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## Working Paper

# An updated bibliography and database on forest ecosystem service valuation studies in Austria, Germany and Switzerland

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# **An updated Bibliography and Database on Forest Ecosystem Service Valuation Studies in Austria, Germany and Switzerland**

Peter Elsasser, Jürgen Meyerhoff, Priska Weller

**Thünen Working Paper 65**

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## Abstract

This collection presents an updated bibliography of those empirical forest ecosystem service valuation studies in the German speaking countries which relate to demand oriented measures of the utility of public goods.

The associated database (which is provided as a separately downloadable Excel-file) contains 77 data sets by October 2016. These data sets are characterised by about 40 descriptors (the exact number depending on the specific valuation method used in the respective study) which present details of the valuation object, the statistical and economic methods applied, the results of the valuation exercise, some other descriptors for study quality, and the associated publications. The structure of the database is explained in detail here.

Keywords: forest, non-market valuation, ecosystem services, Austria, Germany, Switzerland, meta-database, bibliography

## Zusammenfassung

Dieser Arbeitsbericht enthält eine aktualisierte Bibliographie derjenigen empirischen Bewertungsstudien über forstliche Umweltleistungen im deutschsprachigen Raum, die nachfrageorientierte Methoden zur Bestimmung des monetären Nutzens öffentlicher Güter verwendet haben.

Die damit verbundene Datenbank (die als separate Excel-Datei bereitgestellt wird) enthält derzeit (Oktober 2016) 77 Datensätze. Diese Datensätze werden - abhängig von der jeweiligen Bewertungsmethode - durch je etwa 40 Deskriptoren beschrieben, welche Einzelheiten zum Bewertungsobjekt, zu den verwendeten statistischen und ökonomischen Methoden, zu den Bewertungsergebnissen, zu einigen Qualitätsmerkmalen der Studien sowie zu den zugehörigen Publikationen enthalten. Die Struktur dieser Datenbank wird im Folgenden detailliert beschrieben.

Schlüsselwörter: Wald, Umweltbewertung, Monetarisierung, Ökosystemleistungen, Österreich, Schweiz, Deutschland, Metadatenbank, Bibliografie

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## 1 Introduction

Nearly ten years ago, a first version of this bibliography has been published together with a meta-database of forest ecosystem service valuation studies from the German language area (i.e., Austria, Germany, Switzerland) (ELSASSER & MEYERHOFF 2007; cf. also ELSASSER *et al.* 2009). This first version consisted mainly of studies applying the Contingent Valuation Method (CVM), being the predominant method at that time. Meanwhile, however, several additional studies have been published, making an update desirable. Many of the recent stated preference studies have applied Choice Experiments (CE) rather than CVM as a valuation method. Including CE studies in the bibliography, however, not only requires an update with respect to the studies included, but also with respect to the descriptors: although both are stated preference studies, Choice Experiments differ to some extent from CVM studies. We thus used this opportunity to restructure the whole database and to make it at the same time easier for users to access each study. The Excel-file now includes an overview sheet, separate sheets for each valuation method (CVM, CE, the Travel Cost Method [TCM] and Benefit Transfer [BT]), and another sheet for all related literature sources.

Today the Environmental Valuation Reference Inventory (EVRI - <https://www.evri.ca/>) covers the largest number of valuation studies worldwide. However, EVRI only incompletely covers studies from the German language area, and researchers from Austria, Germany and Switzerland do not have free access to EVRI. Hence, a more complete overview is needed, as well as an easier access to the existing studies. This need has particularly become clear in the recently published results of the German study on The Economics of Ecosystems and Biodiversity ('Naturkapital Deutschland – TEEB.DE'), which has documented that from an empirical point of view, not much is known about the economic value of ecosystems and their services here.<sup>1</sup> Generally, only a few economic valuation studies are frequently cited, revealing that a systematic approach to value even the most important ecosystem services is still missing. While a database cannot enlarge the number of useable studies, it is at least an initiative to ensure that the existing studies are accessible. Moreover, it also helps to identify gaps, and thus might help to guide future work.

In the following, we briefly describe the current version of the bibliography, i.e., give an overview of the number of studies, their main objective, their country of origin, describe the descriptors used in the database, and finally present a list of the studies included.

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<sup>1</sup> All three reports published so far (Natural Capital and Climate Policy - Synergies and Conflicts [2015]; Ecosystem services in rural areas: Basis of human well-being and sustainable economic development [2016]; Ecosystem Services in the City - Protecting Health and Enhancing Quality of Life [2016]) are available under <http://www.naturkapital-teeb.de/en/publications/own-publications.html>.

