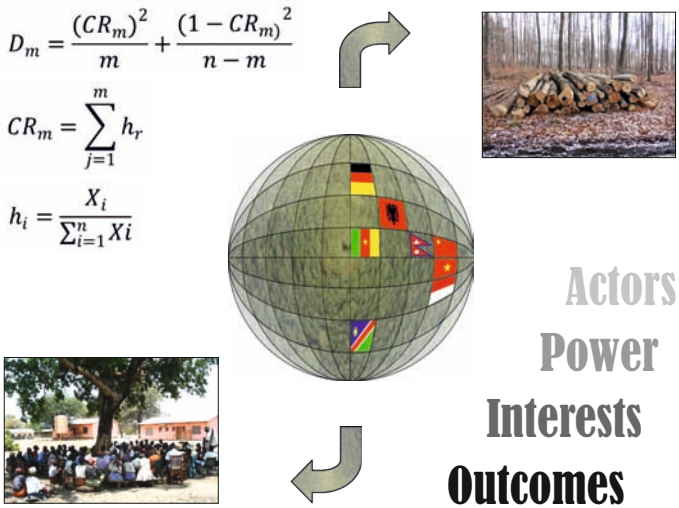
Carsten Schusser

Comparative Analysis of Community Forestry

Theoretical and Methodological Requirements



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der Fakultät für Forstwissenschaften und Waldökologie

der Georg-August-Universität Göttingen

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Carsten Schusser

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This research is part of the comparative research on **"Actors, Interests and Power as Driver of Community Forestry"** conducted by the Community Forestry Working Group. Some parts therefore have been prepared in the context of team work.

Supervision: Prof. Dr. Max Krott
Coordination: Carsten Schusser

Community Forestry Country Studies:

1. Nepal: Rosan R. Devkota
2. Indonesia: Ahmad Maryudi
3. Namibia: Carsten Schusser
4. Cameroon: Mbolo C. Yufanyi Movuh
5. Albania: Manjolla Salla
6. Germany: Carsten Schusser
7. Vietnam: Duy Bach Ngo
8. China: Haiyun Y. Chen and Ting Zhu

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Summary

Recently published books, special issues of internationally recognized scientific journals and published scientific papers highlight the importance of community forestry (CF) worldwide. In addition, there is a strong initiative within the scientific community to gain empirical results from comparative community forestry research studies. Several comparable studies have been conducted or are still in progress, but so far none of these studies has been able to deliver general scientific findings valid for the entirety of the community forestry concept. This framework study will contribute to the scientific discourse and will delve into the question of what requirements need to be fulfilled to achieve successful comparisons of community forestry examples around the world. For these purposes, the framework study will focus on the following key factors:

1. Theoretical requirements for comparative community forestry research
2. Requirements on the methods for comparative community forestry research
3. Research results about community forestry

The basis of this framework study comprises six scientific publications. Each publication approaches at least one issue that addresses the research question. The publications involved are listed below:

- Krott et al. (2012 under review). "Driving Forces in Community Forestry – A Framework for Assessing Actor-Centered Power in a Decentralized Mode of Forest Governance". This article proposes an actor-centred power theory that is observable in the field.
- Maryudi et al. (2012). "Back to basics: Considerations in evaluating the outcomes of community forestry", suggests a theoretical approach on how to analyse the outcomes of community forestry.
- Schusser et al. (2013). "The Applicability of the German Community Forestry Model to Developing Countries". This article exhibits an approach used to operationalize the outcome definition presented in Maryudi et al. (2012). It applies the method to investigate selected community forests in Germany according to their outcomes.

- Schusser et al. (2012). "Sequence Design of Quantitative and Qualitative Surveys for Increasing Efficiency in Forest Policy Research". This presents a method for conducting empirical comparative research. It discusses an approach that involves a quantitative study, a qualitative study and triangulation of the results from both. The method is designed in a way that makes research more resource-efficient and therefore useful for a large comparison of cases in different countries. The strong point of this method is that it allows one to determine the group of powerful actors.
- Schusser (2012a). "Who Determines Biodiversity? An Analysis of Actors' Power and Interests in Community Forestry in Namibia", introduces a theoretical definition do determine to powerful actor's interests on the outcomes of community forestry and empirical results. The research applies the hypothesis developed by the community forestry working group to investigate community forests in Namibia. The article focuses only on the ecological outcome of community forestry.
- Schusser (2012b). "Community Forestry: a Namibian Case Study", presents all the research results from the Namibian case study. It applies the working group's hypothesis, theory and method and addresses the hypothesis with the study's results.

Based upon the attached publications, the author of this study presents a common research hypothesis: "Outcomes of community forestry depend mostly on the interests of powerful actors". The results presented demonstrate the importance of a well-defined research hypothesis. Only because of its existence was the research team able to develop the theoretical and methodological approach that was needed to obtain the necessary results to test the hypothesis. The general scientific notions about the influence of powerful actors in CF support this study's findings. Therefore the study concludes that a well-defined research hypothesis is the basic requirement for successful comparative empirical research on CF. Only with a common research hypothesis can a theoretical and methodological approach be designed to obtain comparable data from community forestry studies in different countries.

The actor-centred power theory is defined as a social relationship between actors. Here, one actor can alter another actor's behaviour without recognizing his will. The actor-centred power theory differentiates between three elements: coercion, (dis-)incentives and dominant information when building

up power. The discussion introduced, on the different possibilities for analysing power in forest policy, as well as the results shown here demonstrate the importance of a well-defined theory. It is needed to develop a method that can obtain results with which to prove or disprove the research hypothesis.

The outcomes of community forestry are based on the core policy objectives of the international community forestry concept. They are summarized as: empowered direct forest users (social outcome), improved livelihood of the direct forest users (economical outcome) and improved forest conditions (ecological outcome). The results shown here and the scientific discussion demonstrate that the theoretical outcome approach is applicable and they help to achieve the results that are needed to test the hypothesis. The Namibian results enforce the conclusion drawn from the German community forestry results, i.e. the theoretical outcome approach is a requisite for testing the research hypothesis.

To analyse the powerful actors' interests in the community forestry outcomes, an interrelation analysis introduces a theory-based indicator. The indicator measures the degree to which the powerful actors' interests can be related to the community forestry outcomes. Based on the actual community forestry outcomes, a test can be conducted to determine whether the interest of the powerful actor corresponds with the outcome. The results presented highlight that the interrelation analysis with its indicator constitute an approach with which the general interests of an actor can be related to a specific CF outcome. It helps produce the kind of results needed to test the hypothesis. Therefore, the interrelation analysis and the indicator can be seen as theoretical requirements for a successful country case study as well as for a comparison of community forestry examples worldwide.

Based on the attached publications, this study has presented and discussed a research hypothesis for comparative community forestry research, an actor-centred power theory, a theoretical community forestry outcomes concept and an interrelation analysis to relate the general actors' interests to the community forestry outcomes. The framework study also presented and discussed a sequence design as a method to identify powerful actors in community forestry.

The results of the community forestry country studies demonstrated that the common research hypothesis, the actor-centred power theory, the interrelation analysis of the actors' interests and the sequence design method were all applicable and useful to test the hypothesis. Since the country studies have used a common theoretical and methodological research approach the results are comparable.

The framework study provides a scientific tool for the comparison of community forestry worldwide by showing that, to be successful, such a comparison requires common research hypotheses and approaches, both theoretical as well as methodological.

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Abbreviations

BMZ	Federal Ministry for Economic Cooperation and Development
CF	Community Forestry
DED	German Development Service
GIZ	German Organisation for International Development Cooperation
IFRI	International Forestry Research Institution
KfW	German Development Bank
NNF	Namibian Nature Foundation
PIDO	Powerful Interest Desired Outcome
REED	Reducing Emissions from Deforestation and Forest Degradation

1 Introduction and Research Background

Recently published books, special issues of internationally recognized scientific journals and published scientific papers highlight the importance of community forestry (CF) (Ojha et al. 2013, Arts et al. 2012, Broekhoven et al. 2012, Coleman & Fleischman 2012, Cashore & Stone, 2012, Poteete & Ribot 2011, Andersson & Agrawal 2011, Barsimantov et al. 2011, van Laerhoven 2010, Schreckenberg et al. 2009, Wollenberg et al. 2007, Flint et al. 2008, Charnley & Poe 2007, Ribot & Agrawal 2006, Silva 2004, Shackleton et al. 2002). All of the publications cited above address CF from a comparative perspective. The books and the special issue (Ojha et al. 2013, Arts et al. 2012, Broekhoven et al. 2012, Schreckenberg et al. 2009) do not analyse CF from a comparatative scientific perspective. Instead, they present an overview of particular, country-specific results.

Schreckenberg and Lutrell (2009) use a methodology that involves a combination of quantitative and qualitative tools to analyse the CF outcomes. However, they do not describe their procedures in detail. Coleman and Fleischman (2012) use interviews to assess forest conditions. They use a ranking system to determine the effect of CF on the forest, which allows them to obtain quantitative data. Andersson and Agrawal (2011) apply a similar approach to that of Coleman and Fleischman (2012) in order to obtain quantitative data. Van Learhoven (2010: 542) applies a “combination of quantitative research methods and forest inventories”. In this way, he analyses changes in forest conditions to obtain quantitative data. Finally, Oyono, Biyong, and Sambar (2012: 176) state that “The process of data collection was supported by following methods and techniques: local context analysis and quantitative research. However, none of these researchers has emphasised the importance of being able to draw general conclusions regarding CF. They contribute to the scientific discourse only with partial findings.

None of the publications mentioned presents alternatives on the possible nature of shared frameworks or further research. In a search of the literature spanning 15 years, Poteete and Ostrom (2008) found 480 articles related to common resource management. While investigating forest governance practice, Arts and Visseren-Hamakers (2012) conducted a search in 2012 in which CF figured as one of the new approaches and which produced about

430.000 hits. This is indicative of a vast wealth of knowledge, even if it is not always scientifically-based. Nevertheless, this knowledge can be of great importance, given the possibility to analyse it scientifically. However, this remains a huge challenge, and the reliability and validity of the date might remain questionable.

Elinor Ostrom is known as of the first to have tackled this problem. She started a database and filled it with empirically-comparable data from various research tackling common-pool resource problems. In her book “Governing the Commons”, first published in 1990 she uses this set of data to explain the conditions under which common-pool resource problems have been solved successfully or unsuccessfully. In contrast to Hardin’s “The tragedy of the commons” (1968) she argues that the problems might be better solved through the voluntary organization rather than through coercion by the state. She is able to draw her conclusions only because her empirical findings were based on a large database.

Researching later, Poteete and Ostrom (2008) discuss the problems involved in building a large-N database. Their designation of a "large-N database" applies to a database which contains observations from many countries. The letter N stands for the number of observations needed to gain statistically reliable findings. As mentioned earlier, in this study they analyse 480 articles and conclude that: “[…] less than one-third analysed a sufficiently large number of observations to count as large-N studies.” (p. 180). Furthermore, they add (p. 177) that: “Cross-national research is expensive and rare, whatever the unit of analysis, number of observations, or methodological approach.” They also raise the following question (p. 177): “Can methodological and practical challenges to comparative research on a broader scale be overcome through collaboration?”

In an earlier article Poteete and Ostrom (2004) had already addressed the issue of how to conduct comparative research. On page 215 they begin the introduction with the following sentences: *“Efforts to resolve scientific puzzles through empirical research confront two major obstacles. First, the key factors expected to affect outcomes of interest are often inconsistently conceptualised and measured. Inconsistent terminology and measurements may obscure consistent patterns or suggest patterns where none exist. Second, the scarcity*

of comparable data makes it impossible to evaluate the relative importance of many of the variables identified in the literature in influencing outcomes of interest. Case studies are extremely important, but case-study authors tend to identify different variables to study, and making the findings from case studies comparable is extremely difficult." Further, on page 217, they state that: "*Contribution of empirical research to study of collective action will be limited unless the challenge of conceptual consistency and data comparability can be overcome."* They offer an approach to overcome these problems with the International Forestry Research Institution (IFRI) a network of scientists who can accumulate a large number of cases. According to the authors (p. 217): "*To archive consistency of concepts and empirical measurements, IFRI researchers developed a common set of data collection instruments and common methods of data collection*" For this research network the "user group" is the unit of research since they assume that collective action is the action of the affected users.

This research does not challenge this approach, it follows it. The difference is that the user group's ability to carry out collective action, in particular community based forest management, is seen as an outcome of CF. Nevertheless, as Poteete and Ostrom (2004) point out, overcoming the inconsistencies that appear when trying to compare different types of research remains a huge challenge. This framework study presents a way to conduct comparative empirical CF research. The theories and methods presented here are designed to be scientifically effective in terms of reliability and validity and at the same time they are resource-efficient and simple to apply to CF field research. The study is based on the major obstacles for comparable empirical research. It will contribute to the discourse by investigating the following main research question:

What is needed for a successful comparison of community forestry around the world?

Based on this research question the framework study will focus on the following key factors:

1. **Theoretical requirements for comparative community forestry research**
2. **Requirements on the methods for comparative community forestry research**
3. **Research results about community forestry**

The following chapters will present the theories and methods used in the attached publications. It will discuss the results obtained and will highlight the contribution toward answering the framework study research question. The following articles form the backbone of this framework study:

The article “Driving Forces in Community Forestry – A Framework for Assessing Actor-Centered Power in a Decentralized Mode of Forest Governance” by Krott et al. (2012 under review) presents a theory on how to analyse power. It proposes an actor-centred power theory that is observable in the field. The author of the present study was part of the team that developed the approach. He contributed to the definition of the power elements of coercion and information. In particular, he introduced the hypothesis that disincentives as an element of power only work in conjunction with the power element of coercion. He is not the first author of this article although he was involved in the writing.

The article “Back to basics: Considerations in evaluating the outcomes of community forestry” by Maryudi et al. (2012) presents a theoretical approach on how to analyse the outcomes of community forestry. The author of this framework study was part of the team who developed the approach but is not the first author of the article.

The article “The Applicability of the German Community Forestry Model to Developing Countries” by Schusser et al. (2013) further operationalizes the outcome method presented in Maryudi et al. (2012). It applies the method to investigate selected community forests in Germany according to their outcomes. The first author of this article made the greatest contribution to the writing, the operationalization of the outcome method and the analysis and discussion of the case study results.

The article “Sequence Design of Quantitative and Qualitative Surveys for Increasing Efficiency in Forest Policy Research” by Schusser et al. (2012) presents a method on how to conduct empirical comparative research. It discusses an approach that involves a quantitative study, a qualitative study and triangulation of the results of both studies. The method is designed in a way to make research more resource-efficient and therefore useful for a large comparison of cases in different countries. The strong point of this method is that it allows one to determine the group of powerful actors. Schusser developed the quantitative design and found scientific way of triangulating the quantitative and qualitative results. He is the first author of the article.

The article “Who Determines Biodiversity? An Analysis of Actors’ Power and Interests in Community Forestry in Namibia” by Schusser (2012a) used the hypothesis developed by the community forestry working group to investigate community forests in Namibia. The article focuses only on the ecological outcome of community forestry. It introduces a theoretical approach (PIDO-Powerful Interest Desired Outcome) on how to analyse the interest of an actor and how to correlate this interest to the suspected outcomes of community forestry. The author of this article is its sole author.

The article “Community Forestry: a Namibian Case Study” by Schusser (2012b) presents all the research results from the Namibian case study. It applies the working group’s hypothesis, theory and method and tests the hypothesis based on the study’s results. The author of this article is its sole author.

The following table highlights the major contributions of the articles mentioned above to this framework study:

Table 1 Overview of publications and their contributions to this study

Number	Publication	Theory	Methodology	Results
1	Krott, M., Bader, A., Devkota, R., Schusser, C., Maryudi, A., Giessen, L., Aurenhammer, H. (2012). Driving Forces in Community Forestry – A Framework for Assessing Actor-Centered Power in a Decentralized Mode of Forest Governance. *Forest Policy and Economics,* under review.	X		
2	Maryudi, A., Devkota, R. R., Schusser, C., Yufanyi, C., Rotchanaphatharawit, R., Salla, M., Aurenhammer, H., Krott, M. (2012). Back to basics: Considerations in evaluating the outcomes of community forestry. *Forest Policy an Economics, Vol. 14 (1)*, pp. 1-5.	X		
3	Schusser, C., Krott, M., Logmani, J. (2013). The Applicability of the German Community Forestry Model to Developing Countries. *Forstarchiv, Vol 84*, pp. 24-29.	X		X
4	Schusser, C. (2012). Who Determines Biodiversity? An Analysis of Actors' Power and Interests in Community Forestry in Namibia, *Forest Policy and Economics*, doi:10.1016/j.forpol.2012.06.005.	X		x
5	Schusser, C., Krott, M., Devkota, R., Maryudi, A., Salla, M., Yufanyi Movuh, M., C. (2012). Sequence Design of Quantitative and Qualitative Surveys for Increasing Efficiency in Forest Policy Research. *AFJZ, Vol. 183(3/4),* pp. 75-83.		X	
6	Schusser, C. (2012). Community Forestry: a Namibian Case Study. In: G. Broekhoven, H. Savenije, S. von Scheliha (eds.). *Moving Forward With Forest Governance*. Trobenbos International. Wageningen, pp. 213-221.			x

2 Theoretical Framework

2.1 Comparative Hypothesis for Community Forestry Research

To overcome the inconsistencies in empirical comparative research, a common research hypothesis is needed. It helps to focus the research efforts and contributes to a theoretically-founded and applicable methodology that will produce comparable data (Jahn 2006). The research hypothesis can be deducted from existing theories. It creates a frame under which the research will be conducted and at the same time it helps to reflect whether the appropriate methodology achieves results helpful to proving or disproving the hypothesis (Przeworski and Teune 1982). This framework study applies the hypothesis developed by the community forestry working group of the Georg-August University Goettingen in Germany. It is based on existing theories presented in an article by Schusser (2012a). "*The key hypothesis that the outcomes of community forestry depend on strong external actors is considered to be relevant for community forestry all over the world. The empirical test will use a comparative approach. The design follows the idea of the most different system design (Przeworski & Teune 1982: 31)". The hypothesis is first tested within the parent group of one specific political system and then the test is done within an enlarged parent group of different countries representing a higher variability of political factors. The results will show in how many cases/countries the key hypothesis applies.*" (Krott 2007: 7) In addition, the community forestry working group developed the following theory-based definitions to test the hypothesis:

1. Theory-based definition about actors' power.
2. Theory-based definition about the actors' interest in the outcome of community forestry.
3. Theory-based definition about the outcomes of community forestry.

The three main definitions were investigated and the hypothesis was tested on selected case studies in Nepal, Indonesia, Namibia and Germany. The results of the Namibian- and German case studies are part of this framework study. The hypothesis created the frame under which the theory and methodology development had taken place. It was a necessary step to gain comparable data. A scientifically well-formulated research hypothesis can therefore be seen as indispensable for a successful comparison of community forestry worldwide.

2.2 Actor- Centred Power

The article Krott et al (2012 under review) discusses the possibilities that an actor might have, theoretically, to wield power. It relates power to an actor and examines which possibilities an actor might have to influence another. The following abstract from the article summarizes well the aim of the paper (Krott et al. 2012: 1). It is presented here again for the purpose of gaining some insight into the theory that will be needed for the following discussion:

"Hence, this article aims at developing an analytical, theory-based and empirically applicable framework for assessing an actors' power using community forestry as an illustrative case. Actor-centered power analysis aims to provide a scientific answer to the question of who are the politically most powerful actors in community forestry practices. In making use of suitable components of power theories it builds strongly upon the social relations of actors, organizational aspects and power sources, as described by Weber, Dahl, Etzioni and their adherents. Actor-centered power is defined as a social relationship in which actor A alters the behavior of actor B without recognizing B`s will. In our framework we distinguish between three core elements: coercion, (dis-)incentives and dominant information. These make up the basis for observable facts which involve not only physical actions but also threats by power elements and the very sources of said power elements. Theoretical considerations show that despite the focus being on actors, by looking to their power sources, a considerable part of structural power can be more tangible at least in part, like rules, discourse or ideologies. Furthermore, the paper shows how the actor-centered power concept distinguishes power from other influences on forest management and contributes to the identification of the group of powerful actors on an empirical basis. Due to the focus on actors and well-defined and observable elements of power, the actor-centered power concept could serve not only as a basis for research but also for quick assessment of power networks, delivering valuable preliminary information for designing land use policy in practice." (Krott et al. 2012: 1)

The definition of power is not new. According to Ritzer (1991) power is defined in many ways in practical understanding as well as in social science. The article presents this fact very well and it discusses briefly the different theories examined. It builds upon Max Weber's (1864-1920) definition of power, which

emphasises the likelihood that an actor will be able to carry out his will, despite resistance, within a social relationship (Weber 1922). The article argues that if power is regarded as being actor centred it becomes observable. The article also follows Etzioni's definition partly and argues on page 6 "This concept meets our aims of differentiating power and of making it readily observable."

Other studies, like Schiffer's (2004), who researched the effects of communal-based natural resource management on local governance in Namibia, followed Weber's approach as well. She argues that (p. 2) "The analysis of power means the analysis of those aspects of social interactions that are *structured by power*." Therefore she proposes two ways for the analysis. One is to ask for "the input", and the other for "the output" of power (Schiffer 2004: 3). With "the input" she addresses the questions "where does power come from?" and "what are the factors leading to an accumulation of power […]" and with "the output" she seeks to answer "what are the effects of power?", and "what can actors do with 'power' that they could not without?" (Schiffer 2004: 3). This proposal is similar to an actor-centred power approach. The actor-centred power approach searches for the actors possibilities for wielding power (power sources), which in Schiffer's approach refers to the input of power. In addition, the actor-centred power also observes and searches for the effects of which refers more to the outputs of power. The difference between the two approaches is that Schiffer (2004) has chosen only the output-orientated way of analysing power. This enables her to explain well phenomena that have actually occurred, but it makes it very difficult to explain power processes in general.

A different study about collective action in a transitional economy applies a similar concept for power analysis (Theesfeld 2004). However, the author cites Koschnik (1993: 789) with his power definition: "…, power is the ability to determine the behaviour of others in accord with one's own wishes". The article adds (Theesfeld 2004: 254): "*Transformation requires a high degree of knowledge, not only because of the simultaneous processes occurring at all levels, but is decentralized and used by certain actors […]*". This statement supports the actor-centred power theory that information makes up a big source of power. The author bases his research on the importance of controlling information and uses it as an indicator for power abuse. Since the

concept stops at this level it is not very useful to explain other issues having to do with power.

Arts and van Tatenhove (2005) propose a conceptual framework to analyse power in policy research. The concept proposed by Arts and van Tatenhove is well designed and tries to cover all aspects of power. For example, they examine (p. 350) relational-, dispositional-, and structural power. This concept is designed promote the understanding of all power processes makes it difficult to understand what particular form of power an actor might use. This is because power is seen not only as a possibility for an actor, but rather, it is the conjunction of the actor's surroundings, i.e., the system, hierarchy, position and so on, which enables an actor to wield power. This is missing in the actor-centred power concept but it is not needed to test the hypothesis that powerful actors influence CF outcomes based on their interests. Actor-centred power only helps to identify a power source that an actor might have, which can be seen as one of the main differences between both concepts.

Additionally, van Gossum et al. (2011) followed the power concept discussed in Arts and Tatenhove (2004) to analyse sustainable management in Flanders. They conducted an evaluation of the government's capacities in this regard and suggest the following dimensions as indicators for the evaluation: discourse, rules, actors and power (van Gossum et al. 2011: 112). In contrast to the actor-centred power concept, they see trust as an actor characteristic which might help to wield power, but not as a form of power in itself. What is interesting is that they do not analyse the power dimension because of the complexity of their method. They only suggest, on page 120, that this "can be seen as a tool for future research."

Torniainen et al. (2006) use a completely different approach to analyse power balances. As the term "balance" implies, their research analyses power as relation between federal authorities, the private forest industries and regional authorities (page 405). The concept seems to be appropriate for their study aim but it is inapplicable to research analysing an actor's possibilities for wielding power.

Pérez-Cirera and Lovett (2006) also analyse power distributions amongst local user groups. The authors do not really explain their power concept. They only state that power is highly disputed but that its analysis is a necessity. They also

propose an applicable method for power analysis. Pérez-Cirera and Lovett (2006: 343) see "*power as the elements possessed by an individual, e. g., personal attributes, resources, means, and so on, that, according to the context, are assumed to allow that individual to influence the course of action of events and /or alter the behaviour of other agents*". Their understanding of power is also an actor-centred understanding but apart from the resources, means (which could refer to incentives and coercion) they add personal attributes of the actor as one form of power. For example, a personal attribute for their study is the literacy of the user. This might play an important role amongst different users, but it is not an effective attribute for analysing other actors who are assumed to be educated up to a certain standard. This understanding of power is fit to analyse power amongst local users, but it is difficult apply to actors outside the community level.

Another different approach to power is: "the Foucauldian concept that has been the most influential to forest policy analysis, discourse, knowledge, and power…" (Winkel 2012: 81). According to Vainio and Paloniemi (2012: 2), *"Definitions of power are highly diverse within social sciences (e.g., Avelino and Rotmans 2009). They can be characterized as ranging from those that define power as an actor's ability to influence others even against resistance (e.g., Fiske and Dépret, 1996; French and Raven, 1959; Turner, 1991, 2005) to those that define power as a structural phenomenon where actors are vehicles of power but do not possess it (Foucault, 1980). According to the first viewpoint, power is defined as the potential to influence, and influence flows only in one direction, from those who have power to those who do not. Consequently, this view cannot explain how social change takes place or how those who have no power can resist power being wielded over them. For Foucault (1980, 1994), instead, power is not a form of possession that some actors have whereas other do not, but an effect of discourse that takes place whenever there is communication. In addition, power is relational: power is seen as a relationship between stakeholders, not as residing in stakeholders' positions themselves. For Foucault, resistance is also an exercise of power: those who are the targets of authorities have the power to resist authorities. The power of discourse creates and destroys, as well as constructs, rationalities; discourse determines how we perceive reality (Foucault, 1970). For Foucault, power and knowledge are closely related: those in a powerful position have the authority to determine*

which social constructs of reality become "truths." As discourse provides meaning to social and physical events, discourse both enables and limits thinking at the same time (Joutsenvirta, 2009)." Vainio and Paloniemi, (2012) explain well the differences between the actor-centred power approach and the "Foucauldian" concept. The "Foucauldian" power concept is rich in providing ideas as to what power could be, but it is missing a clear definition. Even if the actor-centred power concept does not cover all aspects of power it defines what power is and examines well the possibilities for power that an actor has. This makes power observable and can be used effectively to test the research hypothesis.

Another article (Gautam 2006) includes the term power in its headline. But it discusses power only as a policy instrument. According to Krott (2005), instruments can influence social and economic actions and could be therefore related to power. But through an analysis of policy instruments alone certain actors' possibilities might be left out. The actor-centred power concept recognises policy instruments as a source for power if it is observable.

The above discussion on the different possibilities for power analysis in forest policy demonstrates the importance of a well-defined theory. Only if the theory is consistent in itself can it gain acceptance by others. This is needed if the research wants to contribute to the scientific discourse. However, one also needs to develop a method that can gain results to test, prove or disprove the research hypothesis. Especially for comparative research, an accepted theory helps to convince other researchers to use the same method to obtain compatible empirical findings. Considering this, the theory presented in Krott et al. (2012 under review) can be seen as a theoretical requirement to conduct comparative research on CF.

2.3 Outcomes of Community Forestry

"*Evaluations of community forestry outcomes are important to observe whether the community forestry programme produces what it has promised. For the evaluation -as an alternative to the comprehensive criteria and indicators on sustainable community forestry-, we propose an approach based on the core policy objectives of the program."* (Maryudi et al 2012: 1)

Schusser et al. (2012: 24) state "[…] the core policy objectives of the international community forestry concept can be summarized as follows:"

1. Empowered direct forest user (**social outcome**)
2. Improved livelihood of the direct forest user (**economical outcome**)
3. Improved forest conditions (**ecological outcome**)

The theoretical development of the outcomes is well described in the article by Maryudi et al. (2012). In Schusser et al. (2013) the author build upon the concept introduced in Maryudi et al. (2012) and specify the outcomes in more detail. The following table, presented in Schusser et al. (2013) summarizes the theory-based definition used to analyse CF outcomes. The outcome analysis relies on expert judgments, own observations and document analysis.

Table 2 Outcomes/core objectives of CF with definition and the key facts

Outcome	Definition (core objective)	Key facts
Social Outcome:	**Empowerment of direct forest users**	-Access to forest related information -Access to decision making -Access to forest land and resources
Low	No empowerment	No access to information, decision making and/or forest land and resources
Middle	Some empowerment	Limited access to information, decision making and forest land and resources
High	Full empowerment	Maximum access to information, decision making and forest land and resources
Economical Outcome:	**Contribution to the livelihood of direct forest users**[1]	-Forest products -Monetary benefits -Community development
Low	No contribution to livelihood	No access to forest products, no monetary benefits and no community development
Middle	Contribution up to subsistence[2] level	Access to community development which was financed through community forestry and financial benefits and/or products providing subsistence
High	Contribution above subsistence	Access to community development which was financed through community forestry and/or financial benefits and/or products supplied above subsistence level
Ecological outcome:	**Contribution to forest condition**	-Forest growth -Biodiversity
Low	No contribution to forest stands and biodiversity	Observation of decrease in stands and forest area, No management activities
Middle	Contribution to sustained forest stands	Observation in increase of stands or forest area, Forest Management plans, Control of implementation
High	Contribution to sustained stands and biodiversity	In addition to sustained forest stands monitoring and increase of biodiversity

Source: Schusser et al. (2013: 26)

[1] Illegal or legal

[2] Subsistence: earnings too low to allow the possibility of savings

According to Maryudi et al. (2012: 2): *"As has been mentioned in the earlier section, community forestry is very much connected to the following three objectives of: 1) alleviating the poverty of direct forest users, 2) empowering them, and 3) improving the condition of the forests (among others see Wiersum, 1984; Bhattacharya and Basnyat, 2003; Charnley and Poe, 2007; Karmacharya et al., 2008). From this perspective, we do not necessarily discount the importance of other indicators on sustainability. We instead give more emphasis to assessing what community forestry policy has promised, that is, the three policy objectives. Therefore, the rest of the section will analyse the objectives, explaining why they were underlined in community forestry policy formulation, and their key elements of our evaluation approach."*

As for the social outcome, this research investigates the individual forest user's empowerment, which is crucial for a successful CF management. As Theesfeld (2004) states, knowledge about processes is needed for transformation. This necessary knowledge is seen as information related to the resource in this concept. Only if the direct forest user has the full information about the forest can he make independent decisions with regard to management. The participation in decision-making regarding management is also an important outcome for the empowerment of the local user. But what good is the participation in decision-making if he is not allowed to enter the forest or to use its products? This is the reason why access to the forest and its products was incorporated as an indicator for measuring the empowerment of the forest user.

