III Symposium on MMSEA 25-28 August 2002, Lijian, P.R. China, 2003)
- Mercado, A.R., M. Patindol, M. and D. P. Garrity The Landcare Experience in the Philippines: Technical and Institutional for Conservation Farming, *International Landcare Conference*, March 2000, Melbourne, Australia
- Miettinen, Jukka, Shi, Chenghua and Liew, Soo Chin, 'Deforestation Rates in Insular Southeast Asia Between 2000 and 2010' (2011) 17 *Global Change Biology* 2261
- Millennium Ecosystem Assessment, 'Ecosystems and Human Well-being: Biodiversity Synthesis' (Island Press, 2005)
- Millennium Ecosystem Assessment, 'Mountain Systems' in Rashid Hassan, Robert Scholes and Neville Ash (eds), *Ecosystems and Human Well-being : Current State and Trends : Findings of the Condition and Trends Working Group* (2005) 681
- Mohamed-Katerere, Jennifer, *Review of the Legal and Policy Framework for Transboundary Natural Resource Management in Southern Africa*, Paper 1 - IUCN-ROSA Series on Transboundary Natural Resources Management (IUCN ROSA, 2001)

- Movchan, Yaroslav, 'Transboundary Protected Areas: Issues for Consideration' in *Biodiversity Issues for Consideration in the Planning, Establishment and Management of Protected Area Sites and Networks* (2004) CBD Technical Series no. 15, 82
- Murphree, Marshall W, *Communities as Resource Management Institutions* (IIED, 1991)
- Naidoo, Robin, Malcolm, Trent and Tomasek, Adam, 'Economic Benefits of Standing Forests in Highland Areas of Borneo: Quantification and Policy Impacts' (2009) 2 *Conservation Letters* 35
- Nelson, Fred, *Emergent or Illusory? Community Wildlife Management in Tanzania* (IIED, 2007)
- Nollkaemper, André The Contribution of the International Law Commission to International Water Law: Does it Reverse the Flight From Substance? (1996) *XXVII Netherlands Yearbook of International Law* 39
- Obidzinski, K, Andrianto, A. and Wijaya, C., 'Cross-border Timber Trade in Indonesia: Critical or Overstated Problem? Forest Governance Lessons from Kalimantan' (2007) 9 *International Forestry Review* 526
- Olsen, Wendy, 'Triangulation in Social Research : Quantitative and Qualitative Methods Can Really Be Mixed' in M Holborn (ed), *Developments in Sociology* (Causeway Press, 2004)
- Persoon, Gerard A and Osseweijer, Manon (eds), *Reflections on the Heart of Borneo*, Tropendos Series 24 (2008)
- Pimbert, M. P. & Pretty, J.N. *Diversity and Sustainability in Community Based Conservation*, UNESCO-IIPA regional workshop on Community-based Conservation, India (1997)
- Polat, Necati, *Boundary Issues in Central Asia* (Transnational Publishers, 2002)
- Prescott, Victor and Triggs, Gillian, *International Frontiers and Boundaries - Law, Politics and Geography* (Martinus Nijhof, 2008)
- Pressman, Jeffrey L and Aaron B Wildavsky, *Implementation: How Great Expectations in Washington are Dashed in Oakland* (University of California Press, 3rd ed, 1984)
- Price, Martin F et al (eds), *Mountains of the World: Sustainable Development in Mountain Areas - The Need for Adequate Policies and Instruments* (Centre of Development and Environment, 2002)
- Prior, Julian 'Regional Landcare Networks in Australia: Lessons Learnt of Relevance to South Africa', *South African National LandCare Conference, Stellenbosch, 7-9th September 2004*
- Prior, Julian and Holt, Richard, 'Tools for International Landcare- Lessons Learnt From South Africa and Australia' (Paper presented at the International Landcare Conference, Melbourne, Australia, 8 - 11 October 2006)
- Proceedings "Heart of Borneo: Three Countries, One Conservation Vision" Workshop (Brunei Darussalam, 5th- 6th April 2005)