## 2 Principles for inclusion and current study coverage

Studies are included either if they solely address forest benefits or address benefits from areas which are significantly shaped by forests. Geographically, the collection is restricted to study sites located in Austria, Germany or Switzerland. Accordingly, studies that were conducted in one of these three countries but address environmental values outside this area are excluded. Another restriction applies to the methodology used: the collection concentrates on studies that have a welfare theory foundation and relate to demand oriented measures of utility of public goods.

By October 2016, the bibliography contains 77 distinct 'data sets' (each represented by one row in the database) from 45 different 'studies', which are associated to 78 publications. The majority of data sets are from Germany (48), followed by Switzerland (17) and Austria (12). Regarding the valuation methods applied, it becomes apparent that stated preference methods dominate clearly: the most often used valuation method is contingent valuation (43 data sets), in another 15 data sets discrete choice experiments have been applied. Valuation methods relying on revealed preferences, e.g., visits to specific forests, have less often been used in the three countries; only 17 data sets were generated using the travel cost method. Further, only two benefit transfer studies focusing on forests in our target region are available.<sup>2</sup>

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<sup>2</sup> Benefit Transfer studies targeting at forest services at European or international level (like e.g. ZANDERSEN *et al.* 2007, ZANDERSEN & TOL 2009 or SIIKAMÄKI *et al.* 2015) are outside the focus of our database, if their valuation results include countries from the German language region only as a part of a greater region.



### 3 Structure of the database and annotations to the descriptors in the database

Generally, the basic unit of the database is any distinct 'data set' provided by a valuation study. Often studies embrace more than one sample because different regions are covered, or split samples are used to investigate methodological aspects. A study can thus comprise more than one data set.

The database itself is housed in an Excel-file<sup>3</sup> comprising seven sheets. The first sheet (*overview*) reports a numerical data set ID, author(s) and year of main publication as well as a short verbal study descriptor, study region, and the valuation method used for identification. The bottom of the list includes still ongoing studies that we became aware of (even though no detailed entries are possible for those studies. Once a report or publication is available, however, the study will be moved to the list of data sets and a study ID will be assigned).<sup>4</sup> The following four sheets of the database are labelled according to the respective valuation methods (*CVM*, *CE*, *TCM*, *BT*). As these methods are structurally different, each sheet has a different set of descriptors, especially when it comes to reporting design characteristics and estimation results. The sixth sheet of the database (*references*) contains the respective publications. A final sheet (*read.me*) sheet provides a suggested citation, informs about the last update of the database, and contains additional information about currency exchange rates at relevant dates.<sup>5</sup>

For each 'data set' a couple of descriptors (columns) is provided according to the respective valuation method. As Choice Experiments provide more output, for example a marginal willingness to pay estimate for each non-monetary attribute, more fields are needed to report all available outputs. Descriptors are sorted into the following groups: generic descriptors, associated publication(s), the valuation object, details of the statistical and economic methods applied, results of the valuation exercise and some other descriptors for study quality. In the following we briefly describe all descriptors used in the database. If not noted otherwise, the descriptors are similar for all valuation methods.

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<sup>3</sup> The database can be downloaded at <http://www.thuenen.de/>

<sup>4</sup> Readers who may want to report either completed or ongoing studies for recording in the database are very welcome to do so; please just send a message to the corresponding author.

<sup>5</sup> For practical reasons, we have also included some technical notes for the editors of the database at the bottom of this sheet (in German). Since these notes are not relevant for a user of the database, they are not explained here.

## 3.1 Database Descriptors (in order of appearance)

### 3.1.1 Overview sheet (generic descriptors)

- Data set ID: Unique numerical data set identifier
- Author(s): Name of study's author (followed by second author or ,et al.', if applicable)
- Year: Year of (main) publication
- Study descriptor: Short verbal study identifier (not identical with publication, since one publication may have addressed several different target populations and/or different goods, or it may have applied different methods)
- Country: Country in which the valuation object is located. Acronyms follow the ISO 3166-1 standard (Austria: AT; Germany: DE; Switzerland: CH)
- Valuation method: Abbreviation indicating the valuation method applied in the respective data set (BT= Benefit Transfer; CE= Choice Experiment; CVM= Contingent Valuation Method; TCM= Travel Cost Method)

### 3.1.2 Sheets CVM, CE, TCM

#### Generic descriptors

- ID, author(s), year, study descriptor, country, valuation method: As in overview sheet
- Study qualification: Research project, academic theses at undergraduate level (diploma) or at graduate level (PhD). Diploma theses typically are not thoroughly reviewed and are often not publicly available; PhD theses must be published and are reviewed by at least two senior researchers which normally must be university professors or people with a 'Habilitation' (venia legendi).
- Study funding: Studies are funded by various funding bodies such as foundations, ministries or other administrative bodies such as environmental protection agencies or even enterprises. As funding bodies might have their own interests in the studies finding, revealing the funding source increases transparency.

