4th Oxford Desert Conference

University of Oxford
School of Geography and the Environment
8-9 June 2017

*"What makes the **desert** beautiful is that somewhere it hides a well."*
-Antoine de Saint-Exupery

E·S·R·C ECONOMIC & SOCIAL RESEARCH COUNCIL

SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT

UNIVERSITY OF OXFORD

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SCHOOL OF GEOGRAPHY AND THE ENVIRONMENT

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Dear Researcher,

Welcome to the 4th Interdisciplinary Oxford Desert Conference!

The first Desert Conference at the School in 2010 emerged from a meeting of researchers at St. Cross College. We realized that scholars who work on desert-related issues are widely dispersed and often placed academically on one side of the social and physical science divide. The first conference was an effort to overcome challenges to collaboration and find ways to strengthen links between researchers in the physical and social sciences.

Since 2010, two edited volumes have emerged from this effort. *Changing Deserts: Integrating People and their Environment* was published in 2012. This year, *Pastoralist Livelihoods in Asian Drylands: Environment, Governance and Risk* was published by the White Horse Press and represents the work of scholars across the drylands of the Middle East, South Asia and Inner Asia who participated in the Desert Conference in 2015. This year, we have established a special issue in the journal Land on *Arid land systems, sciences and societies* in order to further promote interdisciplinary collaboration and ensure impact from the conference events. Please consider submission to this journal after the conference.

This year, we remain committed to continuing to develop the network of desert researchers and finding new ways to work on enduring themes and research problems. Migration, land tenure governance, development, extractive industries, health, pastoralist societies, dust, water, geomorphology and climate change are the broad categories of research represented by panelists in 2017. In this regard, we aim to provide an open forum to discuss dryland issues and further research in a number of fields.

In this booklet, you will find:

- Programme at a glance
- Abstracts of presentations
- Participant bios and research interests
- A note on conference bags

Thank you for your participation. If you have any questions, just find one of the organizers or volunteers and we will help you as best as we can. We hope that you will enjoy the conference and your stay in Oxford.

Best wishes,

Oxford Conference Team

SCHEDULE

8 June 2017

8:45 **Registration and Coffee** [Herbertson Room]]

10:00 **Welcome** [Gottmann Room]

10:15 **Opening Panel: Desert Themes for 2017** [Gottmann Room]

Speakers: Dawn Chatty, *Emerita Professor of Anthropology and Forced Migration*
Daniel Morchain, *Global Advisor, Climate Change Adaptation, Oxfam*
Richard Walker, *Professor of Tectonics, Oxford Earth Sciences*

11:00 **Tea break** [Herbertson Room]

11:30 **Talks** [Gottmann Room]

Chair: Troy Sternberg

What Attracts FDI to Different Sectors-A longitudinal study of economic sectors of three oil-rich countries
Emilya Lazarova

Neolithic Hydro-Social and Geomorphical Landscape Dynamics in the Gobi Desert
Leah Holguin

Settling the desert: narratives of nomadic pacification and sedentarisation in Jordan
Frederick Wojnarowski

Socio-ecological change in the Turkana Basin: A Synthesis of Current Developments
Jed Stevenson

12:30 **Lunch** [Herbertson Room]

13:15 **Knowledge Exchange Panel: Contextualising risk in deserts: disasters, marginality and policy** [Gottmann Room]

Chair: Allison Hahn

Forecast-based Financing: using early warnings to act early in anticipation of Dzud in Mongolia
Meghan Bailey

New vulnerabilities of Mongolian herders: the case of indebtedness and further perspectives of research
Quentin Moreau

Implementation of a new dzud risk map
Shinoda Masato

Order OR stability? Working with pastoral systems in a 'messy' world
Saverio Krätli

Combined responses to social and ecological uncertainty among pastoralists in Mongolia
Eric Thrift

14:15 **Innovations in Research** [Gottmann Room]

Virtual Reality at the Radcliff Science Library
Oliver Bridle and Team

Intro to Research in Russian and Kazakhstan
Anton Ikhsanov and Aizhan Smailova

14:45 **Tea Break** [Herbertson Room]

15:15 **Talks** [Gottmann Room]

Health in Deserts [Gottman Room]

Chair:
Kaleem
Hawa

Extending dryland disaster science to health science
Masato Shinoda

One Health: linking human and animal health to rangeland ecology in southern Ethiopia
Nikolaus Kuhn

Dust storms from degraded drylands of Asia: Dynamics and health impact
Shinji Otani

Animal Husbandry and Livestock Health in Mongolia
Badgar Battsetseg

Field Report on Gobi Disease, South Gobi Desert
Adrian Mylne

Water & Extraction Industries [Beckit Room]

Chair: Ariell Ahearn

An analysis of potential for enhanced decoupling of water resources in the Jordan Basin Region
Michael Gilmont

Desert Visibilities: Seeing the Political Economy of Mining in the Mongolian Gobi
Lauren Bonilla

Water Risk Management and Sharing Resource Prosperity in the South Gobi Desert
Caitlin McElroy

Walking with the Himba: leveraging pastoralism in frontier land
Linda Pappagallo

International Research on Asian Dust and Environmental Regime Shift
Kai Kenji

16.30 **Tea break** [Herbertson Room]

17:00 **Desert Conference Book Launches** [Gottmann Room]
Discussant: Saverio Krätli
Climate Hazards Crises in Asian Societies and Environments
Pastoralist Livelihoods in Asian Drylands
With authors: Ariell Ahearn, Bumochir Dulam, Allison Hahn, Salah Mazrui, Troy Sternberg, Masato Shinoda, Henri Rueff

17:45 **Conference Reception** [Herbertson Room]

19:30 **Formal Dinner at St. Cross College**

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08:30 **Morning Refreshments**

09:00 **Desert Literature & Linguistics** [Gottman Room]

Chair: Henri Rueff

The problem of preservation of the environment in the literature of Kazakhstan
Svetlana Ananyeva

Ancient Turkic Stone Statues and their characteristics
Oraz Sapashev

Balbals- Deer stones of Kumay, Kazakhstan
Rahima Abduvalieva

Turkmen informants of Alexandre Samoilovich (1880-1938): preserving of historical and literature knowledge among nomad and sedentary population of Central Asia
Anton Ikhsanov

Pastoralism [Beckit Room]

Chair: Martin Kappas

Adaptation Strategies to environmental policy in Botswana's semi-arid Ngamiland pastoral landscapes
Lenyeletse Vincent Basupi

Land, Gender and Commons: Collective land use strategies of pastoralists in Ethiopia and Germany
Jill Blau

On the theory of space: nomadic space and mobile livelihoods – a case from Turkana desert low lands in North Kenya
Greta Semplici

Change in the lifestyle and traditional culture of Inner Mongolian pastoralists with environmental degradation
Wudabalaqiqige

10:00 **Tea break** [Herbertson Room]

10:30 **Desertification** [Gottmann Room]

Chair: Aizhan Smailova

Simulate desertification at regional scale: A spatial system dynamics method integrated natural and social factors
Duanyang Xu

Collaborative research to combat desertification in arid and semi-arid areas
Cho Wonwoo

Condition of Muslims in Dry Districts of West Bengal, India
Safikul Islam

Climate and Drylands [Beckit Room]

Chair: Salah Mazrui

Economics of dryland no-till wheat supports climate change adaptation
Henri Rueff

Carbon dioxide exchange in semi-arid grasslands of Mongolia
Tomoko Nakano

A Very High Resolution Survey of Forest and Tree Cover in Drylands
Alan Grainger

11:15 **Film and Discussion: Extractive Industries in Mongolia and Oman** [Gottman Room]

Chair: Gracie Remmington

Losing Ground- Film by Brad Rappa
Harasiis of Oman- Film by Dawn Chatty

Speakers: Dawn Chatty, Salah Mazrui, Brad Rappa

12:00 **Posters** [Herbertson Room]

Global Drylands are expanding as the earth is warming- Prăvălie Remus

Growth Response and Physiological characteristics of introduced poplar clones in Elsen tasarhai, Mongolia- Cho Wonwoo

Water Resources Development in the Paleo-Aeolian Dune Sands in the East Coast of India between Kandaleru and Swarnamukhi Rivers, Southern Andhra Pradesh- Jagadish Chandra

Dust pollutant effects on human health in South Gobi, Mongolia- Mona Edwards

Institutional Challenges in Groundwater Irrigation Management from the Farmers' Perspective in drylands of Central Iran- Forough Jafary

Soils Erosion, Land Slide, Rock Fall and Mud Flow Risks Evaluation and Management- Kakha Nadiradze

Combining Mongolian Herder and Station Observations of Precipitation Change- Martin Kappas

Sustainable Groundwater Governance in Jordan in the Context of the Syrian Refugee Crisis- Sarah Novak

A pioneer forest restoration project: Berenty Reserve, southern Madagascar- Vanessa Winchester

Natural Hazards Special Issue – Multiple climate hazards in Eurasian drylands - Masato Shinoda

13:00 **Lunch**

14:00 **Talks** [Gottmann Room]

Chair: Safikul Islam

Saving forests to mitigate climate change: what can microfinance contribute to the REDD+ policy process in Ghana?
Albert Arhin

Desertification in Yemen and the future of its population
Helen Lackner

The Dynamic Interaction of Precipitation, Vegetation and Dust Emission in Semi-Arid Regions
Buho Hoshino

Transforming Tradition: the aflaj and changing role of traditional knowledge systems for collective water management
Gracey Remmington

15:00 **Tea break** [Herbertson Room]

15:30 **Epicenters Special Programme** [Gottmann Room]

Chair: Shiloh Fetzek

Panel Speakers: Chad Briggs, Kaleem Hawa, Marcus King, Sinead Osullivan, Troy Sternberg

17:00 **Closing remarks followed by a reception at Green Templeton College**

ABTRACTS IN ALPHABETICAL ORDER

Svetlana Ananyeva

The problem of preservation of the environment in the literature of Kazakhstan

The theme of nature in the literature of Kazakhstan is revealed in different aspects. The motifs of the native land, mountains and steppes are reflected in the work of the poet-philosopher Abai Kunanbayev, who is considered to be the most renown poet of Kazakhstan. Abai Kunanbayev created the poetic cycle "The Seasons" ("Autumn", "Winter", "Spring", "Summer"). The classic of Kazakh and world literature Mukhtar Auezov in the novel "Gray Fierce", the novel-epic "The Way of Abai" and other works artistically reflects conflicts in the lives of the inhabitants of the boundless steppe, the struggle for power and the complex relationship between a man and a wolf.

The president of Kazakhstan, Nursultan Nazarbayev, highlights the importance of the interconnectedness of people and nature and further argues that “The special attitude to the native land, its culture, customs, traditions is the most important feature of patriotism. This is the basis of the cultural and genetic code that any nation makes a nation”.

Ecological themes and problems occupy a special place in modern literature of Kazakhstan and are reflected in the prose of the master of artistic expression Abdizhamil Nurpeisov. The tragedy of the drying Aral Sea, heroic everyday life of fishermen is at the center of the novels “Blood and Sweat” and “Final respects”. Steppe motifs predominate in the lyrics of Valery Mikhailov, Nadezhda Chernova, Lyubov Shashkova. The themes "Nature in Man" and "Man in Nature" became the leading ones in the Anthology of Kazakh Literature "The Stories of the Great Steppe" and "Summer Evening, Prairie Night, Land of Golden Wheat" books that were published in the USA. The formation of an ecological culture of the individual, the education of a sense of pride for the unique landscapes of Kazakhstan, love of the small Motherland is reflected in contemporary Kazakhstani fiction. According to the American researcher R. Abazov, in Western civilization, a person refers to nature in technocratic terms (extracts and resources), while in Kazakhstan it is a question of a person's dialogue with nature. In a way, the literary text in a Kazakhstani context reflects the country’s aspirations to promote sustainable development. In fact Kazakhstan is the only post-Soviet (CIS) country that has adopted the concept of transition to a "green economy" as a new vector in achieving sustainable development, demonstrating to the world its respect to nature and the ecosystem.

