BASE BOTTOM-UP CLIMATE ADAPTATION STRATEGIES TOWARDS A SUSTAINABLE EUROPE

SEVENTH FRAMEWORK PROGRAMME

UNIVERSITY OF EXETER

Subgroup: Agriculture & Ecosystem Services
Case-study: Dartmoor National Park (University of Exeter, UK)

July 2015

Case study developed by:

Roos M. den Uyl and Duncan Russel

University of Exeter

Project:

FP7/ Project BASE [2012-2016]

Date of release:

12/12/2015

Purpose of this document:

"The Case Studies Living Document (CSLD) will be the document that each case study leader will use to share the information that (i) characterize and give context to its case study, (ii) the goals within BASE, (iii) the methods used and mainly (iv) a synthesis of the results that that case study is providing to BASE project. This will allow the CS leader to understand how its own case is going (having a good overview), but also (v) will allow the sub-group to which the case study belong to know what is happening and what can be done (mainly on synergies and so on) as well as to (vi) WP4 & 5 coordinators to use that information to report (including each WP task leaders). These living document will also (vii) allow WP6 & 7 partner to know the information."

Index

1. General Case Study Description

A. Location

(Please insert the coordinates of the geographical centre of your case study and additionally the area of the entire are under investigation. For a city, for example, use the city centre and the area of the municipality. Illustrate in the map the area in study)

GPS: N_____/ W(?) _____
Area: About 924 km^2

Location and contours of Dartmoor National Park (Source: http://en.wikipedia.org/wiki/Dartmoor)
The location is in the Southwest of England, in the County of Devon.

B. Case Study Summary

Dartmoor National Park is an upland located nature conservation area (with several peaks rising up to 600 meters) in the South West of England covering about 954m2. Several ecosystem services are provided by the Dartmoor area. Natural England, an advisory body to the UK government on the natural environment, has recently identified ecosystem services provided by Dartmoor. These include (Natural England, 2014, pp. 13-15):

- provisioning services such as food provision, water availability, and genetic diversity;
- regulating services such as climate regulation, regulating soil erosion, regulating water quality, regulating water flow;
- and cultural services such as sense of place/inspiration, sense of history, tranquility, recreation, biodiversity and geodiversity.

Large parts of this upland located area are covered by moors. The substrate of moors is peat, accumulated organic matter. This peat layer absorbs and then slowly releases water from precipitation; functioning as a sponge and naturally protecting the downstream areas from peak run-offs. This peat layer provides a habitat

for specific flora and fauna. The landscape of the upland moors of Dartmoor is typically highly appreciated for its recreational value. Under influence of increasing temperature and intensive grazing regimes (by sheep, cattle and ponies), the peat layer of this upland moor National Park is expected to decompose and shrink. When this peat layer becomes thinner it will be less able to hold water. As a consequence - together with events of peak precipitation - chances of flash floods are likely to increase. The peat layer may also decompose when agricultural uses increase in this National Park. Eventually, if these moors would disappear, the habitat and landscape would change. There is a climate change adaption plan developed for this National Park, which the Dartmoor National Park Authority states has been translated into their Management Plan (2014-2019).

This case study focuses on:
- analysing how the climate change adaptation strategy for Dartmoor was developed and who was involved in which way;
- identifying what it addresses and why;
- assessing which potential risks are not yet addressed;
- and who is and/or will be in charge for which adaptations.

C. Context

In order to increase our understanding of barriers and enablers to climate change adaption, we will study two local case studies of climate change adaption in Southwest England. In one of our two case studies, i.e. Dartmoor National Park, a climate change strategy has been developed in 2011. In the other case study, i.e the South Devon Coast from Dawlish Warren to Teignmouth, this has not been done yet. This study focuses on identifying current discussions on climate change adaptation in this area, identifying who is involved in which way, identifying which potential risks and vulnerabilities are discussed and which not yet, and who is and/or will be in charge for which type of adaptations. We will focus on the understanding of barriers and enablers in:

- the relationship/dynamics between local initiatives and higher level policy frameworks;
- the relationship with other relevant policy fields (e.g. is climate change adaption integrated in other relevant policy topics such as nature conservation, agriculture and infrastructure, and if so, how?);
- the role of participation (i.e. of local/regional non-state actors in policy making for collective goals);
- the role of knowledge use (e.g. to deal with uncertainties due to variability or due to lack of knowledge).

Also included in our study are evaluating the role/relevance of economic assessments (e.g. does insight in cost-benefit analysis help in decision-making on climate change adaption?), and the role/relevance of adaption pathways (e.g. does insight in adaption choices help in decision-making on climate change adaption?).

D. Brief General Information on Climate CHANGE and related issues

The regional government is expecting climate change impacts for this area. Recent trends of temperature rise – resulting into milder, wetter winters, and hotter, dryer summers are expected to continue for this region (http://www.devon.gov.uk/index/environmentplanning/climatechange/climate-strategy.htm). The

Dartmoor National Park Authority states that: "Between 1961 and 2006, average daily temperature in the South West increased by 1.37°C, the number of days of air frost decreased by 20.9 days. Annual precipitation also increased between 1961 and 2006, with the largest increase seen in autumn (28.6%). Conversely, there was a small decrease in summer rain (8.8%)" (DNPA, 2011, p. 5). The Dartmoor National Park Authority expects climate change impacts to continue in future, and states that adaptation actions are needed in Dartmoor to
prepare for further climate change impacts.

The ecosystem services provided by Dartmoor as identified by Natural England may encounter various pressures due to climate change impacts (Natural England, 2014). Natural England identifies the following impacts of climate change for Dartmoor (2014, p. 35):
- "An increased frequency of drought conditions in the summer months may result in the drying out of wet heath, blanket bog, valley mires, Rhôs pasture and wet woodland; affecting their functions for water and carbon storage. These conditions may also lead to more frequent and intensive moorland fires and erosion causing damage to archaeological sites.
- Increased autumn and winter precipitation levels could lead to higher water levels in upland streams, mires and tracts of blanket bog, resulting in more frequent downstream flooding. There could be an increase in poaching on river banks leading to waterlogged ground.
- Climate change could lead to a longer growing season and enhanced growth rates of vegetation including bracken, gorse and secondary woodland resulting in a decrease in the area of open heather moorland and a 'scrubbing up' of upland stream valleys.
- There might be increased pressure to plant further areas of coniferous plantation and woodland (impacting on open character); planted to enhance the landscape's roles in filtering water, minimising downstream flooding, storing and sequestering carbon dioxide and providing low-carbon fuel sources (through coppice management).
- Changing climate may also result in an increase in the prevalence of pests and diseases which may affect species such as heather and bilberry, and change woodland/tree species composition; there may be a spread of non-native and alien species.
- Climate change may result in increased demand for wind turbines within the open, exposed landscapes of the moorland, as well as outside the NCA visible in long views. There may be further demand for harnessing the power of Dartmoor's fast-flowing rivers through hydroelectric schemes and a demand for bioenergy planting, including short rotation coppice.
- Climate change may lead to more extreme or unseasonal weather events which may change farming and woodland practices, which in turn may have an impact on the character of the landscape."
Natural England has also included quite an elaborate analysis of oppotunities for each ecosystem services in Dartmoor (2014, pp. 44-65).

The Dartmoor National Park Authority had developed a climate change adaptation assessment and strategy, though not explicitly formulated in terms of ecosystem services. The Dartmoor National Park Authority identified climate change impacts for the following themes (2011, vol. 1, pp. 11-13):
- access, recreation and tourism, such as higher expected number of visitors to the park, and mentions e.g. that a survey revealed that "47% of tourism businessess see preparing for change as a low priority" (p. 11);

- biodiversity, such as impacts "for long distance migrants where the peak in their food supply is seasonally earlier but their arrival time remains unchanged" (p. 11);
- community, culture and economy, such as extreme weather events in winter leading to isolation of remote rural sites and hot dry summers leading to water shortages;
- historic environment, such as "likely increase in pest species such as rabbits and invasive species such as bracken that disrupt buried archeology", plus e.g. "wetter conditions may result in the loss of palaoenvironmental evidence" (p. 12);
- farming and land management, such as positive impacts like lengthened growing season and milder winters for earlier lambing, negative impacts like more diseases due to wetter winters, and shrinkage of peat soils due to summer droughts jeopardising water storage and carbon sequestration (p. 13);

The Dartmoor National Park Authority also mentions impacts on the business continuity, such as influence on staff welfare during hot, dry summers (p. 13).

