Institutionalising Biodiversity Conservation – The Case of Ethiopian Coffee Forests

Franz W. Gatzweiler

Abstract: *The predominant notion on institutionalising biodiversity conservation is that as a result of the features and functions of biodiversity as well as the attributes of the actors, institutional diversity and multi-level governance are required. Institutional diversity per se, however, is not a panacea for successful biodiversity conservation and even less useful for identifying starting points for action. The Ethiopian case demonstrates what happens when—according to theory—the government "steps aside" and the "market works its wonders". After recognising the importance of institutional diversity, the challenge is to shape its context-specific patterns by identifying starting points for action. This requires guidance, mediation, and facilitation. The attempt to conserve Ethiopian coffee forests illustrates that the government, NGOs, local communities as well as private companies have their individual interests but also share a common vision to conserve forests. Well coordinated collective action is identified as a necessary consequence of institutional diversity.*

Keywords: biodiversity, institutions, governance, Ethiopia

INTRODUCTION

INSTITUTIONALISING BIODIVERSITY CONSERVATION is a challenging process that requires time.[1] It is an approach which happens in the context of science (collecting and understanding data on biodiversity and its change) and policy (formulating and implementing adequate policies in response to the gained knowledge). In contrast to partial approaches to biodiversity conservation, and

Franz W. Gatzweiler, University of Bonn, Centre for Development Research (ZEF), Walter-Flex Str. 3, 53113 Bonn, Germany.

Address for Correspondence
Franz W. Gatzweiler, University of Bonn, Centre for Development Research (ZEF), Walter-Flex Str. 3, 53113 Bonn, Germany.
E-mail: f.gatz@uni-bonn.de

Conservation and Society, Pages 201 - 223
Volume 3, No. 1, June 2005

suggestions to govern biodiversity by either the market, the state or co-management arrangements, this paper takes a systemic perspective and argues that institutional diversity infers from the specific features of the resource "biodiversity" as well as the attributes of the involved actors. How specific patterns of institutional diversity look and where to start in the process of building institutions for biodiversity conservation is discussed by referring to the Ethiopian case of coffee forest conservation.

Fairhead and Leach (2003) identify four sets of science and policy practices which characterise current approaches towards biodiversity conservation: (1) the listing of plant and animal species; (2) the exploration of ecosystem dynamics through "cutting edge" computer modeling techniques; (3) the harnessing of traditional plant medicines, linked with discussions on biopiracy; and (4) the promotion of "semi-wild" plants, such as oil palm, or in this case, wild coffee populations in the Ethiopian montane rainforests. This paper argues that these are necessary but not sufficient practices for conserving biodiversity. The institutionalisation of the various actors and activities involved in the use of resources is essential for biodiversity conservation. "Recent experience provides convincing evidence that neither can they (institutions) be taken for granted nor do they automatically evolve from getting the prices right" (North 1998: 491). Therefore, this paper argues that apart from "getting prices right", institutionalising biodiversity conservation is a more complex and complicated task which requires getting institutions and governance of biodiversity resources right.

The paper aims at addressing the question of how the process of social organisation can achieve biodiversity conservation goals. We demonstrate, by referring to literature and to the Ethiopian case, that institutional diversity is required to deal with biodiversity conservation. In our case, the attempt to conserve Ethiopian coffee forests has led to the emergence of institutional and organisational diversity at all scales: international, regional, national, and local. We attempt to demonstrate that the evolution of institutional and organisational diversity can help to address different aspects of biodiversity conservation. For example, the government gets involved in co-management arrangement with forest user groups, other farmers continue to use their individual forest plots, and small private companies aim at fair trade arrangements in the coffee specialty sector by paying better prices for forest coffee to the farmers. At some point in time, however, efforts need to be made to coordinate and aggregate the activities of the various stakeholders. The emergence of networks and groups (such as the Ethiopian Coffee Network and the Coffee Forest Conservation Forum) demonstrate how institutions can aggregate.

The paper builds on the framework of social and ecological systems and institutions at their interface (Gatzweiler and Hagedorn 2002). After defining institutions and biodiversity, we characterise biodiversity resources and the human actor characteristics by a set of attributes. In our discussion on

governance, we argue (by referring to Hooghe and Marks 2003) that if one takes such social and ecological heterogeneity into account, the optimal level of authority may be lower than what economies of scale dictate, so that multi-level governance allows decision makers to adjust the scale of governance to reflect heterogeneity. Large scale centralised governmental units do not have the variety of response capabilities that complex, polycentric, multi-layered governance systems have. The Ethiopian case describes the variety of actors and institutions related to coffee forest conservation. They exist next to each other and do not necessarily coordinate actions. Recent developments, however, show that actors and institutions can actually combine to achieve common goals. In this process, the government has a role as facilitator and supporter, which it should take more seriously, especially in a transition country like Ethiopia where trust between the government and local people needs to be reinstated.

