ACRP

Interim Report – Activity Report

Program control:
Climate and Energy Fund

Program management:
Kommunalkredit Public Consulting GmbH (KPC)

1 Project Data

Short title	Private Forest Adapt	
Full title	Understanding and Directing Small-scale Private Forest Owner Behaviour towards Climate Change Adaptation	
Project number	B286281	
Program/Program line	ACRP 5th Call for Proposals	
Applicant	Federal Research and Training Centre for Forests, Natural Hazards, and Landscape (BFW) Univ.-Doz. Dipl.-Ing. Dr. Robert Jandl	
Project partners	University of Natural Resources and Life Sciences, Vienna: Institute of Landscape Development, Recreation and Conservation Planning (BOKU-ILEN) Institute of Meteorology, Center for Global Change and Sustainability (BOKU-MET) Technische Universitaet Muenchen (TUM)	
Project start and duration	Project start: 01.07.2013	Duration: 24 months
Consecutive number of interim report	Interim report 2	
Reporting period	from 01.07.2013 to 30.06.2014	

Synopsis: The project investigates the human dimensions of climate change by focusing on small-scale private forest owners in Austria and their perception of climate change. Through a participatory method, the study explores ways to influence forest owners' adoption of adaptation methods to enhance risk management (e.g. avalanche prevention, debris flow, bark beetle infestation) and the transition to resilient private forest stands. The key challenge is to get this group of landowners "re-interested" in their property and to increase the awareness of their required contribution. The innovative methodological approach combines forest growth modelling and visualisation of possible effects within choice experiments. The collaboration between research consulting and teaching institutions will ensure a direct knowledge transfer of results.

2 Technical /Scientific Description of the Project

Authors: Jandl, R., Pröbstl-Haider, U., Formayer, H., Melzer, V., Mostegl. N.M.

2.1 Project abstract (max. 2 pages)

The project abstract, providing a survey of the project and its content, is based of the following structure:

1. Initial situation / motivation of the project

The impacts of climate change on Austria's forest stands consist of both, direct effects on several tree species, indirect effects such as forest pests, or their combination. These impacts might lead to significant economic losses, but also present possible opportunities for the future. The Austrian forests are mainly owned by private persons. Our target group are the owners of small forests. More than 120 000 forest owners are currently managing approx 20% of the Austrian forest area with individual forest properties being smaller than 5 ha. This group is difficult to capture by traditional information networks. Moreover, these forest owners are mostly engaged in professions outside of forestry and are often only partially educated in forestry. Nevertheless, the awareness of these owners about the consequences of climate change for their forests is significant for the future condition of the Austrian forests and on the ecosystem services provided to the public.

The project focuses on the human dimensions of climate change and adaptation by small-scale private forest owners in Austria. Main concerns are their perception of climate change and ways to influence their likely adoption of adaptation methods to raise awareness of possible risks by inactivity and to promote the transition to resilient private forest stands.

2. Objectives of the project

The goal of the project is to assess the competency of small-scale forest owners on climate change effects on forests. The project investigates the economic and administrative feasibility of alternative policy strategies for promoting adaptation and transition to resilient private forest stands, including incentives for voluntary actions, and the effect of information, including the lack thereof. Incentives include hypothetical positive and negative financial incentives, the role of regional advisors and contracts, and the option of printed and web-based information materials. Testing in different study areas in Austria (Tyrol and Styria) shall reveal if and how economic, cultural, and social factors affect mitigation and adaptation. The project will also test whether the awareness of possible indirect effects of climate change on forests (e.g. on the protective function and the emerging risk) influences the decision making process of private forest owners. Against this background the potential for and the effectiveness of a combination of consulting, information and incentives will be discussed to

form an overarching policy and new solutions to overcome an increasing risk by inactivity or ignorance of climate change effects.

