Community Forestry

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Abstract

Recent and ongoing international studies on community forestry in developing countries have begun to question the success of the international community forestry concept that was introduced by the end of the 1970s. Though it appears that community forestry does contribute to a positive ecological outcome, further results seem to reveal that other advantages promised by the model, i.e., devolution of power to the local resource users and improvement of their livelihoods, simply do not happen.

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But community forestry is a complex collective action by forest users that takes place within a broader network of multiple actors at local, national, and international levels. Apparently, the driving forces behind the programs are actors who are very powerful within the hierarchies. To understand this relationship, it is important to know the involved actors, their power and interests, as well as the outcome of community forestry as such. The following chapter therefore presents an approach which can help to unlock the complexity of community forestry.

Keywords
Community forestry • Actor • Power • Interests • Outcomes

Introduction

"Even the forestry world is driven by different factors and if you like it or not someone is always more powerful than others." (Saying of a national community forestry Director, somewhere in Africa).

Forests are important as a source for valuable products and fulfill environmental and social services. At the same time, several hundred million extremely poor people depend on forest resources for their daily survival. Therefore, it is necessary that policymakers understand the importance of community forestry , take forest governance seriously, and respond better to the needs of the people living nearby Community forests.

"The poor conservation outcomes that followed decades of intrusive resource management strategies and planned development have forced policy makers and scholars to reconsider the role of communities in resource use and conservation. In a break from previous work on development which consider communities a hindrance to progressive social change, current writings champion the role of community in bringing about decentralisation, meaningful participation, and conservation" (Agrawal and Gibson 1999, p. 629). Decentralization approaches started in the end of the 1970s when policymakers and scientists realized that the central managed government systems had failed to stop the still ongoing deforestation. The term *community forestry* (CF) came into use at the same time, when the UN Food and Agriculture Organisation (FAO 1978) initiated activities and programs related to rural communities and their forest–related activities. Since then, community-based management concepts, in particular CF programs, are established in many countries around the globe. Agrawal (2007) mentioned 36 countries covering around 80 % of the forests from which he estimates that around 10 % are managed as community forests. In addition to the practice, the approach community forestry is highly researched and discussed.

All approaches aim to improve the livelihood of local people which depend for their living on the natural resources. It follows the idea that if local people are made responsible for the management by handing over the management rights and some

benefits, the local people would start to protect the resource rather than to destroy it. The core policy objectives of the program are empowerment of direct forest users, improved livelihood of the direct forest users, and improved forest conditions.

What Is a Community Forest?

De Jong (2012, p. 108) states that "Over the years, related terms have been suggested, such as communal forestry, community or communal forest management, community-based natural resource management and others." The FAO accordingly interpreted the term *community forestry* already 1978 as "any situation that intimately involves local people in forestry activities. Important for all Community Forest approaches is the linkage among people, forests and the output of forests." Agraval (2002, p. 41) analyzed several authors and their definitions and states that "The main positive lesson I deriver by comparing these authors are,. . ., members of small groups can design institutional arrangements that help sustainable management of resources." McDermot (2009) follows partly. She goes further and states that ". . ., 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" (McDermot 2009, p. 158). With this, she highlights the role of the local resource user as being the key for a sustainable resource management. At the same time, she also mentions that the same resource user should decide about possible benefits. Baker and Kusel (2003, p. 8) identified community forests' objective as being "to conserve or restore forest ecosystems while improving the well-being of the community that depend on them." Charnley and Poe (2007, p. 301) state that "Community Forestry refers to forest management that has ecological sustainability and local community benefits as central goals, with some degree of responsibility and authority for forest management formally vested in the community."

Summarizing the different arguments, community forestry can be described as follows:

> ***Community Forestry is a concept which emphasises the involvement and the "well-being" of the resource users to conserve or restore forests. Therefor devolution of power to the forest user is the crucial necessity. Although it varies by places, 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.***

Poteete and Ostrom (2004, p. 218) state that "Communal management, for example, occurs when governments grant villagers formal control, but also when local residence exercise de facto control in the absence of formal rights." Since this

is the crucial point, much research was and is conducted to investigate the problem of how to solve natural-resource-related problems when these involve local users. The general conclusion is that this requires power devolution to the local users, even at the community level. This can be, as Potetee and Ostrom (2004) stated, achieved formally ("government grants control") or informally ("in the absence of formal rights"), whereby the absence of formal rights can also be seen as the absence of governmental control.

Investigating more, 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; Schusser 2013a, b).