Rahima Abduvalieva

BALBALS - DEER STONES of KUMAY, Kazakhstan

Ancient Balbals, a type of Turkic stone statue or stele, were recently discovered in the Kumay region of central Kazakhstan. With great national significance, today much interest is centred on Balbals and their meaning. Our initial investigation sought to place Balbals in an Inner Asian context. Comprehensive work on researching, preserving and reconstructing of the monuments within their natural environment of the steppe will allow for these pieces of cultural heritage to become an open-air museum, a training laboratory for young people and scientists, a site for public lectures, as well as national and international attraction. However, initial efforts have led to conflicting modes of preservation and damaged the stone structures. Whilst the site in the Kumay River Valley is one of the most outstanding examples of cultural heritage in Kazakhstan and Central Asia, it will take a concerted effort to preserve the priceless historic relics.

Albert Arhin

Saving forests to mitigate climate change: What can microfinance contribute to the REDD+ policy process in Ghana?

Ernestina Fredua Antoh, PhD (Corresponding author), Kwame Nkrumah, Albert A Arhin*, Kwaku Obeng-Okrah

Deforestation is estimated to contribute to one-fifth of climate change. The idea of Reducing Emissions from Deforestation and forest Degradation (REDD+) has been promoted by UN Framework Convention on Climate Change (UNFCCC) to save tropical forest and mitigate climate change. In Ghana, deforestation is thought to have been driven largely by expansive cocoa production system. In view of this, the policy strategy of the Government has focused on improving cocoa productivity to reduce the expansive forms of agriculture into forest areas. This paper discusses the roles that microfinance can play in this effort. It draws on long-term research on microfinance and semi-structured interviews from hundred households in seven communities around the Kakum National Park in the Twifo Hemang Lower Denkyira District, Ghana. The paper finds that microfinance can enable smallholder farming communities to reduce deforestation in Ghana through at least three roles. These are (a) agricultural investment (b) technological adoption and (c) agribusiness skills development. Based on these findings, it is recommended that the project implementers stand a better chance of achieving the project objective if they include microfinance elements into the programme.

*Main presenter at this conference

Lenyeletse Vincent Basupi

Adaptation strategies to environmental and policy change in Botswana's semi-arid Ngamiland pastoral landscapes

Lenyeletse Vincent Basupi, Claire Helen Quinn, Andrew John Dougill

Semi-arid rangeland pastoral areas have been affected by diverse constraints; livestock diseases, human-wildlife conflicts, droughts and resource scarcity as a result of limited access to rangelands. Pastoralists' adaptations within this constrained environment remains poorly documented. Using iterative participatory rural appraisal methods, this study examines how pastoral societies in Ngamiland south of the Okavango Delta in Botswana are adjusting their pastoral livelihoods to cope with pressures in their pastoral social-ecological system and to sustain livelihoods. Data were collected through semi-structured interviews, meetings with village level institutions and field observations. Findings show a move towards more mixed and spatially varied livelihood strategies. Mixed agro-pastoral farming, fodder conservation strategies, intensification of flood recession farming around Lake Ngami, fishing and a network of self-help groups and social alliances are evident. Pastoralists have become more sedentary with increases in petty trade and higher dependency on social welfare programmes. As the ability to adapt has positive attributes for livelihood sustainability and resilience to climate variability, there is need for practical initiatives that improve pastoralists' adaptive capacity at the community scale.

Battsetseg Badgar

Animal Husbandry and Livestock Health in Mongolia

Altanchimeg A, Buyantogtokh Ch and Byambajav Ts and Battsetseg B
With an area of 1.5641 million km and a population of 3.0 million, Mongolia is the most sparsely populated country in the world, the 5th largest in Asia. The climate of Mongolia is a harsh continental one with four clearly differentiated seasons and different geographical zones. The five kinds of livestock species (sheep, goat, cattle, horse and camel) population counted as 61.5 million in Mongolia as of 2016. Livestock plays a significant role in the Mongolian economy, providing renewable sources of food and consumer goods. However, the pastoral and nomadic character of animal husbandry makes it extremely vulnerable to climatic, environmental changes (desertification) and natural disasters (dust storm, dzud and drought). This is recognized as the prime specific condition of pastoral animal husbandry. In this sense, the consequences of global warming, climate change and large population of livestock (overgrazing) have a strong direct impact on Mongolian animal husbandry and health condition. Controlling livestock health condition by scientific based measures in Mongolia is essential, not only to safeguard a centuries-old life style but also to ensure a prosperous public health, food safety, economy and foreign trade. It endeavors to collaborate internationally on livestock health condition to preserve nomadic cultures, styles, traditions and custom of, which is one of the unique world cultures, existed in few countries in the world.

Jill Blau

Dryland Ecosystem Restoration at Project Wadi Attir

Pastoralist livelihood is generally characterized by collective land-use strategies. These aspects are also very essential for the concept of the commons which evolves all around the use and management of common resources. Pastoralist collective land governance in Ethiopia nor Germany is hardly written about. This is not coincidence. It is part of a grander story in which commons-based land use systems, and thereby livelihoods in which reproductive land care plays a major role, are undervalued. So far, the discourse around the commons has hardly been linked to approaches within feminist economics or ecology. This is surprising, as there is a main parallel critique that the commons and feminist theories share with regards to neoclassical political economic thought on resources: they both stress that it tends to falsely disconnect and invisibilize areas of life that are interdependent as the productive and re-productive. With this talk, I contribute to a re-writing of both the commons and pastoralism. I ask: How do pastoralists continue to manage and use land as a commons in times of increased land enclosure and commodification / privatization? I show that pastoralism as a form of livelihood does in fact represent a challenge to the capitalist logic of productivity. Through two case studies at the Nyangatom in South Ethiopia and at the Rechtler in the Oberallgäu / Germany I highlight both commonalities and differences between land governance structures and the everyday lives of the herders from the Rechtler (Germany) and Nyangatom (Ethiopia) communities.

Lauren Bonilla

Desert Visibilities: Seeing the Political Economy of Mining in the Mongolian Gobi

Desert landscapes allow for different forms of visibility. Their topographic expansiveness make it easy to surveil activities and movements at a distance. Yet, their austereness also facilitates speculation, intrigue, and suspicion given that much which goes on in the desert is unseen by humans. This paper explores the central role that visibility plays in shaping local politics around the Tavan Tolgoi coal complex in the Mongolian Gobi. It attends to how the desert is a co-conspirator of sorts in acts of surveillance by local residents and mine workers who seek

to uncover and see the 'real' workings of not just Tavan Tolgoi, but also the state, which has wide-ranging interests in the mine and its coal exports. In examining how Mongolians monitor the movements of coal trucks, attend to patterns of airborne dust, and analyze the contours of overburden mountains forming on the desert terrain, the paper sheds light on how desert landscapes help make certain aspects of mining and the state more visible and transparent, though enabling other kinds of ambiguities in the process.

Chad Briggs

Foresight Tools & Early Warning Systems for Climate Security

Intelligence and military experts have identified climate change as a substantive security risk, both accelerating existing risks and creating unique challenges for the future. Climate change is a challenging topic to integrate into security planning, owing to the global nature of the problem yet need to downscale to local impacts. This paper discusses the challenges and tools associated with anticipating future climate security risks. Drawing on lessons and best practices from US military and intelligence assessments of climate security, the paper focuses on the crucial role of engaging the scientific community, how to deal with uncertainties, and the use of vulnerability assessments rather than expecting clear predictions. Abrupt climate change and extreme events also play large roles in the ability to prepare for unique futures, in contrast to the typical approach of using 'most probable' or median assumptions about linear changes.

Mona Edwards

Dust pollutant effects on human health in South Gobi, Mongolia

We propose an investigation that will examine and analyse the health challenges of dust from mining activities in South Gobi, Mongolia. This evaluates dust volume, transport, composition and potential impact on human tissues and organs. Using livestock as a proxy and non-invasive medical tests with volunteer herders, we will determine particulate impacts on pulmonary and cardiovascular systems. To do this, a spatial distribution of emissive dust physico-chemical parameters will be mapped across the site. Metal phytoavailability will be studied. We will focus on toxic metal contamination by investigating ex vivo gastric bioaccessibility in livestock meat samples. Complementary biological and chemical acellular tests will determine potential pulmonary bioaccessibility of metals contained in mining dusts. With a clear overview of potential risks involved for human and animals by ingestion or inhalation in exposed zones compared to a control site, mitigation will be possible. Knowledge of dust exposure will enable us to propose mitigation procedures, establish an ongoing testing regime and organise monitoring of dust levels in the community. Findings will engage the mining establishment, residents and the local and national government in discussion of risks and highlight methods to reduce human exposure.

Alan Grainger

A Very High Resolution Survey of Forest and Tree Cover in the Drylands

Drylands cover at least two fifths of the Earth's land surface but the distribution of forest and tree cover in these lands is poorly known. One indication of the level of uncertainty about global forest area which is associated with this is that according to the first FAO Forest Resource Assessment, 40% of all tropical forests in 1980 were in the drylands. In 2015, FAO launched a new Global Drylands Assessment (GDA), which would map the distribution of forest, tree cover and related land attributes at very high (≤ 1 m) spatial resolution using satellite images available on Google Earth. Images were interpreted in 2015 using a Geo-Wiki approach, with usually one scientific institution taking responsibility for one of 12 world regions, and the results were synthesized and

analysed in 2016. This paper will summarize the results of the GDA and outline the opportunities for using the resulting open data to extend the scope of the assessment to include attributes other than area.

Leah Holguin

Neolithic Hydro-Social and Geomorphological Landscape Dynamics in the Gobi Desert

In desert landscapes, the presence or absence of water is critical to the mobility and survival of groups operating within these marginal zones. Water may be used as proxy variable across time in which to evaluate potential human-environment relationships. The Gobi Desert represents one region where people and water interact in unpredictable ways, particularly in areas of less accessible resources, and boundary and transitional areas. The research presented here summarizes results from a recent archaeological pilot survey conducted along the Ulaan Nuur paleohydrological complex in Omnogovi province of southern Mongolia, where several areas of archaeological activity were discovered, including two potential Neolithic-Early Bronze Age habitation sites. This area provides an excellent case study to examine hydro-social interactions and occupation in a marginal dryland landscape, and also highlights the importance of evaluating archaeological evidence within concurrent geomorphological contexts, particularly where landscapes are heavily deflated and eroded.

Buho Hoshino

The Dynamic Interaction of Precipitation, Vegetation, and Dust Emission in Semi-Arid Region

Buho Hoshino, Yuki Sofue, Yuta Demura, Ts. Purevsuren, Kenji Kai

In the Mongolian Gobi region vegetation distribution mainly has annual herbs and perennial shrubs. Annual plants strongly depend on rainfall, and perennial plants can survive even in years of extreme drought. This study focuses on dynamic interaction between precipitation, vegetation (NDVI) and dust emission; however, only in growth season (GS), the annual grasses are reflected in NDVI. It exists as a dead grass in the spring, but it is not reflected in NDVI. Rainfall encourages the growth of annually herbaceous plants and is recorded as a memory of biomass (Dry Matter Productivity), and the following year suppresses dust emission as a dry grass. The differences of dead grass coverage rates may increase or decrease the dust storm outbreaks. The number of dust storm emissions tended to decrease along with an increased rate of the dead grass coverage areas when a maximum wind speed exceeded 9.1 m・s-1 in our study sites. In contrast, there were some cases with the number of the dust storm emission had increased when the dead grass coverage areas had decreased rate at the same maximum wind speed exceeded 9.1 m・s-1. In particular cases, the number of dust storm emissions had a predilection to decrease along with an increased rate of the dead grass coverage even the maximum wind speed exceeded 11 m・s-1.

Anton Ikhsanov

Turkmen informants of A.N. Samoylovich (1880-1938): the collection and studies of Turkmen historical heritage and way of life.