E. Existing Information on Case Study's adaptation history

The Dartmoor National Park Authority had developed a climate change adaptation assessment and strategy, though not explicitly formulated in terms of ecosystem services. It primarily addresses: access, recreation, and tourism; biodiversity; community, culture and economy; historic environment; and farming and land management (http://www.dartmoor-npa.gov.uk/lookingafter/laf-climatechange/adapting-to-climate-change). This strategy also includes business continuity of the National Park Authority itself. The Volume 2 document of this adaptation assessment elaborates on the possible impacts on several aspects of a theme, e.g. for the theme biodiversity possible impacts are identified for the aspects 'flora' and 'fauna', for several timelines, i.e. 2020s, 2050s and 2080s. The assessment provides details on risks and opportunities, consequences, what/who is affected, and likelihood and magnitude of impact. Further, it provides information on actions already in place or planned, potential actions, when action is required, and cross-check against other themes. These categories are assessed for each of the themes, leading to a 12 page detailed matrix of impacts, risks, opportunities and actions. The Dartmoor National Park Authority identified climate change impacts for the following themes (2011, vol. 1, pp. 11-13):

- access, recreation and tourism, such as higher expected number of visitors to the park, and mentions e.g. that a survey revealed that "47% of tourism businessess see preparing for change as a low priority" (p. 11);
- biodiversity, such as impacts "for long distance migrants where the peak in their food supply is seasonally earlier but their arrival time remains unchanged" (p. 11);
- community, culture and economy, such as extreme weather events in winter leading to isolation of remote rural sites and hot dry summers leading to water shortages;
- historic environment, such as "likely increase in pest species such as rabbits and invasive species such as bracken that disrupt buried archeology", plus e.g. "wetter conditions may result in the loss of palaoenvironmental evidence" (p. 12);
- farming and land management, such as positive impacts like lengthened growing season and milder winters for earlier lambing, negative impacts like more diseases due to wetter winters, and shrinkage of peat soils due to summer droughts jeopardising water storage and carbon sequestration (p. 13);

The Dartmoor National Park Authority also mentions impacts on the business continuity, such as influence on staff welfare during hot, dry summers(p. 13).
There is a climate change adaptation strategy developed (in 2011) for Dartmoor by the National Park Authority

Which type of adaptation actions are intended and why, is to be analysed in the current study.

There is also a flood risk strategy developed (in 2009) by the Environment Agency which covers the South East of Dartmoor (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gesw1109bouo-e-e.pdf). Which type of adaptation actions are intended and why, is to be analysed in the current study.

Two projects come forward as striking initiatives/actions to deal with climate change impacts: Dartmoor Farming Futures, a bottom-up project to implement agri-environmental schemes in a localized approach, and Mires on the Moor, a project about bog restoration funded by drinking water company South West Water.

F. Connection with other research projects:

(Please list and shortly describe previous or ongoing research projects directly related with the Case Study)
Please write the name and summary of the project, relevant partner institutions, year of beginning and end of project)
- Sustainable Rural Futures:
http://socialsciences.exeter.ac.uk/research/centres/crpr/research/projects/current/sustainableruralfutures/overview/

G. Case ID, Typologies and Dimensions

BASE OBJECTIVES
1. Compile and analyze data and information on adaptation measures, their effectiveness. (…)
2. Improve current, develop new and integrate methods and tools to assess climate impacts, vulnerability, risks and adaptation policies (…).
3. Identify conflicts and synergies of adaptation policies at different levels of policy making with other policies (including climate mitigation) within and between sectors. (…)
4. Assess the effectiveness and full costs and benefits of adaptation strategies to be undertaken at local, regional, and national scales using innovative approaches (mainly by integrating bottom-up knowledge/assessment and top-down dynamics/processes) with particular attention on sectors of high social and economic importance.
5. Bridge the gap between specific assessments of adaptation measures and top-down implementation of comprehensive and integrated strategies.
6. Use and develop novel participatory and deliberative tools to enhance the effective use of local contextualized knowledge in adaptation strategies to assess perceptions of adaptation pathways and their co-design by citizens and stakeholders.
7. Disseminate findings by sharing the results of the project with policy-makers, practitioners and other stakeholders. (…)

CASE STUDIES CATEGORIES	
A.	Public administration (municipality, regional, national, european)
B.	Research and education Centres (universities, research centres, projects and groups, schools)

C. Public companies
D. Companies (farms, SMEs, big businesses)
E. Social enterprises (cooperatives, non profit companies, woofing farms, etc)
F. Consortiums (partnerships, campaigns),
G. NGOs (environmental NGO, local development NGO, charities, etc)
H. Transition Initiative
I. Ecovillage
J. Informal groups, Movements

Case ID			Typologies and characterization				
Country & Name of CS	BASE Objectives to be answered by the CS	Category of case study	Territorial zones	Scale	Process Direction	Temporal Definition	Timescale[1]
UK, South Devon Coastal Case	[v] Objective 1 [ ] Objective 2 [v] Objective 3 [V] Objective 4 [ ] Objective 5 [ ] Objective 6 [V] Objective 7	A. Public administration (municipality, National Park Authority, regional, national such as ministry of Defence) C. Public companies (Environmental Agency) D. Companies (Duchy of Cornwall, tourism sector) G. NGOs (?)	[v] Rural [ ] Urban [ ] Coastal [v] River Basin	[v] Local [v] Regional [ ] National [ ] Transnational [ ] European /Global	[v] Bottom-Up [v] Top-Down	[v] Retrospective [v] Prospective	2007 (start of Dartmoor National Park Management Plan) – 2080

H. Impacts, Sectors and Implementation

Please tick the relevant boxes for impacts and implementation and insert the number 1 for primary sector and the number 2 for secondary sector.

Impacts		Sectors		Implementation	
Primary CC Impacts (Climate-Adapt)	Primary CC Impacts (BASE)	Primary and Secondary Sector (Climate Adapt)	Primary and secondary Sector (BASE)	Implemented[2]	Phase of Implementation[2]

[1] Please insert year of start and year of end of case study.
[2] When the case study consists of a public administration with a top down approach, implementation can be an approved legislation or regulation. When the case study is about practical adaptation measures like a sand dune, for example, implementation should be considered finished when the dune is built in situ.

☐ Extreme Temperatures ☐ Water Scarcity 2 Flooding ☐ Sea level Rise 1 Droughts ☐ Storms ☐ Ice and Snow	☐ Extreme temperatures ☐ Water scarcity 2 Flooding ☐ Coastal Erosion 1 Droughts ☐ Soil Erosion ☐ Vector Borne Diseases ☐ Damages from extreme weather related events (storms, ice and snow)	1 Agriculture and forest 2 Biodiversity ☐ Coastal Areas ☐ Disaster risk reduction ☐ Financial ☐ Health ☐ Infrastructure ☐ Marine and Fisheries ☐ Water Management ☐ Urban	2 Agriculture 1 Biodiversity & Ecosystems ☐ Coastal and Marine systems ☐ Energy ☐ Health and Social Policies ☐ Transport ☐ Production Systems and Physical Infrastructures ☐ Water resources ☐ Tourism	☐ Yes v Ongoing v No	☐ Assessment v Planning v Implementation ☐ Monitoring ☐ Evaluation

I. Importance and Relevance of Adaptation

Please tick the relevant box for the case study.

☐ Case developed and implemented as a climate change adaptation measure

☐ Case developed and implemented and partially funded as a climate change adaptation measure

v Case mainly developed and implemented because of other policy objectives, but with significant consideration on climate change adaptation aspects

2. Case study research Methodology

a) Research Goals

Our study aims to characterise and understand the current climate change adaption plan and its plan making process, by identifying:
- positions and plans of several actors groups involved in relation to climate change adaption (including identifying who are in charge of what in the management of these upland moors);
- current physical, social, economic and political barriers and enablers to adaptation;
- possible risks and vulnerabilities under scheduled and/or possible adaptation actions;
- and further possible adaptation pathways that could assist groups involved with Dartmoor National Park in adapting to climate change (including identifying who would decide about these possible interventions and their implementation)?

Core research questions include:
1. Who are the key stakeholders involved in climate change adaptation in Dartmoor National Park? These may include actors from various governmental bodies (local, county, national), and from various sectors (nature conservation, agriculture, tourism, flood management, housing/residential, infrastructure, cultural heritage).

2. How can the institutional setting and decision making structure for making decisions on climate change adaptation be characterised in this case?
3. What are the key social (including cultural and historical), economic, political, and bio-physical enablers and barriers to shaping the understanding of climate impacts; and to subsequent adaptation planning activities within the studied area?
4. What are the current and/or coming climate change adaptation plans/pathways, and to which extent do these plans sufficiently address the risks, vulnerabilities and issues under pressure?
5. What possible adaptation pathways can (additionally) address the issues under pressure at Dartmoor National Park, which have not been addressed yet by current or coming plans, or that may address these issues in a more effective/efficient/legitimate/equitable/… way.

b) Stakeholders involved

(Máx 2000 words) *Please insert any information about the stakeholders involved in the adaptation process with which you will relate to, namely their nature, involvement in the process, etc. If possible highlight the decision-making process as well as the leadership process for Climate Adaptation Strategies. Do Mention if there exists any kind of public engagement and participation within the Adaptation process.*

Key actors in the policymaking process for climate change adaptation in Dartmoor:
- Dartmoor National Park Authority, which "is a special purpose local authority created under the Environment Act 1995. The Authority is a freestanding local authority employing around 105 staff and is governed by 22 appointed Members". The National Park Authority developed the climate change adaptation strategy.
- Dartmoor Commoners Council, "The commoners of most commons or groups of commons have formed management associations (Local Commoners' Associations; LCAs), which are in turn grouped in the historic north, south, east and west 'quarters' of Dartmoor. Under the Dartmoor Commons Act of 1985 each quarter elects five commoners to represent them on a central Dartmoor Commoners' Council. The Council also has seats for two representatives of owners of the commons, two from the Dartmoor National Park Authority, one from the Duchy of Cornwall and a vet. The Commoners' Council makes regulations about most matters, which concern the management of the commons, the welfare of the stock de-pastured there and arbitrates in disputes between commoners."
- Natural England, who "is the government's advisor on the natural environment", and who implements the agri-environmental schemes.
- Duchy of Cornwall, private organization from the Prince of Wales, which owns about 27300 hectares, which is about a small third of the park.
- National Farmers Union, Southwest regional office.
- Dartmoor Preservation Association, NGO who aims to keep Dartmoor as it is, enhance public access, and is sceptical about climate change and climate change impacts.
- Devon County Council, regional government under which Dartmoor resides.
- Environment Agency, governmental agency involved in developing and implementing a flood risk plan for South Devon (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gesw1109bouo-e-e.pdf) and involved in the Mires on the Moor Project.
- South West Water, drinking water company involved in the Mires on the Moor project.