#### Publication descriptors

- Main publication ID: Identification number pointing to publication details of 'main publication' (in the references sheet). Since a data set may be analysed in several different publications, this is the publication which contains the most comprehensive description of the data set. This is sometimes grey or unpublished literature. Most entries in the database refer to the main source, but this may be supplemented by data from 'related publications'. In

cases where the main source was not available, the database entries are only based at 'related publications'. (Keep in mind that details may occasionally differ between sources).

- Related publications ID: Identification number pointing to publication details of other publications which relate to the same data set and contain additional information (e.g., methodological analyses about specific problems, summaries in another language), or are more easily available (e.g., journal articles rather than grey literature). These entries may be incomplete since it is not easy to trace every publication. Again, keep in mind that details may occasionally differ between sources.
- Publication type: Refers to main source
- Publication language: First entry refers to main source; if (related) publications exist in other language, this is noted as a second entry.
- Review: If any of the publications related to the data set have been formally reviewed (as a journal peer review or as a PhD review), this is noted here. Keep in mind that only some of the publications related to the data set may have been reviewed, others not. (A review typically encourages researchers to stick to some technical rules, but it is no guarantee for quality. Inversely, the lack of a review needs not necessarily indicate lower precision).

### **Valuation object descriptors**

- Land use form: This descriptor informs about whether the land use changes investigated only apply to forests to or mixed land uses. Particularly choice experiments can address, via separate attributes, various forms of land use in one survey.
- Service valued: A short label for the ecosystem service valued, as typically defined in the texts of publications.
- Object valued: A more concrete description of what has been valued in the study. This is mainly based on the description of the good in the respective questionnaire. If this description has been vague, you will find a vague entry here, too. (In some cases, 'service valued' and 'object valued' do not completely correspond. Keep in mind that here is some level of interpretation here. We might have interpreted the questionnaire differently from the authors of the original studies – and there might have been a third interpretation by the survey respondents).
- Scope: Local, regional (i.e. including several study sites, or addressing a larger area), or nationwide.
- Region: Localisation of the valued good or service

### **Statistical method descriptors**

- Primary/secondary: Primary studies are based on separately collected data, secondary studies on previously existing data. Some studies used a combination of primary and secondary data.
- Target population: Population which has been sampled

- Sampling type: This is not well described in many studies. For example, samples chosen by commercial survey institutes are often described as 'random' even if the institutes have applied some kind of systematic or quota sampling. Therefore, these entries are often rather imprecise.
- Data collection mode: Again, this is not always well described in the studies; on the other hand, the details of the sampling procedures actually applied may sometimes be too complicated to be aggregated in this database. Hence these are again rather rough indicators. It is highly recommended to consult the original studies on this.
- Gross sample size (sheets CVM, CE only): Total number of elements of the target population which have been attempted to include in the sample (i.e. before any sample losses, e.g. due to interview refusals), but except of sample neutral losses. Not reported in many cases.
- Net sample size (sheets CVM, CE only): Number of elements of the target population which are actually included in the sample (i.e. after sample losses e.g. due to interview refusals).
- Usable sample size (sheets CVM, CE only): Number of elements of the target population for which usable valuation data exist (i.e. after losses e.g. due to question specific refusals).
- Reported sample size (sheet TCM only): Number of elements included, as reported in the study. Since the distinction between gross, net, and usable sample size does not make sense for those TCM studies which used other means than surveys for data collection, we just include one sample size descriptor in the TCM sheet. For survey based TCM studies, this is usually the 'net sample size' as described above.
- Data collection dates: Year and month(s) of data collection.
- Survey method: Indicates which method or combination of methods was used for data collection.
- Comment on sampling procedure (sheet TCM only): Additional information about sampling details.

### Valuation method descriptors

- Valuation method: As in overview sheet
- Elicitation method: Stated preference methods: Dichotomous Choice (DC) is used as a generic term, including variants of this approach (e.g. double/triple bounded DC).