The notable contribution of A.N. Samoylovich (1880-1938) to the development of the organization of Turkmen historical and cultural heritage's scientific research is truly incontestable. However, the Samoylovich'es studies were based on very careful work with informants, collecting of manuscripts, folklore materials and accurate

analysis of this material. Such work is closely tied to «the work in field» and good relations with the main collectors of historical and literature materials of previous generations amongst Turkmens themselves. The study of Samoylovich'es diaries, letters and some archive documents reveals not only their names, but simultaneously this material can also present to us with new sources of information on life within Turkmen society, identity and the changes which took place in the period between 1902-1938.
The list of main Transcaspian Turkmen informants of this Russian orientalist consist of fifty odd names and could be separated into 4 big groups: 1 - officials (elders, militia members), 2 - religious figures or local medic stuff (mullahs, ishans, tebibs), 3 - folk singers (bakhsi), 4 - Turkmen students of St. Petersburg University. Every single group had its own peculiarities and its own contribution towards Samoyvlocih'es work.
The research goes further and other specialists on Turkmen studies can now reveal new facts tied to the Turkmens' history and way of life becoming an asset to the forming of the Turkmens identity via retrospective and detailed research of their cultural and historical heritage.

Safikul Islam

Condition of Muslims in the Dry Districts of West Bengal, India

Md Safikul Islam, Lubna Siddiqui, Md Nawaj Sarif

The western plateau and high lands of West Bengal include five districts namely Purulia, Bankura, Birbhum, Bardhaman and Paschim (West) Medinipur, which are actually dry in nature with respect to immense lack of water availability for agricultural activities. Such kind of dryness led to poor economic development in that region since water is one of the significant components for the overall development of any region or society. Dearth of water resources has affected all the spheres of development like social, economic, agricultural, educational, health etc. Muslims living in this region are the victims of dryness like others. The present paper is an attempt to examine the difference between the contemporary and past conditions of Muslims in the dry districts of West Bengal. The present study is entirely based on secondary data, which will be collected from Census of India (1991, 2001 and 2011), Statistical Abstract, Pedological and Hydrological Departments, government reports and journals. In this paper, the regression analysis, co-efficient of correlation, ArcGIS and ERDAS will be used to fulfil the main objectives. The tentative results reveal gradual depletion in overall development of Muslims and this demand an in-depth analysis to be required.

Forough Jafary

Institutional Challenges in Groundwater Irrigation Management from the Farmers' Perspective in drylands of Central Iran

In the majority of arid regions globally, sustainable management of natural resources, and particularly water/groundwater resources is a major challenge for future water supply, maintenance of agricultural production, reducing land degradation and migration. In the governance systems of many developing countries in arid regions, including Iran, the role of farmers is neglected in the decision-making processes and within the land and agricultural water management. Management decisions have major impacts on farmers' livelihood and therefore it is essential to include farmers' perspectives in local governance and management systems and to enable, and legitimize, informed local decision-making.
Currently there is a lack of analytical studies on the role of farmers' behaviour in managing groundwater resources in arid regions, particularly the environmental impacts of a transition, from traditional to drip irrigation systems. This paper uses participatory and community-based approach to identify and examine the social,

economic and cultural dimensions around groundwater drip irrigation systems and its impact on land and crop production levels from the farmers' perspectives, using a local farming system as a case study in central Iran.

Kai Kenji

International Research on Asian Dust and Environmental Regime Shift by the Cooperation between Mongolia, China and Japan

Kai, K., N. Sugimoto, T. Maki, B. Hoshino, J. Huang, S. Khudulmur

The JSPS* Core-to-Core Program on Asian dust and environmental regime shift has been conducted by cooperation between Mongolia, China and Japan since 2014. We introduce the outline and research activity of this program. Dust plays an important role in forming both a climate and an ecosystem. The Gobi Desert, located across Mongolia and China, is one of the great sources of the Asian dust. Grasslands are mainly distributed in the north of the Gobi Desert. There is an interaction between the grasslands and the desert. The Mongolian grasslands that have a rich ecosystem with a variety of wild animals and plants act as a natural barrier to prevent the desertification that extends northward from the desert. We hypothesize that an environmental regime shift (ERS) is occurring around the Mongolian grassland and Gobi Desert due to the global warming and human activity in recent years. We have investigated the ERS by Mongolia-China-Japan international observations of the Asian dust over the source regions. The scientific goal is to better understand the mechanism of dust storms over Mongolian grassland and Gobi Desert with a research emphasis on the ERS and bioaerosols.

*JSPS: Japan Society for the Promotion of Science

Saverio Krätli

Order OR stability? Working with pastoral systems in a 'messy' world

Contexts dominated by variability, contexts like those where pastoralists live, escape 'order' in the conventional sense that associates it with symmetry and stability. They are 'messy' in the sense of the 'mess paradox' described by Emery Roe: because they cannot be 'ordered' into a steady or predictable state. Indeed, efforts to order them — to reduce their uncertainty by introducing stability — only result in increased turbulence. As structurally unstable contexts become more common under the effect of financial volatility, political unrest, or climate change, notions of order as stability become more anachronistic and the relevance of the mess paradox spreads. This presentation is about the implications of the 'mess paradox' when working with pastoral systems, particularly the clash between representing all variability as risk within a risk-aversion framework (mainstream in development and humanitarian aid), and managing variability in the environment by interfacing it with variability in the processes of production (pastoral systems).

Nikolaus Kuhn

One Health: linking human and animal health to rangeland ecology in southeastern Ethiopia

The One Health approach originally linked human to animal health. Moving from prevention of transmission of diseases between humans and animals, the scope widened to improving human health through that provided food of sufficient quality to avoid malnutrition and disease. This approach can reduce health costs significantly in rural areas developing countries, including rangelands. Recognizing land degradation as a major cause of poor animal health, the inclusion of rangeland ecology was a logical expansion of the One Health approach. In this

presentation, the concept of One Health is presented, in particular with regards to dryland pastoralism. The recently started Jijiga One Health Initiative (JOHI) in south-eastern Ethiopia is used as a case study to illustrate the contribution of One Health to sustainable land use and the improvement of health and livelihoods of the rural population.

Helen Lackner

Desertification in Yemen and the future of its population

Yemen, in addition to being involved in a civil war worsened dramatically by its internationalisation, is one of the countries whose future is most jeopardised by climate change. While the major constraint and threat concerns water availability, desertification also plays a related role. With only 3% of its area cultivable and vast areas which are today deserts but were cultivated in past centuries, the expansion of desert and reduction of areas where people can live are not new phenomena. They have been going on for centuries. However two main factors worsen the situation in the 21st century. In past centuries a main strategy to address the problem was widespread and mostly long distance emigration; this option has been increasingly restricted in the past half century and is now demographically insignificant. The other is rapid population increase which, in Yemen as elsewhere, has accelerated in the past century. Therefore we have much greater pressure and demands on increasingly limited natural resources and a shrinking liveable area. Predictions are that much of Yemen will have to be abandoned within a generation or so, where will people go when they need to cross either desert or sea to reach other places where, indeed, they are not welcome.

Emiliya Lazarovs

What Attracts FDI to Different Sectors-A longitudinal study of economic sectors of three oil-rich countries

Foreign Direct Investment (FDI) is considered an important driver of economic growth, a source of financial capital, a way to increase productivity and an opportunity to diversify economic activities. For recipient countries a crucial issue is to what extent policies can influence the level and composition of investment flows. In this study, we focus on Qatar, Saudi Arabia, and United Arab Emirates — and analyse the flow of FDI to 14 sectors from 66 source countries over 2006-2014. All are high-income countries yet they differ in the policies to attract foreign investment. Among the three, the United Arab Emirates has the most active agenda by prioritizing domestic sectors, targeting investment from specific sources, and offering the possibility of 100% foreign ownership.We provide empirical evidence of the effectiveness of these policies towards attracting investment in different sectors. Our findings suggest that policies aimed at attracting FDI to specific sectors are effective among the secondary sectors but not among the tertiary; having strategic partner countries increases FDI to both secondary and tertiary sectors; and the possibility of 100% ownership has only a minor positive effect on tertiary sectors. None of these policies seem to affect FDI to the primary sector of the recipient countries studied here.

Caitlin McElroy

Water Risk Management and Sharing Resource Prosperity in the South Gobi Desert

This paper presents a project from a developing research program titled Sharing Resource Prosperity. It engages with the environmental governance of the mining sector through the argument that the protection of the water system and other aspects of sound environmental governance are essential long-term legacies of mining. It argues that contributions to environmental sustainability are essential for the future prosperity of mining regions and a critical contribution from the sector in sharing the prosperity of resource extraction. The focus of the project

concerns the recent increase in large-scale industrial mining in the South Gobi desert, which has exacerbated many social and environmental governance challenges. Among them is the management of the fragile water system of this region. As the desertification effects of climate change, changing demographics related to the mining, and the mines' use of water interact, the landscape and traditional livelihoods are at risk. This project explores the possibilities for deploying an integrated water risk monitoring system including the mining sector, climate, data, and local stakeholders. The purpose of the monitoring system would be to better advise water use by all stakeholders and in the long-term contribute to climate change adaptations.

Quentin Moreau

New vulnerabilities of Mongolian herders: the case of indebtedness and further perspectives of research

This intervention at the 4th Desert Conference aims at presenting the ongoing work of People in Need in better understanding the current vulnerabilities of the 21st century herders in Mongolia in regards to climate change, pasture mismanagement and a livelihood still transitioning to a market economy. The presentation will highlight initial research performed on herders' indebtedness patterns. It will also present ways People in Need is exploring together with other humanitarian and development partners to collect and analyse key currently missing data, as well as develop integrated information systems able to strengthen the national and international early warning, preparedness, response and early recovery capacities related to dzud episodes and other natural disasters.

Tomoko Nakano

Carbon dioxide exchange in semiarid grasslands of Mongolia

Tomoko NAKANO, Yoshihiro IIJIMA, Takehiko ITO and Masato SHINODA

Carbon exchange and storage in grassland ecosystems are affected by climatic conditions and human activities, and also play an important role of the global carbon balance. The purpose of this study is to evaluate the climatic and grazing effects on plants, soil and carbon cycle in the semiarid grassland ecosystem. The study sites were located in Bayan Unjuul county (BU) and Baganuur district (BN), Mongolia, which contains typical steppe vegetation that is grazed by livestock. To examine the climatic influences, we determined net ecosystem CO2 exchange using an eddy covariance technique and simultaneously measured meteorological variables at BU from 2009 to 2014. The results indicated that rainfall in June was the key factor for interannual variation of the carbon exchange. Concerning the grazing effects, we constructed fences at the study sites to prevent livestock from grazing and monitored the number of animals using time-lapse cameras. More livestock were photographed at BN than at BU during the summer of 2016, suggesting that the grazing pressure was stronger at BN than at BU. Aboveground biomass and CO2 fluxes outside the fence declined significantly compared to those inside the fence at BN, meanwhile there were no significant differences at BU.

Sarah Novak

Sustainable Groundwater Governance in Jordan in the Context of the Syrian Refugee Crisis.

Jordan is one of the most water stressed countries in the Middle East, experiencing increasing numbers of drought events each year due to climate change, a growing population, and now pressure stemming from the movement of over a million Syrian refugees into the country. Part of the Jordan government's response to dramatically decreasing freshwater availability per capita has been the development of the Disi-Amman pipeline project, which

aims to transport 100 million cubic metres (MCM) of freshwater each year from the southern fossil aquifer shared with Saudi Arabia to the northern governorates. Through a critical discourse analysis of the scholarly and grey literature, it is shown that the link between improved water governance and the impacts of the Syrian refugee crisis in Jordan has not been comprehensively explored by many scholars, and that more research would aid countries like Jordan in pursuing sustainable water strategies—especially with regard to their crucial non-renewable groundwater resources. Options for alternative strategies are also analysed through a policy survey of both international and national policy options.