- Ministry of Defense, who uses several areas in Dartmoor for military practice, and 'rents' lands from the Duchy Foundation.

To lesser extent:
- Natural Devon/Devon Local Nature Partnership, "is an umbrella body which brings together and includes everyone with an interest in securing the benefits of our natural environment", affiliated and supported by the Devon County Council.
- Met Office, national governmental office which collects and stores climate data, and makes predictions of climate change impacts.
- DEFRA, UK's national ministry of Environment, Food & Rural Affairs.
- Dartmoor Access Forum, which "is an independent advisory body which was established by the Dartmoor National Park Authority in November 2002. Its purpose is to give advice to the National Park Authority and other organisations, on how to make the countryside of Dartmoor more accessible and enjoyable for open air recreation, in ways which address environmental, social and economic interests."
- Various local agricultural groups, such as Dartmoor Livestock Protection Society, South West Uplands Federation, ….
- Organisations from the tourism industry
- Cultural heritage/archeological organisations

c) Methodology

The overall research aim for these case studies is to explain struggles and progress in climate change adaptation in localised settings.

Angles which may explain struggles and progress in climate change adaptation in localised settings:
- framing of climate change issues, and dynamics on the political agenda;
- institutional aspects such as how responsibilities are assigned, who is involved in which way in policymaking processes/decisionmaking procedures (incl participation of civil society groups), and which formal and informal aspects/arrangements influence decision making procedures;
- conflicts and synergies with higher-level adaptation strategies, such as the UK national adaptation strategy and the EU adaptation strategy;
- and perception or priorities of risks and vulnerabilities relating to climate change, and knowledge use (such risk assessments and cost-benefit analysis);
- differences in ideas and priorities of what is needed in adapting to climate change (or not).

The study will be based on a stakeholder analysis and a policy making analysis to achieve an understanding of the planning process for climate change adaptation process. Also some economic analysis will be conducted to determine key costs and benefits associated with adaptation actions.

Data will be gathered through review of project documentation, and through semi-structured and structured interviews with key stakeholders. Additionally, focus groups will be held to further identify issues under pressure and possible adaptation actions.

The next research steps will include:
- Establishing a 'quick scan' impression of the issues, plans, processes, stakeholders and institutional setting, based on online documentation and on consulting two experts with experience in this field (Michael Winter and Rob Fish).
- Further deepening the assessment by firstly gathering and reviewing project documentation, then by interviewing key actors.
- Further identifying possible issues under pressure, and developing and evaluating possible adaptation actions (and/or pathways) by means of running a (or several if needed) focus group(s).
- The evaluation of possible adaptation actions will also include a cost-benefit analysis, for which the next steps will be: identifying the main adaptation options for Dartmoor and Dawlish; then, identifying possible impacts of those adaptation options; and then finding monetary costs and benefits for those impacts (most of this will probably be based on secondary data).

Interview questions may focus on:
- Current concerns and expected impacts relating to climate change, concerning the interviewed actor;
- Expected possible risks, damages and costs (under different adaptation options), for/to the interviewed actor;
- Expected possible benefits or opportunities (under different adaptation options), for the interviewed actor;
- Current strategies and/or options to adapt to climate change, undertaken by/for the interviewed actor;
- Ideas/perceptions on what/which actions should be taken by collective/public bodies, and which are private responsibilities;
- What factors help or restrict their ability to adapt.

Project documentation to be consulted:
- A climate change adaptation strategy developed (in 2011) for Dartmoor by the National Park Authority which addresses tourism, biodiversity, community, culture, economy, cultural-history, and farming (http://www.dartmoor-npa.gov.uk/lookingafter/laf-climatechange/adapting-to-climate-change).
- The Management Plan 2014-2019 'Your Dartmoor' by the Dartmoor National Park Authority, (http://www.dartmoor-npa.gov.uk/lookingafter/management-plan-review).
- The Management Plan 2007-2013 by the Dartmoor National Park Authority, http://www.dartmoor-npa.gov.uk/lookingafter/pl-dnpmgmtplan.
- Documentation on the 'Mires on the Moor' project (about bog restoration): http://www.dartmoor-npa.gov.uk/lookingafter/laf-naturalenv/dartmoormiresproject
- A flood risk strategy developed (in 2009) by the Environment Agency which covers the South East of Dartmoor (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gesw1109bouo-e-e.pdf).
- The Met Office keeps records of climate characteristics such as rainfall, sunshine and temperature. Information can be found here: http://www.metoffice.gov.uk/climate/uk/regional-climates/sw
And here: http://www.metoffice.gov.uk/media/pdf/n/9/Fact_sheet_No._14.pdf
- The regional government is expecting climate change impacts for this area. Recent trends of temperature rise – resulting into milder, wetter winters, and hotter, dryer summers are expected to continue for this region (http://www.devon.gov.uk/index/environmentplanning/climatechange/climate-strategy.htm).

- Natural England, (2014). NCA Profile: 150 Dartmoor (NE519). Available online: http://publications.naturalengland.org.uk/publication/5098832853467136?category=587130
- High Ground, High Potential – A future for England's upland communities. A report from the Commission for rural communities from 2010. Available at: http://webarchive.nationalarchives.gov.uk/20110303145243/http:/ruralcommunities.gov.uk/wp-content/uploads/2010/06/CRC114_uplandsreport.pdf
- A book on Dartmoor, by Ian Mercer from 2009.
- Further documentation on ecosystem services (in uplands), by Natural England: http://nepubprod.appspot.com/category/38019#content and http://nepubprod.appspot.com/publication/4084624?category=38019
- Documentation on Dartmoor Farming Futures: http://www.dartmoor-npa.gov.uk/lookingafter/laf-landmanagement/dartmoor-farming-futures
- Documentation on climate change impacts in upland peatlands in England, such as: http://quest.bris.ac.uk/research/wkg-gps/soil/briefingnote.pdf, http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_12-12-2013-16-3-21 and http://www.theccc.org.uk/wp-content/uploads/2013/07/ASC-2013-Chap4_singles_2.pdf
- A climate change adaptation strategy developed (in 2011) for Dartmoor by the National Park Authority which addresses tourism, biodiversity, community, culture, economy, cultural-history, and farming (http://www.dartmoor-npa.gov.uk/lookingafter/laf-climatechange/adapting-to-climate-change).
- A flood risk strategy developed (in 2009) by the Environment Agency which covers the South East of Dartmoor (http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gesw1109bouo-e-e.pdf).
- The Met Office keeps records of climate characteristics such as rainfall, sunshine and temperature. Information can be found here: http://www.metoffice.gov.uk/climate/uk/regional-climates/sw
And here: http://www.metoffice.gov.uk/media/pdf/n/9/Fact_sheet_No._14.pdf
- The regional government is expecting climate change impacts for this area. Recent trends of temperature rise – resulting into milder, wetter winters, and hotter, dryer summers are expected to continue for this region (http://www.devon.gov.uk/index/environmentplanning/climatechange/climate-strategy.htm).
- Natural England, (2014). NCA Profile: 150 Dartmoor (NE519). Available online: http://publications.naturalengland.org.uk/publication/5098832853467136?category=587130
- High Ground, High Potential – A future for England's upland communities. A report from the Commission for rural communities from 2010. Available at: http://webarchive.nationalarchives.gov.uk/20110303145243/http:/ruralcommunities.gov.uk/wp-content/uploads/2010/06/CRC114_uplandsreport.pdf
- A book on Dartmoor, by Ian Mercer from 2009.

Academic literature to be consulted:
- Charlton, M.B., Arnell, N.W., 2011. Adapting to climate change impacts on water resources in England-An assessment of draft Water Resources Management Plans. *Global Environmental Change* 21 (1), pp. 238-248.
- Coles, T., Zschiegner, A.-K., 2011, Climate change mitigation among accommodation providers in the South West of England: Comparisons between members and non-members of networks. *Tourism and Hospitality Research* 11 (2), pp. 117-132.