But what about the direct resource users? Maryudi (2011) analyzed community forests in Java, Indonesia, and concluded that local forest users were not benefiting significantly, neither in empowerment nor in livelihood improvements. Devkota (2010) has presented similar findings, and according to Edmunds and Wollenberg (2001, p. 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 comanagement 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. 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. The same is suggested by Shackleton et al. (2002, p. 1): "More powerful actors in communities tend to manipulate devolution outcomes to suit themselves". Similar findings are made by Schusser (2012b, p. 213) which states that "Outcomes of Community Forestry depend mostly on the interests of powerful actors."

Based on these findings, it is therefore important to know whether the influence of powerful actors on community forestry is dominant enough to drive the outcomes more often than not. If actors' power is the decisive factor, it is not necessary to know the details of their interventions. Instead of analyzing complex influences, it would be sufficient to identify the power of the actors and their interests. From these two factors alone, it should be possible to predict the outcomes of community forestry. The direct power analysis will add to detailed findings about influences of different actors, a general framework which links the outcome of community

forestry directly to the power of actors. The advantage of such a rigid framework is its simplicity, which makes quantification and planning much easier. Additionally, the focus on power adds value, because it allows a realistic judgment about the involved actor's situation, for example, and depends on the situation; the goal of community forestry 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 community forestry. Since powerful actors cannot be easily replaced, community forestry project design should cope with this circumstance. Through the development of a community forestry project design that incorporates the interests of powerful actors as well as those of local users, the chances for a success of the community forestry project can be increased.

Following the discourse, the question could be raised if the CF program can ever fulfill all of its promises. It seems to be that CF has a positive outcome for the forest resource, but is this enough to be successful on a long run? So far, none of the countries which established community forests in the last 30 years were finally successful. Some are on a promising stage (like Namibia, Cameroon, Honduras, Indonesia, or Nepal), but the final step to become sustainable has not been taken yet (Schusser et al. 2015; Yufanyi Movuh and Schusser 2012; Maryudi 2011; Devkota 2010).

The reader of this chapter will realize that sometimes the author became very scientific. This is done purposely because the author sees this as very crucial points and he wants the reader, while dealing with community forestry, doing it in a certain way because in this way, important lessons learned can be drawn and used for much broader comparison. This might speed up the process of discovering crucial findings important for the sustainability of community forestry. This is the reason why the author presents a chapter which reflects the current community forestry approaches as a total success story. With this view, no simple community forestry recipe can be presented. Since the conditions worldwide are so diverse, such a simple recipe will hardly exist and could never be described in a short book chapter. But what can be done is to identify the driving factors of community forestry which depend on the involved actors. It is therefore very important to know the involved actors, their actor-centered power, and interest relations. If such information is used smartly, it can become the keystone for the success of community forestry. This is the reason why this chapter will present important definitions and community forestry basics as well as a model to measure community forest outcomes, a concept to identify community forestry actors, as well as their power and interests and present a method how these results can be interpreted to understand the complexity of community forestry.

Community Forestry Institutions

Worldwide, a variety of forest management institutions exists, ranging from state-managed and -owned forests, informal and voluntary community forestry management without formal user rights, state–community comanagement with user rights

and without user rights, private managed with private ownership rights, and community ownership of forestland combined with private ownership of trees or historical community forestry with ideal user rights.

The modern term "community forest" refers to forests where the people in the community are responsible for the sustainable management of the forest. Mostly every person in this community is formally an owner of the forest resource, without owning the land and without specifying which actual portion of the forest he owns (ideal share). Through this, he should have access to the forest and its products. Mostly the land rights itself belongs to other legal entities and only the user rights to the forest resources, mostly trees, deadwood, and nontimber forest products (NTFPs), are granted. This differentiates community forests from commune forests which are owned by political communes (i.e., state forests or regional government forests), where the residents have very limited user rights.

In contrast, Europe's community forests already have a long and ancient history. 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. 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 eighteenth century, a new concept emerged which argued that common land could be better managed when transferred into private ownership. Therefore, several community divestiture orders were enforced which created the legal base upon which to split up the old village cooperatives. 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, but 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 eighteenth century can be seen as the beginning of the European community forestry concepts which are slightly different from the modern established community forests.

As mentioned earlier, modern community forests got implemented since the end of 1970. The main establishment started in the southern countries of the world. But recently, even industrialized countries in the north discover or remember more and more the advantages of community forestry.

In summary, the following phases characterize the establishment of a community forest which follows the above given definition.