The economic benefits are described on the basis of what every individual forest user gets. They are measured as the contribution to the individual forest user's livelihood. As is presented in the table, this can be either direct (money or products) or indirect, through community development activities achieved through CF, if the direct forest user has access to these. The theoretical outcome definition does not investigate the legal basis for the contributions. That is, they can be legal, but also illegal if CF supports this kind of use. "The degree to which the economical outcome contributes to livelihood improvement is compared with the standard of living of the direct forest user. This means that if the economic contribution allows for a subsistence-level standard of living only, we rate the economic outcome as middle. If the contribution is greater, the outcome becomes high. A small contribution

compared to the standard of living will be rated as low […]" (Schusser et al. 2013: 26).

The ecological outcome is measured with two indicators (forest growth and biodiversity). Forest growth refers to the sustainable management of the forest and to an increase of the existing forest stock. Here, the biodiversity indicator measures the CF contribution to an overall biodiversity improvement. Similar suggestions were made by Poteete and Ostrom (2004): "[…] a major interest in questions of biodiversity and forest sustainability […]"
Summing up, it can be said that the existing publications offer indicators that are similar to this approach. But most of these publications are missing a theory-based detailed explanation to identify the outcomes of CF. To achieve comparable data the outcome definition was constructed based on existing theories. The most recently published theories will be discussed, according to their identification of CF outcomes, as follows.

Charnley and Poe (2007: 324) report that "*[…]community forestry shares common goals of improving ecological conditions in forests and encouraging ecologically sustainable forest use practises; increasing social and economic benefits from forests to local communities; increasing forest communities' access to and control over nearby forests."* The theory-based outcome definition presented in this framework study follows the suggestions by Charnley and Poe (2007) in part. Instead of goals, it defines measurable outcomes that are somewhat similar, like the ecological benefits. In contrast to the outcome definition presented here, Charnley and Poe's (2007) economic and social benefits are seen as only as one category: as the contribution to the livelihood of the individual user. And the "access to and control over nearby forests" is defined here as a social outcome for every individual user.

A number of other authors also used similar approaches. The special issue edited by Schreckenberg and McDermott (2009) about CF insights covers some publications where the authors mention, at least in part, variables which that are well covered by the outcome classification concept discussed here. For example: the article by McDermott and Schreckenberg (2009) states, on page 162, that "Community forestry must target the poor […]" who, in this study, are generally referred to as the forest user. Furthermore, they state that if the poor have access to the "[…] decision-spaces", this "enables them to gain a bigger

share of the benefits of community forestry" (p. 162). On the next page they mention "access to land and forest products" and "economic development" as needed outcomes for successful CF.

The article, from Danks (2009) mentions similar outcomes which the programme should achieve, on page 175, which are "largely environmental, largely economic, and largely social". On page 187 he then presents an overview with examples. Apparently, for him social benefits are such which affect the social relationships between the forest users, and a kind of moral benefit, i.e. conflict resolution, skills and knowledge. This aspect is not directly covered by the outcome concept presented first in Maryudi et al. (2012). Skills and knowledge are recognised indirectly, that is, if skills and knowledge contribute to the forest user's livelihood improvement. The conflict resolution can be seen as a kind of community development when it is offered to all users.

Diop and Fraser (2009: 192-193) refer to "political benefits", "social benefits" and "ecological benefits". The political benefits are seen, as the programme on CF supports "African American forest land owners" (p. 192) in capacity building, which enables them to participate in processes like "[…] shaping outreach program at the state level." The social and ecological benefits are seen similarly.

Schreckenberg and Lutrell (2009) see outcomes as benefits and have analysed economical capital ("[…] direct from forest products and indirect benefits from related income generation activities.", p. 225), natural capital ("[…] improvements of the conditions of their forests […]", p. 227), physical capital ("[…] community infrastructure […]", p. 227) human capital ("[…] health benefits resulting from PFM (participatory forest management) […)". p. 228), social and political capital ("[…] change in community-level governance and social cohesion.", p. 228), and the "contribution of PFM to overall livelihood compared with a none PFM situation" (p. 229). There are similar variables, like an empowerment or livelihood contribution, but some variables are seen differently. For example: the income-generating activities and community development are direct benefits for the purpose of an outcome definition (Maryudi et al 2012). Nevertheless Schreckenberg and Luterell (2009) present an approach that is similar. Their way of analysing the outcomes is wider,

whereas, in comparison, the outcome definition presented here narrows it to only three categories.

Lawrence et al. (2009, p. 288) see the outcomes of CF as follows: "*Community forests provide a similar range of economic and social benefits to those delivered by forestry elsewhere in Scotland. These benefits include opportunities for employment, volunteering, recreation, learning, activities promoting physical and mental health and well-being, and landscape improvements*." It is interesting that their outcomes are no different from those in forests with no community forestry. This aspect differentiates them from the concept of outcome discussed here, since the benefits to which they refer can be enjoyed by any forest user.

Pandit et al. (2011) analyses the impacts of CF on selected cases in Nepal. Their research uses "*[...] two environmental impact related concepts. (1) Forest product supply trend and (2) change in local environmental conditions.*" (p. 348). The change in supply trend and environmental conditions is not researched using the outcome concept presented by Schusser et al. (2013). However, they see the possibility of the forest user to access forest products as a benefit, and they investigate the forest condition in the presence of CF.

Interviews are used by Coleman and Fleischman (2012) to measure the forest conditions as an outcome. Andersson and Agrawal (2011) take a path similar to the ecological outcome approach presented above. For them, forest biomass and biological diversity are seen as indicators for an ecological outcome of CF.

Van Learhoven (2010: 542) analysed the forest conditions and the income situation of the local forest user. This is similar to the method presented in Table 2.

Ribot and Larson (2012: 238) refer to the following as outcomes: "*substantial economic and other livelihood benefits, such as increased income, greater human and social capital, natural resource conservation, decreased vulnerability, greater equity, democratisation of power and empowerment."* Again, some of the outcomes presented are similar to the ones in Table 2.

Shackleton, Wollenberg and Edmunds (2002) compare CF in 11 countries but only highlight „types of benefits observed across sites"(page. 2). They separate them in direct benefits and indirect benefits. Some of their examples, i.e.,

empowerment, infrastructure development access to products are covered well in the outcome method presented by Maryudi et al. (2012) and by Schusser et al. (2013) but most of them are too different to compare them directly.

In general, all of research examined used a theoretical concept to analyse the benefits/outcomes of CF. There is a considerable number of similarities, even if the outcomes are often seen from different perspectives. Most of the concepts presented here touch upon one or more of the theoretically-defined outcomes but are not that conceptual specific like the approach presented in Table 2.

2.4 Interrelation Analysis PIDO (Powerful Interest Desired Outcome)

In the article by Schusser (2012, a) the author tests the hypothesis that "outcomes in community forestry depend on the interests of powerful actors" on 14 selected CF case studies in Namibia. In this article he only investigates the hypothesis on the ecological outcome, especially on the issue of biodiversity. Therefore he applies the actor-centred power theory and uses the sequence design method. In addition, he investigates the interests of the powerful actors who were identified using the sequence design. The interest analysis applies the definition by Krott (2005) which is cited in and explained in the article: “He states that interests cannot be observed directly, but according to this definition they can be determined through observations of a given actor's behaviour.”(Schusser 2012a: 4). Due to the fact that an actor will not always behave in direct consideration of an outcome, the results of such an analysis might be varied (see Table 5, page 5 in Schusser 2012a for it). Therefore, a theoretical approach for interrelating the real interest of the powerful actor to the assumed outcome of CF was needed. The solution was found with the development of an indicator (PIDO: Powerful Interest Desired Outcome).

According to Schusser (2012b) the indicator shows the degree to which the powerful actors' interests can be related to the CF outcomes. Based on the actual CF outcomes, a test can be conducted to determine whether the interest of the powerful actor corresponds to the outcome. The following scenarios are possible and are presented below: (adopted from Schusser 2012a)

- **PIDO (+1):** the powerful actor has an interest in a high outcome for the individual forest user
- **PIDO (1):** the powerful actor has an interest in a middle outcome for the individual forest user
- **PIDO (–1):** the powerful actor has an interest in a low outcome for the individual forest user
- **PIDO (0):** the powerful actor has no interest in a specific outcome

The method is needed to test the hypothesis. If a significant correlation between the powerful actor’s interest in the outcome (PIDO) and the achieved outcome can be tested, the hypothesis will be proven.

Marfo and Schanz (2009) define interests on (p. 621) as: *"Rather than imputing interests, on whatever theoretical basis, the approach favoured here is aligned to perspectives, which seek to demonstrate how networks of interest are actually constituted and reproduced through conscious strategies and unwitting practices constructed by the actors themselves.*" They base the term interest on the actors' perception and apparently they analyse it through observation of an actor's behaviour within the network. This is similar to the approach used in Schusser (2012a) but restricts itself to a description of their interest analysis.

Janse (2007) researches sector communications in the EU with regard to the forest sector. This author also explains his results by implicating actors and their interests. In part the article deals with actor interests which appear to be deduced from the literature. . However, on page 745 he states that *"the actors also mostly act in concern, e.g. they cooperate on shared policy statements and communication problems"*. Since he discusses actor's interests in this paragraph it could be assumed that he applies a similar interest definition, like how the actors "act" – behaves to deduce the actor's interest. One can at least conclude that this way of analysing actors' interests is similar to the approach used in the present study.

McDermott at al. (2012: 65) analyses "[…] how different actor and interests are currently influencing its (REED+) design…" Their methodology is somehow relatable to the actor, interest analysis they describe, on page 65: "*Specifically, this article develops and applies three comparative typologies to assess the operationalization of REDD+: (1) an organizational typology (comparing the balance of actors, scale of focus and enforcement or verification mechanisms of REDD+ organizations); (2) a substantive typology (comparing the content of safeguards); and (3) a conceptual typology (comparing the conceptual paradigms behind different approaches to REDD+). This allows us to then consider how the interaction of actors, interests and ideas in different organizations may be influencing the content of safeguards.*" From this statement we might conclude that these authors also deduce what interests are at play by analysing how actors behave.

In the Boyd et al. (2008) article on political processes related to forest governance, the authors explain some of their findings by taking actors' interests into consideration. Although the article does not describe directly the

way in which the authors analysed actor interests, it does imply that these were determined through a process analysis method. This method consisted of observing actors and interpreting their behaviour to ascertain their interests, an approach similar to the one used in the present study.

Lebel et al. (2005) and Silva (2004) incorporated actor interests in their research. Both articles deduce what actor interests are from existing publications and from common understanding and theories of actor interests, e.g. "…states first appeal to wider interests as…" (Lebel et al. 2005: 1) or "the political structure determined the relevant actors, their interests and their power sources." (Silva 2004: 16). This method is different from the approach presented by Schusser et al. (2012).

Aside from pure actor interest analysis, no other research could be found which went further and related the actual interest of an actor to a certain outcome or benefit. This is why the PIDO approach cannot be compared with publications related to forest policy research. Nevertheless, it is a method that enables this research to correlate the actor interests to a specific CF outcome. In this way, the PIDO helps to test the research hypothesis and can therefore be seen as a theoretical requirement for comparing CF research according to one hypothesis.

3 Methodological Framework

3.1 Sequence Design of Quantitative and Qualitative Surveys

The article by Schusser et al. (2012) presents a method for combining quantitative with qualitative results to generate empirically comparable data. The aim was to design a method that is resource efficient but which at the same time produces reliable and valid data for comparative research.

“A sound empirical basis is of high importance for applied research in forest policy despite empirical methods increasing the resources needed for research. Especially in developing countries, the extensive needs of field research might exceed the available resources. A sequence consisting of a quantitative preliminary survey – qualitative study – quantitative follow up study is recommended in the literature as an efficient methodological strategy. This paper investigates how to diminish resources by means of the sequence design and discusses how to keep a high research quality using the example of comparative power analysis in community forestry. The sequence design is applied in seven studies in as many countries, of which are two have been already completed successfully (Nepal, published by Devkota, 2010 and Java-Indonesia, published by Maryudi, 2011). The preliminary quantitative survey is used to identify the group of most powerful actors for each community forest. The measurement validity, meaning the degree of agreement of measurement and theory, is kept high by simplifying the hypothesis down to the claim that a group of powerful actors exists. The reliability of the survey is strengthened by using, for each actor, the external estimate of his power by the other actors in the network. Nevertheless, the reliability is relatively low due to the use of standardized questions only, but it is sufficient to indicate who the actors of the powerful actors group are. The follow-up qualitative power survey ascertains the power resources of the strong actors that have been identified as such. It applies a complex hypothesis about actor-centred power that involves the three power elements of coercion, incentives and trust. Reliability is high due to such multiple empirical resources as are observations, interviews and documents. The data of the qualitative survey is used to improve the quantitative data of the preliminary survey. Finally, a comparative quantitative analysis of the power of actors in community forestry for all researched countries is conducted using the improved data. This analysis tests complex

hypotheses that involve the power of different actors. The actors are differentiated using theoretically meaningful terms from which we can derive hypotheses for the empirical tests. In particular, the theories about bureaucratic politics and interest groups can deliver hypotheses about the power relations of these actors, which are then particularly suitable for the quantitative test. The results show that the sequence survey can reduce the resources needed by about half. Nevertheless, the validity can be kept up by formulating hypotheses of different complexity and sufficient reliability can be ensured by improving the data step by step by means of the follow-up survey." (Schusser et al. 2012: 82)

"Conducting the intended intensive empirical observations in the field requires a vast amount of resources which go beyond the capacity of many projects. The amount of resources required is especially high for international comparative projects. For example, while designing a comparative analysis of community forestry we realized that the fieldwork in seven countries would last 126 months (seven times 18 months, as shown in Table 1 and calculated in detail in chapter 2). In order to reduce this we resorted to a sequence design found in the literature which appeared to be a promising strategy for increasing empirical method efficiency. Mcvilly (2008) gives an overview of mixed methods design and mentions a specific sequence design for (1) a quantitative preliminary survey – (2) a qualitative survey and (3) a quantitative follow-up study […], which focuses the observations on preselected subjects in order to save resources during the field work." (Schusser et al 2012: 75)

Table 3 Comparison of time resources needed for sequence of surveys and single survey.

Method	**Number of countries/ cases and Nr. of days to conduct research**	**Total number of months**
Single survey:		**126 months (100%)**
• Qualitative survey	7 Countries, 12 cases each 45 days	126 months
Sequence of surveys:		**51 months (40%)**
• Preliminary survey	7 Countries/12 cases, each 7 days	20 months
• Qualitative analysis	7 Countries/12 cases, each 10 days	28 months
• Comparative quantitative	7 Countries/12 cases, each1 day	3 months

Sorce: Schusser et al. (2012: 75)

One strong point of this method is that it makes it possible to determine the group of powerful actors, as described in Schusser et al. 2012: 78-79): “Having standardized estimates for each actor, the task remains of determining the group of most powerful actors. We were looking for a measurement sensitive to the specific distribution of power among the actors. If all actors are weak but two are relatively stronger these two should comprise the group of the most powerful. On the other hand, actors should not become part of the group of the most powerful, even if they are strong, if there are some other actors with a similar power level. The dominance degree [...] is a suitably sensitive measurement to differentiate the relational habit of power in a network."

The dominance degree can be calculated in the following way[3]:

- n Total number of actors identified
- X_i Sum of answers per actor and for one power element, $0 > X_i \geq (n-1) *$ $highest\ possible\ answer\ for\ \ the\ corresponding\ Likert\ scale\ (1\ or\ 3)$, $for\ i = 1, \dots, n\ , \sum_{i=1}^{n} X_i = \ Total\ given\ answers\ per\ power\ element$
- h_i is the ratio of power per actor and per power element (i), with $0 > h_i \geq 1\ \ and\ for\ i = 1, \dots, n\ and\ \sum_{i=1}^{n} h_i = 1 = Total\ power\ per\ power\ element$
- r is the position of the sorted ratio of power per actor (h_i), the sorting starts with the highest h_i value until the lowest, equal values can be sorted continually anyway, $for\ r = 1, \dots, n$
- m number of powerful actors considered
- CR_m concentration ratio showing the distribution of the power per actor (e.g., CR2 = 0.4 means that the first two actors hold 40% of the total available power per power element in the network)
- D_m Dominance Degree (Herfindahl-Dominance Degree or Deeffaa-Degree), with m = group of powerful actors and n –m group of less powerful actors

$$h_i = \frac{X_i}{\sum_{i=1}^{n} Xi} \qquad CR_m = \sum_{j=1}^{m} h_r$$

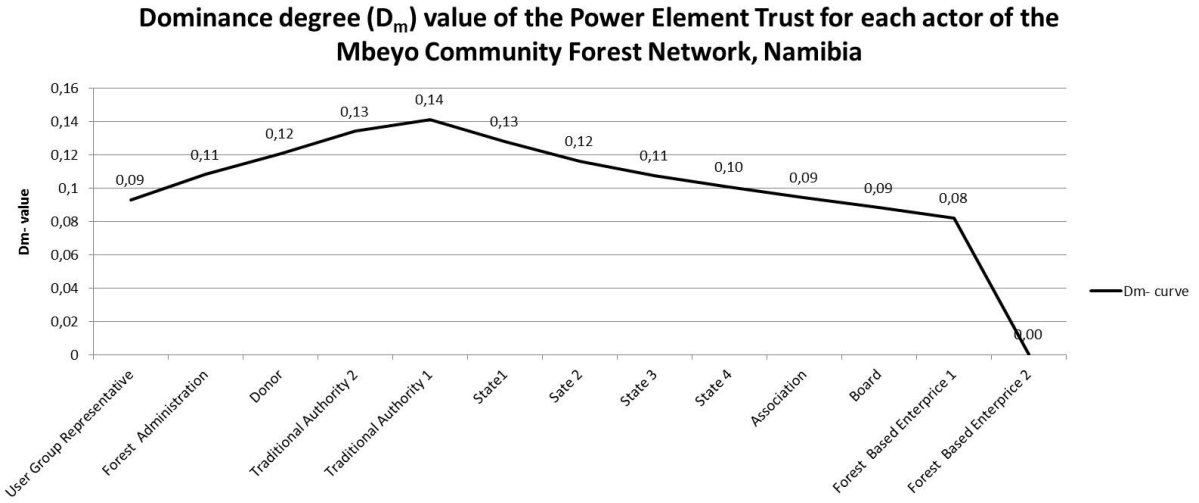
$$D_m = \frac{(CR_m)^2}{m} + \frac{(1 - CR_{m)}{}^2}{n - m}$$

The point of separation between the group of powerful actors and less powerful actors can be found at the maximum of the dominance degree values (highest D_m value). At this point the D_m value for the last member of the group of powerful actors is still higher than the D_m value of the first member of the group of less powerful actors. . This is the point where the power mean value (D_m) for the assumed group of powerful actors plus the power mean value of

[3] Adopted from Duller, C. and Kepler, J. (2005, pp. 348-351)

the assumed group of less powerful actors is higher than in the following assumed actor- power constellation.

Figure 1 : Dominance degree (D_m) value distribution of the power element of trust for all actors of the Mbeyo Community Forest Network, Namibia.



Source: Schusser et al. 2012: 79

Based on the dominance degree, the group of most powerful actors is identified. Table 3 (in Schusser et all. 2012: 79) shows the group to which an actor belongs, for each power element (Trust, Incentives and Coercion) for the quantitative- and qualitative sequence as well as for the triangulated result. The result of the preliminary network survey (QT data in Table 3) is found using the rule which states that each actor who is part of the most powerful group with regard to at least one power element is considered to be part of the group of the most powerful actors."

Poteete and Ostrom (2008: 176) claim to support the combination of qualitative and quantitative methods to build on the strengths of each. They add that few data at the sub-national level exist because such fieldwork is relatively expensive. As mentioned earlier, they argue that to overcome the challenge of conceptual consistency, a common method with a set of streamlined variables needs to be designed (Poteete & Ostrom 2004: 217). As described previously, their approach sees the local resource user as the unit of research, whereas in the present study local user's possibility of involvement in decision-making is a result of CF.

Poteete and Ostrom's (2004) approach contributed to the design of this method. For example, as they explain on page 219, "[...] data are collected by researchers who are closely familiar with local languages, customs, and ways of organizing." The same approach is used in the sequence design since it is a way of saving resources while at the same time improving the quality of the research.

Schreckenberg and Lutrell (2009) use a methodology involving a combination of quantitative and qualitative tools to analyse the CF outcomes, but they do not describe their procedures. They refer to an unpublished document that could not be found. But the article highlights that they used a combination of quantitative and qualitative tools that is similar to the sequence design.

Coleman and Fleischman (2012) use interviews to ascertain forest conditions. They use a ranking to determine the effect of CF on the forest. This allows them to obtain quantitative data. There is a similarity to sequence design in that the latter uses interviews in the first sequence to gain quantitative results.

Andersson and Agrawal (2011) apply a similar approach as do Coleman and Fleischman (2012) to gain quantitative data, which supports the sequence design approach.

Van Learhoven (2010: 542) applied a "combination of quantitative research methods and forest inventories". With these he analyses the change in forest conditions to obtain quantitative data. A similar way was used to examine the power status of the involved actors with the sequence design.

And Oyono, Biyong, and Sambar (2012: 176) state that "*The process of data collection was supported by following methods and techniques: [...] local context analysis for the capture of various characteristics of each area, qualitative research, with structured and open ended interviews through key informants, in order to gather data on relevant topics such as [...] forest conditions, etc.: quantitative research based on market surveys, household surveys, and ecological surveys, and mapping exercises […]*". This quote shows that, even if the methodological approach is different, some similarities exist. In particular, some of the variables used for their analysis of CF outcomes are similar. Their way of processing data is similar to the qualitative follow-up study of the sequence design scheme.

All the publications above apply their methods to investigate CF outcomes. No other CF-related publication could be found that analysed the actors involved using a specific method. Especially, the combination of a quantitative and a qualitative study in a strict defined sequence seems to be a new approach. In addition, the sequence design provides the possibility of ascertaining the group of assumed powerful actors. “The resources needed to conduct this sequence are small. There are only about 10 standardized questions that can be ticked quickly by the actors asked. Due to the size of the network, of approximately 15 actors on average, the survey for one community forest is done within one week. Of course, the empirical indicators are not sufficient for a power analysis, but they are a good starting point for a follow-up survey which would go deeper by focussing on the powerful actors only” (Schusser et al 2012: 80)

All investigated publications used a method, therefore one can conclude that a well-designed method is a methodological requirement for to conduct empirical research. The sequence design provides a method especially developed for comparative empirical research. It specifies the use of a quantitative study followed by a qualitative study, in that sequence. In addition, the method clarifies which sequence should be seen as dominant for the triangulation.

4 Research results

4.1 Research Results for CF in Germany

According to Schusser et al. (2013: 26) “Eleven community forests were analysed in the study. The following chapter will present and discuss the results of the outcome analysis. Due to the rich empirical findings it is not possible to present all results in detail. Therefore we have summarized the results and provide representative examples for better understanding.” The case selection followed the principle of best practise. That means that only community forest which were seen as achieving the maximum outcomes were consider as case studies. The selection of the cases relied on the expert knowledge from the forest administration. Based on these the development status (initial or advanced) and the production potential (high and low) of the community forest were used as additional selection criteria.

The following table presents the summarized results of the outcome analysis according to their frequency of appearance:

Table 4 Summarized results of the outcome analysis according to the frequency of their appearance for all researched cases.

Number of cases per outcome*	Outcome social	Outcome economical	Outcome ecological
Low outcome	1 (9%)	2 (18%)	0
Middle outcome	10 (91%)	9 (82%)	11 (100%)
High outcome	0	0	0

*In comparison to all 11 researched cases

Source: Schusser et al. (2013: 27)

4.1.1 Ecological outcome CF Germany

“The results presented in Table 4 clearly show that the German community forestry concept contributes towards a positive ecological outcome. All researched cases, according to their ecological outcome, were classified as belonging to the middle category, which means that they are managed in a sustainable way and, consequently, that the ability of the forest to provide products and services is strengthened.” Schusser et al. 2012: 8 manuscript)

4.1.2 Social Outcome CF Germany

Schusser et al 2013, on page 17 states: “Apart from one case, all the researched community forests host a general assembly every year. Every 4 to 6 years the direct forest users have the possibility of selecting their management committee. During general assemblies they can vote, according to their shares, on common decisions, e.g, whether the committee wants to buy new land. Apart from that the direct forest user has legal recourse to influence the direction of management through majority decisions which, in reality, are difficult to achieve. He has very limited access to forest products and maybe he is not allowed to obtain other products other than firewood, like poles or trunks, free of charge. Access to the forest, e.g., for recreational purposes, is a common right for every citizen in Germany and is therefore not seen as an outcome of community forestry.” He gos on and describes the influence of the Management Committee as well as the forest administration. In the end he concludes on page 27: “Following these arguments the study concludes that the direct forest user is only partly empowered, as determined for most of the cases” (see Table 4).

4.1.3 Economical Outcome CF Germany

Given the partial empowerment, the economical outcomes were evaluated as belonging to the middle category in most cases. Only in two cases was the pay-out close to zero, which is why these cases were assigned to the low category.

Schusser et al. (2013: 28) concludes: “Burckhardt (1876) already mentioned that to avoid divestiture of the forest and with this its destruction, the community forests should be managed by forest experts and the ability of the owners to split the forest up into small pieces should be removed. He adds that the community forests are brought into the sphere of influence of the Forest Administration and that “nobody thinks about “(1876: 75) removing the laws which have been created for this.”

“Following this statement the results of the study show that the community forest concept cannot deliver on its goals of meaningful participation and high profits for all users. But the approach contributes towards sustainably managed forests. The findings are in line with the scientific discourse about community forestry as it is presented in the introduction.” (Schusser et al. 2013: 28)

4.2 Research Results for CF Namibia

Is it possible to go into the field with this framework studies approach? The following research, presented by Schusser (2012b, 2012a), investigates the role of powerful actors in community forestry in Namibia, to determine whether forests are managed sustainably, whether local people are empowered and whether the livelihood of the forest user is improved. The research tested the hypothesis that "Outcomes in community forestry depend on the interests of powerful actors ". Therefore the research applies the actor centred power theory, the sequence design, the interest analysis method, the outcome analysis method as well as the PIDO interrelation analysis. The findings are based on research results from 14 case studies on community forests in Namibia. The case selection followed the principle of best practise. That means that only community forest which were seen as achieving the maximum outcomes were consider as case studies. The selection of the cases relied on the expert knowledge from the forest administration. Based on these the development status (initial or advanced) and the production potential (high and low) of the community forest were used as additional selection criteria. The results will be presented and discussed in the following sub chapters.

4.2.1 Powerful Actors CF Namibia

With this study's approach it was possible to identify the powerful actors of selected CF cases in Namibia. The actors are mentioned in the article by name but are presented here according to the community forestry working group's actor classification model as follows: Eight actor classes were identified as being powerful actors in most of all researched cases. The power status of the actors was proven by using the actor-centred power theory and the sequence design. Out of these, 3 powerful actors were evaluated as being powerful in all cases (the forest administration, the donor and the traditional authority). As Schusser (2012a: 8) states "The results are not surprising if one considers that the forest administration and the donor are the establishment actors and the traditional authority is the first actor to decide whether a CF project is allowed to be carried out in his or her region. Apart from that, they have been determined to be strong in trust and incentives (forest administration and donor) as well as in coercion (forest administration, traditional authority)". Nevertheless, these results are scientifically reliable and valid. The research results support similar findings made by Jones & Mosimane (2000) and Schiffer

(2004), which conducted research on community based natural resource management in Namibia, and identified actors comparable to those in this study. For example, both identified the central government, which will be classified as public administration, the traditional authority, NGOs referring to support associations, donors, and the user group representatives."

4.2.2 Ecological Outcome CF Namibia

The research analysed the ecological outcome for 10 out of 14 best practice cases as middle. This means that 10 community forests are managed in a sustainable way. According to Schusser (2012a: 6) "The ecological outcome was determined to be low only for four community forests [...] [the] N≠a-Jqna, Muduva-Nyangana and Georg Mukoya community forests belong to conservancies but the CF approach was still at an initial stage: activities regarding the ecological outcome were planned but not yet carried out. The Kampinga-Kamwalye community forests and conservancy were planned to be established as one concept from the beginning, but due to some unsolved land use disputes every activity was put on hold." The results of this research were observed in a variety of similar studies elsewhere (Brendler& Carey 1998, Chakraborty 2001, Dietz et al. 2003, Thomas 2006, Charnley & Poe 2007, Adhikari et al. 2007, Singh 2008, Wollenberg et al. 2008, Devkota 2010, Vodouhe et al.2010, Maryudi 2011, Pandit et al. 2011).

4.2.3 Economical Outcome CF Namibia

According to Schusser (2012b), the economic outcomes, for 10 of the researched community forest were analysed as belonging to the middle category. This means that the forest users had some access to forest products, sometimes they had some financial benefits and / or that they had access to community development which was financed from CF. Only the four community forests mentioned above, which were still in an initial stage during the research, have not achieved economic outcomes for the forest users so far. That CF should contribute to development and livelihood development is an agreed and much-discussed goal. Several other studies concluded with similar results (Shackleton et al. 2002, Shackleton et al. 2007, Flint et al. 2008, Charnley & Poe 2007, McDermott & Schreckenberg 2009, Maharjan et al. 2009, Danks 2009, Lawrence et al. 2009, McDermott 2009, Vyamana 2009, Pandit et al. 2011, Andersson & Agrawal 2011, Maryudi A. et al. 2012, Maryudi & Krott

2012). However, benefits for the direct user might not be always positive. Especially if they are distributed unfairly, this may increase inequity between the forest users (McDermott & Schreckenber 2009, Maharjan et al. 2009, Danks 2009, Lawrence et al. 2009, McDermott 2009, Vyamana 2009, Pandit et al 2011). This aspect is not researched within the study.