- Coles, T., Zschiegner, A.-K., Dinan, C., 2013. A cluster analysis of climate change mitigation behaviours among SMTEs. *Tourism Geographies*, Article in Press.
- Coles, T., Zschiegner, A.-K., Dinan, C., 2013. Climate change mitigation policy and the tourism sector: Perspectives from the South West of England. *Journal of Policy Research in Tourism, Leisure and Events* 5 (1), pp. 1-27.
- McEvoy, D., Cavan, G., Handley, J., McMorrow, J., Lindley, S., 2008. Changes to climate and visitor behaviour: Implications for vulnerable landscapes in the north west region of England. *Journal of Sustainable Tourism* 16 (1), pp. 101-121.
- Mitchell, J., 2008. What public presence? Access, commons and property rights. *Social and Legal Studies* 17 (3), pp. 351-367.
- Schaefer, K., 2012. Performing environmental change: MED Theatre and the changing face of community-based performance research. *Research in Drama Education* 17 (2), pp. 247-263.
- Tubb, K.N., 2003. An evaluation of the effectiveness of interpretation within Dartmoor National Park in reaching the goals of sustainable tourism development, *Journal of Sustainable Tourism* 11 (6), pp. 476-498.
- Academic publications on climate change impacts in upland peatlands in England, such as: http://www.int-res.com/journals/cr/cr-specials/cr-special-24/

METHODS to be used in Case Studies[3]	YES // NO
A) Methods for prioritizing adaptation options	
Cost-Benefit Analysis (CBA)	No
Cost-Effectiveness Analysis (CEA)	No
Multi-criteria Analysis (MCA)	No
Analytic Hierarchy Process (AHP)	No
B) Quantification of impacts and relationships between factors affecting adaptation	
Causal Diagrams	No
Influence Diagrams	No
Process-based Modelling	No
Welfare variation analysis under restrictions	No
C) Uncertainty and sensitivity analysis	
Probabilistic multi model Ensemble	No
Monte Carlo simulations (PRIMATE uses this method)	No
Real option analysis	No
Climate risk management process	No
D) Participatory Methods	
Scenario Workshop	No
Participatory Cost Benefit Analysis (PCBA)	No
Participatory add-ons to CBA	No

[3] For descriptions and references of the Methods please refer to Milestone 8. For data requests from specific Work Packages please refer to Deliverable 4.1

Participatory add-ons to Multi Criteria Decision Analysis	No
Participatory add-ons to Adaptation Pathways	No
Other (add extra lines if necessary):	
Interviews	Yes

d) Case study Timeline

January – April 2014	Developing research approach, elaborating on the background setting and the current situation, desktop search on adaptation plans, developing questionnaire, identifying and contacting key stakeholders, scheduling interviews.
May – September 2014	Conducting interviews collecting data on costs and benefits
July - September 2014	Data analysis (of documentation and interviews).
October-November 2014	Drafting first raw version of case study report.

e) Collaboration with other Partners and Case studies

Collaboration with BASE case studies (see list in EMDESK):

Formerly: Case: Other upland national park cases (e.g. Green Roof in Czech Republic); Person: Eliska Lorencova and Zuzana Harmackova from CzechGlobe

Currently:
- Other agricultural cases; i.e. Holstrebro, Alentejo, Kalajoki, Czech agri case. Persons: Anders Brandt Petersen an Helle Orsted Nielsen from Aarhus, Andre Vizinho and Ana Inglesias from FFCUL; Eliska Lorencova from CzechGlobe.

- Other UK cases; i.e. Health Cornwall and Health UK, Leeds. Persons: Tim Taylor and Sahran Higgins from Exeter, and Olivia Rendon from Leeds.

Collaboration within BASE partners/researchers (EX: for a specific competence):

Name: Tim Taylor; University of Exeter (for expertise on economic evaluation)

f) Research Outputs

a. Scientific Publications

- Interim reports + final case study report for D5.5 (Month 30)
- Scientific papers:
- Den Uyl, R.M., Russel, D., Tim Taylor, Sahran Higgins, Olivia Rendon, Do EU and UK climate change adaptation policies support needs in local climate adaptation planning?. To be submitted to *Environmental Science and Policy* or *Regional Environmental Change* in 2015.
- Den Uyl, R.M., Russel, D., Tim Taylor, Sahran Higgins, Olivia Rendon: Understanding synergies and tensions between national and local responses to climate change. To be submitted to *Climate Policy* or *Environment and Policy C: Government and Policy* in 2015.

b. Other

Scientific conferences: # 1
Title: Understanding synergies and tensions between national and local responses to climate change
Conference: Royal Geographical Society Annual International Conference 2014, London. Month/Year: 26-29 August / 2014

Invited seminars, presentations at local events, etc…

3. Participation in Climate Change Adaptation

a) Process overview

9 Interviews with 8 key stakeholders (in random order):

- Dartmoor National Park Authority
- Dartmoor Commoners Council
- Natural England (advisory and executive government agency for nature conservation and rural affairs)
- regional office from the National Farmers Union
- Duchy Foundation (large land owner on Dartmoor)
- South West Water (extracts drinking water on Dartmoor)
- Dartmoor Preservation Association
- Devon County Council
- (9th interview is with former Dartmoor National Park Authority director and former Dartmoor Commoners Council member, who is now researcher and advisor on Dartmoor, and widely considered as *the* expert on this area)

b) Participation in the Process Phases

Process phases:

1. Initiative/decision to act

- **Climate change adaptation strategy**: developed by Dartmoor National Park Authority, none of the consulted groups so far have been involved in any way. The groups were not aware/informed that the plan was developed, unknown why they were not involved by the Dartmoor National Park Authority.
- **Management Plan 2014-2019**

Stakeholders: National Farmers Union, involved in consultation process for Management Plan. Duchy of Cornwall, private organisation who owns land on Dartmoor, involved in consultation process for Management Plan. Dartmoor Preservation Association, NGO, unknown whether involved.
Citizens: Represented via the Dartmoor Commoners Council, involved in consultation process for Management Plan.
Experts: Not explicitly involved, unknown why.
Local politicians: Dartmoor Commoners Council, involved in consultation process for Management Plan.
Officials/legislators: Dartmoor National Park Authority, leader of the Management Plan 2014-2019. Public official from Devon County Council involved in consultation process Management Plan.

- **Dartmoor Farming Futures**

Stakeholders: farmers via Forest Commoners Association actively involved. Duchy, partly involved.
Citizens: represented via Forest Commoners Association, unknown whether involved.
Experts: not involved, explicitly a bottom-up project, based on expertise from farmers.
Local politicians: via Forest Commoners Association, actively involved.
Officials/legislators: Natural England, actively involved. Dartmoor National Park Authority, actively involved.

- **Mires on the Moor**

Stakeholders: South West Water, part of the initiators and funder of the project. Farmers via Commoners council, not part of initiators. Duchy, not one of the initiators.
Citizens: via Commoners Council, not part of the initiators.

Experts: University of Exeter, initiator of the research approach.
Local politicians: via Commoners Council, not part of the initiators.
Officials/legislators: Environment Agency, partly involved in design of the project.

2. Development of potential adaptation options

Climate change adaptation strategy: developed by Dartmoor National Park Authority, none of the consulted groups so far have been involved in any way. Unknown why.

Management Plan 2014-2019

Stakeholders: National Farmers Union, involved in consultation process for Management Plan. Duchy of Cornwall, private organisation who owns land on Dartmoor, involved in consultation process for Management Plan. Dartmoor Preservation Association, NGO, unknown whether involved.
Citizens: Represented via the Dartmoor Commoners Council, involved in consultation process for Management Plan.
Experts: Not explicitly involved, unknown why.
Local politicians: Dartmoor Commoners Council, involved in consultation process for Management Plan.
Officials/legislators: Dartmoor National Park Authority (DNPA), leader of the Management Plan 2014-2019. Public official from Devon County Council involved in consultation process Management Plan.

Dartmoor Farming Futures

Stakeholders: farmers via Forest Commoners Association actively involved. Duchy, partly involved.
Citizens: represented via Forest Commoners Association, unknown whether involved.
Experts: not involved, explicitly a bottom-up project, based on expertise from farmers.
Local politicians: via Forest Commoners Association, actively involved.
Officials/legislators: Natural England, actively involved. Dartmoor National Park Authority, actively involved.

Mires on the Moor

Stakeholders: South West Water, partly involved in design of the project. Farmers not involved in design of the project, unknown why. Duchy, not involved in deisgn
Citizens: via Commoners Council, not involved, unknown why.
Experts: University of Exeter, leader in the design of the approach.
Local politicians: via Commoners Council, not involved in project, unknown why.
Officials/legislators: Environment Agency, partly involved in design of the project. DNPA not actively involved in design.

3. Decision-making

Climate change adaptation strategy: developed by Dartmoor National Park Authority, none of the consulted groups so far have been involved in any way. Unknown why.

Management Plan 2014-2019

Stakeholders: National Farmers Union, involved in consultation process for Management Plan. Duchy of Cornwall, private organisation who owns land on Dartmoor, involved in consultation process for Management Plan. Dartmoor Preservation Association, NGO, unknown whether involved.
Citizens: Represented via the Dartmoor Commoners Council, involved in consultation process for Management Plan.
Experts: Not explicitly involved, unknown why.
Local politicians: Dartmoor Commoners Council, involved in consultation process for Management Plan.
Officials/legislators: Dartmoor National Park Authority, leader of the Management Plan 2014-2019. Public official from Devon County Council involved in consultation process Management Plan.

Dartmoor Farming Futures

Stakeholders: farmers via Forest Commoners Association, actively involved in decision making. Duchy, partly involved.
Citizens: represented via Forest Commoners Association, unknown whether involved.
Experts: not involved, explicitly a bottom-up project, based on expertise from farmers.
Local politicians: via Forest Commoners Association, actively involved in decisionmaking.

Officials/legislators: Natural England, actively involved in decisionmaking. Dartmoor National Park Authority, actively involved in decision making.

Mires on the Moor

Stakeholders: South West Water, partly involved in design of the project. Farmers not involved in design of the project, unknown why. Duchy, allowsthe project on their land.

Citizens: via Commoners Council, not involved, unknown why.

Experts: University of Exeter, leader in the design of the approach.

Local politicians: via Commoners Council, not involved in project, unknown why.

Officials/legislators: Environment Agency, partly involved in design of the project. DNPA facilitated and allows project.