1. Initiation Phase:
   - Step 1: Awareness Creation and Consultation
   - Step 2: Registration of Interest and Initialization of the Process
   - Step 3: Community Organization

2. Application and Declaration Phase
   - Step 4: Indicative Land Use and Resource Mapping
   - Step 5: Demarcation and Approval of Community Forestry Boundaries
   - Step 6: Socioeconomic Survey and Needs Assessments
   - Step 7: Provisional Forest Management Plan and Bylaws
   - Step 8: Developing Benefit- and Cost-Sharing Agreements
   - Step 9: Negotiating and Drafting a Community Forest Agreement
   - Step 10: Applying for a Community Forest Declaration
3. Implementation and Monitoring Phase
   - Step 11: Forest Inventory and Needs Assessment
   - Step 12: Integrated Forest Management Planning
   - Step 13: Implementing the Integrated Forest Management Plan
   - Step 14: Community-Based Monitoring
   - Step 15: Updating the Forest Management Plan
   - Step 16: Strengthening Community Forest Management and Organizational Capacity
   - Step 17: Continues from Step 13

Community Forestry Outcome Analysis

The analysis of outcomes is oriented toward the core policy objectives of the concept of community forestry. These are the empowerment of the direct forest user (social outcome), the improved livelihood of the direct forest user (economic outcome), and improved forest conditions (ecological outcome) (Maryudi et al. 2012). 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 key facts on how the outcomes can be evaluated. 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, the social outcome can be evaluated as high. By contrast, if there are limited information, decision rights, and/or access, the social outcome for the direct forest user is determined as intermediate ("middle"). If the direct forest user has no information, decision rights, or access, the social outcome is low.

The economic 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 economic outcome contributes to livelihood improvement is

Table 1 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**	Forest products Monetary benefits Community development[a]
Low	No contribution in livelihood	No access to forest products, no monetary benefits and no community development
Middle	Contribution up to subsistence[b] 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 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

[a]Illegal or legal
[b]Subsistence a economy without the possibility to save something

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, the economic outcome can be rated 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. The first part is sustained stands. This means the forest becomes green, grows, and may become larger. 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, the ecological outcome can be rated as high.

The outcome analysis is part of a sequence design method which is described at a later stage. 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 in the following table.

Community Forestry Actor Classification

Since it is important to know who deals with community forestry, it is especially important to define the term "community forestry actor." Many publications have looked at community forestry and identified different actors as important players. But none of it has defined the term "actors" explicitly. This inconsistency makes it impossible to identify actors and analyze them accordingly. Especially on a long run, such findings can't be compared. This would be needed to draw common lessons learned about community forestry worldwide.

Many publications used the terms "actor" or "stakeholder" to examine interrelations within community forestry, but none of the publications defines the terms theoretically. However, this actor-theoretical perspective is needed for community forestry actor comparison. As Schimank points out (2005, p. 29), "actors are source and bearer of actions." He also observes that, in accordance with a methodological individualism, actors should be seen as individuals. According to him, this approach will not help much if research tries to cover societal issues, since individuals usually cannot accomplish much in terms of change. This is the starting point of Scharpf's (2000, pp. 95–107) actor-centered intuitionalism approach, where he highlights the stronger position of composite actors, as opposed to individual ones. In much of the research, actors are seen through the lens of this theory. They are entities that have the possibility of influencing processes in order to achieve their own goals. Böcher and Töller (2012) and Blum and Schubert (2011) go one step further and attribute the term "goal" to an actor's distinct interest. Particularly Böcher and Töller (2012) point out the importance of the actor's interest as a determinant of how the actor acts. This is a crucial point, because an actor's interests determine the involvement with the program and the way he behaves. For example, Grimble and Chan (1995, p. 123) indicate that stakeholder groups are defined "[. . .] on the basis of each group having a district set of interests that distinguishes." Coleman (1990, p. 28) relates actors to resources and describes these resources as "things over which they have control and in which they have some interest." Devkota (2010) and Maryudi (2011) see an actor as an entity that can influence CF outcomes based on its interests and power. According to Hermans and Thissen (2009), actors can "[. . .] influence the world around them, including other actors [. . .]." Schneider (2009, p. 192) defines an actor as an "acting entity which is involved in the formulation and implementation of a policy." What these researchers all find is

a situation where an actor has a distinct interest and the possibility of action. To overcome this inconsistency, the following actor definition summarizes these facts and is given as follows:

A Community Forestry actor is any entity that has a distinct interest and the possibility of influencing Community Forestry.

This definition allows for the different possibilities for what an actor can be, e.g., an individual person like a sawmill owner or a composite actor like a government institution. It strictly associates the term "actor" to a policy, e.g., community forestry, if it is possible for the actor to influence it.

Several scholars conducting research about community forestry conducted comparative research on community-based natural resource management in 11 countries around the world. They mention government, traditional leaders, local government, NGOs, donors, universities, the media, the private sector, alliances, and people's organizations as actors with an interest and the possibility of influencing the program.