- Pushkina, Darya, 'EU Crisis Management Role in Water Conflict in Central Asia: Open Opportunities or Lost Causes?' (2009) 105 *Historical Processes and Peace Politics* 7
- Rakhmatullaev, Shavkat et al, 'Facts and Perspectives of Water Reservoirs in Central Asia: A Special Focus on Uzbekistan' (2009) 2 *Water* 1
- Rands, M. R. W. et al, 'Biodiversity Conservation: Challenges Beyond 2010' (2010) 329 *Science* 1298
- Ratner, Steven R, 'Drawing a Better Line: Uti Possideti and the Borders of New States' (1996) 90 *American Journal of International Law* 590
- Rautner, Mario, 'Borneo: Treasure Island at Risk - Status of Forest, Wildlife and Related Threats on the Island of Borneo' (WWF, 2005)
- Reid, Hannah and Swiderska, Krystyna, Biodiversity, *Climate Change and Poverty: Exploring the Links* (IIED, 2008)
- Republic of Tajikistan, 'National Strategy and Action Plan on Conservation and Sustainable Use of Biodiversity' (2003) 31. <<http://www.cbd.int/doc/world/tj/tj-nbsap-01-p01-en.pdf>>
- Ricklefs, Robert E., *The Economy of Nature* (W.H. Freeman, 5th ed, 2001)
- Robinson, Sarah, Safaraliev, Gulomkodir and Muzofirshoev, Nodalieb, 'Carrying Capacity of Pasture and Fodder Resources in the Tajik Pamirs' (Food and Agriculture Organization (FAO), 2010)
- Robinson, Sarah et al, 'The Impact of Land-Reform Legislation on Pasture Tenure in Gorno-Badkhsan : From Common Resource to Private Property?' (2010) 30 *Mountain Research and Development* 4.
- Roe, Dilys et al, *Local Action, Global Aspirations: The Role of Community Conservation in Achieving International Goals for Environment and Development*, Natural Resource Issues Series No.4 (2006)
- Roll, Gulnara et al, 'Aral Sea- Experiences and Lessons Learned Brief ' (IW: Science, United Nations University-Institute for Water, Environment and Health (UNU-INWEH), 2006)
- Rummel-Bulska, Iwona, 'Experiences in Negotiating Transboundary Agreements ' in Sharelle Hart (ed), *Shared Resources: Issues of Governance* (IUCN, 2008)
- Ryder, Darren S et al, 'Defining and Using 'Best Available Science': a Policy Conundrum for the Management of Aquatic Ecosystems' (2010) 61 *Marine and Freshwater Research* 821
- Salman, Salman MA, 'The Helsinki Rules, the UN Watercourses Convention and the Berlin Rules: Perspectives on International Water Law' (2007) 23 *Water Resources Development* 625
- Sand, Peter H, 'The Evolution of Transnational Environmental Law : Four Cases in Historical Perspective' (2012) 1 *Transnational Environmental Law* 183