Shinji Otani

Dust Storms from Degraded Drylands of Asia: Dynamics and Health Impact

Shinji Otani, Youichi Kurozawa, Yasunori Kurosaki, and Masato Shinoda

Asian dust events are massive meteorological phenomena during which fine particles from Chinese and Mongolian deserts are blown into the atmosphere and carried by westerly winds into northeast Asia. Concerns have been expressed over health hazards in affected areas. The principal damage by Asian dust differs in emission region from that of downwind region. In emission region, an intense dust storm does sever damage to human and livestock. The health effects of dust may be associated with a high prevalence of respiratory diseases and severe subjective symptoms. In downwind regions such as Japan, recent epidemiological studies have shown that Asian dust events coincided with increases in daily admissions and clinical visits for allergic diseases such as asthma. Moreover, it is pointed out that Asian dust influence the symptoms such as itchy eye and skin, nasal congestion, and sore throat in healthy subjects. Analysis of Asian dust particles has shown the presence of ammonium ions, sulfate ions, nitrate ions, and heavy metal compounds that are not considered to originate from the soil. Asian dust particles have been thought to adsorb anthropogenic atmospheric pollutants during transport. These dust events should be considered as a major environmental issue caused by human impact via deforestation, desertification, and atmospheric pollution.

Linda Pappagallo

Walking with the Himba: leveraging pastoralism in frontier lands

The presentation will focus on a personal, life-changing experience, of herding cattle for three days with the Himba, an indigenous group of nomadic pastoralists in the arid regions of northern Namibia. Interviews with local herdsmen revealed changing herding behaviour, caused primarily by climatic alterations and degrading rangelands in the past twenty years. Community-based natural resource management has, in part, been a successful solution for the challenges of over-utilization of Namibia's resources. Thanks to community-based nature conservation for example, today forty percent of Namibia's lands are nature conservancies, resulting in increasing wildlife populations. However overgrazing and rangeland degradation at the boundaries of conservancies pose a threat to pastoralists and biodiversity. Community-based livestock and rangeland management (CBRLM) has been suggested as a plausible solution for issues related to overgrazing and land degradation. Although in theory this looks promising, what are some of the challenges in practice? Complementary solutions to CBLRM are needed. As I describe some of the changing practices in cattle herding and challenges of CBRLM, I will interweave anecdotes that have bought me to envision ways in which pastoralism can be leveraged in frontier lands.

Bradley Rappa

Film Screening: Losing Ground

Losing Ground documents how climate change, overgrazing, and the destructive mining processes that are currently being used in Mongolia are dramatically changing the traditional pastoral lifestyles of the many rural Mongolian families who depend on healthy and biologically diverse ecosystems for their survival.

Prăvălie Remus

Global drylands are expanding as the Earth is warming

Drylands are critical environments due to low water availability and the Earth's largest biome. These terrestrial systems are known for their extensive global reach, estimated until the present at 41% of the global land area, or ~60 mil km2. However, the reanalysis of the global dryland areas, based on new climate data obtained at high spatial and temporal resolution, reveals a total of ~45% of the Earth's terrestrial area, almost 7 mil km2 more than initially estimated by international official sources like United Nations Environment Programme. This work aims to reanalyze the statistical situation of the global, continental and national extent of drylands, by using a new climate database presently available at global scale. Essentially, our results highlight, for the first time, the fact that our planet is significantly more arid (4% more than previously estimated), mainly at high northern latitudes. Considering this new critical spatial dimension of drylands, our investigations also describes some negative implications for land degradation (the most important environmental perturbation of these systems) in over 100 states (where there is already a major crisis generated by food insecurity, soaring poverty, population migration, and escalating conflicts and regional political instability), as well as for global warming.

Gracey Remmington

Transforming tradition: the aflaj and changing role of traditional knowledge systems for collective water management

Living with a harsh, desert climate, Omani rural communities have developed locally-appropriate knowledge to deal with water scarcity. Similar to the *qanat*, the *aflaj* taps into the natural water table and uses a gravity system to channel water through underground channels to villages. Traditional techniques of water management, such as the *aflaj*, represents a way of adapting to and coping with difficult climates which have persisted for millennia. However, knowledge systems have often 'decayed' with the onset of modernity. These management systems, which developed concurrently to early Omani date palm cultivation, has defined,
hereditary water rights which are in decline. This article uses Ostrom's Common Pool Resource (CPR) framework, which prioritises the collective management of shared resources to maximise the benefit for all involved and avoid diminishing benefits that are created by the pursuit of
individual goals. Using this framework, this article's evaluation of the literature found that traditional *aflaj* management systems have a great capacity to evolve and, therefore, the *aflaj* represents both a dying system, and a potential for climate adaptation. Historically, *aflaj* have been managed by ancient water users associations, which provide social controls and govern usage norms. The findings of this review are the *aflaj* system's ability to respond to pressures from competing institutions, including markets, and embedded social capital mechanisms
will influence its capacity to mitigate uncertain hydrology and climate. This article suggests ways in which the management of the *aflaj* can adapt to a multiple institutional framework in order to 'transform' collective water management.

Henri Rueff

Economics of dryland no-till wheat supports climate change adaptation

A large part of the world's wheat is produced in drylands which are expected to expand, with more frequent droughts, and fewer but heavier rainfalls. Maintaining the production of wheat, climate change notwithstanding, is hence a major global food security challenge. No-till (NT) enhances soil moisture and organic components and is therefore a sustainable land management practice suitable to drylands. While NT benefits have been documented, the economics of dryland NT incorporating price and weather uncertainties remains unknown. Yet it is essential to predict how NT feasibility performs under increasingly erratic conditions. Using 30 years of daily weather data and a soil moisture indicator to predict NT wheat yields, this simulation shows that from a production function perspective and considering all other components being equal, rainfed NT wheat is feasible until the semiarid-arid boundary while CT requires state support to be cultivated at the same aridity level. In other words, risk-neutral wheat farmers under conditions similar to those in Israel (one rainy season in winter) will find in NT wheat farming a form of agriculture management suitable for highly uncertain environments. With climate change induced warming, increasing dry spells, and heavier but decreasing rainfalls, dryland farmers will need more inputs and state support for CT and less so for NT wheat. Moreover, soil conservation collateral benefits and climate change mitigation are likely to further support dryland farmers. NT wheat presents significant climate smart agriculture features, which are better adapted to the uncertainty of drylands.

Oraz Sapashev

Ancient Turkic stone statues and their characteristics.

The study of the material culture of the steppe civilization, the samples of the daily life of ancient societies, especially the world of things created by man, is relevant at the interface of ecological culture of the steppes. The statues, depicting people reflected not only the sculptural skill of the sculptor, as these statuary monuments are huge information about appearance, about anthropocide steppe, clothing, inventories, equipment and the elements of everyday life inherent in the Turkic balbal (ancient statue). The challenge before us is fixing and study the stone sculptures in their original position in the complex and memorial buildings. Ancient Turkic statue was placed at the East side of a quadrangular stone structure, called "fence". From the statues to the East it could go a number of stone columns-balbals.

The museumification of balbals (ancient statues) for their safety are in addition to good intentions, the loss of the original complexes. In addition, the statues cannot be studied in isolation from the structures in which they are established, from landscape features. Process study of a multi-faceted sculptures as well as their preservation, creation of open air museums for the preservation of ecological culture of the steppe space is a real challenge.

Greta Semplici

On the theory of space: nomadic space and mobile livelihoods – a case from Turkana desert low lands in North Kenya

Nowadays the desert lowlands dividing the Horn of Africa from the high potential areas of Central Kenya, one of the most arid regions of Sub Saharan Africa, represent a crucial node of development plans in the region. The

northern counties, for long neglected and, still today, undeniably marginalised, become an interesting analytical space where deserts are the framework of new forms of mobility, establishment of new trajectories and conflictual international, national and local relations. Entire populations devoted to mixed and complementary livelihoods live and survive in a precarious ecology threatened by global warming impacts and by increased level of competition over natural resources. By looking at the region with the eyes of nomadic and pastoral people one inevitably realizes how deserts, conversely to what reported by colonial officers at the beginning of the XX century, cannot be described as an "empty [...] blank space" (Brown, 1989:316). Yet, deserts emerge as social spaces embedded into people's trajectories. The analysis of the desert I propose explores a broader concept of mobility (environmental, economic, social, cultural, and spiritual) to better understand the nomadic space and its relations (feedback and adaptation) with the desert people, and explores its semantics for a deeper understanding of what movement means for the people on the move.

Masato Shinoda

Extending dryland disaster science to health science

Climate hazards comprise 87% of disaster events in Asia. In particular, mid–high latitudes drylands (such as those in Eurasia) present a harsh environment with a cold, arid climate. The livelihoods of the people inhabiting these areas have long been jeopardized by the repeated occurrence of natural hazards associated with such a climate. Events can be characterized as the '4Ds': drought, dzud (severe winter conditions), dust storms, and desertification, which occur interactively. However, previous attempts to elucidate disaster mechanisms and efforts to implement appropriate land management techniques have been unsatisfactory as these efforts have typically focused only on individual disasters. To address this issue, the 'Integrating Dryland Disaster Science' project has been conducted focusing on Mongolia (Shinoda, 2017). This talk presents some achievements of this project and their applications to an early warning system of meteorological disasters. It then outlines the significance and possible approach of extending dryland disaster science to health science. This approach is expected to meet the pressing demand of inhabitants and animals whose health and life have been endangered under recent, frequent occurrences of high-impact climate hazards.

Jed Stevenson

Socio-Ecological Change in the Turkana Basin: A Synthesis of Current Developments

This paper synthesizes knowledge on the social and ecological impacts of engineering interventions in the Turkana basin. The Gibe III dam and large-scale commercial farming are currently altering the hydrological regime of the Omo River, the main source for Lake Turkana, the world's largest desert lake. We use a political ecology framework to assess the impacts of the dam and plantations on livelihoods, patterns of migration, and conflict dynamics. The synthesis is based on an expert review, drawing on an interdisciplinary network of researchers with active research in the region. The filling of the reservoir behind Gibe III and regulation of river flow by the dam has eliminated seasonal fluctuations and has begun to lower the level of Lake Turkana, threatening the livelihoods of populations who depend on flood-retreat cultivation and fishing. Reduced flow in the lower basin will also constrain the dry-season grazing crucial for cattle herding. These changes are precipitating conflicts both at a local level and between affected groups and the state. Impacts on indigenous livelihoods are heightened by a large influx of labour migrants into the Lower Omo. Whilst commercial farming is opening up new economic opportunities, it also raises risks of conflict over resource claims.

Frederick Wojnarowski

Settling the desert: narratives of nomadic pacification and sedenterisation in Jordan

This paper considers changing conceptions of the desert/sown interface in Jordan, and how post-1920s policy under the Mandate and the independent Kingdom of Jordan has aimed to simplify complex patterns of Bedouin history and make the badiya legible and controllable by the state, and reliant and subject to transformative development schemes. Much existing work focuses on the various development initiatives aiming to increase social and economic participation by Bedouin groups in their nation-states, stressing the adaptability and resilience of Bedouin identity. However, this often de-emphasises the historical narratives of Bedouin groups themselves, which often stress not continuity and adaptation but rather rupture with the past, seeing the end of an 'age of Shaykhs' and the coming of an 'age of Government'. My doctoral research will look at historical perceptions of increasing sedenterisation among the Bani Sakhr in Jordan. Here I present the evidence from archival sources and secondary literature, as well as from my master's fieldwork in Jordan, that has led me to explore these issues, and some preliminary ideas around the continuity of historical narratives around sedenterisation from the mandate period to the present day in the villages of North-East Jordan.

Cho Wonwoo

Collaborative research to combat desertification in arid and semi-arid areas

The center for combating desertification in arid and semi-arid areas was founded in 2012. It has been supported by the Korea Forest Service, Republic of Korea. The objectives of center is to study scientific and technological desertification matters in arid and semi-arid areas, to make capacity building for graduate students in international society and to learn relevant ways and means on how to combat desertification in Asia and Africa.
The center also aims to establish networks in the country and to assist specialists in combating desertification through the country's training program and implementation based on UNCCD COP-10's follow up action in Republic of Korea. The center is operating scientific and educational programs with the bilateral collaboration of four countries which include Mongolia, Myanmar, Tunisia and Ethiopia. The participants of the center are professors, scientists and graduate students from five universities : Dongguk University, Korea University, University of Seoul, Kangwon National University and Seoul National University.