The self-descriptions of the actors are easy to acquire empirically, but due to the high diversity between different countries and the vagueness of the terms the actors use, the self-descriptions are not sufficient for a sound identification and comparison. The definition should be based on theory and should describe the identity of the actor well. In this way, the diversity of actors from several studies, seen above, is simplified based on theoretical considerations. Therefore, the introduction of a basic definition of "actor" in community forestry is a fundamental requirement for developing a theoretical actor classification.

The role of the specific actor is formulated and legitimized within a society. Depending on the focus of the research, society in general can be divided into different function-based subsystems. These subsystems can be enlarged or adopted based on the research purpose and based on relevant theories. Luhmann (1986, p. 216) proposes political, economic, or social systems as subsystems. The application of these simple theoretical criteria leads to the actors defined in Table 2. Basic roles within the political system are politicians, public administration, boards, donors, and associations. Political theory describes their tasks and their legitimation. In addition, the traditional leaders are identified. They are not part of the formal political system but, at an informal level, still play their traditional roles in many countries and will be classified as politicians.

Within the economic system, the classification discriminates between entrepreneurs, consultants, and the forest users and other user group representatives. They all conduct primarily economic activities related to the forest. The forest user group representative is the actor who manages the community forest. He acts formally on behalf of the user group.

Finally, the social actors are the research institutions and the media. They define their key tasks as being independent from the political system. All actors exist on different geographic levels. (regional, national, and international levels).

Table 2 Theoretical actor classification, definition and examples

Actor	Definition	Example
Political		
Politician	Actor who is elected by the people to fulfil a public mandate and who can legitimise binding decisions	Government and ministers, representatives of political parties, parliament, etc.
Public administration	Public actor that makes decisions concerning specific problems on the basis of general legal standards, resolving those problems by implementing special measures (Krott 2005)	Nature conservation authority, land use authorities, agriculture authorities, police, military, etc.
Forest administration	Public administration focusing on forest tasks	Department of forestry, forest office, directorate of forestry
Traditional leader	Actor who is legitimised to fulfil a public mandate and who can legitimise binding decisions for a community	Village leaders, traditional healers, traditional authority, religious leaders, etc.
Board	Actor formed by politicians, traditional leaders or administrations with public mandate	Land-use boards, public-control boards, etc.
International donor organizations	International actor that offers funds for solving problems	KfW (German Development Bank), Sida (Swedish International Development Cooperation agency), etc.
Association	Actor that articulates the interests of the group he represents and attempts to implement them by lobbying politicians and public administration (Krott 2005)	Forest user group association, carpenters association, foresters association, all etc.
Support associations	Actor that can be characterised as an association but also offers funds for solving problems	All kinds of NGOs which offer funds, health organisations, educational agencies etc.
Economic		
Forest user group representative	Actor that articulates the interests of the local forest users and attempts to implement them	Forest management committee
Other user group representatives	Actor that articulates the interests of other community forestry user groups and attempts to implement them	Village development committee, conservancy management committee, management boards, etc.
Forest entrepreneur	Actor using the forest for production or consumption of products and services	Sawmill operators, logging companies, professional hunters, illegal loggers, companies or individuals buying products or services etc.
Consultant	Actor providing information, funds and management for another actor, based on an contract	Consultants
Societal		
Research Institutions	Actor providing science-based knowledge	Universities, research centres, etc.
Media	Actor distributing and generating information	International and national media, like newspapers, journals, radio and TV stations, etc.
Religious organisations	Actor providing spiritual or religious backup	All kind Churches, mosques, religious or spiritual associations, etc.

In general, the individual forest users' possibility of carrying out collective action, in particular community-based forest management, is seen as an outcome of community forestry. Therefore, the forest user is not forgotten as an actor but is left out, since he is considered to be the actor who should benefit from community forestry (empowerment and livelihood improvements). Nevertheless, as soon as an individual forest user has a distinct interest and the possibility of influencing community forestry, he will become an actor and should be seen as a power player. The actors classified are displayed in the following table.

Actor-Centered Power

The actor-centered power approach is defined by Krott et al. (2014) as a social relationship between actors in which one actor can alter the behavior of another actor without recognizing the latter's will. 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 a group of powerful actors from a group of weak ones. 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. Actor-centered power specifies the following three elements of the general term "power":

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

Power is assumed only if behavior is altered by force, (dis)incentives, or unverified information. These particularities allow the separation of power from other social relations that 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 a social relationship that 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. In cases in which the outcome of bargaining is driven by dominant information or scarce sources, additional power processes could be identified. Open bargaining about sources means offering to other actors what they most urgently demand for themselves, at least in part. In addition, (dis)incentives are regarded as power because the will of the subordinate in respect of his prior resources is neglected by the potentate applying (dis)incentives. For example, the subordinate gets money for planting trees as long as 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 Krott et al. 2014). These include the wielding of power as well as threats and sources. The sources of power offer the best opportunity for collecting information. They are specific and observable, like a weapon, economic resources, or written data.