- Sandwith, Trevor and Besançon, Charles, *Trade-offs Among Multiple Goals for Transboundary Conservation* (Draft) (2005)
<http://www.wilsoncenter.org/events/docs/Besancon_Sandwith.pdf> at 14 April 2009
- Sandwith, Trevor et al, *Transboundary Protected Areas for Peace and Co-operation*, Best Practice Protected Area Guidelines Series No. 7 (IUCN-WCPA, 2001)
- Schoch, N et al., 'Migration and Animal Husbandary: Competing or Complementary Livelihood Strategies. Evidence from Kyrgyzstan' (2010) 34 *Natural Resources Forum* 211
- Scovronick, Noah C and Turpie, Jane K, 'Is Enhanced Tourism a Reasonable Expectation for Transboundary Conservation? An Evaluation of the Kgalagadi Transfrontier Park' (2009) 36 *Environmental Conservation* 149
- Secretariat of the Convention on Biological Diversity, *Biodiversity Issues for Consideration in the Planning, Establishment and Management of Protected Area Sites and Networks*, CBD Technical Series no. 15 (2004)
- Secretariat of the Convention on Biological Diversity, *Global Biodiversity Outlook 3* (2010)
- Shanazarov, A.S. et al, 'Strategy and Action Plan for Sustainable Land Management in the High-Pamir and Pamir-Alai Mountains' (GEF/UNEP/UNU Project "Sustainable Land Management in the High Pamir and Pamir-Alai Mountains – Integrated and Transboundary Initiative in Central Asia", 2011)
- Shaw, Malcom N, 'Territory' in *International Law* (Cambridge University Press, 6th ed, 2008) 487
- Shelton, Dinah, 'International Cooperation on Shared Natural Resources' in Sharelle Hart (ed), *Shared Resources: Issues of Governance* (IUCN, 2008)
- Sievers, Eric W, 'Water, Conflict and Regional Security in Central Asia' (2002) 10 *New York University Environmental Law Journal* 356
- Shigaeva, Jyldyz et al, 'Livelihoods in Transition: Changling Land Use Strategies and Ecological Implications in a Post-Soviet Setting (Kyrgyzstan)' (2007) 26 *Central Asian Survey* 389
- Shine, Clare, 'Legal Mechanisms to Strengthen and Safeguard Transboundary Protected Areas' (Paper presented at the Parks for Peace- International Conference on Transboundary Protected Areas as a Vehicle for International Cooperation, Somerset West, South Africa, 16-18 September 1997)
- Singh, Jaidev ('Jay'), *Study on the Development of Transboundary Natural Resource Management Areas in Southern Africa - Global Review: Lessons Learned* (1999)
- Singleton-Cambage, Krista, 'Note and Comment: International Legal Sources and Global Environmental Crises: The Inadequacy of Principles, Treaties and Custom' (1995) 2 *ILSA Journal of International and Comparative Law* 171

- Small, Stephen A and Uttal, Lynet, 'Action-Oriented Research : Strategies for Engaged Scholarship' (2005) *Journal of Marriage and Family* 936.
- Smith, Joyatee et al, 'Illegal Logging, Collusive Corruption and Fragmented Governments in Kalimantan, Indonesia' (2003) 5 *International Forestry Review* 293
- Sodhi, Navjot S. et al, 'The State and Conservation of Southeast Asian Biodiversity' (2010) 19 *Biodiversity and Conservation* 317
- Spoor, Max, *Agricultural Restructuring and Trends in Rural Inequalities in Central Asia - A Socio-Statistical Survey* (United Nations Research Institute of Social Development, 2004)
- Steimann, Bernd, *Making a Living in Uncertainty. Agro-Pastoral Livelihoods and Institutional Transformations in Post-Socialist Rural Kyrgyzstan* University of Zürich, 2010)
- Stephens, Tim, 'Sustainability Discourses in International Courts: What Place for Global Justice' in Duncan French (ed), *Global Justice and Sustainable Development* (Martinus Nijhoff, 2010) 39
- Taneja, B & Koziell, I, *Biological Diversity - More Debate than Action* (IIED, 2001)
- Tarlock, A Dan, 'Is There a There There in Environmental Law?' (2004) 19 *Journal of Land Use* 213
- Tarlock, A Dan 'Changing Currents: Perspectives on the State of Water Law and Policy in the 21st Century: Four Challenges of International Water Law' (2010) 23 *Tulane Environmental Law Journal* 369
- Thompson, I and Christopher, T, *Cross-Sectoral Toolkit for the Conservation and Sustainable Management of Forest Biodiversity* (Secretariat of the Convention on Biological Diversity, 2008)
- Thorsell, Jim (ed), *Parks on the Borderline: Experience in Transfrontier Conservation*, IUCN Protected Area Programme Series No.1 (1990)
- Tight, Malcolm, 'The Curious Case of Case Study: A Viewpoint' (2010) 13 *International Journal of Social Research Methodology* 329
- Tinker, Catherine, 'Is a United Nations Convention the Most Appropriate Means to Pursue the Goal of Biological Diversity: Responsibility for Biological Diversity Conservation Under International Law' (1995) 28 *Vanderbilt Journal of Transnational Law* 777
- Tolentino, Amado S., 'A Call for a Legal Regime on Transborder Parks' (2001) 2 *International Review for Environmental Strategies* 43
- TRAFFIC, 'Heart of Borneo Judiciary Workshop on Wildlife Crime - Report Summary' (TRAFFIC - SEA, 2009).
- Trombitcaia, Iulia et al, 'River Basin Commissions and Other Institutions for Transboundary Water Cooperation - Capacity for Water Cooperation in Eastern Europe, Caucasus and Central Asia ' (Economic Commission for Europe - Convention on the Protection and Use of Transboundary Watercourses and International Lakes, United Nations, 2009)