4.2.4 Social Outcome CF Namibia

Schusser (2012b) reports that the social outcome was analysed as middle for 12 out of the 14 community forests researched. This means that the forest user had limited access to information, decision making and forest land and resources. Many researchers around the world report similar findings (Brendler & Carey 1998, Chakraborty 2001, Dietz et al. 2003, Thomas 2006, Charnley & Poe 2007, Adhikari et al. 2007, Singh 2008, Wollenberg et al. 2008, Devkota 2010, Vodouhe et al. 2010, Maryudi 2011, Pandit et al. 2011). Neverless, they indicate that it is not the forest user who decides on CF matters entirely. In addition, other researchers point out that decentralisation policies in practise are seldom followed by genuine power devolution to the local natural resource user (Ribot 2004, Ribot 2009, Larson 2005, Blaikie 2006, Dahal & Capistrano 2006).

4.2.5 Interrelation Analysis PIDO CF Namibia

Schusser (2012a: 7) summarized the interrelation analysis results (PIDO) for the ecological outcome as follows: “One of the results of the interest analysis is that the German Development Service (donor) and the Namibian Nature Foundation (support association) desire improved and sustainably-managed natural resources. This is why the corresponding indicator (PIDO) was assigned a +1 (powerful actor has an interest in a high ecological outcome). In the case of the Directorate of Forestry (forest administration), its interest in biodiversity was not visible directly. No clear concern for biodiversity could be found. Nevertheless, one of the Directorate’s interests is the control over these forest resources. They designed rules and regulations that demand a sustainable forest management. Even if no evidence could be found for a true concern about it, this aspect should not be forgotten. Furthermore, no intent could be found to indicate that the Directorate wanted to transform these forests into forest plantations. This is why we concluded that the Directorate of Forestry needs to have at least some interest in the community forest if they do not

want to lose control over the community forest areas. Based on this, we assigned the interrelated interest a value of 1, which means that the Directorate has an interest in a middle ecological outcome. For the other powerful actors no correlation between their interests and the ecological outcome could be found and this is why they were assigned the PIDO value of 0, as is summarized in the following table." Table adopted from Schusser (2012: 220) and Schusser (2012a: 7)

Table 5 Summary of correlated interests concerning CF outcomes for all powerful actors

Powerful actor	**PIDO Social**	**PIDO Economical**	**PIDO Ecological**
Forest Administration	-1	1	1
Donor	+1	1	+1
Traditional Authority 1	-1	1	0
Forest User Group Representative	-1	1	0
Other User Group Representative	-1	1	0
Traditional Authority 2	0	1	0
Public Administration	0	1	0
Support Association	+1	1	+1

PIDO (Powerful Interest Desired Outcome)
• PIDO (+1): the powerful actor has an interest in a high outcome for the individual forest user
• PIDO (1): the powerful actor has an interest in a middle outcome for the individual forest user
• PIDO (−1): the powerful actor has an interest in a low outcome for the individual forest user
• PIDO (0): the powerful actor has no interest in a specific outcome

Source: adopted from Schusser (2012b: 220) and Schusser (2012a: 7)

Since no similar research was found the results of this study cannot be discussed within a given scientific context. Only general assumptions can be drawn. For example NGOs (support associations) are seen as the drivers for natural conservation if they belong to the respective field, e.g., Namibian Nature Foundation as mentioned in Jones & Mosimane (2000). Therefore, one could assume they have an interest in a high ecological outcome. Similarly, Shackleton et al. (2002: 4) mentions donors were funding "development and facilitation of devolution". This could be interpreted as a high interest in being successful. In turn, this would indicate that a donor has an interest in a high social outcome. These kinds of assumptions would support our findings. However, since this conclusion is reached by using the interrelation analysis

PIDO, these findings cannot be seen as independent. Therefore they will not be useful to discuss the PIDO results that are presented in Table 5.

The results presented underscore that the PIDO interrelation analysis is an approach with which to find relationships between the general interests of an actor on a specific CF outcome. It helped to produce the results needed for the hypothesis test. Therefore the PIDO interrelation analysis can be seen as a theoretical requirement for a successful country case study as well as for a comparison of community forestry world-wide.

4.2.6 Hypothesis Test CF Namibia

The results presented by Schusser (2012 a and b) have validated "the hypothesis that outcomes in community forestry depend mostly on the interests of powerful actors, since most of the outcomes can be related to an interest of such an actor. The study analysed the elements of power these actors have; the results show that they use their power to push through their interests. Who the most powerful actor is cannot be answered but it is clear that it is not the forest user." (Schusser (2012b: 220)

"Following the results (presented in Schusser, 2012a) one might question the significance of the direct forest user. Given that he influences the natural resources directly, one might ask whether he is the one who determines biodiversity. The author cannot address this matter in depth in this article, but he has incorporated the matter into his research as a whole. At this point the author would refer to Pröpper (2009: 351), who carried out extensive anthropological research about culture and biodiversity in one of these research areas: "*The protection of their resource base is not a high priority for local land users because they are insufficiently aware of its limits and the fact that they will be the first victims of deforestation.*" Pröpper (2009: 347) adds that "*The issue of interaction between culture and the environment remains extremely fuzzy, multi-facetted and complex, however.*" Considering these two notions and the fact, shown above, that humans have influenced the natural forests in Namibia for a long time, we seriously doubt that local land users act with the improvement of biodiversity in mind. This would imply changing their cultural behaviour within only 10 years. The author will not say that nobody has understood the importance of biodiversity conservation and that CF cannot contribute to this. At this point the article can only conclude that the local

people which are in the Management Committees have not shown an interest towards it." (Schusser 2012: 8)

The quote about the role of the direct forest user brings the discussion back to the research approach presented by Poteete and Ostrom (2004 and 2008) as well to as an article published by Wollenberg et al. (2007). They see the local resource users as the unit that carries out collective action. Following that, the local resource user is the key for the success of a program like CF. Since the program emphasises that as a crucial point, this approach is not questioned by this research. It only has researched the question of who drives CF at this present stage. The results clearly indicate that, so far, the forest user is not the one who determines this. However, the results indicate that certain actors have taken the chance to improve their positions. This is clearly visible by looking at the results in respect of the forest administration. CF in Namibia has helped the forest administration to increase the governmental control over the forest resources through the involvement of the forest user (devolution of power). Ribot & Agrawal (2006) report similar findings in their article "Recentralizing While Decentralizing: How National Governments Reappropriate Forest Resources". Apart from this, results in general support the general scientific notion that actors other than the local natural resource user are the ones who decide how CF is to work in practice. For example, Maryudi (2011) analysed community forests in Java, Indonesia and concluded that local forest users were not benefitting significantly, neither in empowerment nor in livelihood improvements. Devkota (2010), has presented similar findings, and according to Edmunds and Wollenberg (2001: 192), it is likely that the poorest forest user has become worse-off than before. Shackleton et al. (2002: 1) conclude: "The way in which local people realize the benefits of devolution differs widely, and negative trade-offs, mostly felt by the poor, are common." In addition, Wollenberg et al. (2008) conclude that neither the co-management nor the local government model have met the high expectations of the community forest program. A number of researchers (Ribot 2004, Ribot 2009, Larson 2005, Blaikie 2006, Dahal & Capistrano 2006) have analysed the common practice and have shown that decentralization policy is seldom followed by genuine power devolution to the local users. Edmunds & Wollenberg (2001) report similar findings, i.e. those local institutions are vulnerable to external powerful actors and that these powerful actors are more likely to dominate the

processes. Agraval & Gibson (1999: 629) suggested that it would be “more fruitful” to focus on “internal and external institutions that shape the decision-making process” and that it is important to know what the multiple interests of the actors are, and how they make decisions regarding natural resource conservation. Shackleton et al. (2002: 1) suggest the same: “More powerful actors in communities tend to manipulate devolution outcomes to suit themselves”.

5 Practical Relevance

Knowledge transfer from science to praxis is important. That is why this chapter will provide recommendations on how these studies results could be used.

5.1 Relevance for German Development Cooperation

“Since the early 1990s a large number of regional and global conventions, resolutions and recommendations have been drawn up by international organisations and conferences. Together they constitute the body of international forest law. This is the basis of German development cooperation in the forest sector.” (BMZ Homage 1) The Federal Ministry for Economic Cooperation and Development (BMZ) is responsible for Germany’s development cooperation. As they state “The overarching goal of German Development Cooperation in the forest sector is twofold: securing global environmental sustainability and alleviation of poverty […]” (von Pfeil et al. 2007: 1)

On their homepage (BMZ Homepage 2) the ministry specifies the special contributions toward their goals. Two of them can be directly linked to community forestry. The contribution to “defining rights” mentions “community forest ownership” and the contribution to the point “protecting by using” refers to “sustainable forestry can bring benefits all round: for the forests, the climate, for genetic resources and for people, who can thus benefit from nature’s abundance without destroying it.” This statement can be directly linked to CF since it covers its core objectives.

The ministry coordinates and facilitates the German development cooperation but it does not implement it directly on the ground. Therefore the German government created two mayor organisations: the German Organisation for International Development Cooperation (GIZ) and the German Development Bank (KfW). Both organisations coordinate projects related to CF. For example the KfW financially supported the Community Forest Project in Namibia (KfW Homepage 1), whereas the GIZ was involved as an establishment partner. Aside from this, the GIZ supports community based forest management projects in “[…] countries and regions of importance to the conservation of tropical forests […]” (GIZ Homepage 1)

One finding is that CF contributes, in its current setup, to a sustainable use of natural resources. At the same time CF contributes to people's livelihood even if it is only at a subsistence level. Still, these two findings are crucial to promote CF further as an appropriate tool for Germany's forest development cooperation, since CF directly contributes to the main goals of environmental sustainability and poverty alleviation.

The fact that public administration did not have to give up full control of forests might seem to go against Germany's contribution to defining rights for community forest ownership. In the long run, however, this could secure the sustainability of the country-specific CF programme. For example, experience from Germany has shown that community-based management concepts can be successful over a long time. In Germany, the state of many forest users in the past was comparable to those of their counterparts today in many countries around the world. The German cases show that CF can still work even if forest users are no longer dependent on the forest for their livelihood and even if it is the forest administration who decides on the general management concept.

Another crucial finding of the research is that powerful actors decide about CF outcomes. In the case of Namibia the German Development Cooperation (DED), now part of the GIZ, was actually one of the actors pushing for a sustainable management of the forest resources and the empowerment of the forest user. The case study of CF in Namibia concluded that, because of the DED's involvement, positive outcomes were achieved. That shows the high importance of the development actors throughout the establishment of community forests. The result can lead to the conclusion: that the actor representing development cooperation is needed to achieve success with CF projects. Since the research results have shown the hypothesis that the CF outcomes depend on the interests of powerful actors to be right, this finding could be used to adjust current or future project designs. For example, the CF project in Namibia could be restructured as far as its goals. Instead of total devolution of power to the local user being the goal, this could be modified to be devolution of power to a certain level, as needed. This might convince the respective powerful actors of relevance to support the program. Since powerful actors cannot be easily replaced, CF project design should cope with this circumstance. Through the development of a CF project design that

incorporates the interests of powerful actors as well as those of local users, the chances for a success of the CF project can be increased.

5.2 Relevance for Sustainable Forest Management in Germany

Community Forestry also offers a possibility for overcoming the challenge of fragmentation of forest ownership in Germany. A recently held conference on forest commons in Burbach, Germany (2011) highlighted the potential of mobilising additional forest products from these areas. Because of the fragmentation of the forest ownership it is extremely difficult to manage all the resulting small forest fragments in a cost efficient way. CF offers a solution: independently from the question of ownership, local forest owners could form new community forests. These forests can be managed in a sustainable way for the good of all members. The revenue generated could be distributed according to shares or other commonly-agreed regulations. To persuade the owner of joining a community forest, one could ensure that the new member would remain involved in decision-making.

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7 Annex. Constitutive Publications

Krott, M., Bader, A., Devkota, R., **Schusser, C.**, Maryudi, A., Giessen, L., Aurenhammer, H. (2012). Driving Forces in Community Forestry – A Framework for Assessing Actor-Centered Power in a Decentralized Mode of Forest Governance. *Forest Policy and Economics, under review.*

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Driving Forces in Community Forestry – A Framework for Assessing Actor-Centered Power in a Decentralized Mode of Forest Governance

Max Krott, Axel Bader, Rosan Devkota, Carsten Schusser, Ahmad Maryudi, Lukas Giessen and Helene Aurenhammer*

* This research is supported by DFG (Deutsche Forschungsgemeinschaft)

All authors: Chair of Forest and Nature Conservation Policy, Büsgenweg 3, D-37077 Göttingen/Germany

Abstract

Community forestry has been described as a decentralized mode of forest governance, which only partly lives up to its expectations. The power of important actors to also misuse the community forestry approach for their self-interests has been reported as a major obstacle to comprehensive success. Hence, this article aims at developing an analytical, theory-based and empirically applicable framework for assessing an actors' power using community forestry as an illustrative case. Actor-centered power analysis aims to provide a scientific answer to the question of who are the politically most powerful actors in community forestry practices . In making use of suitable components of power theories it builds strongly upon the social relations of actors, organizational aspects and power sources, as described by Weber, Dahl, Etzioni and their adherents. Actor-centered power is defined as a social relationship in which actor A alters the behavior of actor B without recognizing B`s will. In our framework we distinguish between three core elements: coercion, (dis-)incentives and dominant information. These make up the basis for observable facts which involve not only physical actions but also threats by power elements and the very sources of said power elements. Theoretical considerations show that despite the focus being on actors, by looking to their power sources, a considerable part of structural power can be more tangible at least in part, like rules, discourse or ideologies. Furthermore, the paper shows how the actor-centered power concept distinguishes power from other influences on forest management and contributes to the identification of the group of powerful actors on an empirical basis. Due to the focus on actors and well-defined and observable elements of power, the actor-centered power concept could serve not only as a basis for research but also for quick assessment of power networks, delivering valuable preliminary information for designing land use policy in practice.

1. Forest governance, community forestry and actors' power

The ways in which forests are governed and related changes in forest governance at multiple levels have recently been intensively scrutinized (e.g. Glück et al. 2005, Agrawal et al. 2008, Hogl et al. 2008, Arnouts et al 2012, Werland 2009, Arts and Buizer 2009, Rametsteiner 2009, Arts 2012, Giessen et al. 2009, Cashore and Stone 2012, Pettenella and Brotto 2012, Ojha et al. 2009, Howlett et al. 2009, Buttoud 2012, Ed., Böcher et al. 2009, Eds.). The concepts used for analyzing forest governance within this research programme are either of a normative (e.g. Rametsteiner 2009 on good governance,) or an analytical nature (e.g. Giessen 2009, 2010 on regional forest governance). Both types of frameworks were demonstrated useful in assessing

different aspects of forest governance, its dynamics and (for normative ones) also its performance against normative criteria. In the analytical realm the following broader empirical trends in forest governance have been described, which in sum are in favour of voluntary, self-regulatory or market-based mechanisms (after Glück et al. 2005, Hogl et al. 2008, Agrawal et al. 2008, Arts and Visseren-Hamakers 2012):

- **Marketization** through the promotion of market incentives, forest certification, and payment for environmental services
- **Decentralisation** including devolution, new roles for the state as meta governor by incentives and evaluations, participation, community-based forest governance and community forestry, forest self-organisation, opening of traditional actor networks
- **Internationalisation** of forests as an issue including international deliberations, national forest programmes and other vertical coordination efforts,
- **Cross-sectoralisation** of policies including cross-sector linkages and horizontal coordination with other sectos and their policies

Within all these broad trends in forest governance the power of important political actors has been reported being a decisive factor for explaining them comprehensively (e.g. Brockhaus forthcoming, et al 2012. Agrawal et al 2008, Giessen et al. 2009,). And also in the particular field of community forestry as a new and decentralized mode of forest governance power has been identified as a crucial factor which needs closer inspection (e.g. Medina et al. 2009, Cheng et al. 2011 FPE, Agrawal et al. 2008, Devkota 2010, Maryudi 2011).

There is, however, a lack of theory-based, yet empirically applicable, well operationalised analytical frameworks in forest policy research for assessing actors' power as a driving force in community forestry (Devkota 2010, Maryudi 2011, Maryudi et al. 2012, Schusser 2012a,b). This lack in academic work is taken as point of departure for this article. Hence, the aim of this study is developing an analytical, theory-based and empirically applicable framework for assessing the actors' power using community forestry as an illustrative case. The following section will develop this objective in more detail.

2. Actors' power: Making visible the hidden capabilities of political actors by forest governance research

The high aspirations associated with community forestry as a concept, of returning the forest into the hands of local people in order to implement sustainable management was achieved only in part (Wollenberg et al., 2008; Sikor and Nguyen 2007,. Apparently, and in accordance with the concept, local actors gained influence over their forests, but some of the local and even extra-local elites acquired dominant influence and proceeded to misuse the community forest for their own specific interests (e.g. Devkota 2010, Maryudi et al. 2012). In the practical discourse, the questions of who causes failure and who has the potential to improve community forestry practices are discussed heatedly and with much controversy. Policy analysis could provide a scientifically sound knowledge base for answering these questions, especially by analyzing the actors' power and its use as a driving force of community forestry.

Political research can help identify the capabilities specific actors may have for solving problems in community forestry politics. Specifically, an important part of this is making the power of said actors,

which is often hidden, visible empirically. Awareness of the power relations helps to find the right actors, who can support a specific solution politically. Therefore, the aim of the paper is to design a concept for assessing the power of actors in any given land use issue. We have developed our concept doing research on community forestry. Consequently the papers makes use of this case but due to the general basis of our theoretical approach the concept may well fit for analyzing power within other land use issues. The concept is designed as an analytical, theory-based and empirically applicable framework for assessing the actors' power using community forestry as an illustrative case. In more detail it sets out addressing the following specific goals:

*Differentiating between "power" and other capabilities potentials actors may have

An actor influences forestry problems in many ways. He can technically modify the forest by cutting or planting trees; he can improve the decisions with new and better knowledge about the forest, e.g., about the ecological needs of trees, he can participate in discourse or he can sell or buy timber. Influencing forests by these divers' capabilities is linked to power but it adds no value to sum of all capabilities up into a general term of power. .The challenge is to specify the power and to distinguish it from the other capabilities mentioned above. other potentials. E.g.,

*Linking power to specific actors

The aim of describing the potential of a specific actor requires for the power concept to identify results for specific actors. Identifying a power process would not be sufficient, it is also necessary to describe the part of the power which has a link to a given actor. Here, one would hope to ascertain how much power a given actor has, in comparison to other actors.

*Specifying elements of power

"Power" is a general term for an invisible force, which makes it difficult to deal with in practical politics. If scientific analysis were to break down "power" into elements describing the specific processes which constitute it, one could better understand what power is and how it could be manipulated or amplified. For example, if power is based on physical means, like weapons, it is easier to detect it and to find ways to deal with it.

* Observing empirical incidences suggesting the presence of power

We do not expect power to be visible directly and often. Therefore, we need to make observations which may suggest the presence and magnitude of this otherwise invisible force. This concept should bridge well-defined power and empirical findings.

In designing a concept which meets these aims we will rely on existing political theory. First, we will explain how we make use of theory, then we will select suitable theoretical bricks for our concept and finally we will elaborate it. Examples from community forestry are used to illustrate theoretical arguments. Devkota (2010) and Maryudi (2011) have applied the actor-centered power concept in two case studies of community forestry in Nepal and Indonesia already but presenting theses results in detail would exceed the space of this paper. Focused on our goal of describing the power of specific actors, we will speak of an "actor - centered power analysis".

3. The relevant power-theories

3.1 Diverse and contested power theories

Dealing with power means to look at one of the old core topics in political science. In grounding our concept in these political theories we hope to make use of the analytical strength of the numerous political thinkers and, additionally, to build on the vast empirical findings which were used in theory-based analysis of power processes worldwide (de Jong 2012). Forest policy researchers have little doubt that power is a key factor in forest politics as well as in scientific analysis and in practice. But in certain research concepts and results, the factor power often disappears. For example, forest policy authors use the terms “influence” and “capacity” to address processes similar to power (Silva 1997; Winkeln and Sotirov 2011). In contrast, Arts (2004) addresses power explicitly, and offers a comprehensive overview of power theories which gives us a good starting point. It becomes clear that the power debate is very diverse. The different power concepts generate different terms, overlap, and parts of them are contested. Trying to structure and synthesize these theories would be too ambitious a task for our paper. Instead we will check theories to see whether they contribute to the aims of our concept. Valuable contributions will be taken not necessarily from whole theories; portions of them might be used as source for ideas on how to design our own theory. Such a selection is well in line with the critical realist approach of theory building (Modell 2009). Theories can be designed based on different sources of information, among which are other theories. The sources in and of themselves will never determine whether a new theory is right or wrong, the final proof must be empirical evidence exclusively. Therefore, existing theories or parts of them might be used as a pool of ideas but not to determine the quality of one's own theory.

We acknowledge that the critical realist approach is not shared by all the theories about power which we want to look at. Consequently, we are searching for ideas which fit our aims even within theories which basically do not agree with our approach. From the point of view of these authors our selection will not be sufficient. Nevertheless, critical realists can get ideas from such theories.

From a critical realist approach an important requirement for theories are well defined terms which can be linked directly or indirectly to observations (Krott 2012). We avoid terms of the theoretical discourse which have only a vague connection to observations, and we do not use observation directly to characterize power. Instead, a power term should be defined which comprises a vast amount of empirical observations. A basic requirement of our concept is the avoidance of internal contradictions. This simple standard of theory is rather difficult to achieve within the power discourse due to the huge variability of definitions used by power analysts.

Arts and van Tatenhove (2004, p.347) sort the power theories along important dichotomies: Some power theories “situate power at the level of the acting agent, while others situate power at the level of structures”. From the point of view of our aim to identify the power of specific actors, the focus on the acting agent is the right choice. To start with, this leads us directly to Max Weber. The question remains of what to do with structural power. A similar dichotomy is organizational versus discursive power. Actors are closer to the organizational aspect and, again, the integration of discourses into our power concept has to be specified. Yet another dichotomy is dispositional versus relational power. The first is directly linked to “having resources”, whereas the second looks merely at achieving outcomes. The outcomes can be conflict-oriented zero-sum games, in which one party acquires something at another's cost. This transitive power is contrasted with intransitive power, meaning that all achieve something in a collective effort. Finally, power concepts can be dispositional, based on resources or

relational, targeting influence for its own sake. Following these dichotomies we will show the position of actor - centered power analysis.

3.2 Theoretical roots of actor-centered power analysis

Looking for the power of actors means that power theories which focus on acting agents and organizational power are relevant. Weber (1964) places agents at the center of his power theory, defining power as the probability that one actor within a social relationship will be in a position to carry out his own will despite resistance, regardless of the basis on which this probability rests. One actor can do something specific with power. This is exactly the subject which our concept should analyze. The organizational dimension draws the attention to the problem of distinguishing an actor from other social entities like rules, resources or bargaining processes. Actor-oriented institutionalism has elaborated the term "actor" well (Scharpf 2000). The actor is a basic factor in policy analysis and is defined as "acting entity which is involved in the formulation and implementation of a policy (Schneider 2009, p.192)". The actor "acts" in regard to a policy. For example, within the policy of community forestry all entities are relevant as actors which take part in its formulation and /or implementation. The whole formulation and implementation is seen as the results of interventions by actors. These actors might be single individuals or groups. The groups can be collectives built of internally coordinated individuals, or corporative actors acting as an organization as a whole, e.g., state administrations or associations. Our basic assumption is that power is applied by an entity within a social relation to at least one other entity. Such an actor-oriented power term was applied by Dahl (1957) too and developed further by many scholars (Arts, van Tatenhove 2004, p.347).

The main critics argue that the actor-oriented approach overlooks the structural power which is based in the rules, discourses or settings at a societal level. Lukes (1974) shows in his three faces of power the importance of decision and non-decision making at a governmental level. Even more important are ideologies. Bachrach and Baratz (1977) stress the relevance of non-decision making, meaning that keeping an issue outside the realm of political decision creates a power structure which supports the agenda of strong actors and neglects others. We acknowledge that power structures matter and argue that actor-oriented power analysis is capable of analyzing a relevant portion of power structures. This will be discussed in detail within the chapter about our model.

The three-layer model of power by Arts and van Tatenhove (2004, p. 350) solves the dichotomy of actor and structure by expanding the theory of power, adding two different layers, for agents in interactions to achieve policy outcomes and for structuring arrangements. A third layer is in between, dealing namely with the position of agents in arrangements. Arts and van Tatenhove stress that structures, e.g., rules or discourse positions, do not act on their own, without actors, but nevertheless they define power as a part of structural layers. In our concept, power is directly linked to specific actors, therefore defining power as part of structure is outside the scope of our definition and we cannot follow the three-layer concept.

Nevertheless, actor-oriented power analysis does not ignore structures. We look at them from the point of view of the actor. This means that structure, like a position in arrangements as described in rules cannot be power in and of itself, but rather a power source for an actor. The actor can make use of rules, arguments in discourse, ideologies or other structures in order to strengthen his power. The actor can also find allies within a power network. Such support is defined as a source of power but not directly as the power of the actor. In line with actor-oriented institutionalism we argue that by focusing on actors and looking from their perspective at structures and how they use them, a big part of

structural factors are covered (Scharpf 2000). Insofar structural power aspects become part of our actor- centered power concept by defining it as a power sources which will be elaborated later.

Most power theories link the power of an actor with his sources of influence and with the achievement of outcomes. Giddens (1984), and referring to him, Arts and van Tatenhove (2004, p.347), integrate the outcome fully into the definition of power, meaning that part of power is achieving policy outcomes. From the actors' point of view, the link to outcomes cannot be integrated fully into the definition of power. The problem is that outcomes in forest policy are caused by a complex set of factors, like the technology used, reaction of the ecosystem, and economic intervention (Krott 2005, p.282). The activities and power of an actor are only one among many highly diverse factors causing a specific outcome. It might be that an actor with very little intervention achieves the desired outcome, whereas an actor intervening powerfully achieves little, due to other changing factors like bad weather or a drop in demand and prices of timber, which shape the outcome strongly and may override the influence of a specific actor. Therefore, if we aim to define power as an ability of a specific actor we have to keep the achieved outcome separate from power. This does not mean that one neglects the outcome fully. Looking to Weber`s definition of carrying out one's own will against the will of others, power can be restricted to enforce a position within a social relationship, meaning that another person has to adapt a specific activity. This has the purpose that, and might increase the chance that, a desired outcome is achieved, but whether this happens depends on many factors, among which power and the social relations are only one part. The focus on the social interaction between people was already part of Dahls (1957, p.202) theory of power, stating that A has power over B. It makes possible a close link to actors and has the advantage that power becomes discernible from other factors which may influence outcomes, like technical intervention.

4. Conceptual framework: Developing and defining actor-centered power

The theoretical considerations above argue that a power concept which answers the relevant question faced in practice, of who the most powerful is, should focus on well defined actors, on organizational aspects and on having and activating power resources in social relations. Despite being considered as being separate, the aspects of structure, discourses, and achieved outcomes can be integrated partly by looking at them from the point of view of an actor. Following this argument, we suggest the following definition: “actor-centered power is a social relationship in which the actor A alters the behavior of actor B without recognizing B´s will”. The definition is based on Weber (1964) and Dahl (1957) and explicitly used in environmental policy analysis by Hasanagas (2004). In elaborating it we will show how integration of other aspects mentioned above is possible in part and how power can be specified and made observable.

The model considers a social relationship between actor A and actor B. In most cases both actors try to alter the behavior of each other and one actor resists the other's efforts to a degree. For analytical simplicity we call the actor who alters the behavior of another actor “potentate” and the other actor “subordinate”. Every actor plays in different social relations, sometimes the role of potentate or the role of subordinate, depending on the specific issue.

Social relations in which power is exercised are part of complex political processes. They involve actors engaged in policy formulation as well as in implementation. This could happen at all levels, from local to national and international and could be, for example, formal or informal bargaining in a group or bilateral public discourse, forest management under the supervision of public administration, receiving advise and extension service or paying for work. The actor-centered power model does not assume that most political power is applied in political bargaining but rather, that stronger power is

exercised in day-to-day implementations at the local level in the forest. Formulating legally binding guidelines on how community forests should be managed is one power source, but guiding the implementation in the forest strictly in accordance with the guidelines is yet another power process, one with probably a stronger impact on the behavior of subordinates.

A major requirement for our model is to make power observable. Power itself is invisible. It may occur in the imagination of the actors but as critical realists we demand observations to verify the theoretical terms. From this point of view Weber's definition has some weaknesses. In his concept, power can only be verified in the presence of resistance and the use of coercion to break this resistance. As Offe (1977, p.10) has pointed out, in case of absent resistance influence cannot be verified. The better power 'works' in everyday life, as Offe argues the less verifiable it is. However, even Weber (1972, p.28) mentioned that the option of exercising power may be seen as an equivalent to power. With the help of the threat of power, this behavioral concept avoids Offe's paradox. How can the threat of power be measured? Etzioni (1975) proposes that we examine the actor's resources and instruments for coercion. Historical experiences of the use of these resources and instruments would allow us to estimate future uses. Observations of power resources can be made which can suggest threats which indicate a power process. Thus, power potential is verifiable beyond its simple exercise, as mentioned by Krott (1990, p 90-93).

By looking at the resources of power Etzioni goes even further in differentiating power (1975, p.5). He develops a threefold typology of power: coercive, remunerative, and normative. Relying on Weber's conception, he defines power as 'an actor's ability to induce or influence another actor to carry out his directives or any other norms he supports'. Etzioni holds that we can differentiate among types of power by examining the means a potentate employs to make a subordinate comply. These means can be physical, material, or symbolic. According to this typology, Etzioni defines coercive power as the application of, or threat to apply, physical sanctions. Remunerative power entails the control of material resources. Finally, normative power rests on the allocation and manipulation of symbolic rewards Etzioni's threefold typology classifies the means by which a subordinate is made to comply. This concept meets our aims of differentiating power and of making it readily observable.

Etzioni's typology was 'chosen as a point of departure' by Bemelmans-Videc, Rist, and Vedung (1998, p.29). Here, the authors intend to reveal policy instruments classed as 'regulations, economic means, and information'. In more colloquial terms, they state that 'government may either force us, pay us or have us pay, or persuade us.' (Vedung 1998 p. 29). The concept of force and paying in order to alter the behavior of a subordinate fits well into the definition of actor-centered power. We will differentiate physical force from incentives and in doing this expand the meaning of payment to mean all benefits which could be used to influence the subordinate. In addition, the power source information we will differentiate further because not all information works "without recognizing the subordinates will" which is required for it to qualify as a power process following our definition. Most information does quite the opposite, namely, it addresses the will of another actor. With these three elements we form the social relation we call, as a general term, "actor-centered power". These elements shed light into the specific social processes involved between potentate and subordinate and link them to observable facts.