3. Project structure and methodology

Project steps accomplished

The first stage of the research contained a review of research undertaken so far on knowledge dissemination to private forest owners about climate change, as well as the currently on-going consultations and the experience with stakeholder participation in the field. Alongside this literature review, the selection of test sites was initiated and climate data for the test sites were downscaled and projected. The growth simulation model Caldis uses the downscaled climate data to project future forest scenarios in the test regions. Based on the information of the literature review and the climate data, the project developed an online questionnaire, which specifically targets small-scale private forest owners. Crucial stakeholders participated during all qualitative stages of the survey design in focus groups and key informant interviews. The core of the survey builds a Choice Experiment (CE), which aims to obtain a thorough understanding of the salient factors influencing the decision making of private forest owners.

Project steps planned

The survey will be distributed to small-scale private forest owners at the test sites. Survey results will lead to policy strategies and outcomes of the CE will be used to estimate the demand for currently non-existing alternatives, including the forest owner reaction to incentives or regulatory changes. These results will be presented in a user-friendly manner in a decision support tool (DST), which will predict the likely changes in the behaviour of forest owners caused by policies and incentives.

4. Results and conclusions of the project stage concerned

The study is of high relevance for several regions in Austria.

Following conclusions and results can be drawn from the current project stage:

- The project partners participate in a rigorous knowledge exchange and have collaborated well during all steps so far
- Cooperation and inclusion of stakeholders has started and was successful
- The identification of relevant forest owners is as difficult as anticipated. The group is not well addressed by traditional information channels within the forestry sector.
- Meteorological data enquiry is finished and climate models for test sites are obtained
- Suitable test sites have been described and defined
- The survey and the choice experiment are designed and are currently finalized
- There is a strong support from the Tyrolean partners providing addresses and

5. Outlook to the next project stage

The survey (including the CE) is about to be finalized with the help of stakeholders (WP4) – minor changes are expected within the next few weeks due to a planned stakeholder workshop and pre-test. Next steps include the implementation of the survey at the test sites

and its analysis and discussion (WP4), the development of policy strategies and the selection of governance tools (WP5), as well as the dissemination of results (WP6).

2.2 Contents and results of the project (max. 10 pages)

This part of the report provides thorough information about the project targets defined by the applicant, as indicated in the project application, and the methods employed to achieve these targets.

1. Description of the targets originally defined for the reporting period

In the following section, the objectives for each Work Package within the reporting period are listed:

WP1 Project Management and Coordination

- Overall project coordination and interaction between partners
- Coordinating meetings with the project partners
- Reporting to the Climate and Energy Funds
- Establishing and managing a data exchange platform

WP2 Downscaling of possible effects of Climate change for the four test sites

- Providing meteorological input data for forcing a forest model
- Climatological characterization of the test areas now and under climate change conditions

WP3 Literature review on research findings on adaptation and recommendations for private forest owners, development of a visualisation and growth model

- Literature review on adaptation to climate change, forest management
- Providing exemplary simulation runs of the forest development in the test areas as a basis for the interaction with stake holders
- The simulation runs have created synergies with a companion project.

WP4 Development of Survey and Discrete Choice Experiment, Implementation of the Survey on forest ownership

- Transformation of climate and growth model data for scenarios to be used in the choice experiment
- Development of a survey on private forest owners
- Development a discrete choice experiment simulating forestry decisions by private forest owners
- Setting up the survey, Implementation of the survey

2. Description of the preliminary results and milestones of the reporting period (including project progress as percentage of total project on work package basis – e.g chart,..)

WP1 Project Management and Coordination

Milestones

- Coordination of meetings between project partners and international institutions
    - 30.01.2013 - Decision meeting
    - 17.04.2013 - Collaboration meeting
    - 04.07.2013 - Kick-off meeting
    - 19.09.2013 - Meeting 1
    - 20.11.2013 - Meeting 2
    - 18.12.2013 - Meeting 3
    - 04.02.2014 - AFORCE Workshop Paris
    - 06.02.2014 - Meeting 4
    - 13.02.2014 - Theory discussion
    - 20.02.2014 - Meeting 5
    - 02.-04.04.2014 – Klimatag
    - Participation in COST Action FACESMAP
    - 20.05.2014 - Meeting 6
    - 30.05.2014 – Application of a project member for a Short-Term Scientific Mission within COST FACESMAP
- Establishment of data exchange platform, creation of templates for reports, meetings, and knowledge transfer
- Reports to the Climate and Energy Funds
    - Initial report
    - Publication for Journal of Kommunalkredit 'ACRP in Essence', Berichte zur Klimafolgenforschung 2014.