- Trouwborst, Arie, 'Conserving European Biodiversity in a Changing Climate: The Bern Convention, The European Union Birds and Habitats Directives and the Adaptation of Nature to Climate Change' (2011) 20 *Review of European Community and International Environmental Law* 62
- Trouwborst, Arie, 'The Precautionary Principle in General International Law: Combating the Babylonian Confusion' (2007) 16 *Review of European Community and International Environmental Law* 185
- United Nations Economic Commission for Europe, Convention on the Protection and Use of Transboundary Watercourses and International Lakes, Guidance on Water and Adaptation to Climate Change 15, U.N. Doc. ECE/MP.WAT/30, U.N. Sales No. 09.II.E.14 (2009)
- UNEP, *Atlas of International Freshwater Agreements* (2002)
- United Nations Environment Programme (UNEP) *Africa: Atlas of Our Changing Environment* (Division of Early Warning and Assessment (DEWA), UNEP, 2008)
- UNEP, Full Project Brief: Sustainable Land Management in the High Pamir and Pamir-Alai Mountains - an Integrated and Transboundary Initiative in Central Asia, United Nations Environment Programme- Global Environment Facility
- University of New England, Australian Centre for Agriculture and Law, *Training Manual- Additional Training Workshop for Legal Task Forces. GEF/UNEP/UNU Project : Sustainable Land Management in the High Pamir and Pamir-Alai Mountains (PALM project)* (2010)
- Utton, Albert E, 'Which Rule Should Prevail in International Water Disputes: That of Reasonableness or that of No Harm?' (1996) 36 *Natural Resources Journal* 635
- van Amerom, Marloes, 'National Sovereignty & Transboundary Protected Areas in Southern Africa' (2002) 58 *GeoJournal* 265
- van der Keur, Peter et al, 'Identification of Major Sources of Uncertainty in Current IWRM Practice. Illustrated for the Rhine Basin, '(2008) 22 *Water Resources Management*
- van der Linde, Harry et al, *Beyond Boundaries: Transboundary Natural Resource Management in Sub-Saharan Africa* (Biodiversity Support Programme, 2001)
- Vermeulen, Sonja, *Biodiversity Planning: Why and How Should Local Opinions Matter?* , Gatekeeper Series No. 115 (IIED, 2004)
- Vinogradov, Sergei and Langford, Vance P.E., 'Managing Transboundary Water Resources in the Aral Sea Basin: in Search of a Solution' (2001) 1 *International Journal of Global Environmental Issues* 345
- Vollmer, Ruth et al, *Institutional Capacity Development in Transboundary Water Management* (UNESCO, 2009)
- Walker, Brian, 'Conserving Biological Diversity through Ecosystem Resilience ' (1995) 9 *Conservation Biology* 747