4. Implementation

Climate change adaptation strategy: developed by Dartmoor National Park Authority, none of the consulted groups so far have been involved in any way. Unknown why.

Management Plan 2014-2019

Stakeholders: National Farmers Union, involved in consultation process for Management Plan. Duchy of Cornwall, private organisation who owns land on Dartmoor, involved in consultation process for Management Plan. Dartmoor Preservation Association, NGO, unknown whether involved.

Citizens: Represented via the Dartmoor Commoners Council, involved in consultation process for Management Plan.

Experts: Not explicitly involved, unknown why.

Local politicians: Dartmoor Commoners Council, involved in consultation process for Management Plan.

Officials/legislators: Dartmoor National Park Authority, leader of the Management Plan 2014-2019. Public official from Devon County Council involved in consultation process Management Plan.

Dartmoor Farming Futures

Stakeholders: farmers via Forest Commoners Association, actively involved in implementation. Duchy, partly involved.

Citizens: represented via Forest Commoners Association, unknown whether involved.

Experts: not involved, explicitly a bottom-up project, based on expertise from farmers.

Local politicians: via Forest Commoners Association, not actively involved in implementation.

Officials/legislators: Natural England, not actively involved in implementation (that is done by the farmers). Dartmoor National Park Authority, unknown how involved.

Mires on the Moor

Stakeholders: South West Water, partly involved in implementation of the project. Farmers not involved in implementation, unknown why. Duchy, allows the project on their land.

Citizens: via Commoners Council, not involved, unknown why.

Experts: University of Exeter, leader of the implementation of the project.

Local politicians: via Commoners Council, not involved in project, unknown why.

Officials/legislators: Environment Agency, partly involved in implementation. DNPA facilitated and allows project.

c) Participation Experience

(Please report with regards to your case study and the implementation of Participatory Methodologies using a traditional SWOT analysis – Strengths; Weaknesses; Opportunities and Threats)

Strenghts **Climate change adaptation strategy:** participation appears to have been absent; what could be seen as a strength is a relatively quick development of the strategy **Management plan 2014-2019:** most groups were involved in developing this management plan, whereby the discussion process was organised in three themes (working groups). It seems to have resulted into a relatively wide known Management Plan, which also appears to be supported by most groups. **Dartmoor Farming Futures:** due to grassroots character, strong sense of ownership. **Mires on the Moor:** potentially an example for bog restoration, which may profit drinking water company South West Water and groups interested in blanket bog landscape and biodiversity.	**Weaknesses** **Climate change adaptation strategy:** no one at all (apart from the DNPA, who developed the strategy) appears to have heard about this strategy. **Management plan 2014-2019:** - the Management Plan could have (tried to) incorporate(d) the adaptation strategy, but didn't - the agenda of working groups seems to have been set by the DNPA - participation of the working groups seems to have been on an invitation-only basis - not all groups invited participated - there is no public record of these working groups, e.g. agenda's and minutes are not mentioned or available online, and DNPA is not keen on providing them **Dartmoor Farming Futures:** ? **Mires on the Moor:** apparently, while designing and implementing the project, farmers were not informed or involved, though they are affected (rewetted land does not enable passage for the livestock).
Opportunities **Climate change adaptation strategy:** the strategy could be used as a relatively clear proposal to the others involved, or function as a starting point for a debate about risks and options for this area. **Management plan 2014-2019:** the working groups, installed while developing the plan, are no longer in place, but could be kept running, to discuss implementation progress, and ho to deal with issues encountered. **Dartmoor Farming Futures:** could be further upscaled and elaborated on Dartmoor. **Mires on the Moor:** which better process guidance, leadership, involvement of local affected groups, and sufficient financing, could possibly be upscaled or applied at other location. (Note that consulted groups identify that upscaling on Dartmoor won't be possible, only in other National Parks)	**Threats** **Climate change adaptation strategy:** as developed by DNPA alone, risk that they may have missed issues, or did not identify complications in implementation of proposed adaptation actions. **Management plan 2014-2019:** due to the selective participation and relative closed-doors process, and no continuation of working groups during implementation, there is a risk of incompleteness. **Dartmoor Farming Futures:** the new agri-environmental schemes are expected to replace all previous and alternative variants. It will be biodiversity-output oriented, and won't allow for other practices, such as adaptation practices. **Mires on the Moor:** no local support from affected groups, and even strong opposition from 1 local farmer, who raised alarm at several higher levels, and tried to stop the project.

d) Learning through Participation

In order to capture how participation could improve the climate change adaptation process, please report with regards to your case study:

a) Your view whether and how participation influenced the strategies and measures decided in your case?

Climate change adaptation strategy:

Participation was absent. It led to total unawareness of the fact that it was developed.

Management plan 2014-2019:

Some participation in the working groups to develop the plan. However, not clear how participation translated into the actual plan and implementation, as no records available on agenda and minutes of the meetings.

Dartmoor Farming Futures:

Mainly a grassroots initiative, led to high ownership of the implementation practices.

Mires on the Moor:

Participation of local groups was absent. (Groups that did participate: South West Water, Dartmoor National Park Authority, Duchy, Department of Geography of University of Exeter (not us)). No support from local groups for this project.

b) How you think the participatory process in your case could be/have been improved?

Climate change adaptation strategy: organise a participatory process to get feedback from affected and involved groups on identified issues and proposed actions, and to inform them about the plan.

Management plan 2014-2019: The adaptation strategy could have been more explicitly discussed in the Working Groups for the Management Plan. Working groups could have been better documented; and documentation (agenda and minutes) could have been made available online. Working Groups could have been continued during implementation.

Dartmoor Farming Futures: ?

Mires on the Moor: organise a participatory process to get feedback from affected and involved groups on identified issues and proposed actions, and to inform them timely about the plan.

c) Any novel (use of) participatory methods observed in the case studies

No novel participatory methods observed.

4. Climate Change Adaptation Measures and Strategies

a) Adaptation Measures under analysis in your case study

Climate change adaptation strategy: considers a wide range of measures (http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0004/187798/Adapting-to-Climate-Change-on-Dartmoor-2.pdf), but no sign of that these are actually considered for implementation by Dartmoor National Park Authority.

Management Plan 2014-2019: attention for better and clearer communication and information for successful resource management and improved clarity of roles, documentation, monitoring; measures to improve water and carbon storage; promote more sustainable farming to benefit ecosystems; stimulate healthy populations of priority species; to stimulate resilience of ecosystems; promote sustainable modes of travel; stimulate tourism which compatible with nature conservation; stimulate viability of farming including addressing farm succession; a multi action approach to further develop community resilience building on the work of Devon County Council to alleviate the impacts of climate change.

Dartmoor Farming Futures: measures to maintain and enhance public access; measures to assist accessibility of archaeological sites (mainly through grazing); measures to enhance biodiversity in the entire commons area; maintain mosaic landscape with openness (by using grazing) and some parts with higher vegetation; maintain training of commoners to able to fight wildfires and remove vegetation where needed to reduce potential of wildfires; maintain sufficient and adequate flocks and herds to maintain livestock farming.

Mires on the Moor: measures to preserve and restore blanket bog, such as using peat from near the gullies to build numerous small blocks across the gullies (which holds rainwater to form series of small shallow pools, and which prevent further decomposition of the peat and provide conditions for bog plants to recolonize) to facilitate habitat for upland wildlife, to improve water (quality and quantity) supply, and to increase the potential of blanket bog to store carbon and mitigate the impacts of climate change.

b) Adaptation Measures selection and data availability prior to BASE

These are the measures that are implicitly or explicitly related to addressing climate change on Dartmoor.

For the measures from the climate change adaptation strategy, hardly any information is available.

For the measures from the Management Plan, a bit of information is available from the Dartmoor National Park Authority. But they are not yet explicitly monitoring implementation of the Management Plan.

For Dartmoor Farming Futures (DFF), an (independent) early stage-assessment has been done of implementation of the project, by a consultancy (http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0008/384614/Dartmoor-Farming-Futures-Independent-Project-

Evaluation.pdf). Implementation of DFF will be further monitored by the Dartmoor National Park Authority and Natural England.

Mires on the Moor is intensively studied:

- Mainly by University of Exeter (e.g. http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0006/364335/Dartmoor_Hydrological_Monitoring_Summary_June2013.pdf).
- Environment Agency also conducts monitoring of the project (e.g. http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0004/166783/Mires-Dartmoor-monitoring-plan.pdf).
- RSPB are involved in monitoring breeding birds (http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0008/393488/Breeding-Bird-Survey-2013-Summary-report.pdf).
- University of Plymouth, together with University of Exeter, involved in studying carbon storage.

However, governance of adaptation in these upland contexts has not been studied yet.

c) Full description of Adaptation Measures

NOTE: Questions below answered per initiative, so that is per set of measures of the four studied initiatives. So the questions below are answered 4 times.

1) Climate change adaptation strategy

Process

I. Would, or at which part would, institutions and private stakeholders implement the measure autonomously to adapt to climate change (Adaptive capacity)?

It does not look like that the Climate Change Adaptation Strategy will be implemented autonomously.

II. Does the measure initiate further activities for adaptation to climate change? (Y/N) No

III. Does adaptation aim for flexibility and reflexivity (i.e. the ability to change as CC and other factors develop)? (Y/N) Not explicitly, but intended measures could enhance flexibility and reflexivity.

IV. Is the measure effective under different climate scenarios and different socio-economic scenarios? (Y/N) Plan was specified for different time scales, but not for different scenarios. It was specified for different degrees of risk assigned to expected impacts.