Duanyang Xu

Simulate Desertification at regional scale: A spatial system dynamics method integrated natural and social factors

The interaction of driving forces at different spatio-temporal scales leads to a highly complex desertification process; and modeling desertification dynamics as a function of climatic variations and human activities is necessary to predict desertification risk, evaluate the impact of climate change, and support policy-making. Spatial system dynamic (SSD) model is a good choice because it can construct the linkage of different natural and social variables in a grid-based computing environment. In this study, a SSD model for simulating desertification was developed by integrating climate, soil water, population, economy, pasturage, and land use. Net Primary Production (NPP) was selected as an intermediate variable to measure the impacts of driving forces and desertification grades, and Ordos in China was selected to test the model. The results showed that the SSD model was reliable, and the overall accuracy of desertification degree was approximately 83%. Climate factors had relatively higher sensitivities than other parameters. Although humid climate and sustainable development strategy would reduce desertified land area and desertification degree before 2025, the rapid increase in pasturage

pressure would offset this trend. For local government, it is necessary to persist in the present desertification prevention policy and completely banned grazing after 2025.

Wudabalaqiqige

Change in the lifestyle and traditional culture of Inner Mongolian pastoralists with environment degradation

In this paper, we aimed to verify whether recognition of nomadic changes of nomads dealt with in the past study of the authors was recognition beyond generation of Mongolian people. In order to conduct the verification, we conducted a questionnaire survey (describing formula and question of selection formula) for students of the inner Mongolian ethnic college as a representative of the young generation, and analyzed and compiled the diagram with the KJ method. In conclusion, we found that the recognition of Mongolian language and cultural succession is common. Based on this conclusion, we examined the key points for keeping the future transformation and promotion of grassland environment, traditional culture, and nomadic life in Inner Mongolia.

Vanessa Winchester

A pioneer forest restoration project: Berenty Reserve, southern Madagascar

Vanessa Winchester, Hantanirina Rasamimanana, Janet McCrae

The canopy cover of a dry gallery forest, famous for its lemurs, in southern Madagascar is shrinking due to ageing of its dominant tree species and invasion of a non-native vine which thrives in sunlight and suffocates seedling growth. Before embarking on restoration a planting trial is mandatory to avoid costly environmental mistakes. In 2016 trial plots were planted with 1355 endemic seedlings in three different forest areas. The seedlings were measured and soil samples taken. These procedures to be repeated over the next three years before final analysis to determine optimal conditions for growth. The long-term aim is to arrest decline of the closed-canopy forest and restore biodiversity levels to those typical of the remaining forest fragments, thus conserving key resources for the lemurs and other endangered fauna.

PARTICIPANT PROFILES

ANANYEVA, Svetlana

Dr. Svetlana Ananyeva is the Head of Department of Analytics and Foreign Literary relations of Institute of Literature and Art named after M. O. Auezov, Ministry of Education and Science of the Republic of Kazakhstan. Dr. Ananyeva's key research areas are modern literary process, Russian literature of 19th century, Pushkin and Dostoevsky, comparative literature and the literature of ethnic minorities in Kazakhstan. Most recently she published books on Modern Literature of Kazakhstan, Russian prose and Pushkin studies in Kazakhstan. Her latest book is the analysis of works by Moris Simashko who studied ancient Eastern civilisations and the Silk Way countries. In addition to her academic work she supervises PhD students in literature at Kazakh National University in Almaty.

Svetlana Ananyeva was born in Dossor, which is a small city in semi-desert Western Kazakhstan. Dossor is also famous as it is an oil deposit field which was opened by Alfred Nobel in the beginning of 20th century. She grew up in harsh conditions of semi-desert area, which has meant that the water was carried from as far as 100 kilometers away from Ural river. The water was carried on camels because the only water reservoirs nearby the living area were salt lakes.

She was born to the family of two doctors, who were the first doctors in Dossor. Under the conditions of the semi-desert, the first developers of the oil field Dossor were from Moscow, Leningrad (St. Petersburg) and Astrakhan. Her favourite plant is camel's thorn and semi-desert tulips because these flowers remind her of the childhood. Her parents together with the local residents of the villages planted two gardens, in which special types of trees grew - karagach, jida (wild date), acacia, tamarisk and the symbol of the desert - the camel's thorn and jussan (wormwood).

ABDEVELIEVA, Rahima

One of the writer's 'comrades-in-arms', who from 1992 was working together with him in Germany to popularize his work in the German language. After Chingiz Aitmatov's death she moved to London and continued this work within an English environment. Dr. Abduvalieva gives lectures on the writer's work in universities of various countries. She is working on the theory and practice of translating the works of Aksakal into other languages. She is also the director of the Aitmatov Academy in Great Britain and chairs the jury which awards the annual International Chingiz Aitmatov Prize. Dr. Abduvalieva is a holder of the Franz Kafka Medal for literature for her translations of works by Chinghiz Aitmatov into German.

AHEARN, Ariell

Ariell is an ESRC-GCRF postdoctoral fellow at the School for Geography and the Environment and a member of the Transformations Research Cluster. She completed her DPhil from the School for Geography in February 2016. She holds a BA degree in Anthropology from Hartwick College and an MPA from Cornell University in the United States.

Since 2004, Ariell has worked extensively in rural Mongolia with mobile pastoralist communities around land use and rural development issues. She engages with a broad range of individuals and groups, from government officials to business owners and NGOs to rural households. Her doctoral thesis, 'The Changing Meaning of Work, Herding and Social Relations in Rural Mongolia' challenges the notion that pastoralists operate outside of regulatory institutions and discusses the long history of herder involvement with government administrations. Ariell's current research aims to understand the relationship between social systems, resource distribution and governance frameworks in regions undergoing economic transformation. She specializes in qualitative research,

using methods such as ethnographic participant observation, interviewing, mapping and immersive field work to document and analyze the conditions that inform human decision-making and organization.

ALI, Fazlani Sarfaraz

Sarfaraz Ali Fazlani joins the conference from Pakistan. He has a Bachelor in Veterinary Medicine., Master of philosophy (Veterinary Microbiology) and currently works as assistant professor at the Faculty of Veterinary and Animal Sciences, Lasbela University of Agriculture, Water and Marine Sciences, Pakistan.

I am a PhD student at Key laboratory of genetics breeding and reproduction, college of animal sciences and technology, China Agriculture University Beijing since 2014. There are 18 research publications on my account in reputed international and national journals. I am member of DesertNet International (DNI). International Society of Camelid Research and Development., Pakistan Veterinary Medical Council. I have observed that there is lack of experts in the field of animal sciences particularly in biotechnology in my university as well as in my country Pakistan. This state of affair convinces me to get training and higher studies and go to conferences related to animals' health. Thus, it will enable me to achieve my career goals, and contribute in the scholarly world. With reference to academic research, I worked on Bacteriological Study on Clinical Mastitis in Camels during my master dissertation. The findings of above research have already been published in the reputed journals

As a PhD student, my research area is in the reproduction part of livestock health. Specifically working on (a) In vitro maturation bovine refinement and optimization of C-type natriuretic peptide -based pre-in vitro maturation methods for bovine oocyte in vitro maturation (IVM), and the effects on oocytes meiosis and metabolism. Examine the activity of COCs, blastocyst formation rate and mechanisms responsible for sequence of events during the maturation of bovine oocytes in vitro with OSFs such as BMP15 and GDF9 in the presence of CNP pre-IVM treatment. (b) C-type natriuretic peptide (CNP) promotes preantral follicular development mechanism in mice. Proliferation of granulosa cells in vitro, reactive oxygen species detection (ROS), Tunnel assay, signaling pathway NPR2, gene expression related to activation of NPR2 receptor.

ARHIN, Albert

Albert Arhin is currently completing a PhD studies in Geography at the University of Cambridge, UK (i.e. awaiting viva voce). His research interests include environmental sustainability, climate change governance and international development. Albert's PhD explored the evolution of the idea of REDD+, how it was being translated into specific policies and interventions in Ghana and the extent to which it was (not) achieving transformational change in the forestry sector. He holds MSc Degree in Environment and Development Sustainability from the University of Leeds, UK and a BSc degree in Development Planning, Ghana (KNUST).

BASUPI, Lenyeletse Vincent

My research interest focuses on governance of environmental resources in drylands; institutions for management of resources held and used communally, in particular, land and water. I am also interested on issues affecting development and natural resources access by minority communities and their adaptations to environmental and institutional changes. My recent publication and research work was on using participatory geographic information system to investigate pastoral land use transformations and accessibility to grazing and water resources by minority pastoral communities in semi-arid fringes of the Okavango Delta, Botswana.

I am a 3rd PhD candidate in the Sustainability Research Institute, School of Earth and Environment, University of Leeds, UK. I hold an MSc in Environmental Science. Prior to my PhD, I worked as a Land Use Officer in Botswana's Ministry of Land and Water management for 5 years. My PhD research involves investigating land tenure transformation policies, rangeland subdivisions and associated impacts on pastoral systems in Botswana's semi-arid fringes of the Okavango Delta. The research combines qualitative participatory methods with

quantitative spatial analysis using a Participatory Geographic Information System (PGIS) to investigate the local dynamics of land use, dryland pastoralism, and resource access and pastoralists adaptation strategies to both policy and environmental change. My PhD is fully funded by Botswana International University of Science and Technology.

BADGAR, Battsetseg

Badgar Battsetseg- DVM, graduated from Moscow Veterinary Academy Russia in 1990. She got her PhD degree at Gifu University Graduate School, Japan in 2004. and than continued her research study in Obihiro University until 2007. Dr. Battsetseg established laboratory of Molecular Genetics at her institute in Mongolia. Now working as a Director General of Institute of Veterinary Institute Mongolian University of Life Science, Mongolia since 2013. An author of 5 books, more than 30 peer-reviewed scientific manuscript and more than 100 articles in scientific journals in Mongolia in the field of development of diagnostics and drug development for animal protozoan disease, tick transmission, some infectious and non-infectious animal diseases.

Research interest; diagnostics and drug development of protozoan, tick and tick borne diseases, animal resistance, molecular genetics

BLAU, Jill

Jill Blau (formerly Scherneck) is a PhD scholar at the Free University of Berlin and a lecturer at Friedensau University. In her research, she investigates community-based land tenure of herders in Ethiopia and Germany. Her research interests include development studies, land and natural resource use with a specific focus on pastoralism, commons, peace and conflict and gender studies. Jill holds a BA in Development Studies & International Relations from the University of Sussex and a Master of Public Policy from the Hertie School of Governance. She has previously worked for four years at the Heinrich Boell Foundation, both as Head of Department for Feminism and Gender Democracy in the Gunda – Werner Institute as well as Head of Department for International Politics & Globalisation in the International Division. Before that, she was a Junior Project Manager at GIZ Office Berlin.

BONILLA, Lauren

Lauren Bonilla is a Research Associate on the Emerging Subjects project in the Department of Anthropology at University College London. She received her PhD in geography at Clark University, and is broadly interested in how environmental and social change intersects with processes of economic and political development. She studies questions around mining and development, with a focus on how the introduction of new mining-related projects, policies, and infrastructures combine to reshape everyday life for Mongolians.

BRIGGS, Chad

Chad Briggs has a PhD in political science from Carleton University in Canada, and is currently a defense and security adviser in Kosovo with GlobalInt LLC, as well as adjunct professor of global security at Johns Hopkins University and a senior fellow at the Institute for Environmental Security in The Hague. Dr. Briggs was previously Minerva Chair and professor of energy & environmental security at the US Air War College, and senior adviser to the US Department of Energy on climate security risks. His research includes foresight and risk assessments of energy and environmental risks/disasters, and translation of scientific data to security policy. He also specializes in counter-hybrid and information warfare in regions such as Ukraine and the Balkans, and refugee response in Greece.

CHANDRA, Jagadish

I was born on 2nd November 1992 at Erragondapalem – a remote village in Andhra Pradesh, India. I belong to a Scheduled Tribe (ST) Class – known as a Depressed Class during the British rule and included under historically disadvantaged indigenous people recognised in the Constitution of India with certain privileges. I am the only son to my father – Dr. S. Ramanaiah, a Professor of Geology in Sri Venkateswara University at Tirupati and my mother – a housewife. My only sister is married and works as a College Lecturer. I secured post-graduate diplomas in Computer Applications in 2013 and in Multi-media in 2014. I obtained a First Class in Bachelor of Science with Mathematics, Statistics and Computer Science in 2016. As a Member of the Rayalaseema Vikas Parishad (RVP) since 2015, I received training in the scientific development of water resources of adequate quality and quantity in the semi-arid Rayalaseema region of Andhra Pradesh.