- Wegerich, Kai, 'Water Resources in Central Asia: Regional Stability or Patchy Make-up' (2011) 30 *Central Asian Survey* 275
- Westing, Andrew H, 'Establishment and Management of Transfrontier Reserves for Conflict Prevention and Confidence Building' (1998) 19 *Environmental Conservation* 91
- Wiens, John. A. & Dominique Bachelet, *Matching the Multiple Scales of Conservation with the Multiple Scales of Climate Change* (2010) 24 *Conservation Biology* 51
- Whitton, Mark et al, 'Pasture Management and Condition in Gorno-Badakhshan: A Case Study' (Commissioned for the Mountain Societies Development Support Programme with financial support from The Education Dairy and Nutrition Programme (EDNP phase III), 2007)
- Wilson, R T 'Livestock, Pastures and the Environment in the Kyrgyz Republic, Central Asia' 17 *Mountain Research and Development* 57 (1997)
- Wolf, A.T. *Conflict and Cooperation Along International Waterways* (1998) 1 *Water Policy* 251
- Wolf, Aaron T, 'Transboundary Waters: Sharing Benefits, Lessons Learned' (Paper presented at the International Conference on Freshwater, Bonn, 2001)
- Wolf, Frieder, 'Enlightened Eclecticism or Hazardous Hotchpotch? Mixed Methods and Triangulation Strategies in Comparative Public Policy Research ' (2010) 4 *Journal of Mixed Methods Research* 144
- Worboys, Graeme L, 'The 2008 Mountain Transboundary Protected Area and Connectivity Conservation Workshop' (IUCN World Commission on Protected Areas (WCPA), 2008)
- World Commission on Environment and Development, *Our Common Future* (1987) UN Doc A/42/427 (4 August 1987)
- WWF, *A Partnership Approach to Economic Sustainability- Financing the Heart of Borneo* (WWF, 2011).
- Xue, Hanqin, *Transboundary Damage in International Law* (Cambridge University Press, 2003)
- Zbicz, Dorothy C, 'Imposing Transboundary Conservation: Cooperation Between Internationally Adjoining Protected Areas' in Uromi Manage Goodale et al (eds), *Transboundary Protected Areas - The Viability of Regional Conservation Strategies* (2003) 21
- Zbicz, Dorothy C, 'The "Nature" of Transboundary Cooperation' (1999) *Environment* 15
- Zbicz, Dorothy C and Green, Michael J B, 'Status of the World's Transfrontier Protected Areas' (Paper presented at the Parks for Peace -International Conference on Transboundary Protected Areas as a Vehicle for International Co-operation, 1997)

B Cases

Corfu Channel Case (UK v Albania) (Merits) [1949] ICJ Rep 4

Frontier Dispute (Burkina Faso v Mali) (1986) ICJ 554

Island of Palmas Case (Netherlands v US) (1928) 2 RIAA 829

Legality of the Threat or Use of Nuclear Weapons (Advisory Opinion) (1996) ICJ Rep 226.

North Atlantic Coast Fisheries Case (UK v US) (1910) RIAA 11, 180

SS "Lotus" (France v Turkey) (Judgment) PCIJ Rep Series A No 10, 3.

SS "Wimbledon" (France, UK, Italy, Japan v Federal Republic of Germany), (Judgment) PCIJ Rep Series A No 1.

Temple of Preah Vihear (Cambodia v Thailand) (1962) ICJ Rep 2, 6, 3

Territorial Dispute (Libyan Arab Jamahiriya v Chad) (1994) ICJ Rep 6

Trail Smelter Arbitration (US v Canada) (1938, 1941) 3 RIAA 1905, 1965.

C Legislation

Forest Code of the Kyrgyz Republic (The Kyrgyz Republic, No. 66, 8 July 1999).

Land Code of the Kyrgyz Republic (Law of the Kyrgyz Republic, No. 10, 25 June 1999).

Land Code of the Republic of Tajikistan (Republic of Tajikistan Law No. 23 as of 28 February 2004)

Law of the Kyrgyz Republic 'on pastures' (The Kyrgyz Republic, No. 30, 26 January 2009).

Law of the The Kyrgyz Republic 'on Mountain territories' (The Kyrgyz Republic, No. 151, 1 November 2002).

Tajik Law 'on Dehkan Farms' (Republic of Tajikistan Law No. 48 as of 23 April 2002).

D Treaties/Declarations/Memoranda of Understanding/COP Decisions/UNGA Resolutions

African Convention on the Conservation of Nature and Natural Resources (adopted 15 September 1968, entered into force 16 June 1969) 1001UNTS 3

Agreement on Basic Intergovernmental Relations between Republic of Tajikistan and Kyrgyz Republic (signed and entered into force 12 July 1996), 2015 UNTS 139.