Institutions and Ecosystems

Institutions are regulatory mechanisms at the interface between ecological and social systems (Gatzweiler and Hagedorn 2000). They are sets of rules and regulations that constrain or motivate actors to interact with ecosystems and other human beings in certain ways. Institutions are also referred to as "the rules of a game". Obviously, long-lasting institutions for the sustainable provision of environmental goods and services need to respond to biophysical and socio-economic system attributes. This includes finding ways to link different levels of social analysis. Williamson (2000) distinguishes first, the social embeddedness level, where the norms, customs, traditions, and other informal rules are located; second, the institutional environment level, where formal rules (constitutions, laws, property rights) are located, including "… the executive, legislative, judicial, and bureaucratic functions of government as well as the distribution of powers across different levels of government (federalism). Going beyond the rules of the game (property) to include the play of the game (contract) …" Williamson identifies the third level of analysis as that of the institutions of governance: strategies, coordination mechanisms, or "the play of a game". It is "an effort to craft order, thereby to mitigate conflict and realise mutual gains" (Williamson 2000: 599). Defining and enforcing property rights is done at the level of governance. In natural resource management, strict protection enforced by the government, co-management arrangements and market solutions are frequently referred to. The fourth level of analysis is that of the neoclassical optimality apparatus, or getting the prices right. The efficient allocation of resources is achieved by a continuous adjustment of prices and quantities.

Williamson (2000: 598) notes that "once property rights have been defined and their enforcement ensured, the government steps aside. Resources are allocated

to their highest value as the marvel of the market works its wonders." This paper attempts to demonstrate that governing biodiversity is not achieved by singular institutional arrangements, such as a market miracle. The process of institutionalising biodiversity conservation is a constant struggle (Dietz et al. 2003), which requires institutional diversity. The market mechanism would not work well without the existence of formal institutions which, for example, ensure that with the exchange of goods in the market, ownership changes as well. In addition, market exchanges require informal institutions, such as trust and social networks (Fukuyama 1995; Ostrom and Walker 2003). For example, if when buying honey from an Indonesian forest honey farmer, I find he frequently mixes sugar with honey, I will not trust this farmer any longer and will not continue to buy honey from him. Or, if the farmer sells his honey but cannot trust the value of the money he exchanged it for, he may prefer to consume the honey himself or exchange it for a more reliable currency. Therefore, although the market is a useful allocation mechanism for private goods, it still needs to be supported by informal institutions at other levels of society in order to function properly.

In contrast to private goods, the allocation of ecosystem functions with common pool and public good characteristics needs to be addressed by different institutions and governance. Under certain circumstances, people have been able to govern the production and provision of ecosystem goods and services by themselves instead of being dominated by the market or the state (Ostrom 1990; Dietz et al. 2003). But even in indigenous economies where the dominant mode of exchange is characterised by reciprocity, exchange, and tight social norms, the value of some private ecosystem goods is determined by the mechanism of supply and demand (Gatzweiler 2003).

Conceptualising Conservation by Matching Ecological and Social Systems

Ecosystems Functions

We define biodiversity (genetic, species and ecosystems) by the concept of ecosystem goods and services (functions) developed by De Groot et al. (2000, 2002, see Table 1). The concept of ecosystem functions is particularly useful for relating the analysis of ecosystems to that of social systems—a necessary task for biodiversity conservation. This is because it implies that ecosystem functions are not only necessary for maintaining ecosystem integrity and resilience, but also because they deliver goods and services necessary for a decent quality of life. De Groot et al. (2000, 2002) note that the underlying logic in the ranking of the tasks is that regulation and habitat functions maintain "natural processes and components, and are therefore conditional to the availability of the other two function groups: production and information functions."