4.1 Coercion

Coercion builds on the power source force and is defined as "altering the behavior of the subordinate by force". Force works without recognizing the will of the subordinate, therefore we call the social process "induced power" (Hayek 1960, p. 20). Force is caused by physical actions, like taking the

subordinate into any type of custody or harming his body using weapons. Separating the subordinate's body from the forest by physical means, e.g., a fence, is also considered to be force. Force triggers counterforce from the subordinates. In our example, people often try to climb the fence or destroy it. If the fence breaks, the person can enter the forest and fulfill his will independently from the person who builds the fence. In this case, the fence builder is weaker than the other person, and the person entering the forest plays the role of potentate. As mentioned before, our model looks mainly at the result of the process determining whose force prevails, and describes the amount of the dominance as power. Using this simplification we draw the attention to power and we avoid looking into the technical details involved in forceful actions.

When speaking about force it is important to remind ourselves that we consider all types of actors to be relevant. One actor heavily grounded in force is the state, acting through different state administrative offices. At a formal level, the state nearly monopolizes political force (Weber 1921). State force is implemented internally by police and externally by the military. As one considers these forces it becomes obvious that the threat of force is highly important. Our model considers the threat of force to be as much a form of power as the actual use of force would be. For example, the state forest administration forces people to obey forest law mainly by threatening with if there is disobedience. In most cases the threat of force alone suffices to cause the political power process to take place. The direct implementation of force is more rare but not impossible, as police activities in the forest have shown.

The effect of threat depends on the visibility of the sources of the force of the potentate and on the imagination of the subordinate. If the subordinate believes that the potentate has huge sources of power, the potentate can already establish power on this belief, even if in reality his force is weak. We consider that a bluff on the real level of force which is held is very much a form of coercion.

To sum up, we argue that our definition of coercion as “altering behavior with force” includes the threat of force and even bluffing about force which does not exist in reality. Of importance is also the link of force to actual physical actions or to physical actions which are announced or expected. In the literature, the concept of force is often extended to include the realm of psychological harm (Popitz 1992). Such a broad term of force is not useful for us because it conceals the difference between physical action, which alters the behavior of human bodies physically, and psychological action, which influences the mind of the subordinate without physical means. Such psychological processes we will consider to be incentives or disincentives. In the case of the threat of force, the focus on physical action exists too, even if it is only in the imagination. The key impact of physical force is that it alters the body without recognizing the will.

Force caused by physical actions provides a basis for observations. Physical actions can be spotted in the field often. Those relevant for forest policy are, for example, building and maintaining a fence, running a forest guard system equipped with weapons, felling trees unobserved, and selling timber secretly. In addition, one can also find empirical clues as to force originating in threats. Some threats can be observed directly if they are announced in the political process, either in public or in closed arenas. Forestry laws often include sanctions which involve physical force. The state threatens with the ultimate sanction of incarcerating the subordinate or of using state managers to manage the forest in case of disobedience. These rules are indicative of the use of force.

The threat of force can also be identified by the physical means which the potentate has. As long as one partner has stronger physical means than the other, the threat of force exists and power plays an important role in the social relation in question. This does not necessarily mean that the interests of the

subordinate are harmed. Our definition states that in a power process the will of the subordinates is not recognized. Therefore, it could happen that the potentate decides against or in favor of the subordinate. The crucial point is that the potentate enforces his decision. For example, a state forester who manages a community forest for its members through a compulsory process is relying on force even if he has the members' best interests in mind.

Physical means can influence the subordinate or nature directly. For example, the potentate can threaten or hurt the subordinate with a knife in order to impose his will, or he can cut a branch off a tree directly. The latter process we do not call “power” because no human behavior is altered, but rather, the tree is directly manipulated by means of the knife. We consider the effects of physical means on nature to be important for achieving policy outcomes. But these effects are caused by ecologic-technical forces and not by forces within social relationships, which is a precondition for the presence of power in accordance with our definition. Using this distinction we meet the specific goal formulated by our concept, of distinguishing power from other potentials in actors. For example, an actor who owns a chain saw can influence the forest strongly by cutting trees. This is done by means of technical force in our model. Only if the subordinate keeps the illegal intervention secret from the control and influence of forest guards does a power process happen, because he then prevents the guards from altering his, the subordinate's, behavior, namely, by stopping his illegal logging. The importance of this distinction is that ecologic-technical potentials can be analyzed by natural sciences better, whereas the topic of the potential to alter behavior is the competence of social sciences.

The distinction of ecologic-technical influences from coercive power is of special importance because, due to the physical means of coercion, the ecologic-technical influence can be easily mistaken for power. Applying the criteria: altering the behavior (and not producing a specific outcome) the distinction between both forces can be done well.

The definition and observation of coercion is strongly based on actors, but some aspects of structure can be included too. There is no restriction to one single actor and an expansion to include networks of actors is possible (Raab 2007, p. 187-200). The term “network” may cover many structural aspects which are based on a group of actors. Most important is that a network shows the allies of a specific actor and these allies provide him with additional sources of power. The network of allies comprises formal and informal allies which make a broad field of power options visible. For example, legal regulations which are seen as structural power often will be described fully by the formal network of implementation which is formulated in the law. The law provides specific state actors with the right of control and application of sanctions. Their cooperation and sources are fully covered by the formal power network of actors who are responsible for implementation. Additionally, illegal support can be spotted in the same way if actors threaten with physical harm within illegal structures.

4.2 Disincentives and incentives

A disincentive is based on disadvantage and defined as “altering the behavior of the subordinate by means of disadvantages (or advantages)”. Disadvantages cause a power process because the potentate alters the behavior of the subordinate without recognizing his will. He implements disadvantages until the subordinate changes his behavior in the direction of the goals of the potentate. The potentate observes the behavior and the effect of the disadvantages but he does not even know the will of the subordinate. Examples of disadvantages are penalties for illegal logging or bad planting or ecologically harmful logging operations. The subordinate can avoid the penalties only by altering his behavior in line with the wishes of the state, as formulated in law or binding guidelines. His own will does not count. Altering behavior by disincentives is linked to coercive power often forcing the

subordinate to accept the disadvantages. E.g., the amount of a penalty determines the disadvantage but it will work only if the potentate gets sufficient information about the misbehavior of the subordinate and forces him to pay. This link to a coercive component does not mean that the amount of the penalty is not of specific importance as disincentive.

The definition includes advantages too because the power process is similar as when using disadvantages. Offering advantages the potentate buys a specific behavior which is independent in principle from the behavior preferred by the subordinate. Only the number of advantages - the price - will go up in cases where the subordinate strongly prefers a specific behavior. But depending on the sources of the advantages – financial reserves – which the potentate mobilizes, he can influence the behavior according to his will. Such a process fulfills the requirements of our power definition even if it might seem much more comfortable than the use of physical force. Comfort or discomfort is not a criterion for the presence of power. Comfortable power might be even more effective in altering behavior and overruling the will of subordinates.

Incentives are an important element of economic theory (Starr 1988 p.171). Economic theory provides significant insights into how the mechanisms of incentives work. The opportunistic behavior of humans can be altered by incentives and sanctions (Eisenhardt 1989 p.63). We do not follow the model of opportunistic behavior fully but rather we look at behavior from the point of view of both the potentate and the subordinate. Both have wills which tell them how to proceed but the potentate can push his will through because he refers to sources for incentives whereas the subordinate does not have this option. This is not because there is lesser importance or lower value attached to his will but because of the lack of sources. Sources and not the agreement will change the behavior and therefore we indicate it as a power process.

Even if the subordinate follows the incentive he keeps his own will in mind. This means that if he gets greater resources of his own, he would no longer follow the will of the potentate. Economic theory fully integrates the incentives offered into an overall evaluation by the subordinate. It assumes that the evaluation allows him to add up his own preferences and incentives offered externally within one dimension, resulting this in an overall new (opportunistic) preference. In contrast the actor-centered power model relies more strongly on the actors and their wills. Incentives offered by the potentate are considered external to the subordinates' will about what to do in the forest. He may adapt his behavior but the conflict between the incentives and his prior will remains. This becomes clear in case of disincentives like penalties. The subordinate does not agree with penalties created by the state and therefore will not support them with his will. Nevertheless he may follow them if the disadvantages are high. He has no choice due to the sources of the state, which indicate a power process.

Like in the case of coercion, the sources of (dis-)incentives make the power process more apparent. We discriminate between material and immaterial (dis-)incentives. Material incentives are money but also all technical sources like machines, plants or food. Even support in labor counts as material sources. Immaterial sources are manifold too. They offer social or psychological advantages like advantages grounded in moral demands or triggered by erotic impulses (Olson 1971, p 61). Morality labels a certain behavior as being commonly regarded as right. These resources work as disincentives like financial cuts for subsidies or declaring ascertain actions as being detrimental to social convention.

By looking to morality or subsidy we integrate structures into the model. A considerable part of the rules of the game deals with morality or subsidies. The discourse in public and among professionals communicates moral demands and demands of public policy to a great extent. Statements within the

discourse are used by the potentate as sources of power which are, of course, selectively guided by his will.

4.3 Dominant information

Information looks positive and soft when compared to coercion and disincentives. Nevertheless, we identify a power process founded on information and define it as “altering the behavior of the subordinate by unchecked information”. If the subordinate does not check the information received from the potentate and makes a decision based on this information the potentate will have altered the subordinate's behavior without recognizing his will. For example, a subordinate receives the information that the tree species B will grow well, he trust the information, and based on it decides to plant tree species B. His will is to plant a well growing tree but the potentate was lying, promoting tree B and the subordinate planted tree B. This he would have never done knowing that tree B will not grow. By giving wrong information trusted by the subordinate the potentate has altered the behavior of the subordinate without recognizing his will. In this manner, and according to our definition, power can be based in “dominant information” as we call. it.

Simon (1981 p.155) has drawn attention to power in regard to unchecked information. If the subordinate uses information from the potentate and does not check it fully he has become dependent on the potentate. Not checking information can be voluntary or compulsory. It is voluntary if the subordinate is guided by his confidence in the potentate's good will. In the politically important case of ideological discourses the option of redrawing confidence is small only. Ideologies demand from subordinates that they follow key arguments and prevent them from checking the truths of these arguments. They provide a strong basis for dominant information in the interests of the potentate. For example, a core demand of forest ideology is the concept that multiple forest management will best serve all forest functions for society (Glück 1987). The ideology makes it difficult to question the links between forest management and timber production and other forest functions, like providing biodiversity. The forest ideology creates dominant information about forest management, providing forest managers and owners with power as consequence.

The compulsory abstinence from checking information is even more important than the voluntary processes. The subordinate is forced by lack of direct relevant information or lack of methods or sources to accept the information given to him. Certainly, professional foresters possess more knowledge on forest management than laymen, which is what most forest users are. Foresters are experts on forests. They followed a professional training and passed several monitored exams. Larson (1977) calls this setup professional closure. The expert knowledge causes a power process because the experts are the only ones who can check the information (Freidson 1986). The forest user has to accept the dominant information- He is often not able to organize a checking process. He lacks sources to engage experts who might provide counterarguments, or to acquire the educational wherewithal to follow the arguments of the experts. It is worth to note again that the power process does not mean that dominant information is always used against the best interests of the subordinate. It might be that the forest user gets the right expert advice which helps him. But nevertheless, his behavior is influenced according to the will of the expert, which means that there is a power process underway.

In addition, the forest expert could use his superior knowledge to select specific information which supports his interests only and which works against the interests of the forest user. For example, the expert is the only one who knows how much timber is in the wood and can be harvested. He can inform about the right data or make a cautious estimate which offers much less timber to the user. Especially when it comes to biodiversity, expert knowledge is the only way to get the data. Due to the

complexity of the subject matter, the subordinate is not able to check information and to make his own decisions. The process of the subordinate checking information offers many opportunities for observation. The sources of information of the potentate and the subordinate can be analyzed and compared. In all cases in which the potentate is better informed and does not deliver the full information to the subordinate, he has power. The decision process by the subordinate can be observed too. If he neglects to check information due to confidence, lack of time, knowledge or whichever other causes, he is exposed to the power of the potentate (Devkota 2010).

Despite looking closely at the actors, structures are integrated dominant information. The expert discourse and ideologies were already mentioned which analyze theses structure directly as important sources for building up dominant information. Additionally, actors can provide information, and the network of potential and actual actors delivering information is part of power sources covering structural aspects.

5. Conclusion: Power pinned down into an applicable concept

We developed a theory-based, empirically applicable framework for assessing actor-centered power as a driving force in community forestry as a decentralised mode of forest governance. This framework was demonstrated to be useful in assessing the presence of different empirical forms of power used by political actors. Future research should demonstrate its usefulness in other empirical fields of forest governance as well. Summing up the actor-centered power framework, we argue that it makes the power factor in community forestry or other land use issues, which is often blurred, well applicable in research and practice. The four aims for answering the relevant power questions in practice are met:

*Actor-centered power is specified as a specific social relation well distinct from other influences which produce outcomes in the forest. The restriction on altering the behavior of the subordinate excludes all forces from the term “power” which directly influence problem-solving, like managing the forest, for example. It excludes all ecologic-technical forces which intervene in the forest. They can be described and explained much better by the ecologic-technical disciplines than by political science. Another important aspect is that sources an actor owns become power only if they are used to alter the behavior of other actors. As long as they are used to manage the forest they are considered to be building up his ecologic-technical potential. For example, the access to good soil, machines, fertilizer or plants affect forest management to a great degree. Due to the restrictive nature of the term “actor-centered power”, ecologic-technical influence can be analyzed and optimized without confusing it with the complex issue of power.

*Actor-centered power is linked to actors in specific issues directly. They play the role of potentate or subordinate depending on their power sources and the specific issue at hand. The most powerful actors can be identified by accumulating their roles as potentate. This can be done within the framework of a power network, discriminating well a group of powerful actors from a group of weak ones (Devkota 2010, Maryudi 2011). The model does not assume that the powerful actors are always most powerful because in specific relations they might be forced to the subordinate side. This hypothesis fits in with many observations where a specific actor is dominates most of the time but not always in all relations.

*Actor-centered power specifies three elements of the general term “power” (see Table1). Power is assumed only if the behavior is altered by force, (dis-)incentives or dominant information. This specification enables us to separate power from other social relations which alter the behavior of actors. Communication based on checked information is of the greatest importance. If two actors exchange information which is checked by both they build up a social relationship which is the

opposite of a power-based relationship. This kind of communication constitutes political bargaining in which both can make informed decisions as long as all information is shared. Open bargaining about sources means to offer to the other actors what they most urgently demand for themselves, at least in part. As we have discussed, we regard (dis-)incentives as power because the will of the subordinate with regard to his prior sources is neglected by the potentate implementing (dis-)incentives. For example, the subordinate gets money for planting trees until he overrules his prior will to plant corn. The amount of the power source money decides and not the will of the subordinate.

*The specified power elements are linked to observable facts (see Table 1). They include the action of power but also threats and sources. The sources of power offer the best opportunity for collecting empirical data. They are specific and observable, like all kinds of weapons, economic sources or information.

The concept of actor-centered power provides a suitable basis for both, research and consulting activities. Due to the clear-cut definitions and links to observable facts it can be applied well within qualitative and quantitative research (Devkota 20110, Maryudi 2011). The power elements can be identified in forest issues around the world. Two case studies in community forestry, one from Nepal (Devkota 2010) and one from Indonesia (Maryudi 2011) have applied the actor-centered power model successfully already. Due to the general applicability of the power term more cases are being analyzed in Africa (e.g. Schusser 2012a.b) and Europe as well. The aim is a comparative power analysis of community forestry. The hope is that the actor-centered power model might provide the common hypothesis which is required for comparative research. Finally, a future application of the actor-centered power will be to design a checklist in order to identify the group of powerful actors in specific cases quickly. From the example of community forestry we learned that such preliminary information about power would serve well the needs for developing concepts for community forestry in practice. Further the concept might be well applicable in analyzing other land use issues too.

Table 1: Definition of core elements and observation of actor-centered power

Actor-centered power		
Element	**Definition**	**Observable facts**
Coercion	Altering behavior by force	Physical action, threat for physical action or sources for physical action
(Dis-)incentives	Altering behavior by (dis-)advantage	Providing of, threat with or sources of material or immaterial benefit or detriment
Dominant information	Altering behavior by unchecked information	Providing of, threat with or sources of information unchecked due to lack of will or ability

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Back to basics: Considerations in evaluating the outcomes of community forestry

Ahmad Maryudi [a,b,*], Rosan R. Devkota [b], Carsten Schusser [b], Cornelius Yufanyi [b], Manjola Salla [b], Helene Aurenhammer [b], Ratchananth Rotchanaphatharawit [b], Max Krott [b]

[a] Faculty of Forestry, Universitas Gadjah Mada, Bulaksumur-Yogyakarta, Indonesia 55281
[b] Chair of Forest- and Nature Conservation Policy, Georg-August Universitaet Goettingen, Buesgenweg 3, Germany 37077

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ABSTRACT

Evaluations on community forestry outcomes are important to observe whether the program community forestry produces what it has promised. For the evaluation -as an alternative to the comprehensive criteria and indicators on sustainable community forestry-, we propose an approach based on the core policy objectives of the program. In fact, community forestry is very much connected to the following three objectives of: 1) alleviating the poverty of forest users, 2) empowering them, and 3) improving the condition of the forests. Based on field tests in two community forests in Indonesia, the focus on the core policy objectives appears to provide a more practical approach than the use of complex criteria and indicators. We conclude that our approach allows rapid evaluations and eventually reduces the associated costs and time without compromising the goals of the evaluation.

1. Introduction

Why evaluating the outcomes of community forestry? Over the past few decades, the program has been promoted as an innovative and potential approach to improved forest management and conservation strategies with a comprehensive blend of ecological and socio-economic objectives. Many countries across the globe have since experimented with community forestry; the program is now in the run, albeit at different stages of development (Gilmour et al., 2004; McCarthey, 2004). It is estimated that over a tenth of the world's forests are managed accordingly to models of community forestry (Bull and White, 2002). Whether the program's potentials on producing multiple positive outcomes have been shown on the ground is of great interests. In fact, there have been a pool of assessment studies on the outcomes of community forestry program, but scholars are increasingly aware that different forms and models interpreting the program are yet to realize its potentials (see Wollenberg et al., 2008). Even when positive outcomes are there, the comprehensive blend of goals is rarely achieved since the implementation of the program often emphasizes particular goals over the others (Brendler and Carey, 1998; Chakraborty, 2001; Dev et al., 2003; Malla et al., 2003; Thoms, 2006; Springate-Baginski and Blaikie, 2007).

Such has made evaluation on the outcomes of community forestry is still highly appropriate that eventually encourages us to involve ourselves in the procedures on the evaluation. Indeed, there is a need to develop pre-defined standards, against which the performance of the program can be assessed. It is here not to argue that the standards for evaluating the performance of community forestry were absent. Over the past few decades, numerous sets of criteria and indicators (C&I) on sustainable forestry, including those exclusively dedicated for community forestry (e.g. Ritchie et al., 2000), have been there for use. While we also see that the C&I(s) provide robust and comprehensive frameworks on how particular community forests should be managed, a more practical approach is needed to see whether the implementation of community forestry has produced the impacts as initially intended. For this purpose, Krott and Stefanov (2008) recommend to limit the focuses accordingly to the core objectives of community forestry. This eventually allows rapid but appropriate evaluation. Field tests on two Indonesian community forestry cases show that our approach provides meaningful feedbacks to policy makers on how far the objectives were reached and helps them to chart out a course of action (Garcia and Lescuyer, 2008) so that community forestry can produce the potentials it holds.

2. The concept of community forestry

Over the past few decades, community forestry has been placed at the top of priorities of forest policy makers (Gauld, 2000) to tackle forest degradation and the pervasive rural poverty in one single package of program by mobilizing local people, particularly those heavily depend on the resources and directly use them (hereafter we refer to as 'direct forest users') through democratic processes of program formulation and decision making as well as the implementation of the forest activities. The core concept of community forestry lays on its attempt to build active participation of the locals, with the

* Corresponding author at: Faculty of Forestry, Universitas Gadjah Mada, Bulaksumur-Yogyakarta, Indonesia 55281. Tel./fax: +62 274 550541.
E-mail address: maryudi76@yahoo.com (A. Maryudi).

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external involvement having a supportive rather than management nature (Arnold, 1991). The concept is founded on the recognition of interdependency and intimate synergies between rural people and forests (Stevens, 1997). The basic premise is that people's meaningful role in decisions affecting surrounding forests can achieve improved socio-economic well-being and ecological sustainability (Shrestha, 2005). The participatory approach of community forestry is considered to produce increasing benefits for the local community, to make use of local knowledge, to encourage voluntary compliance, to trigger innovation and to contribute to sustainable forestry comprising economic, social and ecological benefits (Kellert et al., 2000).

Since the earliest definition at the 1978 World Forestry Congress, a significant number of scholars (e.g. Shepherd, 1985; Gilmour and Fisher, 1991; Duinker et al., 1994; Hobley, 1996; Shackleton et al., 2002; Pangdee et al., 2006; Thompson et al., 2005; Alden Wily, 2005; Poffenberger, 2006) have reviewed the concepts and definitions of community forestry. The important issues in their definition include (but not limited to): 1) decision-making procedures and authority, 2) representation — who is involved locally and how are they selected; and 3) equity — who pays and who benefits. Nonetheless, many of them focus on the normative values of community forestry, i.e. what it should be — rather than what community forestry actually is. As such, Shrestha (2005) argues on the need for defining and understanding community forestry in relation to specific contexts and with a realization of gaps between actual and ideal versions.

With such a consideration, this paper thus defines community forestry as: "forestry practices which directly involve direct forest users in common decision making processes and implementation of forestry activities". As such, meaningful good community forestry practices require decision-making autonomy to the direct forest users in setting objectives, local control in forest management and utilization, and ownership of the benefits of the forest. McDermott and Schreckenberg (2009:158) have elaborated community forestry as the exercise by local people of power to influence decisions regarding management of forests, including the rules of access and the disposition of products. This definition entails community forestry as 'power shift' from the state to the local communities and opens a question of power sharing in order to deliver its objectives into practice.

3. Community forestry outcomes and the key elements of evaluation

As has been mentioned in the earlier section, community forestry is very much connected to the following three objectives of: 1) *alleviating the poverty of direct forest users*, 2) *empowering them*, and 3) *improving the condition of the forests* (among others see Wiersum, 1984; Bhattacharya and Basnyat, 2003; Charnley and Poe, 2007; Karmacharya et al., 2008). Seeing this way, we do not necessarily discount the importance of other indicators on sustainability. We instead give more emphasis on assessing what community forestry policy has promised, that is the three policy objectives. Therefore, the rest of the section will analyze the objectives, explaining why they were underlined in community forestry policy formulation, and their key elements of our evaluation approach.

3.1. Poverty alleviation of direct forest users

That community forestry has been widely promoted is coined with the pervasive poverty in rural areas in the forest vicinity. Westoby (1987: 291) trenchantly criticizes forest activity by external stakeholders that "its contribution to improving the quality of rural life and raising the welfare of the rural masses has been negligible." While the problems of the poverty of forest dwellers have been long raised, they persist. Hobley (2007: 4) rhetorically asks "why, if this was so clearly the case 30 years ago, we are still repeating the same mistakes with the same consequences". This suggests us to remain focused on the poverty alleviation in our approach to evaluating the economic outcomes of community forestry.

There is a spectrum of theories on poverty alleviation in regard to the implementation of community forestry policy. At one point poverty alleviation is barely meant to serve a safety-net function meeting the basic needs of forest users (see Acharya, 2002). Dev et al. (2003) also emphasize on the access of poorer households to essential forest products for their subsistence. In fact, in most developing countries, desires on community forestry are markedly linked to meeting basic needs and serving subsistence purposes, and therefore the benefits to the community are achieved by extracting them directly from the forest (Glasmeier and Farrigan, 2005). On the other hand, numerous scholars expand the focus and equate poverty alleviation with livelihood improvement (see Pandit et al., 2008). Looking at the various products a community forest can produce Oyono (2005) stresses on the wealth and human well-being in the evaluation of economic outcomes. Sunderlin (2006) also refers poverty alleviation to the accumulation of wealth as the uses of forests as source of savings and asset building for permanent increases in income.

Referring to those two poles, Glasmeier and Farrigan (2005) argue that forest resource uses can embrace conditions ranging from meeting basic needs to full-scale economic development and everything in between. Angelsen and Wunder (2003) summarize that poverty alleviation refer to both poverty reduction (people become better off, in absolute and relative terms) that being lifted out from poverty, and poverty prevention. In this evaluation, we also adopt the two extremes in defining poverty alleviation and refer poverty alleviation as the enhancement of human well-beings of the direct forest users. An optimal result would be lifting direct forest users into a better economic stage.

Further, the economic outcomes are here defined as the products and services the household of a direct forest user obtains from the community forest. Mahanty and Guernier (2008) point out how focusing on pure financial benefits might create an incomplete picture on the way community forestry contribute in poverty agenda. Therefore, the economic outcomes should be qualitative analyzed and partly measured in natural units and/or partly in money. This can vary from case to case. The outcomes can include forest products (among others: timber poles, fodder, firewood as well as land-based products of agroforestry), money and community development/services.

3.2. Empowerment of direct forest user

As earlier said, the enthusiasm on community forestry has been linked mainly with the premises that 'forest communities' are closely attached to the surrounding forests, not only for their daily livelihood but also for cultural and even religious lives. In community forestry, direct forest users are expected play an important role in the common decision making procedures and implementation of forestry activities. To be able to doing so, empowerment of direct forest users is said as the key; in fact the empowerment is one of the core community forestry objectives (see Wiersum, 1984; Bhattacharya and Basnyat, 2003; Charnley and Poe, 2007).

While scholars are generally conclusive on the importance of empowerment in a development intervention, their understanding on empowerment spectrally diverges. Empowerment is often equated with participation and the involvement of local forest users in forestry activities. There have been arguments that the lack of participation exclude disadvantages groups from decision-making, particularly in product distribution (see Brown et al., 2002; Maskey et al., 2007). Nonetheless, even when the forest users are participating in forestry activities, such does not necessarily mean that they get empowered. In fact, the participatory approach in forest management is often modelled for disempowering some forest users (Agrawal, 2001; Sarin, 2001).

Such suggests that participation approaches alone might be insufficient to empower the disadvantages groups. Bryant and Bailey (1997) give more emphasis on the context of existing socio-political power structure and argue that with imbalance accumulation of power of the stakeholders, empowerment of rural poor is unlikely to be achieved. The idea of forest decentralization of the transfer of powers from central government to lower levels in a political–administrative and territorial hierarchy (Agrawal and Ribot, 1999) can be nicely slated in the context of the empowerment of forest users. Timsina (2002) similarly argues that empowerment means the disadvantaged groups gain some power. Further, Sarin (2001) broadens empowerment beyond the context of relationships within the locals, and see the importance on how the locals deal with external actors.

Empowerment is manifested as control over access to the resources (Bryant and Bailey, 1997), meaning real empowerment should enable a direct forest user to influence the forest and forest use. Edmunds et al. (2003: 3) remind us that the key rationale for such devolution policies as community forestry is to provide the poor forest users with "better access to forest resources and more self-determination in decisions about local resources". Although some other scholars (e.g. Alden Wily, 2001) do not see increased access of users to the forest resources as a determinant for empowerment, looking at numerous forest conflicts – which usually stem from struggles over the access to the resources in that less empowered groups secure limited access to the forest resources – control over access should be placed at the prominence of discussing empowerment of forest users. Further, access and control over forest resources are often linked with the extent to which forest users can benefit from the resources (Edmunds et al., 2003; Lachapelle et al., 2004; Mahanty et al., 2006; Larson et al., 2007). Changes in access to the forests are thought to profoundly affect the livelihood of the people (Chomitz, 2007). Therefore, secure access and control is seen here as the principal key of empowerment.

Access and control nonetheless come with prerequisites. Larson et al. (2007) argue that tenurial rights are to affect forest access and the security of the access. Having effective property rights over forests, the users can exclude others, exploit the resource and allocate access (Ribot, 2009). McDermott and Schreckenberg (2009) also focus on the access land and forest products so that community forestry is to bring benefits to the users. Edmunds et al. (2003) emphasize on access and control over decision-making processes, economic assets and livelihood as well as the forest quality. McDermott and Schreckenberg (2009: 160) similarly argue that community forestry needs to expand decision-making space, through which users can gain the desired benefits. Summarizing their indicators/ variables on access and control, the social outcomes in our approach rest on the empowerment of direct forest users, and are measured by the extent they can: 1) access to information on forests, 2) access to decision making, and 3) access to forestland and resources, including the ability to exclude others for using the resources. Such depends on knowledge, information, legal restrictions, technical materials, money and informal access to the forest.

3.3. Improved forest conditions

For the evaluation of the ecological outcomes of community forestry, we also need to highlight that degraded forest condition is one of the main drivers of the implementation of the program. Experience from many countries, e.g. Nepal, India and Indonesia, the goals on restoring the forest conditions are explicitly outlined in the formal policy on community forestry (Bhattacharya and Basnyat, 2003; Rusli, 2003; Karmacharya et al., 2008). It is therefore of high appropriateness of improved forest conditions as the focus of our analysis. There are indeed numerous complex sets of indicators on ecological outcomes. Hagan and Whitman (2006) point out how the complexity can hinder the process of measuring or monitoring. Further, they argue that the complex indicators might not be very useful to decision making processes. In fact, managers might not see the importance to measure everything of potential interest within an ecosystem of forests (Carignan and Villard, 2002).

In light of the complexity, many highlight the importance of selecting critical and relevant indicators for the goals of assessments (Carignan and Villard, 2002; Failing and Gregory, 2003; Hagan and Whitman, 2006). Failing and Gregory (2003) further argue that if the fundamental objective is to preserve ecological services and resilience, then appropriate indicators may be related to primary productivity, or to landscape or ecosystem diversity, and so. For operationalization, they argue that one of valuable characteristics of indicators is cost-effective to measure and can be accurately estimated by all personnel (even non specialists) involved in the monitoring. Gautam and Shivakoti (2008) argue that the positive changes in forest cover and condition are said to provide some evidence of ecological sustainability of community forestry. Rutters et al. (1992) has recommended that forest growth proves as an important indicator to detect changes in forest conditions. Likewise, biodiversity has become a key objective in managing forests (Failing and Gregory, 2003).