My research interests are centred around finding scientific solutions to tackle the plight of farmers and agricultural workers in the dry-land environment of Rayalaseema where agriculture is mostly rain-dependent and where workers are forced to migrate to urban areas for non-agricultural work in every summer. Sinking of several deep dry bore wells in an unsuccessful bid to tap groundwater has led to bankruptcy and suicide deaths. The high soil alkalinity in the region enhances fluoride content of drinking water resulting in the endemic disorders of osteofluorosis and genu valgum. I have become an active member of the NGO – Rayalaseema Vikas Parishad in 2015 in applying science to enhance groundwater quality and availability through rainwater harvesting, soil reclamation to reduce soil alkalinity, scientific citing of well sites through remote sensing, GIS and geophysical methods, improved design of wells, chemical analysis of water samples and creating awareness of people on environmental education.

CHATTY, Dawn

Professor Dawn Chatty is a social anthropologist whose ethnographic interests lie in the Middle East, particularly with nomadic pastoral tribes and refugee young people. Her research interests include a number of forced migration and development issues such as conservation-induced displacement, tribal resettlement, modern technology and social change, gender and development and the impact of prolonged conflict on refugee young people.

Dawn is both an academic anthropologist and a practitioner, having carefully developed her career in universities in the United States, Lebanon, Syria and Oman, as well as with a number of development agencies such as the UNDP, UNICEF, FAO and IFAD. After taking her undergraduate degree with honours at UCLA (University of California at Los Angeles), she took a Master's degree in Development Studies from the Institute of Social Studies, the Hague, Netherlands. She returned to UCLA to take her PhD in Social Anthropology under the late Professor Hilda Kuper.

Following the award of a Leverhulme Trust Major Research Fellowship, Dawn spent the period October 2005–September 2007 researching and writing a manuscript on Dispossession and Forced Migration in the Middle East. The volume was published by Cambridge University Press (May 2010) with the title *Dispossession and Displacement in the Modern Middle East*

EDWARDS, Mona

As Research Laboratory Support Staff for the past 10 years, I performed various geochemical analyses of soils, dusts and waters. Participating in a study on dust particulate absorption by ivy, have sparked my particular interest on airborne dust pollution and effect on human health. I also participated on the pilot study of this research project on dust generated by the mine activities. Now, I would like to more specifically work on research projects by first

assessing the geo-spatial distribution of dust particulates around sources of pollution and to study the dust trail from sources to humans with the objective of quantifying the effect on human health and how we can remedy or reduce the dust inhalation and adsorption by humans.

Professional Experience: Laboratory Manager of the Geolabs since 2007, manage the laboratories and run scientific equipment. Supervision of soils, water and plants analyse projects in the Geolabs. After conducting four years postdoctoral research in Canada, on dust type materials and by-products used in concrete, I took a change in career path. When we moved to the UK, I shifted back into the university research field at Oxford University in 2007, gradually increasing my hours. I contributed to research projects, participated in publications and developed an interest in air pollution research. I am keen now to conduct research of my own in collaboration with other partners.

FETZEK, Shiloh

The Center for Climate and Security proposes to organise a panel examining climate change/variability impacts on arid areas and their interplay with security dynamics. The panel's focus and invited speakers will be clarified by mid-April, and may include, for example, the role of rainfall variability and livelihoods in northern Nigeria on the activities of Boko Haram, water resource management and security dynamics in the Lake Chad region, non-state armed groups' use of water access in the conflict in Iraq and Syria, or similar.

Shiloh Fetzek is Senior Fellow for International Affairs at the Center for Climate and Security. She is a security analyst focusing on climate change and environment, based at international affairs and security think tanks since 2007. Ms. Fetzek led climate security research projects at the International Institute for Strategic Studies (IISS) and as Head of the Climate Change and Security Programme at the Royal United Services Institute (RUSI) in London. As Senior Research Associate for Environment, Climate Change and Security at International Alert, she supported the New Climate for Peace project commissioned by the G7 Foreign Ministers. Ms. Fetzek's research interests include the social and political repercussions of environmental change and their interplay with other drivers of insecurity, including demographic dynamics.

GRAINGER, Alan

Alan Grainger has carried out research into the modelling and monitoring of desertification and tropical forest change, and their links with global climate change, since the late 1970s. He gained his D.Phil at the University of Oxford in 1987 for building a global computer simulation model of the future role of tropical rain forests in the world forest economy. His book, The Threatening Desert, was published by Earthscan Publications in 1990. He has lectured in geography at the University of Leeds since 1992.

HAHN, Alison

Allison Hailey Hahn is an Assistant Professor in the Department of Communication Studies at Baruch College, CUNY. She earned a B.A. in Africana Studies, Anthropology, and Political Science at the University of Pittsburgh. She was then a Fulbright Research Fellow at the National University of Mongolia, Department of Political Science. After returning to the United States, she earned a Masters of International Development (MID) in Development Planning and Environmental Sustainability and a Ph.D. in Communication from the University of Pittsburgh.

Prof. Hahn's research investigates the argumentation and protest strategies used in environmental controversies by pastoral-nomadic communities in Kenya, Tanzania, Mongolia and China. Before coming to Baruch, Prof. Hahn directed the University of Pittsburgh Mongolian Field Studies Program, which took students through China, Russia, and Mongolia. She also coached for the Mongolian National Debate Team, the William Pitt Debating Union, and the Soros Foundation Youth Forum.

At Baruch, Prof. Hahn is offering courses in International Communication, Organizations in International Development, and Research Methodology.

HAWA, Kaleem

Kaleem is broadly interested in the policy implications of Big Data and how large demographic, health, and climate datasets, utilized in space-time geostatistical models, will help explain changing disease and public health dynamics. His research more specifically looks at mapping malaria incidence and progress towards eradication in the hopes of establishing a framework for how governments, granting agencies, and community health organizations can most appropriately target limited resources in tracking and responding to future disease outbreaks. A key facet of this modelling includes a climate change lens that links the spread of malaria to different topographies, rainfall patterns, altitudes, temperatures, and forest coverages. Understanding how planetary warming changes disease proliferation is an essential part of this.

A Rhodes Scholar, Kaleem is pursuing his doctorate in health policy at Oxford University, writing his dissertation at the Big Data Institute on the applications of geospatial disease modelling on global health and national security. Kaleem graduated from the international relations program at Trinity College in the University of Toronto, where he served as Chair of the student government. A Fellow with the Washington-based Center for Climate & Security, Kaleem has previously worked at the World Health Organization in Geneva, the Center for Strategic and International Studies in Washington, McKinsey & Company in Toronto, and the Office of the Premier of Ontario.

HOLGUIN, Leah

I am currently a PhD student at the Department of Archaeology at the University of Southampton. I have worked in Mongolia since 2005 on several archaeological projects including the excavation of the Khunnu cemetery, Gol Mod 2, and the archaeological survey of the Khanuy Valley, both in Arkhangai province. I worked at the Mongolian Palace of Culture as a researcher and studied archaeology at the ational University of Mongolia. I received my Masters of Science from University College, London in Geographic Information Systems and Spatial Analysis in Archaeology, focusing on the spatial patterning of deer stones in Mongolia.

My current PhD research focuses on disappearing landscapes from both archaeological and environmental perspectives in the Gobi Desert of Outer Mongolia during the Holocene. I am interested in how people during the Holocene reacted to uncertainty in environmental changes, especially those connected with paleo hydrology systems. I also am investigating how people managed resources and how they responded to stress in connection with environmental change. To evaluate these landscapes I employ several methodologies including global climate modelling, nested modelling, ground penetrating radar, and remotely sensed satellite imagery combined with geographic information systems.

HOSHINO, Buho

Dr. Buho Hoshino, Professor of Department of Environmental and Symbiotic Science, College of Agriculture, Food and Environmental Sciences, Rakuno Gakuen University, Japan. PhD in the Chinese Academy of Sciences in 1995. His specialty is remote sensing and recent research is including a satellite tracking of wildlife and livestock's and monitoring of Asian dust storm and desertification using optical and microwave satellite data.

IKHSANOV, Anton

Anton Ikhsanov, M.A. graduate of St. Petersburg State University. Main sphere of study is history and culture of Turkmenistan. The participant of a dozen of international conferences and workshops (in Moscow, Ashgabat, St. Petersburg, Exeter and Oxford) and the author of 7 articles in Russian academic journals (Turkological digest, Vostok-Oriens) and Big Russian Encyclopedia. Nowadays in preparation for future Ph.D. admission.

During my brief scientific career I was working on historical and ethnographical topics tied to the socio-anthropological development and history of Turkmenistan, incl. intertribal relations in XVIII-XIX centuries, historical basis of small and medium enterprises development etc. Nowadays, my main topic is a work of Alexander Samoylovich in Turkmenistan at the beginning of XX century.

ISLAM, Safikul

I am a Ph.D. research scholar in the Department of Geography of Jamia Millia Islamia, New Delhi. Basically I belong to Malda, a district of West Bengal, India and I am pursuing Ph.D. in New Delhi, India. I had completed Masters and Graduation in geography with first division from Jamia Millia Islamia. Moreover, I had also secured first division in higher secondary (10+2) and matriculation (10th) from Samsi Agril High School (H.S), West Bengal. In 2015, I qualified UGC NET JRF (Junior Research Fellowship) which stands National Eligibility Test for the post of Assistant Professor. I was awarded by JRF in MANF (Maulana Azad National Fellowship) and NFSOBC (National Fellowship for the Student of Other Backward Class). I ranked second in higher secondary and fourth in Masters (1styear).

I am doing a Ph.D. under the supervision of Lubna Siddiqui in the Department of Geography, Jamia Millia Islamia, New Delhi. My research topic is entitled "Socio-Economic Status of Muslim Women in West Bengal" which broadly deals with the dynamics in social and economic attributes of Muslim women in the state of West Bengal. There are four research paper publications under my domain in which I have talked about education of Muslims, impact of migration on environmental quality, children in urban space etc. I have also presented nine research papers on health conditions of slum people in urban environment, work participation of Muslim women, assessment of water resource and impact of water pollution on human health, change detection of river Ganga, elderly population etc. I have attended training programme on Remote Sensing Technology, research methodology courses and workshops.

JAFARY, Forough

I completed a PhD (2011-2016) on "Interdisciplinary Groundwater Resources Management in Arid Regions" at University of Birmingham- School of Geography, Earth and Environmental Sciences (GEEs). My MSc degree is in 'Environmental and Earth Resources Management'- Kingston University- London. And I did my BSc degree in Environmental Engineering- Natural Resources Management (First Class Honours) in Azad University (Tehran) - Iran. I am currently working as a Flood and Coastal Risk Officer (FCRM), at the Environment Agency in Manchester, UK.

My particular research interests lie in the field of participatory water/groundwater resources management. For my PhD, I investigated the impacts of climate change on local groundwater irrigation management and agricultural practices in dry regions of central Iran, using participatory modelling development. I have also explored various ways of adaptive management strategies and human resilience with environmental changes (e.g. climate change). I innovated and developed a community-based participatory irrigation management processes with local stakeholders, to improve their negotiations with policy makers and also to empower their decision-making abilities for future water management plans.My main interest is to develop and deliver dynamic participatory research methods in the field of natural resources management. Also to engage stakeholders in an active learning process for greater understanding and enhance their knowledge and experiences of complex resource management.

KAPPAS, Martin

His research interests are the use of RS / GIS and in situ data to study landscape dynamics, including land cover / land use change (LULCC) for the future development and evaluation of ecosystem services under changing

societal development. Another long-term research focus is the investigation of climate and human impact on vegetation and desertification in Central Asia / Mongolia and Africa where he developed methods for the acquisition of biophysical variables (LAI, fPAR etc.) to model NPP, GPP, NEP, and ecosystem services.