WP2 Downscaling of possible effects of Climate change for the test sites

Milestones

- Time series for temperature and precipitation at the test sites
- Climatological characterization of the test sites

General Circulation Models (GCM) and even standard Regional Climate Models (RCM) results are too coarse to resolve the complex topography of specific sites within Austria. We used a high resolution (10 km) RCM tha was forced with the ECHAM5 A1B. From this model simulation the relevant meteorological parameters (temperature, precipitation) were made available on a daily basis. A bias correction and localization of the RCM scenarios on a daily basis was necessary. Base for the bias correction was the 1x1 km gridded observational

daily meteorological data from 1977-2006 as provided by the Austrian weather service and the INCA data set for daily temperature minima and maxima from 2003 - 2012.
The climate scenario data were exchanged with the participants of the project.

WP3 Literature review on research findings on adaptation and recommendations for private forest owners, development of a visualisation and growth model

Milestones

- Overview on the main findings in literature:
  Forests are gradually affected by climate change. In some regions an increase in the forest productivity is anticipated and is also shown by the modelling results. However, the productivity increase is a transient phenomenon. For owners of small forest holdings these increases in timber production are also of marginal relevance, because their income is mostly derived from their main profession. The main challenge is that these forest owners respond insufficiently to a changing disturbance regime. The simulation results suggest that pests and pathogens, most prominently outbreaks of bark beetle infestations, lead to considerable economic losses. The standard response in large forest enterprises is an increase in silvicultural counter-measures in order to fend off the bark beetle outbreaks. In cases where the forest owner is not responding in an appropriate way, forest authorities are interfering. The lag-time between the onset of bark beetle aggradations and the enforcement of counter measures may lead to considerable damages and the affection of large tracts of forest land. – The discussed remedies are still controversial. Among the benign approaches is contracting forestry specialists for land management. Tailored service packages are offered by professionals but are so far not successful on the market.
- Discussion of management scenarios (email interaction with experts and practical foresters) (mo 3)
- Simulation results visualized (mo 9)
  The results of the growth simulations have been visualized in different ways. One approach is displaying the growth and the disturbance of forests under specific management regimes in animated sequences. Another approach is displaying the endpoint of a certain forest development as consequence of forest management and climate change in one picture. – We found it particularly challenging to incorporate a realistic disturbance scenario in a picture or a short movie in a meaningful way. The particular challenge is that disturbances are affecting usually only a small part of the forest at a given time. We found that the elaborated pictures and movies are quite clear for fellow forestry experts, but much more ambiguous to non-specialists. The suggested remedy is the support of single pictures with explanatory text. The final version will be elaborated in the pre-test of the choice experiment (see WP 4).

WP4 Development of Survey and Discrete Choice Experiment, Implementation of the Survey on forest ownership

Milestones

- **Stated choice survey: questionnaire and discrete choice experiment**
  Based on the results of the previous WPs, WP4 developed a questionnaire, targeted to small-scale private forest owners. The emphasis of the questionnaire lies on owners' perception of management strategies, their willingness to adapt such strategies, and the influence of climate change and risk on their choices.