Nonetheless, it becomes increasingly apparent that both indicators are spectrally interpreted by different actors accordingly to their respective social and political preferences. Sarkar and Margules (2002: 300) point out how *"[t]he biological realm – patterns and processes – is marked by variability and complexity at every level of organization*" so that difficult to pin down a precise sense for policy-making. Therefore, in this evaluation, we are rather interested on the different interpretations on forest growth and biodiversity of community forests. Such suggests us not to directly evaluate or measure the indicators, but to rely on the existing knowledge on biodiversity directly or indirectly measured by different stakeholders. The factual measurement of ecological outcomes is an indicator for their importance for a special stakeholder. This means the reliance on the existing studies conducted by any (strong) actors within the respective selected community forests, if any.

4. Testing the approach

From the above analysis, we propose a set of key considerations — derived from the core policy objectives of community forestry, for the evaluation of the program (Table 1).

Empirical tests are nonetheless needed to see whether the approach on focusing the core policy objectives of community forestry in evaluating the outcomes can be applied. For that purpose, between October and December 2009 we conducted field tests on two community forests in Gunungkidul District (Indonesia), i.e. Banyusoco and Karangasem, under the community forestry scheme called *Hutan Kemasyarakatan (HKm)*. The community forests were started around the mid of the 1990s, from virtually barren forestland. While the ownership of the forests is still of the state, the forestland was

Table 1
Focus of evaluation and the key elements.

Focus of evaluation	Key elements
Poverty alleviation of direct forest users	▪ Forest products ▪ Cash money ▪ Community services
Empowerment of direct forest users	▪ Access to forest information ▪ Access to decision making ▪ Access to forest land and resources
Improved forest condition	▪ Forest growth ▪ Biodiversity

parcelled for forest users, who are then responsible on the forest management activities and are to benefit for their respective forest parcels.

From the outset, instead of promoting genuine empowerment, the community forestry scheme limits the involvement of the locals only to the functional participation which sees the people as the medium for executing pre-determined objectives and decisions (Hobley, 1996). For instance, prevents tenurial claims over the forestland as the users are bound to acknowledge the state's ownership over the forests despite some sporadic aspirations on foreseeing ownership rights over the forests (see Fuadi and Rahman, 2004). Access on the decision-making procedures is limited to the extent that the locals have to follow management procedures regulated in the HKm licenses. In fact, the community forestry scheme rests on the granting of two different licenses to the users and their groups, i.e. 1) the management license — which focuses on the management of the forests and the uses of the forestland, and 2) the utilization license for timber harvests. According to the Ministerial Regulation No: P.37/ Menhut-II/ 2007, the users and their groups have to submit different working plans to the Ministry for securing both licenses. By the end of 2010, only the management right has been secured. The management right is defined for the duration of 35 years, during which the users are allowed to cultivate food crops and entitled other (non-timber) benefits from, are responsible for nurturing the forest species, and later to obtain a share of the sale of timber from their respective forest parcels.

Given the degraded forest condition at the start of the scheme, forest activities are focused on forest restoration. At first glance, one might expect to sparking efforts on improving the ecological qualities of the forests, but concerns on improving environment forest qualities are rather shifted to the extent that environmental efforts can enhance the forest potential to producing economic benefits, rather than to the broader environmental context of improved biodiversity or such. Such is primarily due to the focuses on commercial monoculture forests for principally timber production that relegates concerns on the broader ecological issues. Observations on the forests have unveiled some promising ecological outcomes in terms of healthy monoculture forests. The barren forestland has successfully been transformed greeneries and healthy stands; the forests have been growing immensely.

While the objective on improving forest conditions has been very much reached, the extent to which the community forestry scheme can contribute in the effort to alleviate rural poverty remains in questions, at least over the next few years. The main products the users can benefit from are the food crops (usually rice and corn) planted under the forest species. There are indications that the crops are by no means to satisfy the farmers' daily needs. Instead, they are seen as either complements to those yielded from their private farmland or additional earnings as some of the users sell the products. As suggested, *"rice from the agro-forestry practices is usually kept for own-uses, but is insufficient to satisfy the daily needs of the users for the whole year. Corn is sold in the markets to provide additional incomes for the users'* (The report on Participatory Rural Appraisal (PRA) of Banyusoco Group, 2003/ Page 11). In addition, there are some concerns on the declining agricultural yields from the forest parcels the forest canopies start to connect. Thinning of the forests is seen as necessary to maintain the outcomes of agricultural crops, but they are yet to be planned, which need approval from the forest offices. Non-timber forest products are indeed free for collection by the forest users. However, given the nature of monoculture forests, the products are sporadic and limited. The common products across cases include fodders and fuel-wood (from dead branches) (Djamhuri, 2008). Overall, at the current stage, HKm community forestry is yet to achieve its high promises on poverty alleviation as it only creates subsistent economy, let alone the accumulation savings and asset building for permanent increases in income.

5. Conclusions

As any form of assessment, evaluation on community forestry outcomes aims to observe whether the program has produced the impacts as initially intended. In evaluating the outcomes, we propose an approach that is based on the core policy objectives of the program, i.e. poverty alleviation, and empowerment of direct forest users as well as improved forest conditions. Based on a test in two community forests in Indonesia, the focus on the core policy objectives appears to provide a more practical approach than the use of complex criteria and indicators. While similar field tests on other community forestry practices at different contexts are indeed needed, we conclude that our approach allows rapid evaluations and eventually reduces the associated costs and time without compromising the goals of the evaluation.

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The applicability of the German community forestry model to developing countries

Die Eignung des deutschen Modells für Gemeinschaftswaldbewirtschaftung für Entwicklungsländer

CARSTEN SCHUSSER, MAX KROTT and JACQUELINE LOGMANI
Department of Forest and Nature Conservation Policy and Forest History, Burckhardt-Institute, Georg-August-University Göttingen, Büsgenweg 3, 37077 Göttingen, Germany

Abstract

Recent international research, especially about developing countries, has begun to question the success of the concept of "Community Forestry" which was introduced internationally by the end of the 1970's. It appears that community forestry contributes towards a positive ecological outcome, but the devolution of power to local users and livelihood improvement do not happen.
Given that community forests have existed in Germany for more than 200 years, the article investigates whether the German community forestry model can be applied to community forestry worldwide. Eleven very successful community forests in Germany were analyzed, focusing on the social, economic and ecological outcomes of community forestry. The results show that the community forestry approach can promote the greening of the forest and its ability to provide products and services. However, the additional goals of the community forest concept, i.e., meaningful participation and high profits for all users, have not been met in the case studies. Sobering results for community forests worldwide seem to be in line with these findings.

Key words: social outcome, economical outcome, ecological outcome, policy objectives, empowerment, devolution, livelihood improvement, sustainability

Kurzfassung

Aktuelle Studien über Gemeinschaftswaldbewirtschaftung in Entwicklungsländer stellen immer mehr das Konzept infrage, welches sich seit Ende der 1970er-Jahre erfolgreich weltweit verbreitet hat. Es scheint, als ob das Konzept der Gemeinschaftswaldbewirtschaftung zwar positive ökologische Ergebnisse erzielt, der lokale Waldnutzer als Schlüssel des Konzeptes jedoch kaum davon profitiert.
Da in Deutschland Gemeinschaftswälder rechtlich schon mehr als 200 Jahre existieren, untersucht der Artikel, ob das deutsche Modell geeignet ist, die Anforderungen an das internationale Konzept zu erfüllen. Dafür wurden 11 sehr erfolgreiche Gemeinschaftswälder in Deutschland untersucht. Der Fokus der Untersuchung liegt dabei auf dem ökologischen Ergebnis für den Wald sowie auch auf dem sozialen und ökonomischen Ergebnis für die lokalen Waldnutzer. Die Ergebnisse bestätigen, dass Gemeinschaftswaldbewirtschaftung in Deutschland zum Walderhalt beträgt. Der Wald liefert dabei wertvolle Produkte und Leistungen. Der lokale Waldnutzer profitiert dabei kaum davon. Vergleichbare internationale Ergebnisse bestätigen dies für das internationale Konzept der Gemeinschaftswaldbewirtschaftung.

Schlüsselwörter: soziales Ergebnis, ökonomisches Ergebnis, ökologisches Ergebnis, Politik-Ziele, Selbstbestimmung, Dezentralisierung, Lebensstandardanhebung, Nachhaltigkeit

Introduction

Community forestry (CF) programs aim to improve the livelihood of local people as well as the condition of natural resources on which they depend for their living. If local people are involved in decision-making processes concerning natural resources, they would develop a sense of ownership and start using them in more conservative ways (Agrawal 2002). It is assumed that the involvement of local natural resource users will contribute to a sustainable practice which will lead to various positive outcomes for the direct user and the natural resource (Kellert et al. 2000, Blaikie 2006). Many researchers concluded that this requires power devolution to the local users, even at the community level (Ostrom 1999, Acharya 2002, Lachapelle et al. 2004, Nygren 2005, Agrawal et al. 2008). Following this notion, the core policy objectives of the international community forestry concept can be summarized as follows:

- empowered direct forest user (social outcome),
- improved livelihood of the direct forest user (economical outcome),
- improved forest conditions (ecological outcome).

Experience around the world has shown that CF programs contribute at least to improved forest ecology (Brendler and Carey 1998, Chakraborty 2001, Dietz et al. 2003, Thomas 2006, Adhikari et al. 2007, Charnley and Poe 2007, Singh 2008, Wollenberg et al. 2008, Devkota 2010, Vodouhe et al. 2010, Maryudi 2011, Pandit and Bevilacqua 2011). However, outcomes for the other objectives, which concern the direct forest user, appear less positive. Maryudi (2011) and Devkota (2010) analyzed community forests and concluded that local forest users were not the decision makers and that their livelihood improved only slightly. According to Edmunds and Wollenberg (2001, p. 192), it is likely that the poorest forest user is now worse off than before. Shackleton et al. (2002, p. 1) conclude: "The way in which local people realize the benefits of devolution differs widely, and negative trade-offs, mostly felt by the poor, are common." In addition, Wollenberg et al. (2008) state that neither the local government model nor co-management has met the high expectations of the community forest program. Several other researchers (Ribot 2004, Larson 2005, Blaikie 2006, Dahal and Capistrano 2006, Ribot 2009) analyzed the common practice of decentralization policy and concluded that it is seldom followed by genuine pow-

er devolution to the local users. Edmunds and Wollenberg (2001) report similar findings. They even go one step further and state that local institutions are vulnerable to external powerful actors and that these powerful actors are more likely to dominate the processes. In addition, Agrawal and Gibson (1999, p. 629) suggested that it would be "more fruitful" to focus on "internal and external institutions that shape the decision-making process" and that it is important to know what the multiple interests of the actors are, and how they make decisions regarding natural resource conservation. Similar findings are made by Schusser (2012, p. 213), which state that "outcomes of community forestry depend mostly on the interests of powerful actors".

If one follows the international research discourse one might question whether if the CF programs can ever fulfill all their promises. It seems that CF has an positve outcome for the forest resource, but whether this is enough to be successful in the long run is unclear.

In contrast, German community forests already have a long and ancient tradition. Extensive research has been conducted on the use of common resources, including forests, which can be traced back in history, as can be the development of the common use of land and its legal status (Löw v. 1829, Stieglitz 1832, Burckhardt 1876, Hasel 1971, Wobst 1971, Köppe 1978, Giesen 1979, Hasel 1985, Lerner 1993, 1994). All of these issues are still controversial; there is no consensus on these matters. What is sure is that today's community forests emerged mostly from village cooperatives, which oversaw common property, including forests. Throughout history the structure and ownership of these cooperatives changed and developed in different ways. In the beginning of the 18th century a new concept emerged, which argued that common land could be better managed when transferred into private ownership. According to Wobst (1971, p. 39) there are several community divestiture orders, e.g., the "Gemeinheitsteilungsordnung Provinz Hannover 1802", which created the legal base upon which to split up the old village cooperatives. He adds that soon after the divestiture of common land it was realized that this would not lead to an improved output of the privately managed land. Shortly thereafter most of the orders were replaced by laws regulating the management of common used and community forests, e.g., Prussian law 1881 (Wobst 1971). According to Wobst (1971) until then most of the old village forests had been attached to political communes or were privatized and only few survive as community forests. The ideal concept has not changed much since then. This is the reason why the end of the 18th century can be seen as the beginning of the German community forestry concept. Since most of the community forests exist until today it can be assumed that the German community forestry concept has been successful.

We will use the rich experience from Germany to assess which outcomes can be achieved by community forestry in practice. In choosing the most successful examples we are looking for the potential of the community forestry model. Lastly, we will compare the results with the goals of the concept, which promise to improve the ecological value of the forest, the livelihood of local people, and to devolve power to local populations who live with forests worldwide.

Theory and Method

The term "community forest" is also applied in translation to German forests, which are in the ownership of political communes, i. e., cities or rural communes, as used by Hartebrodt et al. (2005). For us, the term "community forest" refers to forests where the people in the community are responsible for the forest. For Germany this means that every person in this community is formally an owner of the forest, without specifying which actual portion of the forest he owns (ideal share), and through this should have access to the forest and its products. This differentiates community forests from commune forests, which exist in Germany and which are owned by political communes, where the residents have very limited user rights. Our translation was also used by the forest administration of the federal state of North Rhine-Westphalia, which published a booklet about the situation of community forests under their jurisdiction (Ahlborn et al. 2010).

McDermott and Schreckenberg (2009, p. 158) define "…, community forestry refers to the exercise by local people of power or influence over decisions regarding management of forests, including the rules of access and the disposition of products".

Since the concept of community forestry with ideal shares in Germany is closest to the international understanding of the meaning of community forestry we decided to interpret these types of forests as being community forests.

Case selection

As cases for the empirical analysis we selected successful community forests in Germany. Since we were interested in rich empirical data, we preferred community forests that had been active for longer periods. Therefore, the community forests in the former DDR that had been under state management during the communist period are not suitable. Wobst (1971, p. 5) gives an overview of the community forests in the old territory of West Germany. Community forestry is most prominent in the federal states of Lower Saxony, North Rhine- Westphalia, Hesse and Rhineland-Palatinate (Wobst 1971). We selected cases from these states based on interviews with experts from the State Forests Administration and the Chamber of Agriculture (Failing and Gregory 2003, Interviews 83_G-91_G). The cases should meet the goals of international community forestry concept in practice very well.

Our goal is to identify good examples and not to evaluate how often such examples appear in Germany. Therefore we do not need a representative sample. Furthermore, the cases from Germany are part of a comparative analysis comprising 7 countries (Schusser et al. 2012). For each country we select about 10 cases. The main methodology requirement is to identify successful community forests in terms of the international concept (empowered direct forest user, improved livelihood of the direct forest user improved forest conditions).

Outcome analysis

The analysis of outcomes is oriented toward the core policy objectives of the concept of community forestry (Krott and Stefanov 2008, Maryudi et al 2012). These are: the empowerment of the direct forest user (social outcome), the improved livelihood of the direct forest user (economical outcome), and improved forest conditions (ecological outcome). The outcomes are operationalized as shown in table 1.

Table 1 presents an overview of the outcomes, their corresponding core objectives, the subcategories with their definition and the indicators on how we evaluated the outcomes. The subcategories indicate the level of the impact of community forestry according to their core objectives.

The social outcome measures the empowerment by evaluating the means the direct forest user has to influence the management of the forest. It measures the degree to which he can make decisions about the management of the forest. Here, the access to forest-related information and becoming a part of the decision making are important. In addition, the direct access to the forest and the use of its products empowers the end user. If the three criteria are fulfilled we evaluate the social outcome as high. By contrast, if there are limited infor-

Table 1. Outcomes/core objectives of CF with definition and the indicators.
Ergebnisse/Hauptziele des Gemeinschaftswaldbewirtschaftungskonzeptes mit Definitionen und Indikatoren.

Outcome	Definition (core objective)	Indicator
Social Outcome	Empowerment of direct forest users	• Access to forest related information • Access to decision making • Access to forest land and resources
Low	No empowerment	No access to information, decision making and/or forest land and resources
Middle	Some empowerment	Limited access to information, decision making and forest land and resources
High	Full empowerment	Maximum access to information, decision making and forest land and resources
Economical Outcome	Contribution to the livelihood of direct forest users	• Forest products • Monetary benefits • Community development[1]
Low	No contribution in livelihood	No access to forest products, no monetary benefits and no community development
Middle	Contribution up to subsistence[2] level	Access to community development which was financed through community forestry and financial benefits and/or products providing subsistence
High	Contribution above subsistence level	Access to community development which was financed through community forestry and/or financial benefits and/or products supplied above subsistence level
Ecological outcome	Contribution to forest condition	• Forest growth • Biodiversity
Low	No contribution on forest stands and biodiversity	Observation of decrease in stands and forest area, no management activities
Middle	Contribution to sustained forest stands	Observation in increase of stands or forest area, forest management plans, control of implementation
High	Contribution to sustained stands and biodiversity	In addition to sustained forest stands, monitoring and increase of biodiversity

[1] Illegal or legal
[2] Subsistence an economy without the possibility to save something

mation, decision rights and/or access, we determine that the social outcome for the direct forest user is intermediate ("middle"). If the direct forest user has no information, decision rights or access the social outcome is low.

The economical outcome for the direct forest user is measured by the contribution of the forest to his livelihood. The options are: all forest products, money from selling forest products or exclusive access to such community development as school buildings, roads, or water pipes financed by community forestry. The degree to which the economical outcome contributes to livelihood improvement is compared with the standard of living of the direct forest user. This means that if the economic contribution allows for a subsistence-level standard of living only, we rate the economic outcome as middle. If the contribution is greater, the outcome becomes high. A small contribution compared to the standard of living will be rated as low, e. g., for Germany the standard for comparison is the annual average income of households. The ecological outcome is twofold (Krott and Stevanov 2008, Maryudi et al. 2012). The first part is sustained stands. This means that reforestation is taking place on degraded areas, forest stands are developing in volume and height or that the forest area increases. This forest's sustained stands are rated as middle. The second part of ecology is biodiversity. If the forest contributes additionally to biodiversity, defined by Dirzo and Mendoza (2008) as species biodiversity, genetic biodiversity, ecosystem biodiversity or a combination of these, we rate the ecological outcome as high.

The outcome analysis is part of a sequence design method (Schusser et al. 2012). In this sequence design method, expert interviews are conducted with actors of the community forestry network and documents and observations are obtained and analyzed applying criteria which are summarized as key facts. From May 2011 to June 2012, in total 91 expert interviews were conducted (Interview source 1 - 91).

Results and Discussion

Eleven community forests were analyzed in the study. The following chapter will present and discuss the results of the outcome analysis. Due to the rich empirical findings it is not possible to present all results in detail. Therefore we have summarized the results and provide representative examples for better understanding. Table 2 presents the summarized results of the outcome analysis according to their frequency of appearance.

Ecological outcome

The results presented in table 2 clearly show that the German community forestry concept contributes towards a positive ecological outcome. All researched cases, according to their ecological outcome, were classified as belonging to the middle category, which means that they are managed in a sustainable way and, consequently, that the ability of the forest to provide products and services is strengthened. A majority of the researched cases is declared to be Flora-Fauna-Habitat (FFH) areas. That means that they are affected by the FFH regulation. With this regulation the European Union tries to interconnect ecosystems of importance with regard to nature conservation issues. The regulation limits the forest management to improve the ecosystem towards biodiversity issues. Apart from that, most of the management concepts incorporate biodiversity issues, like habitat trees or a certain amount of dead wood that should be not removed from the forests. Following these arguments alone, the study should conclude that German community forests achieve a high ecological outcome. However, the study could not find evidence, which justifies a high ecological outcome. All of the researched forests are still managed to produce a high amount of timber. Several officials from

Table 2. Summarized results of the outcome analysis according to the frequency of their appearance for all researched cases.
Zusammenfassung der Ergebnisanalyse für alle Fälle, nach Ergebnissen entsprechend der Häufigkeit des Auftretens.

Number of cases per outcome*	Outcome social	Outcome economical	Outcome ecological
Low outcome	1 (9%)	2 (18%)	0
Middle outcome	10 (91%)	9 (82%)	11 (100%)
High outcome	0	0	0

* In comparison to all 11 researched cases

different regional forest administrations mentioned that the forest administration needs to sell the timber for the community forests to justify their amount of personnel (interview source 18, 87, 91). Additionally, the management committees, as the selected representatives of the members aim for a high economical outcome in all researched cases (interview source 1, 9, 17, 25, 38, 44, 50, 56, 62, 68, 76). This means that if the forest administration wants to keep their costumers satisfied while fulfilling their agenda they need to deliver a certain economic output. A majority of the local foresters interviewed does not see conflicts between their management style and the FFH regulation (interview source 2, 10, 26, 39, 51, 63, 77). All of them answered that they have already included biodiversity aspects but, as a whole, they continued operating as they did before the regulations appeared. This could lead to two conclusions: the first is that sustainable management in practice already contributes to high biodiversity outcomes and the second, that a high biodiversity outcome is not feasible in production forests. The latter is especially true if these forests need to cover management costs and to satisfy the different interests of the members involved. Since we have no evidence for increased biodiversity, this study can only arrive at the second conclusion.

Social Outcome

Apart from one case, all the researched community forests host a general assembly every year. Every 4 to 6 years the direct forest users have the possibility of selecting their management committee. During general assemblies they can vote, according to their shares, on common decisions, e. g, whether the committee wants to buy new land. Apart from that the direct forest user has legal recourse to influence the direction of management through majority decisions which, in reality, are difficult to achieve. He has very limited access to forest products and maybe he is not allowed to obtain other products other than firewood, like poles or trunks, free of charge. Access to the forest, e. g., for recreational purposes, is a common right for every citizen in Germany and is therefore not seen as an outcome of community forestry.

The management committee takes on the responsibility of managing the community forest on behalf of all direct forest users (members). Their decision making authority is established in the constitutions or, if not, in the regulations based in ancient laws. One example is the regulation on coppice system management for the commune Altenkirchen, 1890, paragraph 21 (Haubergordnung für den Kreis Altenkirchen), which states that the chairman has the power to issue fines against users who have not followed the management regulations. In most cases the committee informs the members about the activities, which have taken place, as well as about the financial accounting. The committee is able to determine the amount of the annual revenue paid out or decides about whether and how the firewood is distributed among the members. Apart from this, the committee decides mostly about the hunting leasehold rights, which in good hunting grounds are highly valuable.

For all researched community forests the local forest administration, as subsection of the regional forest administration, manages advice and/or supervises the community forests. The local foresters are often a part of the community and in some cases they are also chair holders of the community forests (Interview source 26, 77). They also have forest expert knowledge, which is difficult to verify by the direct forest user of the community forest (observation 5, interview source 2, 10, 18, 26, 39, 45, 50, 56, 63, 69, 77).

Due to the still unsolved legal status in Rhineland-Palatinate and Hesse, the community forests are seen as bodies governed by public law ("Körperschaften des Öffentlichen Rechts") from which an obligation emerges that this kind of forest should fall under the management jurisdiction of the forest administration. In 1975, North Rhine-Westphalia created its own law concerning community forests. In the amended version of 2008, paragraph 19 states that supervision is the responsibility of the regional forest administration, and paragraph 23 that the community forest has to have an annual management plan, which needs to be approved by the same administration. Lower Saxony also created a law, which concerns about organizations and the community forests in their different forms. The law (Niedersächsisches Realverbandsgesetz, 1969, amended 2010) does not regulate forest management, it only prescribes that the overall supervision should be carried out by the nearest political commune. The Lower Saxony forest law requires a management plan but it only stipulates that the plan has to be developed by a forest expert. Lower Saxony recently changed the legal status of its forest administration into a public-law institution. With this the Forest Administration shifted its responsibilities to the Chamber of Agriculture. The community forest in Lower Saxony could decide on who is to draft the management plan and whom they would like to consult on forest expertise. However, all three community forests researched in Lower Saxony are managed by the Forest Administration. The community forest has to pay for the agreed management packages but the management is subsidized by the Chamber of Agriculture and the Regional Forest Office assists with the application process. Since the regional forest administration drafts the management plan and most of the timber is traded via the regional forest offices, the Forest Administration can influence community forest management. Following these arguments the study concludes that the direct forest user is only partly empowered, as determined for most of the cases (see table 2).

Economical Outcome

On average, the direct forest user of a community forest receives an annual payout of around 200 € $year^{-1}$. With the formula presented by Wobst (1971, p. 123), which uses the average annual revenue per chair as well as the forest interest rate (3%) the assumed value per chair for the cases researched can be roughly calculated to be about 6,600 € per chair on average (suggested by several chairman's, interview source: 1, 9, 25, 38, 50, 56, 87). Apart from this, the direct forest users can sometimes obtain firewood for a reduced price or for free and they can use common buildings, e. g., huts, if these exist.

According to the Federal Office for Statistics (Statistisches Bundesamt 2012) the average annual income varies from 3,508 € (male) to 2,861 € (female) per month. Comparing the average annual revenue presented above with these figures it becomes clear that the direct forest user cannot generate his income through community forestry. If he wants to keep his standard of living he has to obtain other income. In recent times most of the direct forest users do not depend on the forest for their livelihoods anymore. This is why the revenue payout, the value of the chair and the possibility of using the huts are evaluated as not significantly contributing to an improvement in the standard of living of the direct forest user. Therefore the economical outcomes were evaluated as belonging to the middle category in most cases. Only in two cases was the payout close to zero, which is why these cases were assigned to the low category.

Nevertheless, all researched community forests can cover their costs with the generated income. This result is not surprising considering that, according to the forest experts, we had selected the best-functioning community forests. This can be surprising however; if someone assumes that the best-functioning community forest should achieve more than a middle economical outcome. In addition, the community forests researched still receive a kind of subsidy and/or support from their respective forest administrations. It would be interesting to determine the consequences, especially for ecological outcomes, if this support is removed as requested by the European Union (interview source: 40, 87, 91).

Conclusion: Forest first in community forests

Burckhardt (1876) already mentioned that to avoid divestiture of the forest and with this its destruction, the community forests should be managed by forest experts and hat it should be forbidden that forest owners split the forest up into small pieces. He adds that the community forests are brought into the sphere of influence of the Forest Administration and that "nobody thinks about" (1876, p. 75) removing the laws, which have been created for this.

Following this statement the results of the study show that the community forest concept in Germany cannot deliver towards the international goals of meaningful participation and high profits for all users. But the approach contributes towards sustainably managed forests.

The findings are in line with the scientific discourse about community forestry as it is presented in the introduction. That means that these results confirm the reality of community forestry, which does not coincide with the ideal concept with its comprehensive ecological, economic and social goals. In Germany no example of the ideal concept can be found, but the German experiences are relevant in practice if the goal is to protect the forest stands and manage them toward long-term goals.

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Who determines biodiversity? An analysis of actors' power and interests in community forestry in Namibia ☆

Carsten Schusser *

Forest- and Nature Conservation Policy, Georg August University Goettingen, Büsgenweg 3, 37077 Goettingen, Germany

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ABSTRACT

Recent and ongoing research has begun to question the efficacy of community forestry programs. In particular, analysis seems to reveal that devolution of power to the local resource user does not happen. Nevertheless, it also appears that community forestry programs do deliver some of their promises. Especially, the biodiversity of the resources involved is often improved. But who determines this, if not the local resource user? This article seeks to answer this by analyzing the biodiversity of 14 community forests in Namibia. The authors apply their power theory and methodology to identify the powerful, actors and these actors' interests. Finally, the author relates his findings to the real outcomes for biodiversity.
The article concludes that biodiversity is only in the interest of a few powerful actors who have used their power to achieve a positive outcome for biodiversity. Therefore, the article argues that biodiversity in community forestry depends on the interests of powerful actors.

1. Introduction

Community Forestry (CF) programs aim to improve the livelihood of local people as well as the condition of natural resources on which they depend for their living. If local people were involved in decision-making processes concerning natural resources, they would develop a sense of ownership and start using them in more conservative ways (Agrawal, 2002). It is assumed that the involvement of local natural resource users will contribute to sustainable practices, leading to various positive outcomes for the direct users and natural resources (Kellert et al., 2000; Blaikie, 2006).

Various community forestry programs were and continue to be implemented around the world. It seems that these approaches enjoy worldwide popularity. They started to develop after the 1970s, when researchers and policy makers realized that conventional centralized management practices were not the right approach for tackling environmental protection issues involving local people. In addition, many researchers have started to look more closely at the problem of how to solve natural-resource related problems when these involve local users. Many of them have concluded that this requires power devolution to the local users, even at the community level (Ostrom, 1999; Acharya, 2002; Lachapelle et al., 2004; Nygren, 2005). Furthermore, many other investigations were conducted to explain how the social processes of community forestry function within the community (Pye Smith et al., 1994; Ostrom, 1999; Agrawal and Gibson, 1999; Gibson et al., 2000; Barrow et al., 2002; Moran and Ostrom, 2005; Thomas, 2008).

It appears that, at least, community forest approaches deliver on their promises in that positive ecological outcomes are achieved (Brendler and Carey, 1998; Chakraborty, 2001; Dietz et al., 2003; Thomas, 2006; Charnley and Poe, 2007; Adhikari et al., 2007; Singh, 2008; Wollenberg et al., 2008; Devkota, 2010; Vodouhe et al., 2010; Maryudi, 2011; Pandit and Bevilacqua, 2011).

What about the direct resource users? Maryudi (2011) analyzed community forests in Java, Indonesia and concluded that local forest users were not benefitting significantly, neither in empowerment nor in livelihood improvements. Devkota (2010) has presented similar findings, and according to Edmunds and Wollenberg (2001:192), it is likely that the poorest forest user has become worse-off than before. Shackleton et al. (2002) conclude: "The way in which local people realize the benefits of devolution differs widely, and negative trade-offs, mostly felt by the poor, are common." In addition, Wollenberg et al. (2008) conclude that neither the co-management nor the local government model have met the high expectations of the community forest program. A number of researchers (Ribot, 2004, 2009; Larson, 2005; Blaikie, 2006; Dahal and Capistrano, 2006) have analyzed the common practice and have shown that decentralization policy is seldom followed by genuine power devolution to the local users. Edmunds and Wollenberg (2001) report similar findings, i.e., that local institutions are vulnerable to external powerful actors and that these powerful actors are more likely to dominate the processes. Agraval and Gibson (1999, p. 629) suggested that it would be "more fruitful" to focus on "internal and external institutions that shape

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* Tel.: +49 551 3919663; fax: +49 551 393415.
E-mail address: cschuss@gwdg.de.

