

Report to FIG on attendance at:-

## **1.5 Degrees – Meeting the challenge of the Paris Agreement**

University of Oxford, September 2016

### Background

The ambition of the climate agreement reached at the UN 21<sup>st</sup> Conference of Parties in Paris last year was to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and to pressure efforts to limit the temperature increase to 1.5°C. This was a substantial, ambitious mitigation objective which revealed a significant research gap on nature, benefits and feasibility of a 1.5°C world, as well as a huge policy challenge.

The conference “1.5 degrees” was organised to lead the scientific response to the Paris agreement. It was meant to provide information on what the likely impact of 1.5°C increase in temperature would be worldwide as well as outline some suggestions for potential mitigation actions. It also aimed to encourage co-operation between scientists and policy makers and to contribute its outcomes to a forthcoming IPCC Special Report on 1.5°C (2018).

It was important that the Falkland Islands were represented at the conference to:-

1. Show that the Islands are aware of the potential impact of climate change
2. Flag up its’ recognition of its global obligation to climate change mitigation.
3. Demonstrate how it is using available scientific evidence to underpin its response to the impact of climate change on land use policy and practice

Given the space-restricted capacity of the conference (to 200 participants) the only way to assure participation was to present a paper (either oral or as a stand-alone poster). Jim McAdam agreed to submit a paper entitled “The response of a small island state to 1.5°C climate change - the example of the Falkland Islands”. Oral papers tended to be generic overviews of global issues, so more localised studies (such as the Falklands) were permitted as posters. A pdf of the poster presented is appended. The abstract of the paper presented was:-

THE RESPONSE OF A SMALL ISLAND STATE TO 1.5°C CLIMATE CHANGE – THE EXAMPLE OF THE FALKLAND ISLANDS.

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*Abstract; Small oceanic islands are particularly vulnerable to climate change given their isolation, biodiversity and self reliance. Climate change predictions for the Falkland Islands (12,000km<sup>2</sup>, 52°S pop 2,800) are for 1.3-2.2°C increase in temperature over the next 100 years. The islands have the*

*highest proportion of peat cover in any of the UK Overseas Territories and given the dry (400-800mm), windy climate and shallow soil cover, are susceptible to erosion and loss of soil carbon. They have a small population density, important biodiversity and a sustainably managed fishery. The Falkland Islands Government (FIG) has supported an EU project to determine the potential impact of and risk associated with a temperature increase in the order of 1.5°C.*

*Following extensive public consultation, key risks identified were: changes in soil moisture and drying; changes to invasive plants, pests and diseases; plants unable to shift ranges; increased fire risk; changes in soil organic carbon; changes in yield and quality of forage species planted. Scientific evidence was accumulated, reviewed and presented to FIG to inform Government in its willingness to demonstrate a sound evidence base to identify risk and underpin policy. FIG will now consider the evidence base from a risk analysis to formulate policy.*

*The islands already invest heavily in renewable energy technologies, nationally over 50% of energy is generated from wind and all renewable resources (wind, sun, rainfall) are mapped for incorporation into business plans for individual settlements to select best possible options.*

*We propose that the Falkland Islands are an exemplar of climate change risk assessment and potential adoption into a government policy which is underpinned by the best scientific evidence available to mitigate impacts across a range of scenarios. Even though it is a small country, the Falklands is recognising its global obligations to climate change mitigation by adopting best evidence-based practice.*

#### The presentation

This presentation was based on findings from a recently (Sept 216) completed EU-funded project (TEFRA – Terrestrial ecosystem response to potential of climate change in the Falkland Islands) carried out principally by RBG Kew (with Dr Rebecca Upson and Dr Colin Clubbe as its main participants) with input from Dr Jim McAdam (through the UK Falkland Islands Trust), Rodney Burton (soil surveyor) and support from within FIG and more widely in the Falklands.

This project aimed to give an overview of the climate of the Falklands and present the findings of a climate change prediction exercise carried out within the remit of the project.

Broadly this was that over the next 100 years, temperatures could potentially increase 1.3 – 2.2°C (i.e. within the 1.5% target) and though there would be no change in precipitation, rainfall episodes would become more sporadic and increase in intensity. It would also likely become more stormy (though this prediction remains to be carried out).