  Figure 1 shows the structure of the questionnaire. In order to increase user-friendliness at the beginning of the survey, initial questions are kept straightforward and easy to answer. These questions will identify the forest structure of the sample and include mostly "classification" questions, which will guide the clustering of participants in particular "groups" (e.g. owners with less than 1 ha forest area, owners with less than 5 ha forest area, etc.) during analyses.
  The following section concerns participants' motivation to own forest. The attributes of this ranking question are loosely based on the Woodland Owner Survey (2013), Schaffner (2001), and Creighton et al. (2002), who defined multiple motivations to own forest.
  The questionnaire then turns to more in-depth management questions, which evaluate past, present, and potential future management efforts, including the type of cultivation, the preferred cultivators, and general perception of the necessity of cultivation efforts.
  The next section of the questionnaire focuses on owners' perception and knowledge of climate change. In addition, the questions will investigate if pending climate will have an impact on owner's management decisions. The last questions of this section concern potential damages occurring in the owners' forests.
  The core of the survey builds the discrete choice experiment (DCE). The DCE follows a learning task page, which will help the participant to get familiar with the concept. The idea of the DCE is to obtain a thorough understanding of the salient factors influencing the decision making of private forest owners. The set-up of the DCE requires participants to imagine that they own a spruce rich forest of a certain size. The forest authorities now advise, that all forests need to be adapted to climate change within the next 20 years, to prevent severe impacts from climate change impacts (e.g. bark beetle infestation, windfall, etc.). Multiple measures exist to accommodate this advice, which imply different effects (e.g. costs, enforcing authority, etc.) Attributes included into the DCE consist of:
    - Measures applied
    - Enforcing authority
    - Changes in forest value
    - Silvicultural / financial risk
    - Risk of personal and infrastructure damages
    - Insurance for 15 years
    - Climate premium

- Climate fitness in % probability

The end of the survey is defined by easy to answer socio-demographic questions.

Currently, the questionnaire consists of 29 closed-ended questions, distributed over 14 web pages. Bars at the top right of each page will show the progress the participant made. In addition to the purely question filled pages, participants will see a welcome page and have the opportunity to open a page project partners and a description of the raffle. The raffle consists of material prizes and one wellness weekend at Hotel Retter in Styria. Only participants with completed questionnaires may participate in the raffle.

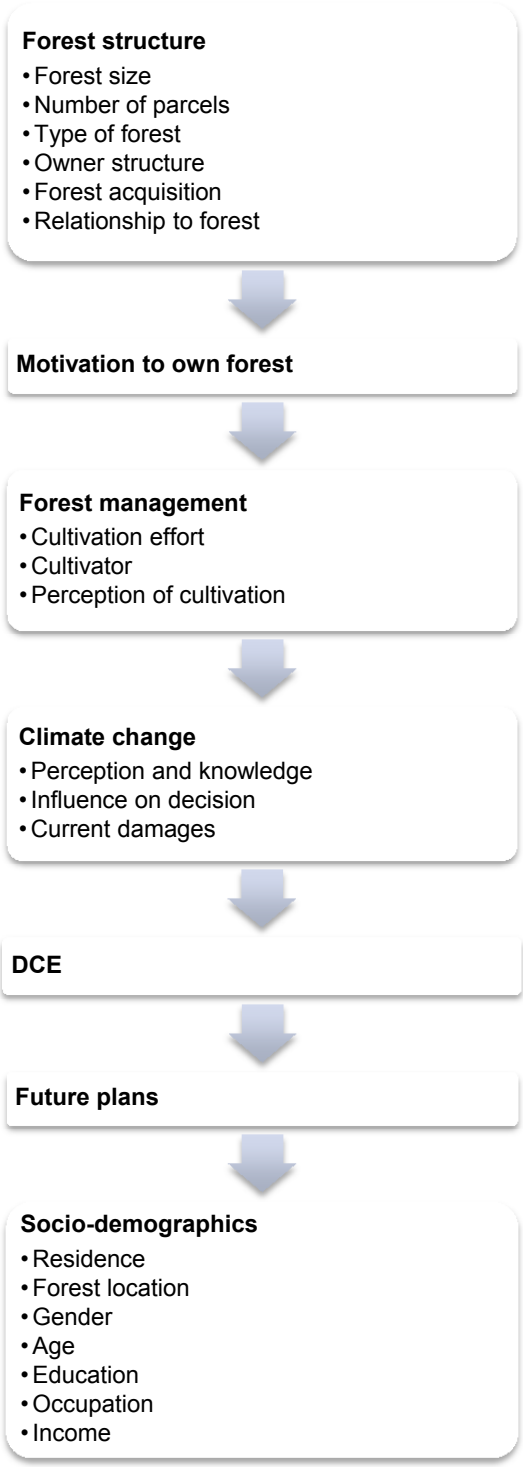


Figure 1. Structure of survey

- **Workshops in the test regions**
  Workshops in Tyrol are planned and will be organized by Dr. Suda and his collaborateurs and in cooperation with the Landesforstdirektion Tirol. A pre-test of the questionnaire is scheduled for August 25, 2014. Participants are forest advisors

(Waldaufseher), forestry experts, and the project team. The workshops are designed to test the questionnaire. The group is deliberately kept small.