Interests of Actors

Krott (2005, p. 8) defines it as follows: "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." For analyzing community forestry, the object is the community forest itself. Therefore, the benefit an actor can receive from a specific community forest is important to know. In theory, the model assumes that the expected benefits directly influence the action of individual actors. The interests are linked to goals of community forestry, obligations, or values, but they are additionally shaped by informal aims. Interests cannot be observed directly, but the link to the actor's behavior offers a chance to learn about the interests by observing the behavior of actors in the past. Quite often, an actor claims to have ecological concerns or to be convinced of the importance of sustainability, but by looking at his behavior in the past, it becomes evident that his actions can be explained wholly by the desire to achieve quick economic benefit or to augment his sources. How the actor behaves and what he does are indicators that show his interests. That is, if an actor has no interest in a positive biological outcome, he will be indifferent toward instruments measuring biodiversity or specific actions that benefit biodiversity. Therefore, interviews with powerful actors were conducted and field observations were made to assess these behaviors.

To know how influential a certain actor is, his interests need to be related to the outcomes of community forestry. To test this, the PIDO (Powerful Interest Desired Outcome) indicator (Schusser et al. 2012a, b) can be used. It shows the powerful actors' interests in specific outcomes for the final end users. 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

A PIDO with the values (+1, 1, or −1) indicates that an actor prefers a specific outcome for the end user. Depending on the interests of the end user or the goals for community forestry, a specific PIDO might be evaluated as being positive or negative. Keeping the official program of community forestry in mind, a result would be assumed to be formally positive if all outcomes are middle to high.

The PIDO is the final element needed to test dependencies between the interest of powerful actors and the real outcomes of community forestry. To use the PIDO makes only sense in cases where community forestry already exists over a longer period.

Sequence of Surveys for a Comparative Analysis of Actor-Centered Power in Community Forestry

The following method is designed to identify the actors involved in a local community forest network and their actor-centered power. At the same time, additional information useful for the outcome and actor-interest analysis can be collected.

The challenge is to find 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. To be practical, all this should be achieved with a small budget and limited time. Therefore, the sequence shown in Table 3 was developed. The preliminary quantitative network survey needs to be 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. The follow-up comparative quantitative network analysis builds on the data produced.

A straightforward way would be to conduct empirical observations of all members of the network. Several cases 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, 30 days would be needed to conduct field work for only one community forest. Keeping in mind that in many developing countries the weather conditions do not allow access to the field during the whole year, a much faster and efficient field survey technique is needed. This is achieved with the method presented.

The 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

Table 3 Sequence of surveys for power analysis compared with single survey

	Sequence of surveys 1–3		
Quality criteria	1. Preliminary quantitative network survey	2. Follow-up qualitative power survey	3. Follow-up comparative quantitative network analysis
Validity	High for simple hypothesis	High for complex hypothesis	High for complex hypothesis
Reliability	Sufficient for identifying the group of powerful actors	Good due to combination of multiple sources	Good due to triangulation of the results of the previous sequence steps
Resource use	Low	Low	Very low

the forest and the offices of the actors. These quality questions are discussed in the chapter about the second step in the follow-up qualitative power survey in detail.

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. The theory assumes that actors are linked by complex power processes which become visible within a network only. The network analysis provides the observer with mostly quantitative tools for describing the power relations. Marsden (2001) 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 2001, p. 380). Trying to cover all these aspects properly would drive the sources needed for the complex survey instruments up.

The solution suggested is to simplify the hypothesis. Instead, looking for a complex power network method is looking for a much simpler model only, namely, for 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 describing power processes exactly. To look for contrasting positions in order to get robust data is suggested by Marsden (1990, p. 456). If complexity is defined 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 provided 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.

The 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 powerful 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. Starting with the chairperson of the specific Community Forest User Group Committee, he can be asked which actors he has to deal with within specific community forests. Afterward, this question is repeated to all actors mentioned, always referring to the specific community forest, until no new actor is mentioned.

Several case studies showed that after the group meets 10–15 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 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. For the special case of looking for powerful actors, the lack of knowledge is regarded as 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 the assumption because data about strong ties and about local networks are better. In contrast, this kind of survey is not very strong for the identification of weak actors, since most in the network pay little attention to them. Due to the prominent position of powerful actors, the first question to identify other actors is an indicator for power already. If actors are not mentioned at all, they can be considered as not powerful from the point of view of the specific actor asked.