The term PC (Payment Card) approach is used with various meanings in the literature. Here it refers to a separate card supporting respondents in specifying their maximum WTP (most of the respective studies in Austria, Germany, Switzerland have applied a variant of a card with some graphical elements at the centre and bid proposals arranged around which has been developed and tested to avoid anchoring biases; see ELSASSER 1996:65ff.). Other lists of proposed bids which were part of the questionnaire are labelled 'choice between xy bids'. Additionally, it is indicated whether answers are analysed with DC techniques or as open-ended responses.

TCM sheet: It is indicated whether zonal or individual data have been analysed for constructing the demand curve (if the analysis is not based at demand curves, the unit of measurement is indicated).

- Welfare measure: Abbreviations: CS (Consumer Surplus); WTA (Willingness To Accept); WTP (Willingness To Pay; different Hicksian measures not distinguished); 'WTP to avoid' (WTP to avoid a proposed environmental change).
- Time costs (sheet TCM only): Indicates whether costs of travel and/or of on-site time were included in the study to incorporate opportunity costs of time.
- Payment vehicle (sheets CVM, CE only): Respondents stating a zero method by which the payment for the valued commodity would take place in the hypothetical market. For revealed preference methods, this does not apply (marked as '-').
- Zeros/protests (sheets CVM, CE only): Respondents stating a zero WTP either may have a genuine zero WTP or may have refused the valuation question. If a study has tried to distinguish these by additional questions (and accordingly, by different treatment in the analysis), this is labelled as 'distinguished'.
- Regression (sheets CVM, TCM only; for CE, see 'model for WTP' below): Indicates the type of regression used for the data analysis.
- Validity experiments (sheets CVM, CE only): Number of separate experiments to test for validity of results associated with the data set.
- Sensitivity analysis: Indicates whether different calculations were conducted in order to reveal influence of necessary assumptions, and which calculations.
- Reference method: Indicates whether results have been additionally complemented by an independent valuation method.
- Focus group (sheets CVM, CE only): A preceding group meeting, typically with 6 to 12 people, in order to understand peoples' thinking and perception of the environmental change under investigation, and to check and develop the questionnaire, e.g., comprehensibility of wording used. Many studies report only that focus groups have been conducted, without providing further details (e.g., the composition of the focus groups, duration of the discussion, or the like); other studies do not mention this issue at all. Hence we just indicate whether focus group meetings have been conducted or not (if a study does not report about focus groups, this is interpreted as 'no' focus group meeting).
- Pilot/Pre-Test (sheets CVM, CE only): A preceding small study in order to test whether questionnaire design works under field conditions.
- Questionnaire available (sheets CVM, CE only): Indicates whether the complete questionnaire is printed in a publication, available as an internet source, or otherwise publicly accessible.
- Valuation question disclosed (sheets CVM, CE only): Indicates whether the valuation question (as a part of the questionnaire) is disclosed literally. (This is relevant for studies which have not quoted their full questionnaire).

- Explanation of payment vehicle disclosed (sheet CE only): indicates whether additional explanations for the payment vehicle within a choice card, as given to the CE respondents, are disclosed in the publication.
- Method specific comments (sheet TCM only): Contains additional methodological information, e.g. about the treatment of multipurpose trips, assumptions about time costs, etc.
- Experimental design (sheet CE only): This entry refers to the process of preparing specific combinations of attributes and their levels that respondents will evaluate in the choice questions of a CE (cf. REED JOHNSON *et al.* 2013). This can be done in various ways. While at the beginning of the advance on choice experiments orthogonal fractional factorial designs have dominated, more and more researchers have moved to so called efficient designs acknowledging that orthogonal designs match to linear models while choice models are generally non-linear. Efficient designs are characterised by assumptions about the preferences (so called prior values, informing the design process, for example, that prices are generally expected to have a negative sign) in order to minimize the standard errors and thus increase the statistical efficiency. The priors could be incorporated as 'fixed' or as 'random', with the latter trying to account for uncertainties regarding the 'true' prior values.
- Price attribute range (sheet CE only): The minimum and maximum value of the price attribute.
- Number of price attribute levels (sheet CE only): The number of different price levels presented within a Choice Experiment.
- Number of non-price attributes (sheet CE only): Choice Experiments generally contain more than one attribute describing the changes in the provision of forest goods and services. This entry gives the number of this type of attributes in the study.
- Number of non-price attribute levels (sheet CE only): Since a CE may contain varying number of levels for different non-price attributes, the minimum and maximum number of attribute levels is given here.
- Number of alternatives (sheet CE only): Reports the number of alternatives on a choice set. (If status quo or other opt-out options are used in the choice set design, this option is included in the reported number of alternatives).
- Opt-out option included (sheet CE only): This entry informs about whether the choice sets comprise an opt-out alternative, for example by providing a status quo alternative that would leave everything as it is today, or whether people are forced to make a choice only among alternatives that would lead to environmental changes.
- Number of choice sets (sheet CE only): Reports the number of choice sets that have been presented to one respondent.
- number of observations in analysis (sheet CE only): Since a CE usually presents more than one choice set to each respondent, this is the product of the number of respondents, times the number of choice sets presented to each respondent, minus refusals or other sample losses.