WP 5 - Policy strategies for promoting adaptation and transition to resilient private forest stands

Not yet started

WP 6 - Dissemination and Knowledge Transfer

Dissemination has started; a formal knowledge transfer will be initiated once the results of the choice experiment are evaluated.

3. Description of difficulties encountered in the pursuit of the targets during the reporting period (if any)

The multiple-choice experiment requires the display of forest dynamics in simple graphics, either pictures, or brief movies. We found it difficult to find a format that is not overly simplistic for persons with knowledge in forestry but still sufficiently bold so that forest dynamics under different management regimes are obvious for an interested non-specialist in forestry.

We did expect that the identification of a representative group of forest owners will be difficult. The problem has been resolved.

Finally, it proved to be difficult to develop a web application / questionnaire providing the required information for the stratification of the results and the critical scientific content. Early versions of the questionnaire were rather longish. Such questionnaires are bearing the danger that the respondents lose interest and do not pay full attention to some questions, or leave the web application before completion of the questionnaire. The fine-tuning of the questionnaire is still ongoing.

4. Description of project progress “highlights”

We achieved international recognition for our approach. First findings will be presented internationally at the IUFRO world conference in October, a joint JPI call showed broad interest in the methodological approach.

In addition we were impressed how well the target group of forest owners is identified by the forest authorities (Landesforstdirektion) in the province of Tyrol.

5. Literature

Creighton, J.H., Baumgartner, D.M. & Blatner, K.A. (2002). Ecosystem Management and Nonindustrial Private Forest Landowners in Washington State, USA. Small-scale Forest Economics, Management and Policy, 1(1): 55-69.

Hogl, K.; Pregernig, M. & Weiss, G. (2005) What is new about new forest owners? A typology of private forest ownership in Austria. Small-scale forestry 4, 325-342

Lawrence, A. & Marzano, M. (2013) Is the private forest sector adapting to climate change? A study of forest managers in north Wales. Annals of Forest Science,

National Woodland Owner Survey (2013). USDA Forest Service

Schaffner, S. (2011). Realisierung von Holzvorräten im Kleinprivatwald – Typen von Kleinprivatwaldbesitzern und deren Verhalten bezüglich Waldbewirtschaftung und Nutzungsaufkommen. Dissertation am Wissenschaftszentrum Weihenstephan für Ernährung, Landnutzung und Umwelt

2.3 Description of dissemination and publication measures

This includes a list and, possibly, a description of project workshops, publications and presentations at external events during the reporting period.

- Klimatag 2014 – Poster presentation
- IUFRO 2014 application (Presentation in October); Special technical session chaired by the project coordinator.

3 Presentation of Costs

Please note the following: Payment of the installment due, based on the volume of support committed in the contract and on information provided in the corresponding report, does not mean that the expenses submitted are accepted as eligible. The eligibility of expenses is established after completion of the project through a detailed review of project costs by KPC. The last installment is paid out after approval of the final report and the final statement of expenses and subsequent adoption by the support management department of KPC.

3.1 Table of costs for the reporting period

The following table provides an aggregated overview of the costs incurred by the applicant and the project partners in the reporting period, broken down by staff costs, capital expenditure, travel expenses, administrative and material expenses, and third-party costs.

All figures in EURO.
Please add further columns for additional partners or start a new table.