The social desirability bias caused by the selection of "social and political correct" answers instead of 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, the reliability of the survey can be estimated as low to use the data for 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. It creates standardized measures based on the theory of actor-centered power before data collection. As described earlier, the actor-centered power theory defines power as a social relationship in which actor A alters the behavior of actor B without recognizing B's will. Altering the behavior can be achieved by coercion, incentives, or trust.

In order to measure incentives, the actors can be asked, directly, from whom they had received any kind of incentives. This information can be transcribed in a Likert scale: the answer yes into a 1 and the answer no into a 0. In the same simple manner, they should be asked whom they trust in the network. Assuming that answering questions about trust is impossible to ask directly, indirect questions should be used. This can be done by asking "Who provides you with information?", "How good was this information?", and "Did you ever verify this information?" Finally, "coercion" as power should also not be addressed directly but rather with 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 both answers are "yes" with regard to specific actors, it can be assumed they have strong coercive power whereby only one yes would refer to some coercive power and two no's to no coercive power. All results should be coded in a Likert scale (see Annex for it). As many external estimates for the specific

power elements for each actor can be received as there were other actors in the network. The multiple external estimates are stable against the bias which would be inevitable if they were to ask an actor about his own power. Based on the data of all external estimates, the power for each actor for the three elements of coercion, incentives, and trust can be calculated separately.

Having summarized estimates for each actor, the task remains of determining the group of most powerful 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[1]:

n Total number of identified actors

X_i Sum of answers per actor and for one power element, $0 > X_i \geq (n-1) * highes\ possible\ asnwer\ of\ the\ coresponding\ Likert\ scale\ (1\ or\ 3),\quad for\ i = 1, \ldots, n\ ,\ \sum_{i=1}^{n} X_i = Total\ given\ answers\ per\ power\ element$

h_i Ratio of power per actor and per power element (i), with $0 > h_i \geq 1,\ and\ for\ i = 1, \ldots, n\ and\ \sum_{i=1}^{n} h_i = 1 = Total\ power\ per\ power\ element$

r Position of the sorted ratio of power per actor (h_i); the sorting starts with the highest value until the lowest; equal values can be sorted continually anyway $for\ r = 1, \ldots, n$

m Number of considered powerful actors

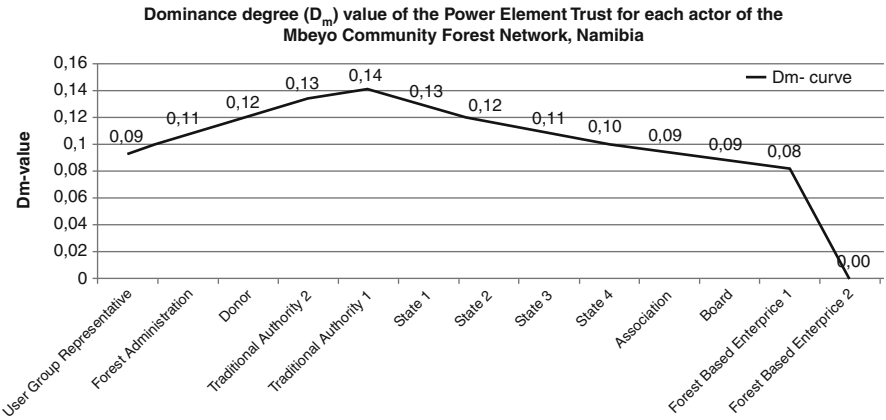
CR_m Concentration ratio, shows the distribution of the power per actor (i.e., CR2 = 0.4 means that the first two actors hold 40 % of the total available power per power element in the network)

D_m Dominance Degree (Herfindahl-Dominance Degree or Deeffaa-Degree), with m = group of powerful actors and n − m group of less powerful actors

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

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

[1]Adopted from Duller and Kepler (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

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 4 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 4) 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 4 are sorted according to the earlier introduced actor classification.

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 some 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 1 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.

A sample questionnaire to process as well as calculate the values for the preliminary quantitative analysis is provided in the Annex to this chapter.

Table 4 Quantitative, qualitative data and triangulated results for all power elements for the Mbeyo Community Forest Network, 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		

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 letters 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. If no evidence could be found, the observation should be disregarded.

Conducting a qualitative field investigation which makes use of observations, interviews, and all kinds 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 five powerful actors which were identified within one case, on average (Schusser 2012a, b). 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 observer can spend more time with the most relevant actors, looking for documents and making his own observations, which increases the reliability.

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, the quantitative data is not recognized as being reliable and review them giving priority to the qualitative information (see Table 4).