Agreement Between the Governments of the Republic of Kazakhstan, the Kyrgyz Republic, and the Republic of Uzbekistan on the Use of Water and Energy Resources of the Syr Darya Basin, signed 17 March 1998 <<http://ocid.nacse.org/tfdd/tfdddocs/591ENG.pdf>> .

Agreement on Cooperation in the Field of Joint Water Resources Management and Conservation of Interstate Sources ('Almaty Agreement'), (signed and entered into force 18 February 1992)

Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and Contiguous Atlantic Area, Oct. 22-25, 2007, Dubrovnik, Croat., Report of the Third Meeting of the Contracting Parties to ACCOMBAMS, at 3, 9, 96, available at http://www.accobams.org/index.php?option=comdocman&task=doc_download&gid=45&Itemid=50. See Baldwin, n.99 above, 559-60.

ASEAN Declaration, 8 August 1967

Berlin Rules on Water Resources, International Law Association Berlin Conference (2004)

CBD–COP6, 2002. Decision VI/26. Mission.

Charter of the Association of Southeast Asian Nations, ('ASEAN Charter') opened for signature 20 November 2007, (entered into force 15 December 2008), art. 1 (1), (2), (6), (8), <http://www.aseansec.org/AC.htm>

Convention on Biological Diversity (adopted 4 June 1993, entered into force 29 December 1993) 1760 UNTS 142

Convention on Biological Diversity, Conference of the Parties, Ecosystem Approach, UNEP/CBD/COP/5/6 (2000)

Convention on Biological Diversity, Conference of the Parties, Ecosystem Approach, UNEP/CBD/COP/7/11 (2004) (2004).

Convention on Biological Diversity, Conference of the Parties, Mountain Biological Diversity, UNEP/CBD/COP/7/27 (2004), Annex- Programme of Work on Mountain Biodiversity

Convention on European Wildlife and Natural Habitats (adopted 1 September 1979, entered into force 1 June 1982) 9 ETS No. 104

Convention on Nature Protection and Wildlife Preservation in the Western Hemisphere (adopted 12 October 1940, entered into force 1 May 1942) 161 UNTS 193

Convention on International Trade in Endangered Species, adopted 3 March 1973, entered into force 1 July 1975) 993 UNTS 14537

Convention on the Conservation of Migratory Species of Wild Animals (adopted 23 June 23 1979, entered into force 1 November 1983) 1651 UNTS 28395

Convention on the Non-navigational Uses of International Watercourses, adopted by the U.N. General Assembly & open to signature May 21 1997, U.N. Doc. No A 51/189 (Treaty not yet in force).

Convention on the Protection of the Alps, opened for signature 7 November 1991, 1917 UNTS 315, (entered into force March 1995)

Convention on the Rights and Duties of States (adopted Dec. 26 1933) 3802 LNTS 21 Art 1(b)

Convention Relative to the Preservation of Flora and Fauna in their Natural State adopted 8 November 1933, entered into force 14 January 1936) 172 LNTS 241

Convention on Wetlands of International Importance Especially as Waterfowl Habitat (adopted 2 February 1971, entered into force 21 December 1975) 996 UNTS 14583

COP10 Decision X/2, 'The Strategic Plan for Biodiversity 2011-2020', presented as an annex to the decision paper. Available at < <http://www.cbd.int/cop10/doc/>>.

Declaration on the Heart of Borneo Initiative, 12 February 2007, Brunei Darussalam - Republic of Indonesia - Malaysia.

Declaration on Environment and Development, in Report of the United Nations on Environment and Development (12 August 1992) UN Doc. A/CONF.151/26 (Vol. I)

Helsinki Rules on the Uses of the Waters of International Rivers, adopted by the International Law Association at the fifty-second conference, held at Helsinki in August 1966. Report of the Committee on the Uses of the Waters of International Rivers [hereinafter Helsinki Rules] (London, Int'l Law Association, 1967)

'Heart of Borneo - Strategic Plan of Action' (2008).