V. Is the adaptation measure iterative? (Y/N) The set of measures could have been implemented iteratively.

VI. Does the measure contribute to overall sustainable development, alleviate already existing problems and bring benefits for other social, environmental or economic objectives than adaptation (no regret measures)? (Y/N) If implemented, it could.
    a. Please describe briefly how

E.g. Measures address issues relating to visitor pressures, which is an issues DNPA is trying to address anyhow.

VII. Can adjustments be made later if conditions change again or if changes are different from those expected today? (Y/N) Depends per measure, in most cases that will be possible.

Outcome

Relevance and effectiveness of adaptation measures

VIII. How important is the climate change threat addressed by the measure? What economic values, ecosystem functions and socio-cultural values are at stake, and to what extent are they affected by climate change impacts? Is there an indication of overriding public interest, e.g. critical infrastructures, public health?

For each area of potential impact, the risks and possible consequences are mentioned. Areas of potential impact range widely from e.g. historic buildings and archeological sites to e.g. managing water resources.

IX. What portion of the targeted potential damages can be avoided by implementing the measure? (0-100%) That depends how potential damage is understood. This strategy works with a risk assigned to likelihood and impacts.

Efficiency

X. How high are the benefits of the measure relative to the costs? Are the costs justified by the

Cost benefit analysis was not conducted for this climate change adaptation strategy.

benefits (Please refer to results of economic evaluation in chapter 5)

XI. What are the costs of the administrative implementation of the measure? Are there potential funding options under the umbrella of other European policies (e.g. CAP/Cohesion policy)?

Costs of administration are not assessed. DNPA has indicated that lack of implementation is related to lack of funding (from UK government) for climate change topics.

XII. Does the measure give an incentive for innovation to different actors (e.g. SMEs) / can it deliver a competitive advantage for the local economy? (Y/N) N

XIII. Does the measure have effects on employment? (Y/N) N

XIV. How long is the time-lag between implementation of the adaptation measure and the effect of the measure? Depends per measure. Expected effects are differentiated for short, mid and long term time scale.

XV. What is the timeframe during which the measure will have an effect? Short term is identified as 2020s. Mid-term as 2050s. And long term as 2080s.

XVI. Does the measure create synergies with mitigation (i.e. reduce GHG emissions or enhance GHG sequestration)? (Y/N) It could have, as peat preservation was also mentioned.

XVII. Does the measure alleviate or exacerbate other environmental pressures? (Explain briefly)

Depends per measure. Mostly it would have alleviated.

Equity

XVIII. What are the impacts on different social or economic groups, are there expected impacts on particularly vulnerable groups? (distributional impact)

It looks like most of the measures would have benefitted the commoners.

XIX. Does the measure enhance well-being and quality of life (e.g. in the urban environment)? (Y/N)

It probably would have.

2) Management plan 2014-2019

Process

XX. Would, or at which part would, institutions and private stakeholders implement the measure autonomously to adapt to climate change (Adaptive capacity)?

It does not look like that the Climate Change Adaptation Strategy will be implemented autonomously.

XXI. Does the measure initiate further activities for adaptation to climate change? (Y/N) No

XXII. Does adaptation aim for flexibility and reflexivity (i.e. the ability to change as CC and other factors develop)? (Y/N) Not explicitly, but intended measures could enhance flexibility and reflexivity.

XXIII. Is the measure effective under different climate scenarios and different socio-economic scenarios? (Y/N) Plan was specified for different time scales, but not for different scenarios. It was specified for different degrees of risk assigned to expected impacts.

XXIV. Is the adaptation measure iterative? (Y/N) The set of measures could have been implemented iteratively.

XXV. Does the measure contribute to overall sustainable development, alleviate already existing problems and bring benefits for other social, environmental or economic objectives than adaptation (no regret measures)? (Y/N) If implemented, it could.

a. Please describe briefly how

E.g. Measures address issues relating to visitor pressures, which is an issues DNPA is trying to address anyhow.

XXVI. Can adjustments be made later if conditions change again or if changes are different from those expected today? (Y/N) Depends per measure, in most cases that will be possible.

<u>Outcome</u>

<u>Relevance and effectiveness of adaptation measures</u>

XXVII. How important is the climate change threat addressed by the measure? What economic values, ecosystem functions and socio-cultural values are at stake, and to what extent are they affected by climate change impacts? Is there an indication of overriding public interest, e.g. critical infrastructures, public health?

For each area of potential impact, the risks and possible consequences are mentioned. Areas of potential impact range widely from e.g. historic buildings and archeological sites to e.g. managing water resources.

XXVIII. What portion of the targeted potential damages can be avoided by implementing the measure? (0-100%) That depends how potential damage is understood. This strategy works with a risk assigned to likelihood and impacts.

Efficiency

XXIX. How high are the benefits of the measure relative to the costs? Are the costs justified by the benefits

Cost benefit analysis was not conducted for this climate change adaptation strategy.

XXX. What are the costs of the administrative implementation of the measure? Are there potential funding options under the umbrella of other European policies (eg. CAP/Cohesion policy)?

Costs of administration are not assessed. DNPA has indicated that lack of implementation is related to lack of funding (from UK government) for climate change topics.

XXXI. Does the measure give an incentive for innovation to different actors (e.g. SMEs) / can it deliver a competitive advantage for the local economy? (Y/N) N

XXXII. Does the measure have effects on employment? (Y/N) N

XXXIII. How long is the time-lag between implementation of the adaptation measure and the effect of the measure? Depends per measure. Expected effects are differentiated for short, mid and long term time scale.

XXXIV. What is the timeframe during which the measure will have an effect? Short term is identified as 2020s. Mid-term as 2050s. And long term as 2080s.

XXXV. Does the measure create synergies with mitigation (i.e. reduce GHG emissions or enhance GHG sequestration)? (Y/N) It could have, as peat preservation was also mentioned.

XXXVI. Does the measure alleviate or exacerbate other environmental pressures? (Explain briefly)

Depends per measure. Mostly it would have alleviated.

Equity

XXXVII. What are the impacts on different social or economic groups, are there expected impacts on particularly vulnerable groups? (distributional impact)

It looks like most of the measures would have benefitted the commoners.

XXXVIII. Does the measure enhance well-being and quality of life (e.g. in the urban environment)? (Y/N)

It probably would have.

3) Dartmoor Farming Futures (DFF)

Process

XXXIX. Would, or at which part would, institutions and private stakeholders implement the measure autonomously to adapt to climate change (Adaptive capacity)?

The commoners are already implementing the DFF measures, which was initiated largely on their initiative. However, it was funded with money from national government. And it's not likely it would be implemented without national funding.

XL. Does the measure initiate further activities for adaptation to climate change? (Y/N) No

XLI. Does adaptation aim for flexibility and reflexivity (i.e. the ability to change as CC and other factors develop)? (Y/N) Not explicitly, but intended measures could enhance flexibility and reflexivity.

XLII. Is the measure effective under different climate scenarios and different socio-economic scenarios? (Y/N) Unknown.

XLIII. Is the adaptation measure iterative? (Y/N) No, but they are adjustable if needed.

XLIV. Does the measure contribute to overall sustainable development, alleviate already existing problems and bring benefits for other social, environmental or economic objectives than adaptation (no regret measures)? (Y/N) Yes

a. Please describe briefly how

E.g.contributions to biodiversity management (in SSSIs), contributions to improving water quality, contribution to dealing with wildfires.

XLV. Can adjustments be made later if conditions change again or if changes are different from those expected today? (Y/N) Depends per measure, in most cases that will be possible.

Outcome

Relevance and effectiveness of adaptation measures

XLVI. How important is the climate change threat addressed by the measure? What economic values, ecosystem functions and socio-cultural values are at stake, and to what extent are they affected by climate change impacts? Is there an indication of overriding public interest, e.g. critical infrastructures, public health?

The DFF programme addresses biodiversity preservation, landscape management, water quality, peat soil preservation, fire fighting and prevention (among others)

XLVII. What portion of the targeted potential damages can be avoided by implementing the measure? (0-100%) That depends how potential damage is understood, and at which spatial and temporal scale. And some of the DFF measures work with spatial coverage (such as biodiversity and landscape management), and others are incident based (such as wildfire management).

Efficiency

XLVIII. How high are the benefits of the measure relative to the costs? Are the costs justified by the

Apparently, DEFRA considers the DFF project as worthwhile to fund. (But only until 2016/17, because then the whole AES system will change.)

benefits

XLIX. What are the costs of the administrative implementation of the measure? Are there potential funding options under the umbrella of other European policies (eg. CAP/Cohesion policy)?

Costs of administration are not assessed.

L. Does the measure give an incentive for innovation to different actors (e.g. SMEs) / can it deliver a competitive advantage for the local economy? (Y/N) N

LI. Does the measure have effects on employment? (Y/N) N

LII. How long is the time-lag between implementation of the adaptation measure and the effect of the measure? Depends per measure.

LIII. What is the timeframe during which the measure will have an effect? The DFF programme started in 2011, and was first monitored in 2013 (http://www.dartmoor-npa.gov.uk/__data/assets/pdf_file/0008/384614/Dartmoor-Farming-Futures-Independent-Project-Evaluation.pdf). There were some early signs of positive outcomes. Although the Commoners Council considered implementation too early to be evaluated.

LIV. Does the measure create synergies with mitigation (i.e. reduce GHG emissions or enhance GHG sequestration)? (Y/N) It could have, as contributing to peat preservation is also included.