The key risks identified were: changes in soil moisture and drying (evapo-transpiration changes); effect on some native plants less-able to shift their ecological range to adapt; threats from invasive species, pests and diseases; increased fire risk; loss of soil organic Carbon; changes in yield and quality of forage species planted. These risks were quantified as much as possible and potential mitigation strategies outlined. The paper also pointed out the highly responsible attitude FIG was making to climate change mitigation through major investment in renewables, particularly wind energy. It also enabled me to elaborate and expand on how they planned to widen the use of renewables (e.g. solar, hydro) by encouraging farm settlements to have a portfolio of costed options (with mapping of these resources currently being undertaken).

It was highlighted that the Falklands' greatest "asset" was its approximately 1Mt of carbon stored in its organic "peaty" soils (this is equivalent to 3681Mt CO<sub>2</sub> and equates to a total soil organic carbon audit of 838 tonnes/ha). It also highlighted that findings from the project would be incorporated into recommendations for best practice to manage this resource to maintain its integrity (by vegetation and water management) in the light of climate change predictions.

The poster attracted great interest with many visitors during the dedicated poster session. It attracted particular attention because, while the Paris agreement specifically highlighted the fact that small oceanic islands are particularly vulnerable to climate change given their isolation, biodiversity and self-reliance, only 2 small islands were "represented" in the presentations – The Maldives and the Falklands. One of the organisers commented that our paper was the only one with a politician on the author list!

### The conference – some relevant points

There were 16 relatively high level papers delivered on topics such as Regional impacts of 1.5°C; Impact of 1.5°C on weather and climate extremes; Covariant ocean climate effects; Natural mitigation pathways; Governance of 1.5°C; Moral questions around a 1.5°C goal, etc (for full list see - <http://www.eci.ox.ac.uk/assets/img/main/1p5d150916.pdf> ). There were 8 parallel sessions of presentations on:-

Mitigation options

Sensitivity of natural systems

Human impacts of 1.5°C

Implications of 1.5°C target for adaptation

Mitigation Pathways for 1.5°C

Financing 1.5°C

Societal and development implications of the Paris Agreement

and some 70 poster papers.

The first day concentrated on how the earth's climate is changing and why. There was a substantial contribution on potential impacts globally. There were numerous studies referred to which will be of interest to the Falklands. The Met Office predict that the post-industrial increase to 1.5°C will likely not happen for 20-30 years. Earth's temperature is increasing 0.17-/0.19°C per year. Glaciers are retreating particularly quickly in the Southern Andes (run-off is a big issue). Impacts on biodiversity will depend on range and mobility of species. (The FI TEFRA project has already highlighted species which are vulnerable). Weather extremes will definitely increase. There will be more hot and cold days and likely more storms (though this is not so predictable) and heavy precipitation is very likely. Regarding general comments on small islands, there was much more uncertainty as the oceans are not so well covered (though the mention of oceans in the Paris Agreement was a first for a major climate change proclamation. The collapse of the Larsen B ice sheet is climate-driven and already a 1°C increase in temp has destroyed 25% of the Great Barrier Reef.

The contribution of agriculture to GHG emissions is increasing, forestry decreasing (decreasing rates of deforestation). Decreasing sheep numbers in the Falklands (largely since the abattoir construction) is a positive step in the right direction for the Falklands overall contribution to reducing GHG emissions. Other intensive agriculture countries where stock numbers are increasing is making their target achievement very difficult (e.g. in Ireland the farming sector contribute 26% to total GHG emissions. This is almost all from cattle and government targets to decrease GHG emissions are in direct conflict with a drive to double milk and meat production). This is a huge issue.

Although minor, the Falklands should highlight its decreasing emissions from agriculture. In conjunction with this, agriculture's contribution will be strengthened by positive measures to retain carbon in the soil.

A part of the conference was devoted to Natural Solutions to climate problems. Mankind must reach carbon neutrality by mid-century – how much can land (and photosynthesis) contribute to mitigating climate change. There are 3 types of actions to be taken:

- (i) Protect intact ecosystems
- (ii) Restore native ecosystems
- (iii) Improve practices on native lands.

The Falklands can use its management of natural systems to improve C sequestration. Peatlands are a global “natural solution”. They will slowly oxidise with increased temperature. Loss of peatlands is a social imperative.

### Renewables

Energy generated from the wind has become more cost-effective than solar. Natural mitigation pathways are a no-brainer. Mitigation must be integrated into quality of life issues. Nature has a branding problem – we see nature as a victim yet it is a machine which can produce a lot of these services. Relevant science is a big part of the solution

There was an important paper (by Prof Lavanya Rajamani) on governance implications of the 1.5°C goal (see Appendix 1 for slide content). It is likely the UK Government will sign up to the full terms of the agreement and have compulsory targets. At present the only legally binding obligations are of conduct in relation to submission of Nationally Determined Contributions (NDC), but achievement of them is not legally binding. Each country is to set its' own NDCs.