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the decision-making process" and that it is important to know what the multiple interests of the actors are, and how they make decisions regarding natural resource conservation. The same is suggested by Shackleton (2002, p. 1): "More powerful actors in communities tend to manipulate devolution outcomes to suit themselves".

Considering all this, we started to wonder whether community forestry programs are suitable for the achievement of power devolution and the fulfillment of its promises. To contribute to the scientific discourse, we designed a research project which involves community forest case studies from 9 countries around the world. The aim was to obtain results which allow international comparisons. We developed our own power theory and methodology to find out who the powerful actors were, and we analyzed their interests as well as the ecological, social and economic outcomes. Our research aims to test the following hypothesis in each country: "Outcomes in community forestry depend on the interests of powerful actors". We would wish that our results could contribute to the fulfillment of the needs which Shackleton (2002, p1), identifies in her conclusion: "A sheared framework, more accountable to local livelihood needs and people's rights to self-determination, is required…".

Due to the complexity of the research project this article will only focus on the issues of biodiversity as an ecological outcome, and the powerful actors and their interests in community forestry in Namibia.

2. Methodology

This research was conducted in separate field research periods from November 2007 to November 2009. It focuses on the CFN (Community Forestry Namibia) project (formerly known as Community Forestry in North Eastern Namibia (CFNEN)). With the funds available for the field research, fourteen community forests could be selected as appropriate case study areas.

The selection was done after consultation with local forest experts. The selection criteria included the development status of the community forest, where 7 community forests were in the advanced stage (forest management rights are handed over officially) and 7 others in the initial stage (this being the establishment phase). The case study areas are located in northeast Namibia and are distributed in three core CFN Project regions (Otjozondjupa, Kavango and Caprivi). It was assumed that most of the actors involved were still available during the research since all community forests were active and supported by the project. Apart from this, the researcher was familiar the regions, could speak some of the local languages and had good contacts to the actors of the CFN project. These are the reasons why the selection in these three regions was confirmed for the case study.

2.1. Actor-power analysis

To work with this number of cases we developed a sequence design of preliminary quantitative and follow-up qualitative methods to save resources. We assumed that a sequence of quantitative and the qualitative surveys could save about half of the resources needed for the field work as compared to a single qualitative method. At the same time, the quality of the research could be kept high by having flexibility in the formulation of hypotheses and in the search for empirical evidence. Good validity was secured by starting based on radically simplified hypotheses and then formulating increasingly complex hypotheses, step by step, based on existing theories but remaining within in the framework of the initial hypothesis. This means that we simplified the hypothesis for the quantitative survey in a way such that we were able to say that there were only two groups of actors, powerful ones and less powerful, without explaining why. In the second step we were then looking only at the powerful actors. We then made the hypothesis complex and tried to explain their power status. According to Schusser et al. (2012) this method fulfilled its promises and reduced the actual number of months of work needed for one qualified researcher down to 40% as compared to an approach with a single qualitative method.

The sequence design starts with a preliminary quantitative network survey. It aims to identify most of the participating actors, their power and the most powerful actors. We consider not only individual persons to be actors, but also institutions and organizations if these have the possibility to intervene in community forestry by themselves. According to our own power theory (Krott et al., in review) which was used by Devkota (2010) and Maryudi et al. (2011), we define actor-centered power as a social relationship between different actors. We define the power of an actor as the ability to influence the behavior of another regardless of the latter's will. The model of actor-centered power is built on three power elements an actor might have to exercise power. These are coercion, incentives and trust, which we define as follows:

- Coercion: altering the behavior of another actor by force
- Incentives: altering the behavior of another actor by providing advantages (or disadvantages)
- Trust: alteration of another actor's behavior due to his accepting information without verifying it

To identify the actors and their power elements, a network analysis technique was used and adopted, where a snowball sampling technique (Hasanagas, 2004; Patton, 1990) was applied to identify all actors. A special kind of interview called survey research interviewing (Neumann, 2011) was conducted. Semi structured, in-depth interviews were used to get interviewees' opinions, views and interpretations of the reality of the actors' power (Walsham, 1995). In a second step the preliminary findings were enriched through any kind of evidence, e.g., observations and/or documents.

The research started with a quantitative preliminary network survey in pre-selected community forests. A snowball interview technique was used, interviewing first the chairperson, and if he was not available, another member of the community forest management committee. The interviewee was asked to mention all actors with whom they cooperated for any of their community forest activities. This question was addressed to all actors mentioned, always referring to the selected community forests, until no new actor appeared. The interviewee was asked to evaluate the actors which he had mentioned before (assessment by others). An experienced researcher asked the questions in a way which the interviewee could understand. Through his cultural understanding the researcher could offer "face-saving alternatives" (Neumann, 2011) to keep the social desirability bias small. All answers given for each individual actor and the three corresponding power elements were summarized to complete the quantitative preliminary study.

To determine, from that information, which actors belonged to the group of powerful actors, a simple but justifiable and reliable method, called the dominance degree (D_m) (Häni, 1987) was applied. The method was discovered in the field of economics (Schmidt, 2005) and it tried to identify the group of actors who dominate the group of all actors executing power on the same market. The method was examined and tested via the three following assumptions:

Assumption 1. The power element values are equal, indicating that all actors have the same power and are weak within the network.

Assumption 2. The power element values are distributed in progressive stages (gradational). This means that everybody has two neighbours with more or less the same power. In this case a large number of actors are needed in order to establish a strong alliance.

Assumption 3. The power is unequally distributed and few actors have high power element values, which identify the strongest actors, those which make up the powerful actor group.

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The tests verified the assumptions and therefore the method was used to determine which actor belonged to the group of powerful actors (see Appendix A).

Marsden (1990, 2011) states that the accuracy of the information gathered from the interviewees referring to other actors in the network is relatively low. Factors like gender, moral restrictions and relationships, especially when questions were asked about powerful actors, could contribute to the distortion of the answers or could be answered incorrectly. This is why the results from the preliminary quantitative network survey were tested in the follow-up qualitative power survey.

The qualitative data analysis examines individually the power sources of the actors representing the most powerful actors. Theoretically, the observations look for empirical evidence of specific power sources or processes within the framework of the three elements of power. For example, coercion can be exercised by using a power source or by threatening. The power source could be the rifle of a forest guard, the physical strength of a truck or igniting a fire. Qualitative in-depth interviews shed light into such power features, accompanied by observations and secondary data like a forest management plan, laws, meeting minutes, guidelines or letters of formal acts from the field. The interviewer identifies an empirical phenomenon in order to find a relation to the power element which would support the existence of the specific power element. For example, the possession of a rifle by a forest guard indicates that he can exert considerable coercion over a forest user with no gun. The hypothesis specified in the power feature becomes complex, therefore we need to identify theories which correspond to the observation and which support empirically the formulated power feature.

A qualitative field investigation requires good access to the field actors. An initial introductory meeting between the researcher and the actors was followed by arguments and discussions which were merely symbolic at the beginning, but after time the observations became more substantial. Reliability is increased when the field researcher requires more time for the respective actors, for making the observations, and then analyzing them and the documents obtained in the field work.

A triangulation of preliminary sequence and qualitative investigation results is the final step in the sequence. If an actor is powerful some evidence can be found during the qualitative follow-up sequence. Therefore, the proof or disproof of the results of the preliminary quantitative sequence could be made via the qualitative second sequence. If the quantitative data analyses indicate power elements of an actor, it is the qualitative follow-up sequence which identifies power features. For example, if the quantitative survey determined that a certain actor had coercive power, the qualitative investigation had to find irrefutable evidence of this. Priority of the results was given to the qualitative survey due to the rich empirical evidence in qualitative interviews, documents and observations. The qualitative survey does not quantify the power of an actor, but identifies the power sources.

Following our own power theory (Krott et al., in review) we argue that the actor-centered power model makes the power factor, which is often blurred, well applicable in research and practice. The following goals for answering the relevant power questions in practice are met.

"Actor-centered power is described as a specific social relation, distinct from other influences which produce outcomes. The restriction, by definition, that it must alter the behavior of the subordinate excludes all forces from the term "power" which directly influence problem-solving, like managing the forest, for example. It excludes all ecological–technical forces which intervene in the forest. Those can be described and explained much better by the ecological–technical disciplines than by political science. Another important aspect is that any resources an actor may own become power only if they are used to alter the behavior of other actors. As long as they are used to manage the forest they are considered to be building up his ecological–technical potential. For example, the access to good soil, machines, fertilizer or plants affects forest management to a great degree. Due to the restrictive nature of the term "actor-centered power", ecological–technical influence can be analyzed and optimized without confusing it with the complex issue of power.

Actor-centered power is linked to actors directly. They play the role of potentate or subordinate depending on their power sources and the specific issue at hand. The most powerful actors can be identified by accumulating their roles as potentates. This can be done within the framework of a power network, discriminating well a group of powerful actors from a group of weak ones (Devkota, 2010; Maryudi, 2011). The model does not assume that the powerful actors are always most powerful because in specific relations they might be forced to the subordinate side. This hypothesis fits in with many observations where a specific actor dominates most of the time but not always in all relations.

Actor-centered power specifies three elements of the general term "power" (see Table 1). Power is assumed only if behavior is altered by force, (dis-)incentives or trust. This specification enables us to separate power from other social relations which alter the behavior of actors. Communication based on verified information is of the greatest importance. If two actors exchange information they both verify, they build up a social relationship which is the opposite of a power-based relationship. This kind of communication constitutes political bargaining in which both can make informed decisions as long as all information is shared. Open bargaining about sources means offering to other actors what they most urgently demand for themselves, at least in part. As we have discussed, we regard (dis-)incentives to be power because the will of the subordinate with regard to his prior resources is neglected by the potentate applying (dis-)incentives. For example, the subordinate gets money for planting trees until he overrides his prior will to plant corn. The amount of the power source known as money decides the outcome, and not the will of the subordinate.

The specified power elements are linked to observable factors (see Table 1). These include the wielding of power as well as threats and sources. The sources of power offer the best opportunity for collecting empirical data. They are specific and observable, like any kind of weapons, economic resources or information."[1]

2.2. Outcome analysis

"Biodiversity — the constellation of plants, animals, fungi, and microorganisms on earth; their genetic variation; and the communities and ecosystems of which they are a part — is a central component of the earth's life support systems…." (Dirzo and Mendoza, 2008: Encyclopedia of Ecology, pp. 368–377). The definition shows that biodiversity can be seen from different angles: species biodiversity, genetic biodiversity, ecosystem biodiversity or a combination of these. To test our hypotheses that the ecological outcome of CF depends on powerful actors' interests we need to know what that ecological outcome is. We think that biodiversity is an appropriate factor with which to assess the ecological outcome, since it covers most aspects of a forest resource. To analyze ecological outcomes we needed an endpoint, as suggested by Failing and Gregory (2003). What does this mean? We could assume that at the beginning of the CF program the Namibia forests were already in a degraded state. Then the fundamental objective would be the improvement of biodiversity to improve the social and economic value of the resource. In this case Oka et al. (2001) suggest the use of indicators which are related to genetic diversity or ecosystem biodiversity. We would even go one step further and argue that species biodiversity should be also targeted since species are the source for economic tradeoffs. But we

[1] Krott et al. (in review). Actor-centered power analysis for identifying the political potential of stakeholders.

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Table 1
Definition of core elements and observation of actor-centered power[2].

Power element	Definition	Observable facts
Coercion	Altering behavior by force	Physical action, threat of physical action or sources of physical action
(Dis-)incentives	Altering behavior by (dis-)advantage	Providing benefits and/or removing detriments or threatening to introduce detriments and/or remove benefits, material or immaterial
Trust	Altering behavior by unchecked information	Providing of, or threats with sources of information unverified due to lack of will or ability

could also assume that existing forests have been structurally changed with, for example, the enrichment through exotic species which do not fit into the ecosystem. In this case CF needs to remove the exotic tree species (unsustainable management) to restore the original conditions and improve the biodiversity of the ecosystem (ecosystem biodiversity). The different assumptions demonstrate how difficult it is to measure the impact of CF on biodiversity without knowing why biodiversity is important (Failing and Gregory, 2003).

Previous evaluations of the state of Namibian forests include the following assessment by Barnard (1998, p.108): "This section of the Biodiversity Country Study gives what might be the "meat" of Namibia's information on biodiversity […] Unfortunately the "patchiness" of information alluded to elsewhere in the book is nowhere more apparent than here." The quote shows how difficult it is to obtain information related to biodiversity in Namibia. The same applies to forest-resource related information. Erkkilä and Siiskonenen (1992, p. 142) state that "there have been no national assessments of wooden biomass in Namibia." They mention old forest inventories for the researched regions: Caprivi region: Breitenbach(1968); Kavango region: Gelendenhuys (1975) and Otjozondjupa region: Hilbert(1986). The reports of the inventories are unpublished and could not be obtained. Further information provided by Erkkilä and Siiskonen (1992) about these inventories leads to the conclusion that it would be impossible to transfer the old information onto today's community forests. Erkkilä and Siiskonenen (1992, p149) also state that "Namibian forests and trees have for centuries provided building material, fuelwood …" and they cite Breitenbach (1968) who researched the succession stage of forests in the Caprivi region and discovered that the forest "rarely developed towards their climax stage" (Erkkilä and Siiskonenen, 1992, p 167). Apart from the old forest inventories and some new forest resource assessments which were conducted by the Namibian Forestry Administration together with a Finnish project in the late nineties, nothing could be found which describes the biodiversity conditions of the researched forest before the CFN project started. Medlesohn and el Obeid (2003) state that in the Kavango region the people which in the past had mostly settled along the river now live also inland and use the forests for their living. Supporting this, Shackleton et al. (2007) also mention the importance of forests for people's livelihood. Taking this into consideration, as well as the other information mentioned above, we concluded that the natural composition of the researched community forests was already human-influenced. Therefore we decided to follow our first assumption: the CF objective is to improve biodiversity in order to maintain and/or increase the social and economic values of the forest resources. Therefore it needs to improve the existing biodiversity so that it more closely resembles the natural ecosystem.

[2] Krott et al. (in review). Actor- centered power analysis for identifying the political potential of stakeholders.

Monitoring results is necessary in order to analyze the ecological outcome. Spellenberg (2005) defined monitoring as "the systematic measurement of variables and processes over time" to determine whether the conservation approach has reached its objectives (Stuart- Hill, 2003). We are aware that monitoring biodiversity, especially in southern Africa, is complicated and that there is a debate about whether this can be done through the involvement of local people. This was tested with the event book system, used mostly for wildlife monitoring in Namibia (Stuart- Hill et al., 2005; Costa, 2007) and this approach brought some promising results. This is why we looked for a concept which is at least similar to evaluate the biodiversity of forest ecosystems.

The situation was complex, since almost no data existed. Even if an actor conducted an assessment we could not judge the effect of the community forestry approach. Apart from that the time frame within which the project ran (the 10 years during which the research was conducted) might have been too small to determine the impact on biodiversity, especially in these very slow-growing forests. For example, *Pterocarpusangolensis* or *Baikiaeaplurijuga*, very popular sources for timber and the main tree species, need around 130 years (Mendelsohn and el Obeid, 2005) to grow into a harvestable size (45 cm diameter at breast height (DBH)). Since we did not find appropriate information to develop indicators and since it was impossible for us to develop indicators and to measure them in the field, we estimated the effect of CF on biodiversity via modeling and expert judgment, as suggested by Failing and Gregory (2003). Therefore we designed a model with 3 categories which are possible to evaluate and which involves expert judgments. This meant that, to evaluate the effect on biodiversity we were searching for factors to determine into which category the outcome falls. At the same time, the factors relied on the expert knowledge on how to improve biodiversity (activities promoting better management like assessments, management plans, fire management…). Alternatively, they relied on the expert's judgment on how to monitor biodiversity (monitoring systems or reports) which is presented in Table 2.

2.3. Interest analysis

Asking an actor directly what his interests are might be a way to determine these. But the answers might be questionable, especially if the actor wants to hide his real interests. To avoid this we analyzed actors' interests following Krott (2005): "Interests are based on action orientation, adhered to by individuals or groups, and they designate the benefits the individual or group can receive from a certain object, such as a forest". He states that interests cannot be observed directly, but according to this definition they can be determined through observations of a given actor's behavior. How

Table 2
Definition and observation ofthe ecological outcome.

Ecological outcome *(corresponding forest resource)*	Definition	Observable factors
Low	No improvements on biodiversity or reduced biodiversity	No management or uncontrolled management activities
Middle	Assumed improved biodiversity through the application of sustainable management	Resource assessments, inventories, management plans, controlled harvesting activities, protection activities, e.g., fire management activities
High	Improved biodiversity	Acceptable proof, like a monitoring system or report

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the actor behaves and what he does are indicators which show his interests (Schusser, 2012 in print). This means that if an actor has no interest on a positive biological outcome he will be indifferent toward biodiversity issues. Therefore interviews with powerful actors were conducted and field observations were made to assess these behaviors.

2.4. Interrelation analysis

To test our hypothesis we assessed the correlation between the interests of the powerful actor and the achieved ecological outcomes of community forestry. Therefore we designed an indicator (PIDO: Powerful Interest Desired Outcome). The indicator shows the degree to which the powerful actors' interests can be related to the ecological outcome. Based on the actual community forest ecological outcomes we can now test whether the interest of the powerful actor corresponds with the outcome. The following scenarios are possible and are presented below:

- PIDO (+1): the powerful actor has an interest in a high outcome
- PIDO (1): the powerful actor has an interest in a middle outcome
- PIDO (−1): the powerful actor has an interest in a low outcome
- PIDO (0): the powerful actor has no interest in a specific outcome

3. Results

3.1. Actors and their power

In the sequence design fourteen community forest networks were analyzed. The results show that the identified participating number of actors (network size) varies from 9 actors (smallest) up to 27 actors (biggest). In total, 349 interviews were conducted. The results of the sequence design for the powerful actors are presented in Table 3.

The Directorate of Forestry bases its power on a mixture of all three power elements, of which coercion is at its full potential, 100%. The results can be explained by the establishment of CF Project where DoF is one of the partners which holds monitor and control functions regulated by the Namibian Forest Act and also provides incentives or has the power to withdraw them (disincentives). DoF provides a great part of the information related to the CF establishment and management. Most of this information was accepted by the local community without verification. We could verify this on occasions when the Directorate distributed incorrect information which was never questioned by the target group. In addition, the Directorate provided financial incentives, like payments for opening up and maintaining firebreaks. It also offered management possibilities to the communities and threatened communities to withdraw them if they did not comply with its rules. But it was classified as 100% powerful by the use of coercion. According the Forest Act the officers of the DoF are allowed to use coercion or threats to maintain the law. We could verify this on several occasions, e.g., officers of the Directorate stopped other vehicles on the road, using cars which could not be identified as government cars, wearing no uniform and no guns and no ID cards, but still carried out vehicle searches and in some cases confiscated personal belongings, in one case even the car of a suspect who offered no resistance.

The German Development Service (DED) is considered to be 100% powerful, based on trust and incentives as power elements. DED is the second partner in the establishment of community forests. It administrates the funds provided for the CFN project by the German government via the German Development Bank (KfW). Like the DoF, it provides information which is accepted without verification. It provides most of the benefits and can use the threat of disincentives, e.g., if the communities do not do what the DED wants, it can stop payments and/or remove promised incentives like the construction of an office building. Unlike the DoF, the DED is unable to use the power element of coercion.

The Traditional Authority (TA) is considered to be 100% powerful regarding coercion and sometimes trust. The trust is based on the status of the Traditional Authority. They are seen as the leaders and representatives of the different tribes. Culturally, questioning their status is not allowed. The finding that the power element of trust was seen as a power source for the Traditional Authority only in 50% of the cases is interesting. The coercive power remains in Namibian law. The regions where research was conducted are declared to be common land (state owned). This means nobody can own them privately. The Namibian Traditional Authority Act provides the legal base from which recognized traditional tribe leaders can wield power The TA leader determines the land use, needs to approve a community forest application and acts with judicative authority in cases of mismanagement or criminal actions, which was observed on several occasions.

The Village Head Man/Woman is part of the Traditional Authority at the village level. By himself, the Village Head Man has fewer possibilities for wielding power than do their leaders. Nevertheless, he is usually an elderly person whom the people of a community believe to be experienced and to have the wisdom to negotiate conflicts and manage various aspects of village life (Pröpper, 2009). The recommendations (information) from the Village Head Man are highly valued and are not verified in 14% (2 Community Forests) of the researched cases. This small figure can be explained as follows: only three of the researched community forests (Ncumcara, Ncaute, and Mbeyo) are not in joint cooperation with a conservancy. The conservancies operate on a larger scale and involve more than one community (village) whereas these 3 community forests are surrounding only one community (village). In one of the community forests the local villagers had a dispute with the Village Head Man, who was

Table 3
Summary of power elements used by powerful actors and their frequency of appearance in comparison to all 14 researched community forests.

Name of powerful actor	Frequency of appearance in comparison to all cases (%)	Frequency of each power element identified in comparison to all cases (%)		
		Trust	Incentives	Coercion
Directorate of Forestry (DoF)	100	79	71	100
German Development Service (International Donor)	100	100	100	0
Traditional Authority (TA)	100	50	0	100
Forest management Committee (FMC)	100	71	0	0
Conservancy Management Committee (CMC)	43	43	0	0
Village Head Man (TA)	43	14	0	0
Ministry of Environment and Tourism	71	14	0	0
Namibian Nature Foundation (NGO)	21	14	14	0

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against the CF approach and therefore always questioned any information he received concerning the CF. The conservancies have a direct link to the TA leaders, and therefore the Village Head Man plays a minor role.

The Forest Management Committee (FMC) is selected by the people of the corresponding community forest to act on their behalf. The FMC manages the Forest and can decide on most management activities. Consultations within the community take place with regard to crucial questions, like how to use generated community money. The FMC is considered to be trustworthy in 71% of the cases. This means that not in all the community forests researched did people accept unverified information provided by the FMC.

The Conservancy Management Committee (CMC) belongs to another approach of the Community Based Natural Resource Management (CBNRM) concept in Namibia. They are the elected representatives of conservancies which deal with the sustainable management of natural environments, with a strong focus on wild animals and tourism activities. In most of the areas where the CMC was identified as a strong actor, the conservancies were already in place before CF started. The CF regulations require having an elected FMC, which is why these double structures can be found. CMC's are mostly in charge of activities related to the management of wildlife and tourism, and have less to do with forest management. For this reason they are seen as a separate actor, although some interviewees have mentioned them as one. In 43% of the researched cases they were assessed as being a strong actor with regard to the power element of trust. This comes about because the CMC also provides information about CF, and since they have good standing as the representatives of the conservancies, the community people have accepted the CF-related information unchecked.

Conservancies are supported by the Ministry of Environment and Tourism (MET) as well as the NNF (Namibian Nature Foundation) non-governmental organization (NGO). This explains the power status of these actors, which centers mostly around trust and incentives as power elements in the case of the NNF. Both actors mostly distribute information about CF which was never found to have been verified (examples of distributed information which was incorrect were never questioned) Apart from that, the NNF provided some small incentives, namely funding for joint meetings or offers of financial support for management-related activities.

3.2. Ecological outcome

Table 4 presents the ecological outcomes analyzed, and also those factors on which the findings are based.

The ecological outcome was determined to be low only for four community forests. That does not mean that biodiversity is not an issue for them. N≠a-Jqna, Muduva–Nyangana and Georg Mukoya community forests belong to conservancies but the CF approach was still at an initial stage: activities regarding the ecological outcome were planned but not yet carried out. The Kampinga–Kamwalye community forests and conservancy were planned to be established as one concept from the beginning, but due to some unsolved land use disputes every activity was put on hold.

Apart from these four community forests all other researched community forests were categorized as middle, meaning that an improved biodiversity can be assumed. Only the Makata community forest had a monitoring system based on the forest resource, but it was not followed up and no final evidence of improved biodiversity could be found. Masida, Kwando, Sashona, Mujako, Izimbwe, Ngoma, and N≠a-Jqna belong to conservancies in which they use the event book system (monitoring system). But since the event book system had not yet been adopted to monitor the forest conditions as well, no final evidence of improved biodiversity for the corresponding forest ecosystem could be found.

3.3. Interests of powerful actors

On January 3, 2006 an illegal harvesting case was discovered in the Mbeyo Community Forest, where 54 logs were harvested without a permit. The illegal harvesters were sent to a traditional court on March 16, 2006. The judge at this trial was a Senior Head Woman who lived in the area and who belonged to the Mbunza Traditional Authority. The illegal harvesters were charged with penalties. Six months later, a new illegal harvesting case was discovered during the inspection of the transport permits issued. In this case, 232 logs were harvested illegally, but they were transported legally, with valid documents issued by the Forest Management Committee. The case was investigated and discussed extensively, and results highlighted a misuse of the power granted to the FMC in question. The origin of this was found to be a lack of qualification to issue and monitor permits. A plan was drafted which was meant to improve the situation. A DED staff member recommended to stop the harvesting of trees for the next two years or until an assessment were to show that the number of illegally harvested trees would not exceed the sustainable yield. During that time 140 trees were allowed to be harvested per year via a permit issued by the directorate. The number of harvestable trees was based on the results of the resource assessment of a neighbouring area. Seven months later (March 2007) a new case of illegal harvesting was found. This time, the harvesters of 57 logs were arrested. The investigation revealed that the Senior Head Woman who had been the judge in the case mentioned earlier was the employer of the arrested harvesters, and that she had commanded them to harvest the trees for her. The DoF district forest officer brought all evidence together and presented it to the Senior Head Woman during an official meeting in the presence of the police. At the end of the meeting he arrested the Senior Head Woman and handed her over to the police. The chief of police of this region released her directly thereafter and the case was dropped. As a consequence, the DoF office in charge established a rule that all transport of community forest wood products out of the region should be monitored by the corresponding DoF office. In February 2009, this researcher was present at a community meeting where DoF and DED staff tried to clarify another illegal harvesting case which was discovered via the transport permit control. The case was investigated and brought forward by an involved DED staff member. This time more than 400 logs from timber trees were harvested illegally. It was found that the corresponding DoF office had monitored the transport permits which went out of the region and had approved them without realizing that the Mbeyo community forest had already exceeded its official limit. During that meeting the Senior Head Woman from the earlier cases was present as an official representative for the Mbunza Traditional Authority. In the end, the results were the same as with the other transport permit case. The meeting concluded with the agreement to improve the situation, and the Mbeyo community forest, and especially the FMC, were still allowed to continue their activities.

The examples above demonstrate how the interest of the actors was analyzed. They indicate clearly that the interests of the Directorate of Forestry, the Forest Management Committee of Mbeyo

Table 4
Results of ecological outcome analysis and factors on which the outcome was evaluated.

Name of CF	Ecological outcome	Observable facts
Ncumcara	Middle	PNRA, wood resource report, preliminary MP, forest fire management attempts
Mbeyo	Middle	PNRA, preliminary MP, forest fire management attempts
Ncaute	Middle	PNRA, preliminary MP, forest fire management attempts
Muduva-Nyangana	Low	No factors were observed
Georg-Mukoya	Low	No factors were observed
Kampinga-Kamwalye	Low	No factors were observed
Masida	Middle	PNRA, preliminary MP, preliminary fire MP
Kwando	Middle	PNRA, preliminary MP, preliminary fire MP
Sashona	Middle	PNRA, preliminary MP, preliminary fire MP
Mujako	Middle	PNRA, preliminary fire MP
Izimbwe	Middle	PNRA, preliminary fire MP
Ngoma	Middle	PNRA, preliminary fire MP
Makata	Middle	PNRA, preliminary MP, forest fire management attempts, adopted forest event book system (established, not followed up)
N≠a-Jqna	Low	No factors were observed

PNRA: Participatory Natural Resource Assessment.
PM: Management Plan.

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and the Traditional Authority of Mbunza do not lie with the sustainable use of trees. Officially they all wish to use resources in a sustainable way, but as the examples show, they do nothing for this. Rather, this state of affairs seems to indicate that all three actors mentioned want CF to continue, but for the wrong reasons. From the observations it could be assumed that the FMC and the TA are only interested the benefits generated through the sale of forest products (logs). The reason for the Directory of Forestry's continuing support cannot be found through this observation. Nevertheless, other evidence found (observation of an national planning meeting for the development of the Forest Strategic Plan as well as the draft Forest Strategic Plan) indicates that the Directorate uses the figures from CF to legitimize their status at the national level (DoF with community forestry contributes to the GDP via the mobilization of forest products, and with this, to rural development and poverty reduction). Other evidence (Budget Plan 2005 and 2006) indicates that, through the CFN project, the Directorate had access to a new budget earmarked exclusively for CF activities, which they had never had before 2006.

Regarding the interest in biodiversity only the German Development service took action to prevent overutilization. The existence of preliminary management plans or resource assessment was initiated by the DED. They developed and established the PNRA, were highly active to get it applied in the field and paid most of the costs. They incorporated the assessment of non-timber forest species as well as the assessment of dead wood and they created 3 new positions. Appropriate knowledge was needed to analyze the PNRA data on a GIS-based computer program. In the Caprivi region the DED brought the analyzed information back to the community forests. At the same time, they developed a technique which allowed the local resource users to be part of the analysis and to understand the data. Later, the results were discussed and the local people got the possibility to decide about the future management of their resources. The example shows that the DED is an actor whose actions clearly indicate its high interest in biodiversity.

The examples above are shown in this article to demonstrate how the interests of the powerful actors were analyzed. The summarized results are presented in Table 5.

Table 5
Summarized main interests of powerful actors.

Name of powerful actor	Main interests
Directorate of Forestry (DoF)	–Control over forest resources –Further funding for community forestry –Improved status of the DoF at national level (community forestry contributes to the GDP via the mobilization of forest products, and with this, to rural development and poverty reduction)
German Development Service (DED)	–Improved and sustainably-managed forest resources –Poverty reduction –Empowerment of the local resource users
Traditional Authority (TA)	–Maintaining and improving status/position –Benefits
Forest Management Committee (FMC)	–Benefits
Conservancy Management Committee (CMC)	–Benefits
Village Head Man (HM)	–Maintaining and improving status/position –Benefits
Ministry of Environment and Tourism (MET)	–Expertise/knowledge on participatory natural resource management –Benefits from forest use will help support the conservancy approach
Namibian Nature Foundation (NNF)	–Improved and sustainably-managed natural resources –Poverty reduction –Empowerment of the local resource users

3.4. Interrelation analysis

One of the results of the interest analysis is that the German Development Service and the Namibian Nature Foundation desire improved and sustainably-managed natural resources. This is why the corresponding indicator (PIDO) was assigned a +1 (powerful actor has an interest in a high ecological outcome). In the case of the Directorate of Forestry, its interest in biodiversity was not visible directly. No clear concern for biodiversity could be found. Nevertheless, one of the Directorate's interests is the control over these forest resources. They designed rules and regulations which demand a sustainable forest management. Even if no evidence could be found for a true concern about it, this aspect should be not forgotten. Apart from that, no intent could be found to indicate that the Directorate wanted to transform these forests into forest plantations. This is why we concluded that the Directorate of Forestry needs to have at least an interest in the community forest not disappearing if they do not want to lose control over the community forest areas. Based on this we assigned the interrelated interest a value of 1, which means that the Directorate has an interest in a middle ecological outcome. For the other powerful actors no correlation between their interests and the ecological outcome could be found and this is why they were assigned the PIDO value of 0, as is summarized in the following table.