LV. Does the measure alleviate or exacerbate other environmental pressures? (Explain briefly)

Depends per measure. Mostly it alleviates.

Equity

LVI. What are the impacts on different social or economic groups, are there expected impacts on particularly vulnerable groups? (distributional impact)

The DFF scheme seems to benefit the commoners.

LVII. Does the measure enhance well-being and quality of life (e.g. in the urban environment)? (Y/N)

It probably will, as measures contribute to improving quality of the environment, and to commoners' livelihoods. Though measures are not oriented towards well-being.

4) Mires on the Moor

Process

LVIII. Would, or at which part would, institutions and private stakeholders implement the measure autonomously to adapt to climate change (Adaptive capacity)?

This project was initiated by a private actor, namely Southwest Water (drinking water company), in cooperation with National Park Authority, Environment Agency, Duchy and University of Exeter (not us, other department).

LIX. Does the measure initiate further activities for adaptation to climate change? (Y/N) No

LX. Does adaptation aim for flexibility and reflexivity (i.e. the ability to change as CC and other factors develop)? (Y/N) Not explicitly, the project ran as a 5-year experimental project. It is not likely to be continued, as South West Water is not interested in further funding this project on Dartmoor.

LXI. Is the measure effective under different climate scenarios and different socio-economic scenarios? (Y/N) Unknown.

LXII. Is the adaptation measure iterative? (Y/N) No, not specifically. The project is explicitly designed to learn from though.

LXIII. Does the measure contribute to overall sustainable development, alleviate already existing problems and bring benefits for other social, environmental or economic objectives than adaptation (no regret measures)? (Y/N) Not specifically

a. Please describe briefly how

The measures in this project do contribute to peat soil preservation, flood risk management, drink water supply, and bog biodiversity preservation.

LXIV. Can adjustments be made later if conditions change again or if changes are different from those expected today? (Y/N) If the measures as applied in the 5 year project could stay in place, it would presumably lead to more bog growth at those specific locations. The new bog could be removed, if necessary, by cutting the peat. But that's probably a very unlikely outcome.

<u>Outcome</u>

<u>Relevance and effectiveness of adaptation measures</u>

LXV. How important is the climate change threat addressed by the measure? What economic values, ecosystem functions and socio-cultural values are at stake, and to what extent are they affected by climate change impacts? Is there an indication of overriding public interest, e.g. critical infrastructures, public health?

The issues at stake which the Mires on the Moor project addresses are: carbon emission, flood risks, drinking water supply, bog biodiversity.

LXVI. What portion of the targeted potential damages can be avoided by implementing the measure? (0-100%) Bog restoration as in the Mires on the Moor project could contribute to reduced carbon emission, reduce flood risks, improved drinking water supply and enhanced bog biodiversity. But not quantifiable. And the Mires Project is relatively at small scale (about 120 hectares in 8500 hectares of bog).

Efficiency

LXVII. How high are the benefits of the measure relative to the costs? Are the costs justified by the

Well, Southwest Water has decided not to fund a followup to this project, as they don't think the benefits are evident enough to justify the costs.

benefits (Please refer to results of economic evaluation in chapter 5)

LXVIII. What are the costs of the administrative implementation of the measure? Are there potential funding options under the umbrella of other European policies (eg. CAP/Cohesion policy)?

Costs of administration are not specified. Southwest Water funded this 5-year project with £1.1 million.

LXIX. Does the measure give an incentive for innovation to different actors (e.g. SMEs) / can it deliver a competitive advantage for the local economy? (Y/N) N

LXX. Does the measure have effects on employment? (Y/N) N

LXXI. How long is the time-lag between implementation of the adaptation measure and the effect of the measure? What can be detected within 5 years will be monitored, how the effects will be monitored beyond that, is not yet known.

LXXII. What is the timeframe during which the measure will have an effect? The project started in 2010, and runs until (end of) this year (2015). What can be detected within 5 years will be monitored, how the effects will be monitored beyond that, is not yet known.

LXXIII. Does the measure create synergies with mitigation (i.e. reduce GHG emissions or enhance GHG sequestration)? (Y/N) The project does aim to contribute to reducing emission GHGs and sequestering carbon in the peat soil.

LXXIV. Does the measure alleviate or exacerbate other environmental pressures? (Explain briefly)

Mostly alleviates. But raised water tables have consequences for relatively dryers grassland species, and affects the grazing space of the cattle.

Equity

LXXV. What are the impacts on different social or economic groups, are there expected impacts on particularly vulnerable groups? (distributional impact)

The commoners were negatively affected, as the grazing grounds for the cattle was reduced, and passage to other graziong grounds impeded.

LXXVI. Does the measure enhance well-being and quality of life (e.g. in the urban environment)? (Y/N)

The measures contribute to flood risk protection and drinking water supply for people downstream. While for the commoners on Dartmoor, there are rather negative effects.

5. Implementation Analysis – Understanding, Leadership and Governance of the implementation of adaptation measures

(Please describe the process of implementation of adaptation measures in real world contexts, namely key barriers and opportunities, governance dynamics and the concrete use of scientific knowledge and economic analysis in political decision-making. Please address Policy Questions from WP2&7 on the CSLD_Support doc)

The aim of this section is to establish whether adaptation measures can be implemented in the real world context of case studies, and what the key obstacles and opportunities are in doing so. To ensure the answers provided in this section are comprehensive and in line with WP2 and WP7, a checklist is provided below with the main factors that all case holders need to consider in their answers If relevant to the implementation of your case study.

Checklist

When answering the main questions below ensure you consider each factor listed in the checklist below that might have had a role in the implementation of your case study work. Write in the table how important each factor has been to the implementation of your BASE work and adaptation in general at your case study; where 1 = unimportant, 2 = slightly important, 3 = Important, 4 = Very important, and 5 = Critical). The checklist might not be all-inclusive, so feel free to discuss other factors that are not listed.

Key factors:	Rank from 1 – 5
i. **Knowledge and information about climate adaptation**	1
ii. **Actors** (e.g. leadership, perceptions, understanding of climate adaptation, participation, decision making, stakes, conflicts/synergies)	5
iii. **Framing of climate adaptation** (e.g. as sustainability concern, (urban) planning or environmental issue, disaster risk mitigation topic)	3
iv. **Local and regional context** (e.g. culture, history, geography, environment, economy)	4

v. **European, national, regional and local regulatory framework** (e.g. be specific about laws, strategies, policies)	2
vi. **Institutional context** (e.g. integration of adaptation into existing structures/activities/strategies, decision making, conflicts/synergies, governance arrangements, incentives for engagement)	4
vii. **Resources** (e.g. financial, human)	5
viii. **Nature of adaptation measures** (e.g. no regret, flexibility, important co-benefits, side-effects)	3
ix. **Other**: standard practice to address certain issues vulnerable to climate change, although not under the heading of adaptation	3

Summary Information (based on your answers to the questions below)

a) Specify sectors covered (e.g. coast, city, agriculture): biodiversity, agriculture, flood risk management

b) Specify adaptation measures covered (e.g. altering cultivation practices, building defences; explain why they were chosen):

- bog restoration experiments to study how to preserve the peat;
- placing hiking paths and access points strategically to reduce pressure on the peat and the ecosystem;
- improve ecosystem management to achieve 50% of SSSI's in favourable condition by 2020, intended to reduce ecosystem vulnerability;
- to maintain chemical water quality (good & very good), intended to help preserve blanket bog and ecosystems;
- to prevent wildfires, e.g. by removing vegetation to reduce potential for wild fires, and train commoners to fight fires, which also helps to preserve blanket bog;
- and, to ensure that livestock is acclimatised and appropriate to higher moor (which helps to maintain food production if weather and/or climate circumstances may change on Dartmoor).

c) Specify climate change impacts covered (e.g. flooding, heat stress, sea level rise):

- drying and hotter climate (affects peat soil, ecosystem, wildfires, drinking water provision);
- flood risks (heavy peak precipitation and thinner peat soil lead to more flash floods).

d) Specify main results of activities (e.g. changes, outputs):
   - Climate change adaptation strategy: not specifically implemented
   - Management Plan 2014-2019: not yet known, is not yet monitored and evaluated
   - Bog restoration project (Dartmoor Mires on the Moor): ends 2015, will not be continued
   - Farming Futures project: one early stage monitoring report slightly positive, further monitoring & evaluation planned, continuity of project uncertain because of new agri-environmental schemes in 2016 ('NELMS')

Questions

Answer these six questions giving specific evidence and examples where possible. In principle all implementation activities should be included, i.e. adaptation activities supported by BASE partners as well as those by other actors. If it is possible to inform about the implementation of those adaptation measures assessed for task 5.2, it is very important to do so in order to comply with the DoW. The measures covered can be extensive and/or particular to a case study. They can include for example, the development of plans and strategies, vulnerability/risk assessments, economic assessments such as CBA, MCA, the development of participatory processes/public dialogue, through to the implementation of actual measures including physical measures such as engineering developments and land use change, incentives/subsidies for behavioural change, etc. This list is not all-inclusive and is merely a guide. Your own case study may have very different measures. However, **you must be clear what measures you are refereeing to when answering these questions.**

1. How have climate change adaptation measures and strategies been advanced in the case study? Describe the process! *Note:* Retrospective case studies will not answer this question, but have to update their answer to question 1 E of this document on the history of adaptation at their case study. (Approximately 500 words)