**Results: Sheets CVM, TCM**

- Mean: This descriptor reports the average valuation result (e.g., WTP per person).
- Dispersion measure, dispersion value:
- CI: Confidence Intervals (95%, if not otherwise noted);
- CV: Coefficient of Variation (in % of the mean); SD: Standard Deviation of the mean.
- Aggregated result: Mean estimates aggregated to whole population (if aggregated to hectares, this is indicated).

**Results: Sheet CE**

- Model used for willingness to pay estimates: As willingness to pay estimates depend on the model used, this descriptor reports the model that was indicated in the paper as that one that was used for calculating the respective estimates (abbreviations: MNL= Multinomial Logit [also named CL= Conditional Logit]; MIXL= Mixed Logit; ECM= Error Components Model; GMNL= Generalized Multinomial Logit; LC= Latent Class logit model)
- Name of attribute 1, ..., n<sup>6</sup>: A short label for each attribute, corresponding to the respective descriptions in the Choice Experiment
- Mean marginal WTP for attribute 1, ..., n: Average WTP for the respective attribute
- Confidence interval for attribute 1, ..., n: 95 % confidence limits around the mean WTP for the respective attribute
- Aggregated result: In addition to the marginal WTP estimates per attribute level change, the results from choice experiments can also be used to calculate non-marginal welfare changes, i.e., a combination of changes of several attribute levels. Thus, this entry contains the aggregated WTP of a target population for a defined policy change which affects the supply of one or more attributes valued in the Choice Experiment, if such an aggregated result is presented in a study. The corresponding policy change will usually have been described under 'object valued'.

**Further information**

- Data availability: Indicates whether data are available for re-estimating models or using data for benefit transfer. This information, however, is often not reported by authors although more and more journals nowadays ask authors to provide data as well as model syntax used for estimation. Due to our experience this generally requires contacting the authors, which could be difficult especially if studies have been conducted long ago.

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<sup>6</sup> Since Choice Experiments typically value several attributes at the same time, results are listed consecutively for each attribute

- GIS data included: Indicates whether the individual data in the data set (e.g., the respondents' places of residence) are connected to GIS data ('yes'), or whether the data set contains information which makes an analysis by Geographical Information Systems possible ('possible'), or whether there is no such geographical information ('no'). Information about the resolution of these data is given in brackets (like e.g. postal codes, county of origin, or the like)
- Remarks: Other observations characterising the study which did not fit the preceding inventory scheme (necessarily more subjective in some cases)
- contributed by: Initials of the editor who has added a specific entry (for internal use)

### 3.1.3 Sheet BT

#### **Generic descriptors, publication descriptors, valuation object descriptors; further information**

As above (sheets CVM, CE, TCM). Note that these entries refer to the "policy site" (which is being valued in the respective benefit transfer study), not to the "study sites" of the original studies (which have supplied the data input for the benefit transfer).

#### **Valuation method descriptors**

- Transfer method: Indicates which approach has been used for transferring benefit estimates from a "study site" to a "policy site" (e.g., simple unadjusted mean transfers, adjusted mean transfers, function transfers, meta-analysis).
- Method specific comments: Provides further information regarding the transfer method used, information about possible transfer errors, and the IDs of the data sets used as an input (if included in this database).

### 3.1.4 References sheet

- Publication ID: Unique numerical identifier of the publication
- Related to data set(s): This entry contains the ID of the data set(s) which is described and analysed in the respective publication.
- Main publication: Indicates whether this is the main publication for the related data sets(s) or not (in ambiguous cases, i.e. if the source is the main publication for one data set but only a secondary one for another data set, this will be noted under 'remarks').
- Remarks: Further information relevant for the literature reference
- Publication details: Full bibliographical entry of reference



## 4 Bibliography of forest valuation studies

The table below lists the main references used to gain information about the data sets included in the database. The complete references are given in the reference list at the end of the paper. Additionally, information about the valuation object, the valuation method(s) used, and the geographical region plus country are given.