How these NDCs are set will be critical for the Falklands. I would suggest that targets in GHG reductions (e.g. through shifting of agricultural priorities and increase in renewable commitments) could be set for FI which could be achieved.

There are a lot of uncertainties though on progress with measurement etc. At the minute the audit cycle is aspirational. In terms of any global stock take, the Falklands is well down this route and thanks to the TEFRA project much of the information to base a stock- take on is available. More work needs to go into quantification of the soils stocks. The current Shackleton Scholarship on soil survey can help by substantially revising the soil map generated from the TEFRA project.

Overall it was good to be present at this conference. If the UK Government does ratify its obligations

and the Falklands is asked to draw up NDC, the guidelines from this conference will be helpful. There was very strong interest in the Falklands and general surprise that it was taking its climate change position very seriously.

Jim McAdam

Oct 2016

## **Appendix 1**

Title of presentation:- Governance Implications of the 1.5°C Goal

Extent to which the hybrid architecture of the Paris Agreement can deliver on the temperature goal?

Extent to which the 1.5°C frames the obligations in the Paris Agreement?

### **Hybrid Architecture**

- Bottom up element: Nationally Determined Contributions (NDC's)
- Top down elements: Ambition Cycle
- Transparency framework
- Expectation of progression and highest possible ambition
- Five yearly NDCs
  - Informed by Global stock take
- Global Stock Take
  - Informed by outputs of transparency framework
- Long term low greenhouse emission development strategies
- Compliance

### **Nationally Determined Contributions**

- Legally binding obligations of conduct in relation to submission of NDC's but content of NDC's (i.e. achievement) not legally binding
- Bottom up may not add up, thus need strong top-down elements – ambition cycle

### **Ambition Cycle: Transparency**

- Purpose of transparency framework
  - Track progress towards achieving NDC's
  - Inform the Global Stock Take
- Information subject to:
  - Technical Expert Review
  - Multilateral Consideration of Progress
- Details in the post-Paris negotiations, but in informing stock take and thus next cycle of NDC's – transparency plays an important role

### **Ambition Cycle: Progression**

- Expectation of progression & highest possible ambition in relation to individual NDC's

- But unclear how progression and highest possible ambition is to be measured (form, stringency, other?) and by whom
- Self assessment by Parties?
  - Lima decision – Parties to report on how they consider their contribution “fair” and “ambitious”
  - But progression and ambition will be subject to peer review and be judged against the 1.5°C goal as well

### **Ambition Cycle: Global Stock Take**

- The Global Stock Take: assess collective progress towards achieving the purpose of the Agreement and its long term goals
  - purpose includes temperature and other goals
  - comprehensive – mitigation, adaptation, support
  - takes into account equity and science
  - outcome to inform Parties in updating and enhancing their NDCs (key to ambition cycle)

### **Ambition Cycle: Strategies**

- Recommendation that Parties present “long-term low greenhouse gas emission development strategies”
  - may trigger strategic thinking about national development plans, sectoral plans
  - may need to be broadly compatible with a well below 2°C/1.5°C global pathway

### **What if we miss the temperature goal?**

#### **Implications for Adaptation**

- Adaptation response tied to temperature goal
- Support for vulnerable countries – “continuous and enhanced international support” – but support obligations are carefully circumscribed
- Global Stock Take is to
  - review adequacy of support for adaptation
  - enhance implementation of adaptation action

#### **Implications for Loss & Damage**

- Loss and Damage
  - Separate article – beyond adaptation
  - Warsaw International Mechanism for Loss and Damage may be “enhanced and strengthened” – will need to respond to the changed reality
- But no “basis for any liability or compensation”

#### **Key Messages**

- On legal character
  - aspirational goal to be implemented in the context of equity, sustainable

development and poverty eradication

- On governance
  - goal has “bench-mark setting” function in the ambition cycle
  - goal has implications for timing and scale of ambition of individual NDCs
  - if goal is missed, it will frame obligations relating to adaptation, loss and damage, and corresponding support needs

#### **However**

- Limits to which the hybrid architecture of the Paris Agreement – a system built on “nationally determined” contributions – can deliver on the 1.5°C goal
- Limits to which this can be done in an equitable fashion within the context of the Paris Agreement
  - given limited support obligations
  - no top-down determination of equity or fairness