In addition to the history of the case as outlined under question 1 E, and with a specific lens on what influences implementation:

- Climate change adaptation strategy: The Dartmoor National Park Authority (DNPA) has developed a climate change adaptation strategy in 2011. They state it has been translated into the Management Plan 2014-2019 (but do not want to explain how), and will be implemented as such. The Management Plan 2014-2019, however, does not refer to the climate change adaptation strategy from 2011. It does include some adaptation measures though, albeit not under the heading of climate change. The Management has been development in consultation with various stakeholder groups.
- Management Plan 2014-2019: The two documents (the climate change adaptation strategy and the Management Plan) use a different approach. Whilst the climate change adaptation strategy is based on a climate risk assessment which explicitly considers adaptation as a group of policy interventions to cope with the risks, impacts and opportunities related to climate change, the Management Plan uses an ecosystem-based approach (thus only indirectly addressing adaptation needs). The two documents use different scientific references: the climate change adaptation strategy (with the risk assessment) refers to the 2009 UK Climate Projections and to IPCC reports; the Management Plan refers to more local-oriented reports, such as "Climate Change – What does it mean for Dartmoor?" DNPA (2011) and South West Devon Strategic Energy

Study: The Evidence Base, by University of Exeter (2013). DNPA state that the Management Plan will be implemented and monitored, though they don't know exactly yet how and when, and whether evaluation outcomes will be used to adapt practices and measures if necessary. Also, they have stated that climate change impacts and adaptation is currently not one of their priorities. That indicates that after the attention for climate change impacts, risks, and identifying possible actions (in 2011), appears to have shifted. What may explain this current relatively lack of interest or focus on climate change impacts and adaptation, is that they have been recently been severely cut back in their funding.

- Bog restoration project: the Mires on the Moor project is about bog restoration (partly initiated and) funded by drinking water company South West Water. The Mires on the Moor project started in Exmoor National Park, and was later also applied in Dartmoor National Park. It is not a public policy initiative; it is initiated and implemented by drinking water company South West Water and the University of Exeter, and takes place on land owned by the Duchy (and covers about 120 hectares), and (partly) used by the commoners. It is further facilitated by the Environment agency and the Dartmoor National Park Authority. The project entails rewetting of bog areas, and is intended to include compensation payments for the commoners/farmers affected by the rewetting. The project has received some criticism and there were and are some sensitivities around this: South West Water has not indicated what the compensation payments will be exactly, and some commoners and farmers felt South West Water has (partly) failed to use the local expertise and to give locals an opportunity to respond, by not including the commoners/farmers in the project and not informing about them about it. The project is currently being implemented, and monitored by the University of Exeter. The project ends in 2015, and South West Water has decided not to fund any continuation of the project on Dartmoor (they will on Exmoor National Park).
- Farming Futures project: Dartmoor Farming Futures is a bottom-up project to implement agri-environmental schemes in a localized approach. Dartmoor Farming Futures (DFF) was initiated around 2010 by local farmers together with the Dartmoor Commoners Council, the Forest Commoners Council, the Haytor and Bagtor Commoners Council, and the DNPA, together with the Duchy of Cornwall, Natural England, RSPB, South West Water, and the Ministry of Defence. It is currently implemented as a local interpretation of the national (and EU) agri-environmental schemes, whereby the local commoners who participate have made and signed agreements with Natural England and Defra. A first preliminary evaluation has been conducted in 2013, the DFF programme will be further monitored and evaluated. So far, it appears to be a successful bottom-up initiative to translate to and use national (and EU) policies in a localised setting. However, continuity of project is uncertain because of the new agri-environmental schemes which will start in 2016 ('NELMS'). The NELMS will be biodiversity output focused, and is not expected to allow for alternative interpretations.

2. What and who drives (or enables) the adoption and implementation of adaptation measures and strategies/policies? Please explicitly refer to the factors mentioned in the checklist, highlighting the factor in bold, and be specific about any relevant policies! (Approximately 500 – 1000 words)

- Climate change adaptation strategy: The climate change adaptation strategy was probably developed as part of **a national policy programme** for National Parks. According to the National Park Authorities' website: "The Climate Change Act 2008 introduced the Adaptation Reporting Power, an assessment to identify the risks and opportunities arising from predicted climate change and actions to respond to them. In their joint statement on Climate Change, the English National Park Authorities

voluntarily committed to produce adaptation reports covering each National Park." The Climate change adaptation strategy appears to have been developed by the DNPA solely, that is without consultation of other stakeholders in the area.

- Management Plan 2014-2019: is developed and implemented as **standard practice** by the Dartmoor National Park Authority. There were some working groups with stakeholders which contributed through discussion and advice to the development of the current Management Plan 2014-2019. Implementation is mainly driven by the fact that it is a core task of the Dartmoor National Park Authority.
- Bog restoration project: initiative was bottomup and taken by several local **actors**: the regional private drinking water company (South West Water), the Dartmoor National Park Authority and a couple of academic researchers. They did have slightly different interests to initiate and implement this project. For the drinking water company, the main interest was to find a way to enable a steady supply of clean drinking water. For the National Park Authority, the main interest was to benefit from the study, and learn about peat preservation. For the academics, the main interest was to find a location and financing for their research project.
- Farming Futures project: also a bottom-up project started by local **actors**. This project was started by the farmers on Dartmoor. Their main interest was to develop and implement an alternative interpretation of the agri-environmental schemes, better tailored to the local circumstances.

3. What obstacles were encountered during the adoption or implementation of adaptation measures and strategies/policies? Please explicitly refer to the factors mentioned in the checklist, highlighting the factor in bold, and be specific about any relevant policies! (Approximately 500 – 1000 words)

- Climate change adaptation strategy: The National Park Authority states that they could not implement this specific climate change adaptation strategy, due to lack of **resources**.
- Management Plan 2014-2019: is currently implemented. It's not really clear yet whether there any significant obstacles.
- Bog restoration project: at the beginning of the implementation, in 2010, it turned out that the initiators had communicated insufficiently in advance with the local **actors**, i.e. the commoners (farmers) about the project. There were quite some protests to the project, as it concerns raising the water tables, which influences accessibility for the livestock to graze in and wander through those areas. The difficulties led to some delays of the experiments, and during the experiments protests continued. South West Water stated that this is mainly a shortcoming of the National Park Authority, the National Park Authority has indicated that indeed communication with the other user groups could have been better. South West Water has stated that these difficulties with communication with the local actors and handling these protests, are the reason why they are not interested in funding a continuation of the project.
- Farming Futures project: at the beginning of the project, the initiators (i.e. the commoners) had some difficulties negotiating their proposal into the existing agri-environmental policy, i.e. the **national regulatory framework**. And, now, a new obstacle has emerged: a new agri-environmental policy (i.e. NELMS) will be put in place in 2016, and it is uncertain whether this local project can continue to be financed under the new policy.

4. If any obstacles were overcome, how was this achieved? (Approximately 500 words)

- In the case of the Climate change adaptation strategy, the reported obstacle of lack of resources was not overcome.

- In the case of the Management Plan 2014-2019, it is not yet really clear yet whether there any significant obstacles.
- In the case of the bog restoration project, there were difficulties with protests and objections from the commoners (farmers) about the project. These protests and objections were partly overcome by starting a dialogue and providing more information. But these protests and objections are also still present, and a reason why the project will not be continued. (Or maybe the obstacle could also be framed as: a lack of know-how or lack of interest in how to deal with these kinds of issues.)
- Farming Futures project: at the beginning of the project, the initiators (i.e. the commoners) had some difficulties negotiating their proposal into the existing agri-environmental policy. This was mainly overcome, by involving a mediator/negotiator/go-between, who facilitated the process between the farmers and Natural England (i.e. the body that approves the local interpretation, and distributes the finances for it). There are no signs yet the new obstacle in the shape of the new agri-environmental policy (i.e. NELMS) will be overcome.

5. What are the future prospects of the climate change adaptation activities in the case study? (Approximately 200 – 500 words)

On the whole, the prospects are not that promising. The National Park Authority claims they have insufficient resources to specifically address climate change adaptation. The bog restoration initiative, a relatively expensive project, does not seem to have been handled very well in terms communication with local users (i.e. the farmers). And now the financing party has withdrawn. And the initiative from the farmers will probably not be continued, because of the new agri-environmental policy.

The currently most likely way vulnerabilities will be addressed is through the Management Plan. That the National Park Authority will address some of these vulnerabilities, but not under the heading of climate change adaptation.

6. What is the key message from this case study (and which could work in other cases as well)? Don't forget to consider any specific policy recommendations that arise in your case study! (Approximately 200 – 500 words)

In terms of the climate change adaptation strategy, we can learn that only assigning National Park Authorities to develop such a strategy is not enough. To enable implementation, it will have to be accompanied by resources.

In terms of the Management Plan, we can learn that there may be measures which address climate change, although not under that heading. To monitor and evaluate progress in climate change adaptation, resources and a wider scope to identify measures would help.

In terms of the Mires on the Moor (bog restoration) project, it is quite obvious that communication and deliberation are key factors. Although these may seem obvious factors to many social scientist academics, one can see that they are (still) not obviously applied in practice.

In relation to the Dartmoor Farming Futures project, a lesson learned is that local bottom-up initiatives can work quite well. But when they depend on a national policy for their funding, and that policy changes, the initiative maybe threatened.

6. References

See above, at list of project documentation and academic literature to be consulted.