Giving stronger credit to the qualitative survey is justified by methodical arguments:

(i) The quantitative survey is done in a methodical rudimentary way asking a few questions only in order to save resources. The data indicate the group of powerful actors but not more. For example, no complex network indicators are calculated, and a most simple scale with "0 (no)," "1 (some)," and "2 (strong)" for describing the quantitative results should be used.
(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 prove the answers and on observations, e.g., of his technical sources.

(iii) The qualitative survey is linked much better to specific findings than the quantitative survey which measures a general power relation. If the quantitative survey indicates a powerful actor in general, it is not possible to describe his power process and sources. The weak link to detailed evidence justifies additionally overruling the quantitative data by qualitative ones. Even in the rare cases, whether the quantitative data are better remains unproven.

(iv) Giving priority to qualitative data derives the question why to rely so much on the strong actors identified in the quantitative survey. First, it is not done fully. The qualitative survey may omit strong actors or add some if the data give evidence for power sources and processes. Second, it might oversee some powerful actors due to the weakness of the quantitative survey and the focus of the qualitative survey on the actors identified by the quantitative survey. Underestimating the powerful actors is not destroying the ability to identify powerful actors and to determine the outcome. A positive result can be seen as a proof. Of course, if this phenomenon turns out frequently, additional surveys in order to find the hidden powerful actor should be carried out.

The preliminary actor-power network is reviewed focusing on the powerful actors based on the qualitative data. For example, in Table 4, 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 actors 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 progress of the comparative analysis is that it can classify the actors into categories which are meaningful. In line with the guiding question who decides about community forestry, the method can describe power processes and resources. But one 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 this design. As discussed, this restriction can be justified with the hypothesis that in explaining the outcomes, the powerful actors make the difference. For example, state agencies 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.

Conclusion

Community forestry assumes that the local resource user is the key for the success of a program. Since the program emphasizes that as a crucial point, this approach is not questioned. The method presented addresses the question of who drives CF at this present stage. Current studies clearly indicate that, so far, the forest user is not the one who determines this. However, certain actors have taken the chance to improve their positions. This is clearly visible by looking to the forest administration. Community forestry can help the forest administration to increase the governmental control over the forest resources through the involvement of the forest user (devolution of power). Nevertheless, the above already presented statement from Shackleton et al. (2002, p. 1) brings it to the point: "More powerful actors in communities tend to manipulate devolution outcomes to suit themselves."

The method presented in this chapter provides a tool to easily analyze the existing power structure of actors involved with community forestry. It facilitates the analysis of the actor's interests as well as archived outcomes in case the program is implemented already for a certain time. The results of such an analysis can help to adjust existing programs or to plan new initiatives accordingly. If powerful actors and their interests are known, an appropriate approach can be developed. Most important is that community forestry depends on the people who live in community forests. They only do so if they see certain benefit for themselves. The forest administration is interested in a certain surface of forest resources which are essential to justify their existence. On the other side, local people are interested in the resources for use. If the local user has the feeling that the resources somehow belong to him, he might have a greater interest to protect the forests on a long run. Since the local user is not the only one who decides about the outcomes of community forestry, a sustainable way can only be achieved if the right mix of decision-making power, satisfaction of interests, and ownership of the forest resources is found.

Annex

Questionnaire: Task and Experiences with Community Forestry

Researcher: **Interviewee:**

Community Forestry:

Date:

Please complete the table:

Mention all actors you deal with related to the specific Community Forest (CF):

Questions 1–5

1. Who of these actors provides you with information related to the specific CF and how good was this information according to your own judgment? (0 no or

unacceptable information, 1 acceptable- good information, 2 very good information)
2. Have you ever verified this information? (0 always, 1 never, 2 sometimes)
3. Who of these actors provides incentives (0 no incentives, 1 material or moral incentives or disincentives)
4. Apart from the information or provided incentives is one of these actors still needed to carry out your activities related to the specific CF? (0 not needed, 1 needed)
5. Do you need to get permission from one of your mentioned actors to carry out your activities related to the specific CF? (0 not needed, 1 needed)

Name of actor	**1: T_q Information** 0 no or unacceptable 1 good 2 very good	**2: T_v Info verified** 0 always 1 never 2 sometime	**3: I Incentives** 0 none 1 yes	**4: C_i Needed actor** 0 not needed, 1 needed	**5: C_p Permission** 0 not needed, 1 needed

Quantitative Actor- Power Network Analysis and calculation instructions for the preliminary quantitative power analysis

Calculate based on the entries in the above table the values for the different power elements as followed:

Power element Trust $\left(T = T_q \div T_v\right)$, possible cases:

- No Trust Power:

$$T_0 = \left\{\left[\left(T_q = 0\right) \wedge \left(T_v = 0\right)\right] \vee \left[\left(T_q = 0\right) \wedge \left(T_v = 1\right)\right] \vee \left[\left(T_q = 0\right) \wedge \left(T_v = 2\right)\right] \vee \left[\left(T_q = 1\right) \wedge \left(T_v = 0\right)\right] \vee \left[\left(T_q = 2\right) \wedge \left(T_v = 0\right)\right]\right\}, \quad \text{code with } 0$$

- Some Trust Power:

$$T_1 = \left\{\left(T_q = 1\right) \wedge \left(T_v = 1\right) \vee \left(T_q = 1\right) \wedge \left(T_v = 2\right) \vee \left(T_q = 2\right) \wedge \left(T_v = 2\right)\right\}, \quad \text{code with } 1$$

- Full Trust Power:

$$T_2 = \left\{\left(T_q = 2\right) \wedge \left(T_v = 1\right)\right\}, \quad \text{code with } 2$$

Power element Incentives $(\mathrm{I} = \mathrm{I})$, possible cases:

- No Incentives Power

$$I_0 = \{0\}, \quad \text{code with } 0$$

- Incentives Power:

$$I_1 = \{1\}, \qquad \text{code with 1}$$

Power element Coercion $\left(C = C_i + C_p\right)$, possible cases:

- No Coercive Power:

$$C_0 = \left\{(C_i = 0) \wedge \left(C_p = 0\right)\right\}, \qquad \text{code with 0}$$

- Coercive Power:

$$C_1 = \left\{\left[(C_i = 0) \wedge \left(C_p = 1\right)\right] \vee \left[(C_i = 1) \wedge \left(C_p = 0\right)\right]\right\}, \qquad \text{code with 1}$$

- Strong Coercive Power:

$$C_2 = \left\{(C_i = 1) \wedge \left(C_p = 1\right)\right\}, \qquad \text{code with 2}$$

Enter the calculated power element values accordingly into the following Table:

Name of Community Forest:							
T: trust: 0,1, 2,(0 no T -2 full), I: Incentive: 0 or 1 (0=none, 1= yes), C: coercion: 0 , 1 , 2(0= none, 1=some, 2 strong)							
Actor's name	Power Factor	Actor's name Actor 1	Actor 2	Actor 3	Actor 4	Actor 5	Actor x
Actor 1	T I C	no entry					
Actor 2	T I C		no entry				
Actor 3	T I C			no entry			
Actor 4	T I C				no entry		
Actor 5	T I C					no entry	
Total (xi)	**T I C**	**Sum Sum Sum**	**Sum Sum Sum**	**Sum Sum Sum**	**Sum Sum Sum**	**Sum Sum Sum**	**Sum Sum Sum**

Sort the summarized power elements for all actors with the highest value to the lowest value per power element and proceed as followed

	A	B	C	D	E	F	G	H
19		C						
20	Total (xi)	T	Sum	Sum	Sum	Sum	Sum	Sum
21		I	Sum	Sum	Sum	Sum	Sum	Sum
22		C	Sum	Sum	Sum	Sum	Sum	Sum
23								
24								
25		Power element	1	2	3	4	5	6
26		Coercion	Actor 4	Actor 5	Actor 1	Actor 3	Actor 2	
27		xi	F 22	G 22	C 22	E 22	D 22	Sum of A1 to A5
28		hi	C28/H27	D28/H27	E28/H27	F28/H27	G28/H27	
29		Cri	C28	C29 + D28	D29 + E28	E29 + F28	F29+ G28	
30		Dm	{C29^2/C25) +{(1-C29)^2/(5(Total Number of actors)-C25)}				{G29^2/G25) +{(1-G29)^2/(5-G25)}	
31			*adoped for D2- D4 following example D1 and D5*					
32								
33		**Example**						
34								
35		Power element	1	2	3	4	5	
36		coercion	Actor 4	Actor 5	Actor 1	Actor 3	Actor 2	
37		xi	15	14	5	3	1	38
38		hi	0,394736842	0,368421053	0,131578947	0,078947368	0,026315789	
39		Cri	0,394736842	0,763157895	0,894736842	0,973684211	1	
40		Dm	0,186345799	0,296304457	0,267959372	0,237092182	=(G39^2/G35)+((1	
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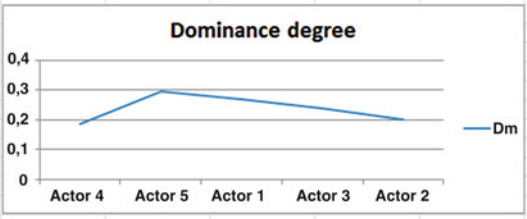

The peak on the graph dominance degree graph (Dm) indicates the point of separation between the group of powerful actors (Actor 4 and Actor 5) and the group of less powerful actors (Actor 1, Actor 3 and Actor 2).

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