Cost category	**Eligible total costs according to contract**	**Cumulative costs of the reporting period** Total costs for the consortium*	**Applicant** Costs in the reporting period from 01.07.13 to 30.06.14 (BFW)	**Partner 1** Costs in the reporting period from 01.07.13 to 30.06.14 (ILEN)	**Partner 2** Costs in the reporting period from 01.07.13 to 30.06.14 (MET)	**Partner 3** Costs in the reporting period from 01.07.13 to 30.06.14 (TUM)
Staff costs	195,497.00	57748	4488	41,285.21	11,975.20	0
Capital expenditure				0		
Travel expenses	26,000.00	764	203.40	560.74		
Administrative and material expenses				0		
Third-party costs	11,800.00			0		
Total	233,297.00	58513	4691	41,845.95	11,975.20	0

* Sum total of costs incurred / cost category of the applicant and all partners

3.2 Statement of costs in the reporting period

The staff costs developed as expected for Partners 1 (ILEN) and 2 (BOKU-Met). ILEN spent its expenses on staff that was mostly engaged in developing the web application for the

choice experiment. BOKU-Met provided downscaled scenarios of the future climate for the regions. The Coordinating Institution (BFW) covered the preliminary modeling costs by results from an ongoing project. It was a coincidence that similar simulation runs of forest productivity and forest development were required within another research projects. The costs currently charged on the project are therefore mostly administrative costs. After the pretest of the choice experiment in August 2014 the modelling exercise will be repeated with a refined set of user requests. Partner 3 (TUM) opted for a joint payment of the first and second instalment in July 2014. The reason was that the main work load of Partner 3 is confined to the second half of the year 2014.
Travel expenses are so far merely the costs of attending the Austrian Klimatag in Innsbruck (April 2014). We intend to present outcomes of the project at the IUFRO World Congress 2014 in Salt Lake City and Partner 1 will likely charge some costs to the project.
Third party costs concern the costs of implementing the survey. We are lucky with having a highly committed stakeholder in our project impersonated by Dieter Stöhr from the Landesforstdirektion Tirol. Another payment will go to the Slovenian Forestry Institute once the Choice Experiment is in its final format.

3.3 Cost reclassification

Presentation and motivation of cost reclassifications, if any (between partners and/or cost categories) during the reporting period.

Cost-neutral reclassification within the project – Staff:
ILEN:

- Nina Mostegl and Verena Melzer were approved as new employees instead of Ulrike Pröbstl and N.N. as stated in the application (compare letter from 24.02.2014)

Cost-neutral reclassification within the project – Cost categories:
ILEN:

- 10,000.00 Euro from Travel costs (WP4) to Personnel costs (WP4) for the programming and design of the survey to do an online-survey instead of face-to-face interviews (compare email and letter from 04.06.2014). The reclassification has been approved by the KPC (compare letter from 24.06.2014).

4 Outlook

The **foreseeable developments and priorities of the project in the next reporting period**, as well as any changes in time and cost schedules to be expected beyond that time frame, are to be described in this section.

4.1 Time schedule

Please describe the sequence of activities planned for the coming reporting period. Indicate any changes in the future work and time schedule and adjust the original work and time schedule accordingly.

Since the beginning of the project was postponed for 4 months backwards, the official start was July 1st, 2014. Hence, all Work packages start 4 months later as shown in Figure 2.

Figure 2: Time Schedule application (above) and actual time schedule (below)

4.2 Planned Cost schedule

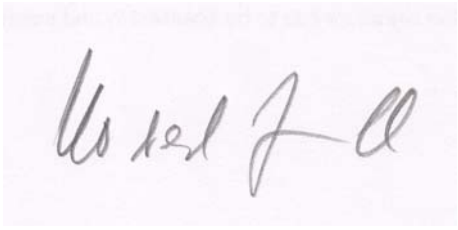
Please describe the costs and/or groups of cost items to be incurred in the coming reporting period.

The next cost blocks are the costs for the design and programming of the questionnaire, the technical implementation of the survey (WP4), the analysis, discussion and visualization of the results as well as the development of policy strategies for promotion adaptation and transition to resilient private forest stands (WP5) and then for the dissemination and knowledge transfer (WP6).

It was agreed with TUM to transfer the funds for the first year at only one occasion in July 2014 instead of the initially suggested two transfers (40% at beginning of project, 40% in July 2014).

5 Signature

I herewith confirm that the report in its entirety has been accepted by the project partners.



Vienna, July 26th, 2014

Place, date	Signature of the applicant (coordinator)

Please note: the signature has to be scanned in and inserted into the document.