4. Discussion

The results shown in Table 6 indicate that only two powerful actors have an interest in an improved biodiversity: the German Development Service and the Namibian Nature Foundation. The Directorate of Forestry has an interest in at least a stable biodiversity, whereas the other 5 remaining powerful actors are not concerned about biodiversity at all. An interesting fact is that none of the powerful actors had an interest in a low ecological outcome which could have been attributed to the actor's interest in changing the forest into another form of land use. Somehow this could also be interpreted as a positive result for biodiversity and the CF approach.

The results in Table 4 highlight that most of the community forests' ecological outcome was evaluated as being medium. Only four of the researched community forests were evaluated as being low. All of these four community forests were still in an initial stage were no assessment has been made so far. It can be concluded that 11 out of 14 researched community forests achieved an ecological outcome assumed to be positive. As already mentioned in the introduction, our findings support the general scientific opinion that CF approaches contribute toward a positive ecological outcome. Apart from this there are several papers related to conservancy management (CBNRM approach) in Southern Africa and Namibia which indicate similar findings (Flintan, 2001; Jones, 2004a, 2004b; Odera, 2004; Stuart- Hill et al., 2005; Jones and Weaver, 2009).

These positive results could be questioned by taking into consideration the example of the Mbeyo Community Forest shown above.

Table 6
Summery of correlated interest concerning biodiversity for all powerful actors.

Name of powerful actor	PIDO ecological
Directorate of Forestry (DoF)	1
German Development Service (DED)	+1
Traditional Authority (TA)	0
Forest management Committee (FMC)	0
Corresponding Conservancy (K)	0
Village Head Man (HM)	0
Ministry of Environment and Tourism (MET)	0
Namibian Nature Foundation (NNF)	+1

- PIDO: Powerful Interest Desired Outcome.
- PIDO (+1): the powerful actor has an interest in a high outcome.
- PIDO (1): the powerful actor has an interest in a middle outcome.
- PIDO (−1): the powerful actor has an interest in a low outcome.
- PIDO (0): the powerful actor has no interest in a specific outcome.

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That example might raise the question of whether community forest management contributes to the destruction of forest resources. Since no data about the situation prior to the CF projects exist, it is assumed that the CF revealed the reality of the situation. Following the argumentation about the expert's judgment, the recording of illegal cases is interpreted in this research as a good sign towards a better management.

Table 3 presents the summarized results of the power analysis. We identified 8 powerful actors out of all researched cases. We have proven their power status by using our own power theory and method. Out of these, 3 powerful actors were evaluated as being powerful in all cases (the Directorate of Forestry, the German Development Service and the Traditional Authority). The results are not surprising if one considers that the DoF and DED are the establishment actors and the TA is the first actor to decide whether a CF project is allowed to be carried out in his or her region. Apart from that, they have been determined to be strong in trust and incentives (DoF and DED) as well as in coercion (DoF, TA). Our findings support similar findings made by Jones and Mosimane (2000) and Schiffer (2004), who identified actors comparable to those in this study, i.e., both identified the central government, which in our case is the DoF, the TA, NGOs, donors, which would refer to the DED and the NNF, and the Conservancy Management Committee, which is also similar to the FMC. Jones and Mosimane (2000, p. 82) state that "…power might be expressed in different ways. It might be control of decision making, control of income and expenditures, distribution of jobs and contracts, improved status, etc." They do not really define power and how they have measured it. Nevertheless, their assumptions about power, which can be covered by our power theory with the power elements of coercion and incentives, support our power theory in part.

By bringing all these findings together can we now answer the question of who determines biodiversity in community forestry. Comparing the actors' related interest (PIDO) to the direct outcome we have only one match: the Directorate of Forestry has an interest in a middle ecological outcome, which is achieved for the most part. By looking at the Directorate's power elements (trust 79%, incentives 71% and coercion 100%) we could conclude that this actor has used its power to achieve the desired outcome. But this alone would be too simple. Apart from the Directorate, both the DED and NNF are interested in a positive outcome. They even had an interest in a high ecological outcome. With their power elements (trust and incentives) they pushed for their interests, and maybe only because of this the middle outcome was achieved. This raises the question of what happened with the other powerful actors which were indifferent to biodiversity. Perhaps they have also contributed to the middle outcome through their inaction. We are assuming that powerful actors use their power to achieve a certain outcome which is in their interest. As a logical consequence of this they do not use it if they are not interested. Based on this we conclude that the powerful actors have decided directly or indirectly about the ecological outcome of the researched community forest. The author believes that if some more powerful actors were to be interested in a high ecological outcome, this could have been achieved.

Following the results one might question the significance of the direct forest user. Given that he influences the natural resources directly one might ask whether he is the one who determines biodiversity. The author cannot address this matter in depth in this article, but he has incorporated the matter into his research as a whole. At this point the author would refer to Pröpper (2009, p. 351), who carried out extensive anthropological research about culture and biodiversity in one of these research areas: "The protection of their resource base is not a high priority for local land users because they are insufficiently aware of its limits and the fact that they will be the first victims of deforestation." Pröper (2009, p. 347) also states that "The issue of interaction between culture and the environment remains extremely fuzzy, multi-facetted and complex, however." Considering these two notions and the fact, shown above, that the natural forests in Namibia have been influenced by humans for a long time, we seriously doubt that local land users act with the improvement of biodiversity in mind. This would imply changing their cultural behavior within only 10 years. The author will not say that nobody has understood the importance of biodiversity conservation and that CF cannot contribute to this. At this point the article can only conclude that the local people which are in the Management Committees have not shown an interest towards it.

5. Conclusion

The findings support the general scientific notion that CF contributes to the improvement of biodiversity. Aside from this the article also demonstrated that our power theory and method were useful to identify the powerful actors, their interests and the ecological outcome. Maybe not surprisingly, the main establishment actors of the CF project as well as the Traditional Authority were always considered to be powerful actors. Of all 8 powerful actors, only 3 had an interest related to biodiversity. The others are indifferent towards it. We conclude that powerful actors determined biodiversity in CF in Namibia. The findings of this article will contribute to our international research about CF to test the hypothesis that outcomes in CF depend mostly on the interest of powerful actors. The ecological outcome was only one aspect we were looking for but it already indicates a trend. Our overall results seem to indicate that CF achieves positive results, but not as is generally assumed.

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Appendix A. Calculation of the dominance degree

The dominance degree can be calculated in the following way[3]:

- n total number of actors identified
- Xi sum of answers per actor and for one power element,

$$0 > X_i \geq (n-1) * \textit{highest possible answer in the corresponding Likert scale (1 or 3), for } i = 1, \ldots, n, \ \sum_{i=1}^{n} X_i = \textit{Total given answers per power element}$$

- h_i is the ratio of power per actor and per power element (i), with

$$0 > h_i \geq 1, \textit{ and for } i = 1, \ldots, n \textit{ and } \sum_{i=1}^{n} h_i = 1 = \textit{Total power per power element}$$

- r is the position of the sorted ratio of power per actor (h_i); the sorting starts with the highest h_i value until the lowest, equal values can be sorted continually anyway, *for* $r = 1, \ldots, n$
- m number of powerful actors considered

[3] Adopted from Duller and Kepler (2005, pp. 348–351).

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- CR_m concentration ratio; shows the distribution of power per actor (i.e., CR2 = 0.4 means that the first two actors hold 40% of the total available power per power element in the network)
- Dm Dominance Degree (Herfindahl-Dominance Degree or Deeffaa-Degree), with m = group of powerful actors and n − m group of less powerful actors

$$h_i = \frac{X_i}{\sum_{i=1}^{n} Xi} CR_m = \sum_{j=1}^{m} h_r D_m = \frac{(CR_m)^2}{m} + \frac{(1-CR_m)^2}{n-m}$$

The point for the separation between the group of powerful actors and less powerful actors can be found at the maximum of the dominance degree values (highest D_m value). At this point the D_m value for the last member of the group of powerful actors is still higher than the D_m value of the first member of the group of less powerful actors.

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Sequence Design of Quantitative and Qualitative Surveys for Increasing Efficiency in Forest Policy Research

Professur für Forst- und Naturschutzpolitik, Georg-August-Universität Göttingen, Büsgenweg 3, D-37077 Göttingen

(With 1 Graph and 3 Tables)

Carsten Schusser[1)], Max Krott[2)], Rosan Devkota, Ahmad Maryudi, Manjola Salla and Mbolo C. Yufanyi Movuh

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Power analysis; mixed methods; triangulation; quantitative and qualitative analysis; community forestry; sequence design; power features.

Machtanalyse; kombinierte Methoden; Triangulation; quantitative und qualitative Erhebungen; Gemeinschaftsforsten; Sequenz Design; Machtelemente.

1. EFFICIENCY BY LINKING QUANTITATIVE AND QUALITATIVE SURVEYS

A sound empirical basis is of high importance for applied research in forest policy. Conducting the intended intensive empirical observations in the field requires a vast amount of resources which go beyond the capacity of many projects. The amount of resources required is especially high for international comparative projects. For example, while designing a comparative analysis of community forestry we realized that the fieldwork in seven countries would last 126 months (seven times 18 months, as shown in *Table 1* and calculated in detail in chapter 2). In order to reduce this we resorted to a sequence design found in the literature which appeared to be a promising strategy for increasing empirical method efficiency. Mcvilly (2008) gives an overview of mixed methods design and mentions a specific sequence design for (1) a quantitative preliminary survey – (2) a qualitative survey and (3) a quantitative follow-up study adapted from Morse (1991), which focuses the observations on preselected subjects in order to save resources during the field work.

We focus our attention on the following question. How to save resources and simultaneously to fulfill high methodical standards? First we will describe cost efficiency and the methodical quality criteria which we apply. Then we will introduce both survey methods which we will compare: the single survey model and the sequence model which we have designed in order to improve efficiency. The main part of the paper will discuss how to save resources while keeping methodical quality high based on accepted common research standards.

[1)] Corresponding author: Carsten Schusser. Mitarbeiter der Professur für Forst- und Naturschutzpolitik. Tel.: 0170/6876123. E-Mail: cschuss@gwdg.de

[2)] Contact address: Prof. Dr. Max Krott. Leitung der Professur für Forst- und Naturschutzpolitik. Tel.: 0551/39341. E-Mail: mkrott@gwdg.de

Tab. 1

Comparison of time resources needed for sequence of surveys and single survey.
Vergleich des Zeitaufwandes für eine Sequenzmethode und eine singuläre Methode.

Method ***Methode***	**Number of countries/ cases and Nr. of days to conduct research** ***Anzahl der Länder/Anzahl Fallstudien und Anzahl der Tage für die Durchführung***	**Total number of months** ***Gesamtanzahl in Monaten***
Single survey: ***Singuläre Methode*** • Qualitative survey	7 Countries, 12 cases each 45 days	**126 months (100%)** 126 months
Sequence of surveys: ***Sequenz Methode***		**51 months (40%)**
• Preliminary survey	7 Countries/12 cases, each 7 days	20 months
• Qualitative analysis	7 Countries/12 cases, each 10 days	28 months
• Comparative quantitative	7 Countries/12 cases, each1 day	3 months

The input of resources into the surveys we evaluate with the economic criteria cost efficiency (THOMMEN and ACHLEITNER, 2006). It is defined by the minimum costs needed to achieve a specific output of scientific results. Within social science methods the biggest input is the working time of researchers. Therefore we consider the working time measured in working days of qualified researchers as a good estimate of the cost for the input of resources. The outputs are the results achieved with the sequence design and will be evaluated with the following criteria.

As basic quality criteria we define measurement validity. It shows "how well an empirical indicator and the conceptual definition of the construct that the indicator is supposed to measure fit together" (NEUMAN, 2006; p. 193). The "construct supposed to be measured" is defined by theory and hypothesis. Therefore this type of validity shows the fit of the hypothesis and the supposed observations by specific methods.

By reliability we mean that the measurement method itself does not cause deviation in the results (Neuman, 2006; p.189). High reliability requires minimizing the bias produced by the researcher or by the empirical observations, like answers, written resources or behavior.

2. SEQUENCE OF SURVEYS FOR A COMPARATIVE ANALYSIS OF ACTOR-CENTERED-POWER IN COMMUNITY FORESTRY

With our research we try to identify the actors involved in a local community forest network and their actor-centered power, in order to test the hypothesis that "Activities and outcomes in community forestry depend mostly on the interests of powerful actors". Apart from the sequence design we also apply interest analysis and outcome analysis techniques which will be not discussed in this paper. Our project compares community forestry in Albania, Cameroon, Germany, Indonesia, Namibia, Nepal, and Kenya. Two case studies, Nepal and Indonesia, have been completed and their results are published (DEVKOTA, 2010; MARYUDI, 2011). The two case studies made experiences with the sequence model which is discussed here. In this paper, for the purpose of illustrating methodical arguments, we select the issue of implementation of community forestry being informally dominated by "local elites", as recent studies have revealed (WOLLENBERG et al., 2008, p. 39; EDMUNDS and WOLLENBERG, 2001, p. 192). We will focus on the hypothesis that, within a network of actors linked to a specific local community forest, specific actors are more powerful than others. Despite being simple, specifying and proving this hypothesis empirically will answer highly relevant questions. For example, which are the types of powerful actors: state agencies, associations, international associations, enterprises or other actors? In addition, the power processes and sources of the powerful actors can be analyzed. This analysis requires a link to hypotheses about power theories developed by DEVKOTA (2010) and MARYUDI (2011). For illustrative purposes it will suffice to mention only some of the theoretical assumptions (see chapter 4) for the following methodical discussion.

The methodical challenge was to design a sequence of quantitative and qualitative surveys which are suitable to identify the involved actors, to stratify these into a group of powerful actors and less powerful actors, and to observe their specific power behavior empirically. All this had to be achieved with a small budget and limited time. Therefore, we designed the sequence shown in *Table 2:* The preliminary quantitative network survey was conducted to identify actors involved for a specific community forest as well as to stratify them into the two groups mentioned above. The follow-up qualitative power survey analyzes the power resources of the individual powerful actors according to three different power elements of the actor-centered power concept (DEVKOTA, 2010; MARYUDI, 2011 and KROTT et al., 2011). The follow-up comparative quantitative network analysis builds on the data produced by the prior step of the sequence and tests hypotheses about powerful actors, comparing the situations in seven countries.

In *Table 1* and *2* the sequence of surveys is compared with a single survey. The single survey follows basic assumptions of the network analysis of power (HASANAGAS, 2004; PATTON, 1990). It is aimed to observe the power of all members and to link them within a power network. A straightforward way is to conduct empirical observations of all members of the network. The case studies by DEVKOTA (2010) and MARYUDI 2011) show that the network of an individual community forestry comprises approximately 15 actors in average including the speaker of the committee of the community forest, the state forest agencies and other state agencies at different levels, donors, forest-based enterprises and a number of associations lobbying for community forestry. Estimating on average 2 days of field work for each actor we get 30 days for one community forest and 360 days for the 12 cases planned. Keeping in mind that in many developing countries the weather conditions do not allow access to the field during the whole year a realistic estimate of the resources needed is one researcher in the field for 1.5 years per country. This means in average 45 days per one case (See *Table 1*).

The scientific quality of the single survey is quite similar to the second step in the sequence of surveys because the field observation applies the same combination of quantitative and qualitative questions, documents and observations directly in the forest and the offices of the actors. These quality questions are discussed in the chapter about the second step the follow up qualitative power survey in detail

3. PRELIMINARY QUANTITATIVE NETWORK SURVEY

This huge amount of resources of a single survey approach can be diminished by focusing the observations on the findings of a preliminary network analysis. The method of network analysis follows the theoretical model of a power network closely (HASANAGAS, 2004). The theory assumes that actors are linked by complex power processes which become visible within a network only.

Tab. 2

Sequence of surveys for power analysis compared with single survey.
Sequenz von Methoden im Vergleich mit einer singulären Methode für die Machtanalyse.

Quality criteria *Qaulitätskriterium*	**Sequence of surveys 1-3,** *Sequenz der Methoden 1-3*			**Single survey** *Singuläre Methode*
	1.Preliminary quantitative network survey *1.Quantitative Netzwerkanalyse (Vorstudie)*	2.Follow-up qualitative power survey *2.Qualitative Machtanalyse (Folgestudie)*	3.Follow-up comparative quantitative network analysis *3.Vergleichende quantitative Netzwerkanalyse (Folgestudie)*	1.Qualitative survey *1.Qualitative Studie*
Validity ***Validität***	High for simple hypothesis *Hoch für einfache Hypothese*	High for complex hypothesis *Hoch für komplexe Hypothese*	High for complex hypothesis *Hoch für komplexe Hypothese*	High for complex hypothesis *Hoch für komplexe Hypothese*
Reliability ***Reliabilität***	Sufficient for identifying the group of powerful actors *Ausreichend zur Identifizierung der Gruppe der mächtigen Akteure*	Good due to combination of multiple sources *Gut durch die Kombination verschiedener Quellen*	Good due to triangulation of the results of the previous sequence steps *Gut durch die Triangulation der Resultate beider Vorstudien*	Good due to combination of multiple sources *Gut durch die Kombination verschiedener Quellen*
Resource use ***Mitteleinsatz***	Low *Niedrig*	Low *Niedrig*	Very low *Sehr niedrig*	High *Sehr hoch*

The network analysis provides the researcher with mostly quantitative tools for describing the power relations. MARSDEN (2011) draw the attention to the numerous errors which can occur in survey data about networks. The respondent answers within a "four-stage cognitive model: comprehending a question, retrieving relevant information from memory, integrating the information retrieved to develop a judgment about an answer and providing a response within the format given in the survey instrument" (MARSDEN, 2011; p. 380). Trying to cover all these aspects properly would drive the sources needed for the complex survey instruments up.

The solution we suggest is to simplify the hypothesis. Instead looking for a complex power network we are looking for a much the simpler model only namely the hypothesis that "Within the power network of a specific community forest there are only two groups of actors, powerful ones and less powerful ones". This hypothesis contrasts two positions, namely powerful or not powerful rather than it describes power processes exactly. To look for contrasting positions in order to get robust data is suggested by MARSDEN (1990, 456). If we define complexity as the number of acknowledged variables, their diversity and the multiple relations between them, it becomes obvious that this hypothesis is simple because it assumes that power is an unspecified attribute of a group of unspecified actors. The information we get from the simple hypothesis is much lower than from a complex network hypothesis. But the hypothesis indicates actors belonging to the powerful group which helps in focusing the follow up steps of the analysis.

Our main argument is that for such a simple hypotheses a preliminary networks analysis is able to achieve high validity. High validity does not require complex data about all individual power relations. Instead it is sufficient already when the data indicates whether an actor belongs to the power full group or not. Further the validity is not hurt a lot when the survey misses one or two actors because the hypothesis did not deal with individual actors but with a group.

The instrument used for the preliminary network analysis is a quantitative survey. The first question identifies the actors involved following a snowball technique (HASANAGAS, 2004; PATTON, 1990). Starting with the chairperson of the specific Community Forest User Group Committee we ask him which actors he has to deal with within specific community forest. Afterwards, this question is repeated to all actors mentioned, always referring to the specific Community Forest, until no new actor is mentioned. The case studies by DEVKOTA (2010) and MARYUDI (2011) showed that after the group meets

10 to 15 actors no new actor is mentioned anymore indicating that the core group is observed.

Each actor is asked simultaneously with the first question other questions regarding the power of the other actors. The external estimation of power has the advantage that the bias of strategic answers about the own power is avoided. Of course also the external estimation has a bias caused by lack of knowledge and lack of willingness to tell about their knowledge (FRIEDRICHS, 1990). For the special case of looking for powerful actors we regard the lack of knowledge low because the powerful actors influence other actors who feel them and know them within the context of the community forestry. General experiences of network analysis support our assumption because data about strong ties and about local networks are better (MARSDEN, 1990; p. 456). In contrast this kind of survey is not very strong for the identification of weak actors, since most in the network pays little attention to them. Due to the prominent position of powerful actors we regard the first question to identify other actor as an indicator for power already. If actors are not mentioned at all we consider them as not powerful from the point of view of the specific actor asked.

The social desirability bias (NEUMANN, 2011) caused by the selection of "social and political correct" answers instead of the own opinion exists and might be higher in surveys conducted in countries with an uncertain justice system like in many developing countries. Even if an actor understands the question well it might be that he avoids speaking about the power of other actors. Due to this bias we estimate the reliability of the survey to low to use the data for a complex network analyses. But the reliability is sufficient to identify some of the powerful actors. The improvement by the follow up qualitative survey is important.

The survey measures the power of the actors in a quantitative manner, meaning that numeric data count how strong the power is (BRYMAN, 2001; MCVILLY, 2008; p. 172). We create standardized measures based on our theory of actor-centered power before data collection (NEUMAN, 2006; 157). As described by DEVKOTA (2010) and MARYUDI (2011) the actor-centered power theory defines power as a social relationship in which the actor A alters the behavior of actor B without recognizing B's will. Altering the behavior can be achieved by coercion, incentives or trust. The three elements of power are discussed in DEVKOTA, 2010; MARYUDI, 2011 and KROTT et al., (2012 in review) in detail. For the methodological considerations we will not deepen the theoretical discussion here but we will show how we define simple quantitative indicators for each power element.

In order to measure incentives we asked the actors, directly, from whom they had received any kind of incentives and we transcribe in a Likert scale the answer yes into a 1 and the answer no into a 0. In the same simple manner we asked whom they trust in the network. Assuming that answering questions about trust is more sensitive we used a four-grade Likert scale which assigned the value of 0 to the option "no trust at all" and 1 to 3 to more differentiated answers. Finally we did not address coercion directly but rather, we used the two questions: "Apart from the information and incentives provided, do you still need one or more actors to carry out your involvement in community forestry?" And "Do you need the permission of one of these actors?" If one of these answers is "yes" with regard to specific actors we assume they have coercive power and coded this with "1", otherwise we assigned a "0". We received as many external estimates for the specific power elements for each actor as there were other actors in the network. The multiple external estimates are stable against the bias which would be inevitable if we were to ask an actor about his own power. Based on the data of all external estimates we calculate the power for each actor for the three elements of coercion, incentives and trust, separately. Finally, the data are standardized for each actor by calculating the percentage of the sum he got relative to the maximum an actor could get.

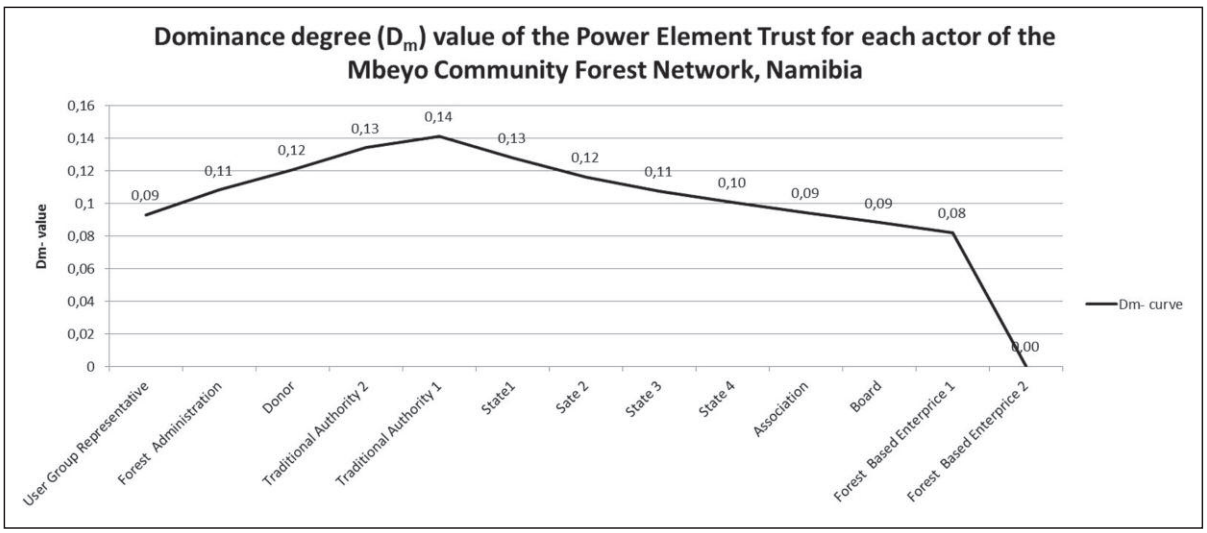
Having standardized estimates for each actor, the task remains of determining the group of most powerful actors. We were looking for a measurement sensitive to the specific distribution of power among the actors. If all actors are weak but two are relatively stronger these two should comprise the group of the most powerful. On the other hand, actors should not become part of the group of the most powerful, even if they are strong, if there are some other actors with a similar power level. The dominance degree (PIESCH, 1975; DEFFAA, 1982; HÄNI, 1987; SCHMIDT, 2005) is a suitably sensitive measurement to differentiate the relational habit of power in a network.

The dominance degree can be calculated in the following way[1)]:

- n Total number of identify actors
- X_i Sum of answers per actor and for one power element, $0 > X_i \geq (n-1) * highes\ possible\ answer\ of\ the\ corresponding\ Likert\ scale$ (1 *or* 3) *for* $i = 1, \ldots, n$, $\Sigma_{i=1}^{n} X_i = Total\ given\ answers\ per\ power\ element$
- h_i is the ratio of power per actor and per power element (i), with $0 > h_i \geq 1$, *and for* $i = 1, \ldots, n$ and $\Sigma_{i=1}^{n} h_i = 1 = Total\ power\ per\ power\ element$
- r is the position of the sorted ratio of power per actor (h_i), the sorting starts with the highest h_i value until the lowest, equal values can be sorted continually anyway, *for* $r = 1, \ldots, n$
- m number of considered powerful actors
- CR_m concentration ratio, show the distribution of the power per actor (i.e.: CR2 = 0.4 means that the first two actors hold 40% of the total available power per power element in the network)
- D_m Dominance Degree (Herfindahl-Dominance Degree or Deeffaa-Degree), with m = group of powerful actors and n–m group of less powerful actor

$$h_i = \frac{X_i}{\sum_{i=1}^{n} Xi} \qquad CR_m = \sum_{j=1}^{m} h_r \qquad D_m = \frac{(CR_m)^2}{m} + \frac{(1 - CR_m)^2}{n - m}$$

[1)] Adopted from DULLER, C. and KEPLER, J. (2005, pp. 348–351).



Graph 1

Dominance degree (D_m) value distribution for the power element of trust for all actors of the Mbeyo Community Forest Network, Namibia.

Dominanz Grad Verteilung für das Machtelement Vertrauen, für alle Akteure des Mbeyo Gemeinschaftswaldes, Namibia.

Tab. 3

Quantitative, qualitative data and triangulated results for all power elements for the Mbeyo Community Forest Network, Namibia.

Quantitative, qualitative und triangulierte Ergebnisse für alle Machtelemente für den Mbeyo Gemeinschaftswald, Namibia.

	Trust			Incentives			Coercion		
Actor Classification	QT	QL	R	QT	QL	R	QT	QL	R
Forest Administration	2	+	**2**	2	+	**2**	2	+	**2**
Donor	2	+	**2**	2	+	**2**	2	-	**1**
User Group Representative	2	+	**2**	2	-	**1**	2	-	**1**
Traditional Authority 2	2	+	**2**	2	-	**1**	2	-	**1**
Traditional Authority 1	2	+	**2**	2	-	**1**	2	+	**2**
State 1	1	0	**1**	1	0	**1**	1	0	**1**
State 2	1	0	**1**	1	0	**1**	1	0	**1**
State 3	1	0	**1**	1	0	**1**	1	0	**1**
State 4	1	0	**1**	1	0	**1**	1	0	**1**
Association	1	0	**1**	1	0	**1**	1	0	**1**
Board	1	0	**1**	1	0	**1**	1	0	**1**
Forest Based Enterprise 1	1	0	**1**	1	0	**1**	1	0	**1**
Forest Based Enterprise 2	1	0	**1**	1	0	**1**	1	0	**1**

Group of most powerful actors:	2	*quantitative data:*	QT
Group of less powerful actors:	1	*qualitative data:*	QL
		final result	
Power source observed:	+	*(triangulated):*	R
Power source not observed:	-		
No data:	0		

The point for the separation between the group of powerful actors and less powerful actors can be found at the maximum of the dominance degree values (highest D_m value). At this point the D_m value for the last member of the group of powerful actors is still higher than the D_m value of the first member of the group of less powerful actors. This is the point where the power mean value (D_m) for the assumed group of powerful actors plus the

power mean value of the assumed group of less powerful actors is higher than in the following assumed actor-power constellation.

As an illustrative example, *Graph 1* shows the distribution of the dominance degree values for all actors, sorted from the strongest to the weakest, measured for the power element of trust. The peak is with the fifth actor, indicating that these five are members of the most powerful group.

Based on the dominance degree, the group of most powerful actors is identified. *Table 3* shows the group to which an actor belongs, for each power element (Trust, Incentives and Coercion) for the quantitative- and qualitative sequence as well as for the triangulated result. The result of the preliminary network survey (QT data in *Table 3*) is found using the rule which states that each actor who is part of the most powerful group with regard to at least one power element is considered to be part of the group of the most powerful actors.

The actors in *Table 3* are sorted into a theoretical based classification according to the classification used by DEVKOTA, 2010.

Summing up, the preliminary network survey produces quantitative results indicating the members of the most powerful group. The resources needed to conduct this sequence are small. There are only about 10 standardized questions which can be ticked quickly by the actors asked. Due to the size of the network, of approximately 15 actors in average, the survey for one community forest is done within one week. Of course, the empirical indicators are not sufficient for a power analysis, but they are a good starting point for a follow-up survey which would go deeper by focusing on the powerful actors only.