ILC's Draft Articles on Responsibility of States for Internationally Wrongful Acts (UNGA 'Draft Articles on Responsibility of States for Internationally Wrongful Acts' Report of the International Law Commission on its fifty-third session, UN GAOR 56th Session Supp No 10 (A/Res/56/10) (Nov.2001) ('ILC Draft Articles')

International Convention for the Regulation of Whaling (adopted 2 December 1946, entered into force 10 November 1948) 161 UNTS 72

International Convention for the Protection of Birds, adopted 18 October 1950) 638 UNTS186

Johannesburg Declaration on Sustainable Development, UN Doc. A/Conf.199/L.6/Rev.2 (2002).

Johannesburg Plan of Implementation of the World Summit for Sustainable Development, U.N. Doc. A/Conf.199/20 (2002).

Memorandum of Understanding on the Joint implementation of the Strategy on Sustainable Land Management in the High Pamir and Pamir-Alai Mountains and Action Plan, (15 February 2011).

Memorandum of Understanding Concerning Conservation Measures for Marine Turtles of the Atlantic Coast of Africa, May 6-9, 2002, Nairobi, Kenya,

Nukus Declaration Among the Heads of States Of Central Asia to Provide All Possible Assistance And Extend Trust to the Organizations Of The International Aral Sea Fund, signed 20 September 1995. Nukus, Uzbekistan, Kazakhstan- Tajikistan, Kyrgyz Republic, Uzbekistan- Turkmenistan.

Paris Declaration on Aid Effectiveness(2005)

Plan of Implementation of the World Summit of Sustainable Development, United Nations Department of Economic and Social Affairs (2002), [42], 25.

Resolution on the Status of Preparation for the International Year of Mountains, 2002, GA Res 189, UN GAOR, 55th sess, 87th plen mtg, UN Doc A/RES/55/189 (2000)

Resolution on the Sustainable Development in Mountain Regions, GA Res 216, UN GAOR, 58th sess, 78th plen mtg, UN Doc A/RES/58/216(2003)[3], 2; Sustainable Mountain Development: Report of the Secretary-General, UN GAOR, 62nd sess, UN Doc A/62/292 (2007)

Resolution on Sustainable Mountain Development, GA Res 196, UN GAOR, 62nd sess, 78th plen mtg, UN Doc A/RES/62/196 (2007).

The Future We Want- Rio+20 Outcome Document, UN Doc A/CONF.216/L.1 (2012).

United Nations Framework Convention on Climate Change, opened for signature 9 May 1992, 1771 UNTS 107, preamble (entered into force 21 March 1994).

United Nations Convention of the Law of the Sea (adopted 10 December 1982, entered into force 14 November 1994) 21 ILM 1261

United Nations General Assembly (UNGA) ‘Recommendations Concerning International Respect for the Right of Peoples and Nations to Self-Determination’ UNGA Res 1314 (12 Dec 1958), GAOR 13th Session, UN Doc A/RES/ 1314

UNGA, ‘Permanent Sovereignty Over Natural Resources’ UNGA Res 1803 (14 December 1962) UN Doc A/RES/1194

UNGA ‘Permanent Sovereignty Over Natural Resources of Developing Countries’ UNGA Res (18 December 1972) GAOR, 27th Session UN Doc A/ 3016.

Vienna Convention on the Law of Treaties, open for signature 23 May 1969, 1155 UNTS 33, (entered into force 27 January 1980)

E Websites

Pachova, N., H. Förster, et al. ‘Energy Crisis in the Pamir Mountains’ (January 15 2010) from <http://ourworld.unu.edu/en/highland-people-struggle-to-fuel-their-lives/>.

F Radio Program

Eugene Huskey, Kyrgyzstan: An Island of Democracy , Rear Vision (ABC Radio National Broadcast July 21, 2010), <<http://www.abc.net.au/rn/rearvision/stories/2010/2958901.htm>> accessed 21 July 2010)