<b>main source / study</b>	<b>valuation object</b>	<b>method</b>	<b>region (country)</b>
Glück & Kuen 1977	recreation	TCM	Grosser Ahornboden (AT)
Schelbert et al. 1988	recreation	CVM, TCM	Zürich (CH)
Bergen & Löwenstein 1992	recreation	TCM	Südharz (DE)
Nielsen 1992	recreation, health	CVM, TCM	Lugano (CH)
Klein 1994	recreation	CVM	Ruhr District (DE)
Löwenstein 1994	recreation	CVM, TCM	Südharz (DE)
Schwatlo 1994	recreation	CVM	Mühlheim/Ruhr (DE)
Hackl & Pruckner 1995b	establishment of national park	CVM	Kalkalpen (AT)
Löwenstein 1995	avalanche protection	CVM	Allgäu (DE)
Luttmann & Schröder 1995	recreation	CVM, TCM	Lüneburger Heide (DE)
Schüssele 1995	recreation	CVM	Ziegenhagen (DE)
Uflacker 1995	recreation	CVM	Kaufunger Wald (DE)
Best <i>et al.</i> 1996	recreation	CVM	Thuringia (DE)
Elsasser 1996	recreation	CVM, TCM	Hamburg; Pfälzerwald (DE)
Kosz 1996a	recreation	CVM, TCM	Wienerwald (AT)
Schönbäck <i>et al.</i> 1997	recreation existence	CVM	Donauauen (AT)
Braune 1998	forest condition	CVM	Lübeck (DE)

Rommel 1998	biosphere reserve development	CVM	Schorfheide (DE)
Best <i>et al.</i> 1999	non wood services	CVM	Thüringen; Hessen (DE)
Franzen <i>et al.</i> 1999	recreation	CVM	Switzerland (CH)
Hanusch <i>et al.</i> 2000	integrity of alluvial forest	CVM	Donau (DE)
Elsasser 2001	recreation	BT	Germany (DE)
Küpker & Elsasser 2001	biodiversity	CVM	Germany (DE)
Bernasconi & Schroff 2003	recreation	CVM	Bern (CH)
Kleiber 2003/2006	recreation	CVM	Baselbiet (CH)
Meyerhoff & Liebe 2004/2006	biodiversity	CVM	Germany (DE)
Ott & Baur 2005	recreation	TCM	Switzerland (CH)
Bernath 2006	recreation	CVM, TCM	Zürich (CH)
Meyerhoff <i>et al.</i> 2006	biodiversity	CVM, CE	Lüneburger Heide; Solling/Harz (DE)
Küpker 2007	biodiversity	CVM	Germany; Schleswig-Holstein (DE)
Grêt-Regamey 2007	various ecosystem services	CVM	Davos (CH)
Rajmis 2008	risk reductions	CE	Hainich National Park (DE)
Elsasser <i>et al.</i> 2010	landscape beauty, recreation	CE	North Eastern Plain (DE)
Reibetanz 2010	non-market benefits	BT	Saxony (DE)
Bade <i>et al.</i> 2011	biodiversity	CE	Switzerland (CH)
Olschewski <i>et al.</i> 2011	avalanche protection	CE	Andermatt (CH)
Meyerhoff <i>et al.</i> 2012	national biodiversity strategy	CVM	Germany (DE)
Elsasser & Weller 2013	recreation	CVM	Germany (DE)
Mayer 2013	existence of national park	CVM, TCM	Bavarian Forest (DE)

Wüpper 2013/2016	recreation	CE	Jasmund National Park (DE)
Von Grünigen <i>et al.</i> 2014	recreation	TCM	Switzerland (CH)
Ryffel <i>et al.</i> 2014	reforestation for flood protection	CE	Kleine Emme water catchment (CH)
Lienhoop & Brouwer 2015	farmers' preferences for afforestation schemes	CE	Saxony (DE)
Getzner <i>et al.</i> 2016	various ecosystem services	CVM, TCM	Austria (AT)
Horbat <i>et al.</i> 2016	nature oriented floodplain development	CE	Hohe Garbe/Elbe (DE)
Völker & Lienhoop 2016	forest ecosystem services	CE	Western Saxony (DE)

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