4. FOLLOW-UP QUALITATIVE POWER SURVEY

The follow-up survey examines the power sources of the actors belonging to the group of most powerful actors individually, in a qualitative manner. The observations look for empirical evidence of specific power sources or processes within the framework of the three elements of power defined theoretically. For example, coercion can be exercised by using a power source or threatening to use it only. The power source could be the rifle of a forest guard, the physical strength of a truck or igniting a fire. Qualitative, in-depth interviews shed light into such power features. They are accompanied by observations and secondary data like a forest management plan or law, written meeting minutes and guidelines or letter of formal acts from the field. The interviewer identifies an empirical phenomenon and sees whether he can find a relation to the power element. If he can, the phenomenon supports the existence of the specific power element. For example, the possession of a rifle by a forest guard indicates that he can exert considerable coercion over a forest user with no gun. The hypothesis specified in the power features becomes complex. It would be seen later whether it is possible to identify theories already formulated in the literature which correspond to the observation. If this is the case, the power feature is formulated and supported empirically. If we cannot find a theory, we disregard the observation. The selection of observations which correspond to theories formulated prior to the survey is used as technique to ensure high validity for hypotheses which are more complex than those within the preliminary survey (MODELL, 2009; p. 213).[2)]

Conducting a qualitative field investigation which makes use of observations, interviews and all kind of documents requires good access to the field actors. An initial meeting between the researcher and actors for the purpose of introductions and the exchange of arguments which are largely symbolic is followed by other meetings which are more substantial. About 10 days were needed to carry out the field investigation of the 5 powerful actors which were identified within one case, on average. In comparison with the quantitative preliminary survey this means that the time spent with each interview partner is 400 % higher, but the overall time per case study is only 30 % higher (DEVKOTA, 2010; MARYUDI, 2011). The strict focus on the powerful actors increases the efficiency of the survey. This means the field researcher can spend more time with the most relevant actors, looking for documents and making his own observations, which increases the reliability.

5. FOLLOW-UP COMPARATIVE QUANTITATIVE NETWORK ANALYSIS

The comparative quantitative network analysis builds on the data of the preliminary sequence triangulated with the results of the qualitative investigation. The triangulation follows the simple rule that if an actor is powerful some evidence for it can be found during the qualitative follow-up survey. This means that if a proof or disproof of the results from the preliminary quantitative survey can be made with the qualitative survey, the triangulated result will be the finding of the second survey. Only if no information can be collected during the second survey will the result of the triangulation always be not powerful, regardless of the result from the first survey. For each power element quantified by the preliminary survey, qualitative support has to be found. If the quantitative data indicates a power element of an actor, the qualitative follow-up survey must identify power features. For example, if the survey estimated high coercive power, the qualitative investigation must find a "smoking gun" somewhere. The qualitative survey cannot quantify the power elements but rather, guided by theory, it looks for empirically-based evidence of power features which may be a strong indicator as to whether they exist. Otherwise, we do not recognize the quantitative data as being reliable and review them giving priority to the qualitative information (See *Table 3*).

Giving stronger credit to the qualitative survey is justified by our specific research question as well as by methodic arguments:

[2)] For the methodical discussion the argument that we select all qualitative observations guided by existing theories is important. Due to limited space we cannot present here all complex hypotheses of the actor-centered power theory and how they guide the selection of observations. See DEVKOTA (2010) and MARYUDI (2011) for this.

(i) The quantitative survey is done in a methodical rudimental way asking a view questions only in order to save resources. The data indicate the group of powerful actors but not more. E.g., no complex network indicators are calculated and we use a most simple scale with "1 (no strong)" and "2 (strong)" for describing the quantitative results.

(ii) In contrast the qualitative survey is done combining interviews, documents and observations. The results relay not only on the judgment of the actor asked but also on the documents which proof the answers and on observations, e.g. of his technical sources.

(iii) Derived from our research focus on explaining the power process we are interested in empirical evidence for constructs based in our theory about power. The qualitative survey is linked much better to specific hypothesis than the quantitative survey which measures a general power relation. If the quantitative survey indicates a powerful actor in general and we are not able to describe his power process and sources based on theory we cannot use the empirical data for the further analysis. The weak link to detailed hypotheses justifies additionally overruling the quantitative data by qualitative one. Even in the rare cases the quantitative data are better they are not highly useful for testing our hypothesis.

(iv) Giving priority to qualitative data derives the question why we rely so much on the strong actors identified in the quantitative survey. First we do this not fully. The qualitative survey may omit strong actors or add some if the data give evidence for power sources and processes. Second we might oversee some powerful actors due to the weakness of the quantitative survey and the focus of the qualitative on the actors identified by the quantitative survey. Underestimating the powerful actors is not destroying the ability to test our hypothesis that powerful actors determine the outcome. If we get a positive result we accept the hypothesis. If no proof is given by data it could be because the hypothesis is wrong or because we have overseen a powerful actor. Nevertheless we will not accept the hypothesis in this case following a cautious principle in testing. Of course if this phenomenon turns out frequently we will be forced to do additional surveys in order to find the hidden powerful actor.

The preliminary actor power network is reviewed focusing on the powerful actors based on the qualitative data. For example, in *Table 3*, and for all three power dimensions, the data for "powerful" (2) and "not-powerful" (1) are examined to see whether they are supported by the qualitative results and they are corrected in case of abbreviation.

The final data goes into the follow-up comparative quantitative network analysis. The first two steps in the sequence build up a quantitative data set which comprises all cases (powerful actor per community forest) from all countries. All actors of the power networks of the Community Forests studied for all countries are classified according to their power elements as being "powerful" or "not powerful". This set of data can be used for the quantitative comparative analysis of more complex hypotheses about power.

The main theoretical progress of the comparative analysis is that we classify the actors into categories which are theoretically meaningful. In line with our guiding research question we select hypothesis which describe power processes and resources. An additional restriction caused by the empirical method applied is the focus on powerful actors. The identification of weak actors and their specific power processes is not covered by our research design. As discussed we justify this restriction by the hypothesis that in explaining the outcomes the powerful actors make the difference. For example, we can differentiate those state agencies which are described well by the rich theory of bureaucracy (PETERS, 1995). From this theory we get hypotheses on how powerful bureaucracies generate and use power, which can be set against the elements of coercion, incentives and trust. For example, the quantitative data can prove whether state forest agencies in case they are powerful rely more on coercion or on trust in managing community forests, which is highly relevant for the discourse on governance.

All categories of actors in *Table 3* are linked to theories about state or private actors. From these theories we get a rich supply of hypotheses which can be tested by comparative quantitative analysis.

Due to the quantitative data produced and improved by the methodological sequence the resources needed for the final qualitative analysis are fairly small. Only an analysis of the literature and running a computer program are required. It is estimated that one qualified researcher for three months is needed.

6. CONCLUSION: EFFICIENCY GAIN FOR THE METHODOLOGICAL SEQUENCE DUE TO FLEXIBILITY IN HYPOTHESIS AND EMPIRICAL EVIDENCE

The experience of the comparative analyses of power in community forestry supports our claim that a sequence of quantitative-qualitative-quantitative surveys could save about half of the resources needed for the field work. We reduced the amount of months of work for one qualified researcher from 126 months to 51 months.

Nevertheless, the quality of the research could be kept high by having flexibility in the formulation of hypotheses and in the search for empirical evidence:

Good validity is secured by starting based on radically simplified hypotheses and then formulating increasingly complex hypotheses, step by step, based on existing theories and remaining within the framework of the initial hypothesis.

Good reliability is achieved by using the preliminary quantitative survey to lead toward the research subject, namely powerful actors only, and subsequently checking the results using qualitative observations. Then we can use the qualitative data to correct the quantitative data for the final comparative quantitative analysis.

The methodological experience might encourage forest policy research to look for methodological sequences. However, one must be aware that the mix of quantitative and qualitative data has to be accompanied by an explicit strategy to maintain high research quality.

7. SUMMARY

A sound empirical basis is of high importance for applied research in forest policy despite empirical methods increasing the resources needed for research. Especially in developing countries, the extensive needs of field research might exceed the available resources. A sequence consisting of a quantitative preliminary survey – qualitative study – quantitative follow up study is recommended in the literature as an efficient methodological strategy. This paper investigates how to diminish resources by means of the sequence design and discusses how to keep a high research quality using the example of comparative power analysis in community forestry. The sequence design is applied in seven countries studies from which are two are already successfully completed (Nepal, published by DEVKOTA, 2010 and Java-Indonesia, published by MARYUDI, 2011).

The preliminary quantitative survey is used to identify the group of most powerful actors for each community forest. The measurement validity, meaning the degree of agreement of measurement and theory, is kept high by simplifying the hypothesis down to the claim that a group of powerful actors exists. The reliability of the survey is strengthened by using, for each actor, the external estimate of his power by the other actors in the network. Nevertheless, the reliability is relatively low due to the use of standardized questions only, but it is sufficient to indicate who the actors of the powerful actors group are.

The follow-up qualitative power survey ascertains the power resources of the strong actors which have been identified as such. It applies a complex hypothesis about actor- centered power which involves the three power elements of coercion, incentives and trust. Reliability is high due to such multiple empirical resources as are observations, interviews and documents. The data of the qualitative survey is used to improve the quantitative data of the preliminary survey.

Finally, a comparative quantitative analysis of the power of actors in community forestry for all researched countries is conducted using the improved data. This analysis tests complex hypotheses which involve the power of different actors. The actors are differentiated using theoretically meaningful terms from which we can derive hypotheses for the empirical tests. In particular, the theories about bureaucratic politics and interest groups can deliver hypotheses about the power relations of these actors, which are then particularly suitable for the quantitative test.

The results show that the sequence survey can reduce the resources needed by about half. Nevertheless, the validity can be kept up by formulating hypotheses of different complexity and sufficient reliability can be ensured by improving the data step by step by means of the follow-up survey.

8. ZUSAMMENFASSUNG

Titel des Beitrages: *Vernetzung von quantitativen und qualitativen Erhebungen zur Steigerung der Effizienz in der Forstpolitikforschung.*

Für die angewandte Forstpolitikforschung ist eine belastbare empirische Basis von großer Bedeutung, auch wenn dadurch die Ressourcen für die Forschung steigen. Dies gilt insbesondere für die Entwicklungsländer, in denen empirische Projekte häufig an den nur knapp verfügbaren Ressourcen scheitern. In der Literatur wird eine Sequenz von quantitativer Vorstudie – qualitativer Erhebung – quantitativer Analyse vorgeschlagen, um die Effizienz der Methoden zu erhöhen. Im Folgenden wird am Beispiel der Machtanalyse „Gemeinschaftswälder (Community Forestry)“ untersucht, ob eine solche Sequenz den Ressourcenbedarf senkt und wie die Qualität der Methoden hoch gehalten werden kann. Die Sequenz wurde bereits in sieben Länderstudien angewandt wovon schon zwei Studien erfolgreich abgeschlossen wurden (Nepal, veröffentlicht: DEVKOTA, 2010 und Java-Indonesien, veröffentlicht: MARYUDI, 2011).

Die quantitative Vorstudie identifiziert innerhalb der Gemeinschaftswälder eine Gruppe von mächtigen Akteuren. Hohe Validität, d.h. die Übereinstimmung des Gemessenen mit der Theorie, wird durch eine starke Vereinfachung der Hypothese gesichert, indem nur die Existenz einer Gruppe mächtiger Akteure behauptete wird ohne Binnendifferenzierung der Akteure oder der Macht. Die Reliabilität wird erhöht, indem die Fremdeinschätzung der Macht der einzelnen Akteure erfragt wird und nicht die Selbsteinschätzung. Sie ist ausreichend, um eine erste Identifizierung jener Akteure vorzunehmen, die zur Gruppe der Mächtigen gehören.

Die nachfolgende qualitative Analyse erhebt differenziert die Macht der ausgewählten starken Akteure. Sie setzt eine komplexe Machttheorie ein, die auf den Elementen Zwang, Anreiz und Vertrauen beruht und aus der Literatur vor der Erhebung abgeleitet wurde. Die Reliabilität wird insbesondere dadurch gestärkt, dass die Experteninterviews durch Beobachtung und Dokumentenanalyse erweitert werden. Die Daten dienen zur Verbesserung der Daten aus der quantitativen Vorerhebung.

Die verbesserten Daten gehen in die quantitative vergleichende Analyse aller untersuchten Länder ein. Diese testet komplexe Hypothesen über die Macht unterschiedlicher Akteure. Die Akteure werden in Begriffe mit definierter Bedeutung in ausgewählten Theorien differenziert. Aus diesen können Hypothesen für den empirischen Test abgeleitet werden. Insbesondere Theorien über bürokratische Politik und Interessengruppen liefern Hypothesen über das Machhandeln dieser Akteure, die für den quantitativen Test gut geeignet sind.

Im Ergebnis erreicht die Sequenz eine Verminderung der Ressourcen um rund 40 %. Dennoch können die Validität durch Einsatz von Hypothesen mit unterschiedlicher Komplexität und die Reliabilität durch schrittweise Verbesserung der Daten hoch gehalten werden.

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6.1 Community forestry: a Namibian case study

CARSTEN SCHUSSER

Introduction

In article 1.1 Bas Arts and Ingrid Visseren-Hamakers briefly explain what forest governance is and how it emerged. As a solution to the vast and ongoing process of deforestation, community forestry is a new mode of forest governance. It follows the assumption that if government involves local people by giving them management rights and benefits to the use of forest resources, they will develop a feeling of ownership. They would then be more likely to conserve rather than damage these forest resources, because they depend on them. Community forestry would also help local people improve their living standards and reduce poverty. The main pillar of the concept is the direct involvement of forest users: the state must be willing to hand over some forest administration power to local communities.

As Arts and Visseren-Hamakers mention, the results of local forest management are mixed. Some positive ecological outcomes, such as increased vegetation cover, have been achieved (Brendler and Carey 1998; Chakraborty 2001; Charnley and Poe 2007; Tomas 2006; Devkota 2010; and Maryudi 2011). The empowerment and improved livelihoods of forest users has not been achieved, however; according to Edmunds and Wollenberg (2001:192), "the poorest forest users have become worse off than before."

OUTCOMES OF COMMUNITY FORESTRY DEPEND MOSTLY ON THE INTERESTS OF POWERFUL ACTORS.

Who determines outcomes in community forests if the forest users are not the main pillar of community forestry? Arts and Visseren-Hamakers cite critics who state that power is not addressed as an issue in forest governance research. This article tests the hypothesis that outcomes in community forestry depend mostly on the interests of powerful actors.

Carsten Schusser is a PhD student and coordinator of the Community Forestry Research Group at the Forest Policy and Nature Conservation Institute of Georg August University, Goettingen, Germany.

Methodology

The research focused on the CFN project (Community Forestry in Namibia, formerly Community Forestry in North Eastern Namibia, or CFNEN). The field research was conducted in separate periods from November 2007 to November 2009. The project studied 14 community forests in northeast Namibia.

To test the hypothesis, the study tried to answer the following questions:

- Who are the powerful actors?
- What are the interests of the powerful actors?
- What are the outcomes of community forestry?

Identifying powerful actors

The study included a preliminary quantitative survey and a qualitative follow-up survey (Schusser et al. in press). The method identified the actors involved in a specific community forest network, their power, their interests and the outcomes of community forestry. Actors included individual persons as well as institutions and organizations if they had the ability to intervene in community forestry. Standardized questions evaluated the power status of all actors, following a power theory developed by the author.

The theory is built on three elements that an actor might use to wield power:

- coercion: altering the behaviour of another actor by force;
- incentives: altering the behaviour of another actor by providing advantages or disadvantages; and
- trust: altering another actor's behaviour due to his or her accepting information without verifying it.

The quantitative information collected during the preliminary survey was used to separate the actors identified according to their level of power. The powerful actors were revisited during the qualitative follow-up study. Since this group was smaller more time could be spent with them. The qualitative survey does not quantify the power of an actor, but identifies the power sources.

Semi-structured interviews were used to gain more information and to carry out further observations and search for any other evidence indicative of the power that an actor might have. For example, if the quantitative survey determined that a certain actor had coercive power, the qualitative investigation had to find irrefutable evidence of this. Priority was given to the qualitative survey due to the rich empirical evidence provided by qualitative interviews, documents and observations.

Identifying powerful actors' interests

Although it is possible to obtain information by asking actors directly what their interests are, the answers may not be accurate, especially if an actor wants to hide his or her real

interests. To avoid this the study analyzed the actors' interests following Krott's definition (2005: 8). He states that interests cannot be observed directly, but can be determined through observations of a given actor's behaviour. How the actor behaves and what he does are indicators of his interests.

Determining community forestry outcomes

The approach developed by Maryudi et al. (2011) was used to examine the social, economic and ecological outcomes of community forestry. The study defined the social outcome as empowerment of the forest user through participation in decision-making, and the economical outcome as improvement in the forest user's livelihood. To evaluate the ecological outcome the study searched for any proof of initial resource assessment and of follow-up monitoring based on it. If these were present, the study also analyzed these documents. Outcomes were then categorized (Table 1).

Table 1: Categorization of community forestry outcomes

	Low	Middle	High
Social outcome *(forest user)*	no participation in decision making	some participation in decision making	complete participation in decision making
Economical outcome *(forest user)*	no improvements in livelihood	some improvements in livelihood	significant improvements in livelihood
Ecological outcome *(corresponding forest)*	no improvements in biodiversity	initial natural resource management activities	improved biodiversity

Results

In all, 14 community forests and 349 interviews were analyzed. The number of actors involved in one community forest varies between 9 and 27.

Powerful actors

In February 2006 the Namibian government announced the first 13 official (gazetted) community forests. According to the regulations (Community Forest Guidelines 2005), an implementation and monitoring phase[1] should start after gazettement. The first step is a forest resource inventory. The second step, based on the inventory, is an integrated forest management plan; the third step is the plan's approval by the Directorate of Forestry. Step four is implementation of the plan by the forest management committee.

The gazettement happened suddenly and unexpectedly. At the time the project had been in existence for five years, but no process for a forest inventory had been approved by the

Directory of Forestry. It became obvious that completion of the first three steps would take a long time, and that only after doing so would the community be in a position to manage a community forest. To satisfy the communities and to motivate them to continue, the Directorate of Forestry designed a block permit. The block permit is an official document that allows the communities to harvest certain timber species and generate income from the harvest. This was an example of the incentive power element, since it offered benefits and changed the communities' behaviour.

Communities started to require a new block permit when the old one expired. The block permit does not appear in the guidelines or in the *Forest Act* as a legal community forest management tool and the communities never inquired whether it was the right procedure. This example shows how the study analyzed the power element trust. The study would only analyze the information provided by one actor if it was was verified by another actor.

The Directorate of Forestry conducted inspections to monitor the implementation of the block permits. The *Forest Act* of Namibia provides a legal basis for this. According to it, officers in charge can issue fines or arrest suspects. The study observed these on several occasions. This could be seen as an example of the coercive power of the Directorate of Forestry.

The results of the qualitative follow-up survey were analyzed and are summarized in Table 2.

Table 2. Summary of power elements used by powerful actors in 14 community forests

Name of powerful actor	Percentage of each power element present (%)		
	Trust	Incentives	Coercion
Directorate of Forestry	79	71	100
German Development Service	100	100	0
Traditional Authority	50	0	100
Forest Management Committee	71	0	0
Conservancy Management Committee	43	0	0
Village Head Man	14	0	0
Ministry of Environment and Tourism	14	0	0
Namibian Nature Foundation	14	14	0

Economic outcome

In 2006 the CFN Project began an initiative to generate income for the members of the Ncumcara community forest through the sale of dead wood for firewood.

The German Development Service provided a rotation fund that allowed the Forest Management Committee (FMC) to pay the firewood producers when they delivered the firewood. After the sale of the firewood, the costs were subtracted and the profit was deposited in the fund.

Forest users saw the firewood rotation fund as a possibility for generating additional household income. In addition, the Ncumcara community forest generated revenue through the collection of permit fees and the sale of confiscated timber. The money was not paid directly to the forest users; instead, it was invested in community projects that benefitted every member of the community forest, e.g., maintenance of a public water point. The forest users benefited from the sale of firewood, both directly and indirectly through the community projects, but not in a significant way. Based on these facts, it was determined that the economic outcome for the Ncumcara community forest belonged to the middle category. The economic outcomes for all 14 community forests studied are presented in Table 3.

Table 3. Results of the outcome analysis

Name of community forest	Social outcome	Economic outcome	Ecological outcome	Powerful actors involved	Powerful actors whose PIDO* corresponds with the outcome
Ncumcara	middle	middle	middle	1, 2, 3, 4, 6	1, 2, 3 4, 6
Mbeyo	middle	middle	middle	1, 2, 3, 4, 6	1, 2, 3, 4, 6
Ncaute	middle	middle	middle	1, 2, 3	1, 2, 3
Muduva-Nyangana	middle	low	low	1, 2, 3, 7, 8	1, 3
George Mukoya	low	low	low	1, 2, 3	None
Kampinga-Kamwalye	low	low	low	1, 2, 3, 4, 8	None
Masida	middle	middle	middle	1, 2, 3, 4, 5	1, 2, 3, 4, 5
Kwando	middle	middle	middle	1, 2, 3, 4, 5	1, 2, 3, 4, 5
Sashona	middle	middle	middle	1, 2, 3, 4, 5	1, 2, 3, 4, 5
Mujako	middle	low	middle	1, 2, 3, 5	1, 2, 3
Izimbwe	middle	low	middle	1, 2, 3, 4, 5	1, 2, 3
Ngoma	middle	low	middle	1, 2, 3, 4, 5	1, 2, 3
Makata	middle	middle	middle	1, 2, 3, 4	1, 2, 3, 4
N#a Jagna Conservancy	middle	low	low	1, 2, 3, 4	1, 3

* PIDO = Powerful Interest Desired Outcome; 1. Directorate of Forestry; 2. German Development Service; 3. Traditional Authority; 4. Forest Management Committee; 5. Conservancy Management Committee; 6. Village Head Man; 7. Ministry of Environment and Tourism; 8. Namibian Nature Foundation

Ecological outcome

After gazettement the German Development Service developed a forest inventory technique. They were highly active in having it applied in the field and paid most of the costs. The results were incorporated into the integrated forest management plan and submitted to the Directorate of Forestry for approval. Apart from ten Participatory Natural Resource Assessments and six unapproved integrated forest management plans, no other document existed to assess natural resources and no evidence of monitoring was found. The ecological outcome was found to be in the middle category in most cases (see Table 3).

Social outcome

The community forestry guidelines recommend the establishment of a forest management body. This was done in all community forests through the selection of an FMC, which would manage the community forest on behalf of all forest users. The committee was supposed to implement the management plan, but since no plans were approved, it had very limited decision-making power over the use of forest resources. In addition, the forest users depended on the block permit, and consequently, on the good will of the Directory of Forestry. This also applied to other activities, such as fire management. Apart from the selection of the committee members and the participation in making decisions about how to use the generated community revenue, the forest users are not really involved in decision-making processes. For this reason, the social outcome was determined as middle for most of the community forests researched (Table 3).

Interest analysis

At the end of the field research in September 2009, ten years after the CFN project started, no management plan had been approved by the Directorate of Forestry. The directorate did support the FMCs in the detection and reduction of illegal harvesting. For example, illegal harvesting activities were discovered in the Mbeyo community forest: 100% of harvestable trees were cut down illegally. Before community forestry started in Mbeyo, the area was known as a hotspot for illegal harvesting activities, but no illegal activity was ever officially reported.[2] During that time the Directorate of Forestry was responsible for managing the Mbeyo forest, but it had neither the resources nor the personnel to do so on a regular basis. Through the involvement of the communities and the establishment of FMCs the directorate has now better control over the large forest areas. Because the directorate needs the involvement of the communities it is willing to hand over some management responsibilities, but it doesn't want the communities to decide on their own behalf. This is why the directorate is delaying or complicating processes. The interests of the powerful actors involved were analyzed and are summarized in Table 4.

Assessing the results

To test the hypothesis — that outcomes in community forestry depend mostly on the interests of powerful actors — the study compared the interests of powerful actors with the outcomes of community forestry. An indicator (Powerful Interest Desired Outcome, or PIDO) was designed (Table 3 and 5).

Table 4. Summary of interests of powerful actors in the 14 community forests

Name of powerful actor	Interests
Directorate of Forestry	- control over forest resources - further funding for community forestry - improved status of the DoF at national level (community forestry contributes to the GDP via the mobilization of forest products, and with this, to rural development and poverty reduction)
German Development Service	- sustainably managed forests - poverty reduction - empowerment of the local resource users
Traditional Authority	- maintain and improve status/position - benefits
Forest Management Committee	- benefits
Conservancy Management Committee	- benefits
Village Head Man	- maintain and improve status/position - benefits
Ministry of Environment and Tourism	- expertise/knowledge on participatory natural resource management - benefits from the forest use will help to support the conservancy approach
Namibian Nature Foundation	- sustainably managed forests - poverty reduction - empowerment of the local resource users

The indicator shows the degree to which the actors' interests correspond to the outcome. Based on the actual community forest outcomes the study could test if the interest of the powerful actor corresponded to the outcome. The results of the test are shown in Table 5.

Table 5. Correlation between actors' interests and outcomes

	Name of powerful actors	PIDO Social	PIDO Economic	PIDO Ecological
1	Directorate of Forestry	1	0	0
2	German Development Service	+1	1	1
3	Traditional Authority	1	0	0
4	Forest Management Committee	0	1	0
5	Conservancy Management Committee	0	1	0
6	Village Head Man	0	1	0
7	Ministry of Environment and Tourism	0	0	0
8	Namibian Nature Foundation	+1	1	1

PIDO +1: the powerful actor desires a high outcome; PIDO 1: the powerful actor desires a middle outcome;
PIDO –1: the powerful actor desires a low outcome; PIDO 0: the powerful actor does not desire a specific outcome

Conclusion

The social and economic outcome results for the forest users presented in Table 3 were mostly determined as middle, indicating that the forest user benefitted only slightly from the community forest concept. They can decide who will be selected as an FMC member, and they are asked what should be done with the money generated through the community forest management. Often, the forest users benefit only through community improvements.

The results also indicated that a stable or improved biodiversity was not a desired outcome for most of the powerful actors. Only two powerful actors desired a high ecological outcome. Because of their involvement in ten cases, the community forests' ecological outcome was evaluated as medium.

In two cases that were in the initial stage of community forestry, the PIDO did not correspond to an outcome. In all other cases powerful actors have interests that correspond to an outcome. In eight cases even powerful actors have at least one interest that corresponds with an outcome.

These findings prove the hypothesis that outcomes in community forestry depend mostly on the interests of powerful actors, since most of the outcomes can be related to an interest of such an actor. The study analyzed the elements of power these actors have; the results show that they use their power to push through their interests. Who the most powerful actor is cannot be answered but it is clear that it is not the forest user.

Endnotes

1. See Community Forest Guidelines, 2005, p. 20
2. Interview sources were the chairman and former illegal harvester, the head man of the village and the first project coordinator for the German Development Service.

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Carsten Schusser
17.03.1977
Halle / Saale
Married, 1 child

Im Eichenschlag 8
37434 Wollbrandshausen
Germany
cschuss@uni-goettingen.de

Curriculum Vitae

Carsten Schusser

Academic Curriculum Vitae

PhD "Comparative Analysis of Community Forestry: Theoretical and Methodological Requirements", defended with magna cum laude **10/2007 – 12/2012**

M.Sc. in Tropical and International Forestry**,** Georg- August University Goettingen, GERMANY **10/1998 - 09/2002**

B.Sc. in Forest Science and Forest Ecology Georg- August University Goettingen, GERMANY **10/1996 - 10/1998**

Abitur on the Thomas Müntzer Gymnasium Halle, Germany **09/1990 - 07/1995**

Scholarships

Erasmus Scholarship for a two-semester study period at the UPV (University of Valencia), Spain. Major subjects: Mediterranean Forestry and Nature Conservation **09/2001 - 09/2002**

TÖB Scholarship (Tropical Ecology Assistant Program/Tropenökologisches Begleitprogramm) funded by the GTZ (German Development Cooperation for Technical Assistance), for a 4 month field study in Ecuador, topic of the research: "Tropical Soils Carbon Fixation Capacities under Different Land Use Practises" **08/2000 - 07/2001**

Professional Experience

Consultant for the German Development Service (DED) in Namibia, project „Community Forestry in North Eastern Namibia" in cooperation with the Namibian Forestry Administration and mentor for a junior professional **04/2005 - 05/2007**

Junior Consultant for the German Development Service (DED), in Chile, project: „ Conservation and Sustainable Use of Natural Forests" (Conservación y Manejo Sustentable del Bosque Nativo/PCMSBN) in cooperation with the Chilean Forest Administration **11/2003 - 11/2004**

Short Time Consultant for the German Development Cooperation for Technical Assistance (GTZ) in Chile, project: „Cost benefit Analysis of selected Sub Projects of the PCMSBN project" **01/2003 - 04/2003**

Göttingen, 05.02.2013

Dr. Carsten Schusser was born in 1977 in Halle, East Germany. He studied Forestry Science at the Georg-August University Goettingen, Germany and at the Polytechnic University of Valencia in Spain. He completed a Bachelor's degree in Forestry and Master's degree in Tropical and International Forestry.

After some years as a professional advisor in the field of international development cooperation in South America and Africa he returned to science. In 2007 he started to research community forestry, first in Namibia and later in Germany. In 2012 he completed his PhD at the Department of Forest and Nature Conservation Policy of the Georg-August University in Goettingen. In the research toward completion of this degree, he analysed the outcomes of community forestry, the actors involved in it, and their relative power and interests. Currently Dr. Carsten Schusser is a senior researcher and the coordinator of the Community Forestry Working Group at the same university department.

The book presents theories and methods which anable the comperison of community forestry around the world:

Many publications highlight the importance of community forestry worldwide. In addition, there is a strong initiative within the scientific community to obtain empirical results from comparative community forestry research studies. Several comparative studies have been conducted or are still in progress, but so far none of these studies has been able to deliver general scientific findings valid for the entirety of the community forestry concept.

This book will contribute to the scientific discourse and will delve into the question of what requirements need to be fulfilled to achieve successful comparisons of community forestry examples around the world. The basis of this book comprises six scientific publications. It provides a scientific tool for the comparison of community forestry cases worldwide.

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VVB LAUFERSWEILER VERLAG
STAUFENBERGRING 15
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Tel: 0641-5599888 Fax: -5599890
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