KENJI, Kai

I am a coordinator of the JSPS Core-to-Core Program (B. Asia-Africa Science Platforms) since 2014. The title of the program is "Collaborative Research between Mongolia, China and Japan on Outbreaks of Asian Dust and Environmental Regime Shift". The URL is:
http://env728.env.nagoya-u.ac.jp/asiandust-ERS/Seminar3/index.html
As part of JSPS Core-to-Core Program, our group have installed a ceilometer at Dalanzadgad Observatory, Mongolia to monitor the vertical distribution of Asian dust over the Gobi Desert, with cooperation of Information and Research Institute of Meteorology, Hydrology and Environment, Mongolia. The ceilometer is a compact lidar (laser radar) with a wavelength of 910 nm. The observation data is automatically collected and transported to Nagoya University every hour to monitor the observation condition in real time. I study the occurrence of the Asian dust over the Gobi Desert and its long-range transport to the downwind regions using the ceilometer data etc.

KING, Marcus

Marcus King is John O. Rankin Associate Professor in the Elliott School of International Affairs at the George Washington University. Dr. King also directs The Elliott School's flagship Master of Arts in International Affairs degree program. Dr. King joined the Elliott School from the research staff of CNA Corporation's (Center for Naval Analyses). Previously, he was a globalization planning fellow at Georgetown University. Dr. King held Presidential appointments in the cabinet offices of the U.S. Secretaries of Energy and Defense where he represented the United States in nuclear and environmental negotiations including the UNFCCC process. King is a senior fellow at the Center for Climate and Security. He has published widely on the security implications of resource scarcity and energy policy. He holds a Ph.D. in International Relations from the Fletcher School of Law and Diplomacy at Tufts University.
My research and teaching is located in the environmental security field. My research focuses on identifying the national and international security consequences of climate change's impacts including implications for societal stability in fragile states and the changing missions and requirements of military and defense related organizations. My most recent work examines linkages between water stress and subnational violence in Syria, Nigeria and Somalia including the weaponization of water and related infrastructure.

KUHN, Nikolaus

Nikolaus J. Kuhn got his first degree in Physical Geography (1990-1995) in his native country Germany from the University of Trier, completing a thesis on Holocene climate change and dryland lake hydrology in NE-Spain. Winning the Government of Canada Award to undertake PhD research, he moved to the University of Toronto in 1996. There he completed a PhD in Geography (1996-2000), studying the effects of varying weather patterns on soil erosion in Canada and Mexico. The PhD was followed by postdoctoral research in Israel (2001) on the role of rainfall-surface interaction for landscape development in the northern Negev. In 2002, he started academic teaching as Visiting Assistant Professor at Clark University, Worcester, Massachusetts. He joined the University of Exeter as Lecturer for Geography in July 2003. In 2007, he was appointed Honorary Professor at the University of Exeter.
The research interests of Nikolaus Kuhn and his group focus on the physical geographic dimension of environmental change, in particular the interaction of surface processes and climate on geomorphology and associated biogeochemical cycles. Their key aim is to identify the functioning of landscape systems, their spatial extent, reaction to change and mutual effects on each other. Current major projects include the reconstruction of Carbon and nutrient cycles in rangelands, the role of agricultural dust emissions on climate and health in southern

Africa, the ecological impact of the land reform on communal land in Namibia, and a grant by the Swiss Space Center supporting the search for life on Mars.

LACKNER, Helen

Helen Lackner worked as a consultant in social aspects of rural development for four decades in over thirty countries, mostly in the Middle East, Africa and Europe. She is currently a research association at the London Middle East Institute in SOAS. She has been involved in Yemen since the early 1970s where she lived in all three Yemeni states for over 15 years. She now focuses on analysis and writing, trying to promote commitment to equitable development and peace in Yemen. Her most recent publications include Yemen's Peaceful transition from autocracy: could it have succeeded? (International IDEA 2016) and Understanding the Yemeni Crisis: the transformation of tribal roles in recent decades (Durham, Luce Fellowship Paper 17, 2016). In 2014, she edited Why Yemen Matters (Saqi). She is currently working on Yemen in Crisis: autocracy, neo-liberalism and the disintegration of a state to be published by Saqi in October 2017

LAZAROVS, Emiliya

Emiliya Lazarova is a Senior Lecturer in Economics at the University of East Anglia. She has done empirical work on governance and life expectancy, migration and human capital, adoption of new technologies, and procurement contracts. Together with Haifa Al Hamdani they are currently studying Foreign Direct Investment to three Gulf countries--Qatar, Saudi Arabia, and United Arab Emirates --using sectoral level data. Emiliya has a growing interest in imperfect property rights and their impact on economic performance with a special focus on the Central Asian region**.**

MAZRUI, Salah

Salah al Mazrui read social anthropology at Cambridge University in the UK. His research interest is architectural anthropology especially vernacular architecture of Oman, Yemen and Hejaz in Western Saudi Arabia. His other research interest is ecological anthropology in particular the ecology of Oman, Yemen and the Arabian Gulf. Salah is currently the Project Leader of Earthwatch Institute's study of the high woodlands of Jabal Al Akdhar and Jabal Shams in the Sultanate of Oman. The aim of the project is to identify and pilot a framework for the sustainable management and protection of high altitude Juniper Woodlands, working with the mountain tribal communities. The Project Team consisting of various scientists and experts, led by Salah, deliver research focussed on understanding the impact of human induced and natural pressures on the mountain woodlands, and identified practical solutions to mitigate these pressures. In addition, the Project delivers capacity development and learning activities to research assistants working with different government institutions.

MCELROY, Caitlin

Caitlin's research is concerned with the relationship between mining, the environment, and development from an economic geography perspective. She is particularly interested in the role of new institutional forms of mediating and managing financial investments related to the environment, development, and water infrastructure legacies. Her research has taken place in US, UK, Mongolia, Chile, Namibia, and Kenya.

Caitlin is a Departmental Research Lecturer in Enterprise and the Environment at the School of Geography and the Environment and the Smith School of Enterprise and the Environment at the University of Oxford. Caitlin is also the Director of the Smith School's Executive Education Programmes. She completed her DPhil and MSc at the University of Oxford and her BA from the University of Pennsylvania. She teaches undergraduates, postgraduate, MBA, DPhil, and executive students. The opportunity to explore many fascinating places and work with talented people around the world continues to drive her academic enthusiasm.

MOREAU, Quentin

With a background in Philosophy, Quentin Moreau is living and working in Mongolia since 8 continuous years. He has witnessed and been involved in the three last dzud episodes while mainly working in the humanitarian and development sector for international NGOs such as AVSF, Mercy Corps and People in Need. As a Country Director for People in Need since 4 years, he has, amongst other topics, been involved in humanitarian response & coordination and tries to drive the NGOs programs towards a comprehensive rural disaster risk reduction approach.

NAESS, Marius

Marius Warg Næss is a Senior Researcher at the Norwegian Institute for Cultural Heritage Research, High North Department, Tromsø, Norway where he has worked since 2014. He was awarded a PhD in social anthropology from the University of Tromsø, Norway in 2009. He has worked with Saami reindeer husbandry in northern Norway and nomadic pastoralists on the Tibetan Plateau. He is currently leading the project "The Erosion of Cooperative Networks and the Evolution of Social Hierarchies: A Comparative Approach" that investigates how changing land tenure policies affect cooperation and social organisation among reindeer herders in Norway and Tibetan pastoralists. He is also involved in the comparative project "Reindeer husbandry in a Globalizing North – resilience, adaptations and pathways for actions", leading a work package that investigates the ecologic and social foundations of mobility among reindeer herders in Norway, Sweden and Finland.

NAKANO, Tomoko

I am interested in climate change and dynamics of greenhouse gases, particularly carbon dioxide (CO2). At present, I am focusing on CO2 exchanges between a semiarid grassland ecosystem and the atmosphere in Mongolia, because global climate models predict future drying in this region during summer and studies have indicated that the semiarid grasslands respond sensitively to changes in precipitation. Another intriguing question is effects of human activity on the CO2 exchange in the grassland ecosystem. In Mongolia, nomadic grazing is a key industry and the number of livestock changes temporally and spatially. Grazing can alter plant biomass, community structure, soil biotic and abiotic factors, and can consequently change the carbon exchanges between ecosystem and the atmosphere.

Present position: Professor, Faculty of Economics, Chuo University.
Born in Hokkaido, Japan. Graduated from the School of Science, Hokkaido University in 1990. Completed the master's program at the Graduate School of Environmental Science, Hokkaido University in 1992. Completed the doctoral program at the Graduate School of Science, Hokkaido University in 1995 and gained a PhD in Science. Worked as assistant professor on the Faculty of Urban Environmental Sciences, Tokyo Metropolitan University and associate professor on the Faculty of Economics, Chuo University before taking up the current position in 2011.

NOVAK, Sarah

I am interested in the politics of transboundary environmental issues, including transboundary energy trading, managing water scarcity across borders, Arctic resources disputes, and land reclamation in the Asia Pacific. I am relatively new to this area and, as an undergraduate, am exploring avenues for my senior year thesis paper and am aiming to publish a short research paper in this area that stems from my work at Oxford. I am currently taking the course "Water and Society in the Middle East" with Dr Troy Sternberg.

Sarah is a New Zealander and third-year Politics, Philosophy, and Economics student (minoring in Environmental Studies) at Yale-NUS College in Singapore, a new American-style liberal arts college established by Yale University and the National University of Singapore. She is currently studying abroad at Oxford for six

months where she hopes to deepen her academic knowledge of the nexus of politics and environmental issues. She has professional experience in government, non-profits, and public-sector consulting in Oceania, Asia, the United States, and Europe. She is also a keen cyclist, an avid coffee-drinker, and a proud kiwi.

OTANI, Dr. Shinji

I am a medical doctor and I have been working as a surgical oncologist in Tottori University Hospital and several general hospitals. I received PhD in medicine from Faculty of Medicine, Tottori University, and I joined Japanese Antarctic Research Expedition as a doctor of wintering member in mid-career.
Currently, I am doing research on arid land and medicine at Arid Land Research Center, Tottori University in parallel to the work on Tottori University Hospital (associate professor).

The main subject of my research is 'climate change and human health'. The field of specialization includes epidemiology, biology, nutriology, and disaster science. For comprehensive risk assessment of climate change related disaster, collaboration with faculty across disciplines is necessary. My study aimed to evaluate health risk of climate change and prevent health damage.

PAPPAGALLO, Linda

Linda holds a BSc degree in Economics from Nottingham University and a Master's degree in International Relations from Columbia University in the United States.
Her five-year professional career has primarily focused on collecting social data through mobile technology, with a start-up called Ulula; and, through large scale randomized control trials with Innovations for Poverty Action (IPA), a non-profit research and policy organization.

Her most recent experience as regional project coordinator for one of IPA's largest impact evaluations on a Community-Based Rangeland and Livestock Management program in Namibia exposed her to the challenges of natural resource management when there is a breakdown of cultural and governance practices coupled with environmental pressures. This experience, as well as her passion for nature conservation and nomadic pastoralism in arid regions, has spurred her to begin a PhD focusing on pastoralism and conservation in the Middle East and North Africa (MENA).
Having lived most of her life in the MENA (Jordan, Lebanon, Syria, Morocco, Israel and Tunisia) she has developed a strong attachment to the region. In her spare time she writes for Green Prophet, an online news platform that focuses on environmental issues in the MENA.

RAPPA, Brad

Bradley Rappa, an Assistant Professor in the Cinema, Photography and Media Arts program at Ithaca College, is an award winning animator, documentarian, and experimental filmmaker whose films have screened worldwide. Currently, Bradley produces documentary films that focus primarily on environmental issues. He studied at Syracuse University and after receiving his M.F.A. in filmmaking, moved to New York City where he worked for over ten years as a cinematographer. In 2002 he was hired by the University of Arizona's College of Public Health, where he developed and taught a progressive media literacy and production curriculum designed to empower the Native American youth who lived in the greater Tucson area. This transformative opportunity rekindled Bradley's love for teaching and reinforced his principles that creativity and a passion for discovery are crucial components of producing thought provoking and impactful films. His most recent work tackles the critically important issues of global consumer culture, industrialization, and the challenges we all face as we try to live locally, sustainably, and in harmony, within our communities and our natural environment.

REMUS, Prăvălie

Prăvălie Remus and Bandoc Georgeta are teachers and researchers at the University of Bucharest, Faculty of Geography. Their central work is concerned with interdisciplinary environmental, climatology and renewable energies research.

RUEFF, Henri

Henri Rueff is a Geographer interested in smallholder's livelihoods living in resource scarce and remote areas in mountains and deserts. Henri conducted extensive research in the Hindu Kush-Himalaya Mountains of Northern Pakistan, the Gobi and in the Middle East. After completing two postdocs at University of Bern and Oxford he is now a researcher and lecturer at University of Basel, Switzerland, evaluating critically farming technologies and innovative payment schemes affecting smallholders' practices. He investigates the validity of complex human-environment interactions leading to an environment-poverty nexus. He is especially interested in documenting and understanding smallholders' strategies such as income diversification in areas undergoing rapid changes. The effects of changes he explores are mostly environmental (climate change, climate shocks) and institutional (multilevel) using economic models, climate data, and qualitative analysis from first hand data.

SAPASHEV, Oraz

Areas of research:
1) Language and grammar of old Turkic written monuments. In 2000 he defended his Ph. D. thesis on the topic "The sentence in the ancient language based on the materials of Orhon-Yenisei script".
2) Old Turkic epigraphy and paleography. The study of the ethnogeny code graphics and signs from the ancient Turkic ethnogeny code Tamga signs relatively ancient, based on the petroglyphs.
3) Ancient funeral structures and stone sculptures. A field expedition to study the historical and religious places in the ancient era was conducted under the leadership of Sapashev in 2004-2007. The characteristics of the stone statues, memorial structures, their preservation and labelling for ecotourism to historical places were studied. The monograph "Statuary monuments of East Kazakhstan early middle ages" has been released on the base of this research. Almaty, 2010
4) The religious identity of Central Asia Turks. Design-based research is the study of Turkic religious-cultural identity in globalizing society.

SEMPLICI, Greta

Greta Semplici is a DPhil Candidate at Oxford Department of International Development. Her research investigates the problematic and challenging concept of resilience when applied to people who live in deserts. She did extensive fieldwork for her DPhil in Turkana county, North Kenya. She previously worked for FAO Somalia as M&E in "Building Resilience in Somalia" joint initiative, and other development organisations which motivated her interested in learning more about resilience from the people point of view and seeing whether there is room for a dialogue with more normative and institutional approaches to resilience. She holds a BA and a MSc in development economics from the university of Florence and is now specializing in more ethnographical approaches.

SHINODA, Masato

I received D.Sc. in climatology (on African droughts) from the Department of Geography at the University of Tokyo. My research career until the present position covered a visiting scientist of the Department of Meteorology, University of Nairobi of Kenya, an assistant professor and subsequently an associate professor of the Department of Geography, Tokyo Metropolitan University, and a professor of the Arid Land Research Center, Tottori University.

I served as author or expert reviewer of the Second to Fourth Assessment Reports of the Intergovernmental Panel on Climate Change, which received the Nobel Peace Prize in 2007 and as a leader of dust study under the Global Center of Excellence for Dryland Science program by the Japan Society for the Promotion of Science.

My research involves many observational aspects of climatology. The field of specialization includes ecological climatology, i.e., study on eco-climate system dynamics; drought sciences, dust emission mechanism, and early warning system of dryland natural disasters. My study area covers world arid regions extending from Africa to central Asia and Mongolia.

SMAILOVA, Aizhan

Areas of research:
1) Theory of the language. In 2007 defended her scientific degree thesis on the topic "Adaptation of foreign proper names in Kazakh language".
2) Cognitive linguistics, social linguistics, cross-cultural communication
3) Old Turkic epigraphy and paleography. The study of the ethnogeny code graphics and signs from the ancient Turkic ethnogeny code Tamga signs relatively ancient, based on the petroglyphs.
4) The religious identity of Central Asia Turks. Design-based research is the study of Turkic religious-cultural identity in globalizing society.

STERNBERG, Troy

Troy's research centres on climate hazards in Asian drylands. This includes climate documentation, hazard analysis, assessment of social and environmental risk and system exposure to extreme events. Climate - hazard interaction in deserts is part of an intricate equation that includes government policy, land use decisions and cultural and historical patterns as much as precipitation, temperature and landscape dynamics. He likes the Gobi (Mongolia and China), Thar (India) and Arabian (Oman) deserts as well as Baja California and the badlands of Wyoming; water, climate, hazards, people and transboundary risk are favourite research themes. Troy is trying to find shallow groundwater for nomads in the Gobi using remotely-sensed palaeo-channels and palaeo-shorelines as potential indicators of water resources.

STEVENSON, Jed

I studied Archaeology, Classics, and Classical Art at University College London as an undergraduate. After working on archaeological sites in the Mediterranean and the Persian Gulf, I turned my attention to issues of health and disease in Africa, gaining an MPH in Global Health and PhD in Anthropology from Emory University in Atlanta. I have held postdoctoral research positions in Global Health at Emory and Evolutionary Anthropology at UCL, and began my teaching career in Medical Anthropology at Durham. I currently coordinate the Omo-Turkana Research Network (oturn.msu.edu).

My research centres on health and human development in sub-Saharan Africa. I am particularly interested in the health implications of mass schooling, forced migration, and food and water insecurity. Since 2007 I have conducted a longitudinal study of child development in Ethiopia, and more recently, I carried out research on hunting and forest livelihoods in Congo. I am currently researching the impacts of hydroelectric dam and plantation development on the people of the Omo-Turkana basin in Ethiopia and Kenya.

THRIFT, Eric

Eric Thrift is a socio-cultural anthropologist whose research interests include mobile pastoralism, environmental governance, the anthropology of development, and digital ethnography. He has worked as an applied

anthropologist and development practitioner in Mongolia for more than a decade. Eric currently teaches anthropology and development studies at the University of Winnipeg.

WINCHESTER, Vanessa

Dr Winchester, awarded a D.Phil. in 1990 (thesis title: "An evaluation of lichenometry: with field studies in Lappland, Britain, and the Western Alps"), has been affiliated to the School of Geography and the Environment as a Research Associate since 1997 and a Senior Research Associate since 2002.
She began research on glacier retreat around the North Patagonian Ice field in 1991 and continued working there until 2009 using both lichenometry and dendrogeomorphology to date rock surface exposure following glacier retreat.

Dr. Winchester's research interests include the application of lichenometric and dendrochronological techniques to the dating and interpretation of environmental change. Her work has included studies of glacier retreat in southern Chile, mass wasting events in Peru and the northern Tien Shan Mountains, Kazakhstan, with changes in these regions linked to climate warming in progress since the mid-nineteenth century. Latterly, she has turned her attention to landscape dynamics in arid lands using tree rings as indicators of change, including work on-gully erosion in Colorado, dune movements on the Baltic foreshore in Poland, a pilot study on water table changes around a new mine in the south Gobi, Mongolia and forest dynamics in S.E. Madagascar.

Currently her interests have expanded to the analysis of landscape processes and rates of change in arid environments. In 2002 she established the Oxford Laboratory of Dendrogeomorphology and in 2005 ran the "20th International Dendroecological Field week" in North Devon in collaboration with the Swiss Federal Institute for Forest, Snow, and Landscape Research, Birmensdorf, Zurich, the originators of this annual event.

Web page: http://www.geog.ox.ac.uk/research/geomorphology/dendro/index.html

WOJNAROWSKI, Fredrick

Fred is currently a PhD candidate in Social Anthropology at University of Cambridge, where he is a Vice-Chancellor's Scholar. His research explores narratives around the 'end of nomadism', and the emergence of an ideology of pacification and enforced sedenterisation emerging under colonial regimes in the inter-war period, focusing on the British Mandate in Transjordan. Having studied anthropology at Oxford and SOAS he became interested in the ethnography and history of the Middle East, in part through studying under two leading anthropologists of the region, Paul Dresch and Magnus Marsden. His MA thesis focused on the B'dul Bedouin of Petra, who had been resettled to a Government-built village to make way for the development of mass tourism in Petra, which was rapidly replacing herding as their main economic activity. After a four year break from academia working in the civil service, he is returning to these long-standing research interests at Cambridge.

Research themes: Nomadism, oral history, nationalism, colonial history, political ecology, the anthropology of history and colonial archives, international development

I intend to examine ethnographically and historically perceptions around the seeming 'end' of Bedouin nomadism and autonomy. I will focus on the continued significance of narratives of the end of the 'Age of Shaykhs' and the coming of the 'Age of Government' during the formation of the Emirate of Trans-Jordan under the British Mandate to the Bani Sakhr Bedouin in North-east Jordan. Through this I hope to deepen and historicise our understanding of the way Bedouin identity is formulated in relation to the nation state in the Arab world, and increase scholarly understanding of the impact of Imperial 'desert frontier' polices on modern discourses around Bedouins. This will also speak to broader anthropological theories of temporality and historical memory.

WONWOO, Cho

I majored in forestry in my undergraduate course. The master's course has been tested for adaptability in the Inner Mongolia region of China, using native and introduced poplar clones. The doctoral research area is the boundary between Mongolia's grasslands and desertification areas. The main contents of the research are poplar clone selection, physiology and growth pattern analysis, and development of seedling production system that can be applied locally**.**

Wonwoo Cho is a doctoral researcher and works at Dongguk University in Korea. Through H. ammodendron research, he was interested in dry plants first. During the master's course, the adaptation experiment was conducted through long-term monitoring of native and introduced poplar clones in Inner Mongolia area in China. Currently, he is studying poplar clone selection, physiology, growth and plant technology development in the Mongolian experimental site. He has been a researcher at the CCDASA(Center for combating desertification in arid and semi-arid areas), supported by the Korean Forest Service since 2012, and has received a Global Ph.D Fellowship Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Education.

XU, Duanyang

Duanyang XU received his Ph.D.degree in Soil Science from Nanjing Agricultural University of China in 2009. He is currently an associate professor in the Institute of Geographic Sciences and Natural Resources Research, Chinese Academic of Sciences. He has worked on desertification monitoring, driving forces assessment and simulation, desertification control and capacity over 10 years. His major contribution and findings are: 1) develop a quick method to monitor desertification at national scale by combing different sources of remote sensing images and Decision Tree model; 2) develop a method to separate the relative role of climate change and human activities in desertification dynamics by analyzing and comparing the changing trends of potential NPP and the difference between potential and actual NPP, which had been proved reliable in North China; 3) develop a spatial system dynamic model and decision supporting system for desertification simulation and control by combining climate, vegetation, economy, population, pasturage and land use; 4) systematically assessed the ecosystem service change that induced by desertification in North China.

Research Interests include:
1. Desertification monitoring and driving forces assessment. Including of how to develop new method and make criterion to quickly and accurately monitor desertification by combining different remote sensing images at different scales; and how to separate the effect of climate change from the human-induced desertification and assess the relative role of ecological projects and polices on desertification rehabilitation. **2. Desertification dynamics simulation.** Including of how to reconstruct the processes of desertification and quantify the relationship among desertification dynamic and their driving factors by using the systematic theory, and how to develop a spatial system dynamic t model for desertification simulation and policy-making. **3. Water source capacity assessment in desertification rehabilitation.** Including of how to simulate and determine the scale and intensity of desertification rehabilitation according to the available water resources, especially under the sustainable development framework at regional scale that considering the economic growth and the improvement of people's livelihood. **4. Ecosystem service and compensation for desertification control.** Including of how to monitor and measure the ecosystem service value and its dynamics that induced by desertification reversion and expansion, how to design the mechanism or policy based on ecological compensation theory for desertification control.

A Note on Conference Bags

The conference bags were produced by women from the village of Mardan, Pakistan in Khyber Pakhtunkhwa province in the northern areas of Pakistan. This project helped the women get further education in sewing techniques and has enabled them to purchase or refurbish their sewing machines. This project has had very positive effects on the lives of these women and their future outlook.

We hope that this project is the first of many for the women of Mardan.

If you would like to give your feedback about the bags or offer a few words of encouragement, please e-mail Zainab Khattak at khattakzainab1@gmail.com