Table 1
Ecosystem goods and services (functions)

Functions	Ecosystem Processes and Components	Examples of Goods and Services
Regulation Functions		
Maintenance of essential ecological processes and life support systems		
1 Gas regulation	Role of ecosystem in the bio-geochemical cycles (e.g. CO_2/O_2 balance, ozone layer)	1.1 UVb-protection by O_3 (preventing disease) 1.2 Maintenance of (good) air quality 1.3 Influence on climate (see also function 2.)
2 Climate regulation	Influence of land cover and biological mediated processes (e.g. DMS production) on climate	Maintenance of a favorable climate (temp., precipitation, etc) for, for example, human habitation, health, cultivation
3 Disturbance prevention	Influence of ecosystem structure on dampening environmental disturbances	3.1 Storm protection (e.g. by coral reefs) 3.2 Flood prevention (e.g. by wetlands and forests)
4 Water regulation	Role of land cover in regulating runoff and river discharge	4.1 Drainage and natural irrigation 4.2 Medium for transport
5 Water supply	Filtering, retention and storage of fresh water (e.g. in aquifiers)	Provision of water for consumptive use (e.g. drinking, irrigation and industrial use)
6 Soil retention	Role of vegetation root matrix and soil biota in soil retention	6.1 Maintenance of arable land 6.2 Prevention of damage from erosion / siltation
7 Soil formation	Weathering of rock, accumulation of organic matter	7.1 Maintenance of productivity on arable land 7.2 Maintenance of natural productive soils
8 Nutrient regulation	Role of biota in storage and recycling of nutrients (e.g.N,P,K)	Maintenance of healthy soils and productive ecosystems
9 Waste treatment	Role of vegetation and biota in removal or breakdown of xenic nutrients and compounds	9.1 Pollution control/detoxification 9.2 Filtering of dust particles 9.3 Abatement of noise pollution
10 Pollination	Role of biota in movement of floral gametes	10.1 Pollination of wild plant species 10.2 Pollination of crops
11 Biological control	Population control through trophic-dynamic relations	11.1 Control of pests and diseases 11.2 Reduction of herbivory (crop damage)
Habitat Functions		
Providing habitat (suitable living space) for wild plant and animal species		
12 Refugium function	Suitable living space for wild plants and animals	Maintenance of biological & genetic diversity (and thus the basis for most other functions)
13 Nursery Function	Suitable reproduction habitat	Maintenance of commercially harvested species

Table 1...continued

Production Functions - Provision of natural resources		
14 Food	Conversion of solar energy into edible plants and animals	14.1 Hunting, gathering of fish, game, fruits, etc. 14.2 Small-scale subsistence farming & aquaculture
15 Raw materials	Conversion of solar energy into biomass for human construction and other uses	15.1 Building & manufacturing (e.g. lumber, skins) 15.2 Fuel and energy (e.g. fuel wood, organic matter) 15.3 Fodder and fertiliser (e.g. krill, leaves, litter).
16 Genetic resources	Genetic material and evolution in wild plants and animals	16.1 Improve crop resistance to pathogens & pests 16.2 Other applications (e.g. health care)
17 Medicinal resources	Variety of (bio-)chemical substances in, and other medicinal uses, natural biota	17.1 Drugs and pharmaceuticals 17.2 Chemical models & tools 17.3 Test- and essay organisms
18 Ornamental resources	Variety of biota in natural ecosystems with (potential) ornamental use	Resources for fashion, handicraft, jewellery, pets, worship, decoration & souvenirs (e.g. furs, feathers, ivory, orchids, butterflies, aquarium fish, shells, etc.)
Information Functions - Providing opportunities for cognitive development		
19 Aesthetic information	Attractive landscape features	Enjoyment of scenery (scenic roads, housing , etc.)
20 Recreation	Variety in landscapes with (potential) recreational values	Travel to natural ecosystems for eco-tourism, outdoor sports
21 Cultural and artistic information	Variety in natural features with cultural and artistic qualities	Use of nature as motive in books, film, painting, folklore, national symbols, architecture, advertising, etc
22. Spiritual and historic information	Variety in natural features with spiritual and historic value	Use of nature for religious or historic purposes (i.e. heritage value of natural ecosystems and features)
23 Science and education	Variety in nature with scientific and educational value	Use of natural systems for school excursions, etc. Use of nature for scientific research

Source: Adapted from Costanza et al. (1998); De Groot (1997); De Groot et al. (2000).

For organising and governing biodiversity conservation, key features of ecosystem functions need to be considered. These are:

- Non-universality: Biological resources can have private good (e.g. timber, fruit, medicines), as well as common pool and public good characteristics (beauty, water purification, CO_2 sequestration, climate regulation).
- Imperfect exclusivity/subtractability: Benefits and costs accrue to the owner and others. Efforts to exclude others from the benefits of biodiversity are usually too costly to make exclusion feasible. Actors who are not entitled to use the goods or services (or have limited entitlements) are free riding or behave opportunistically which can result in the depletion of biodiversity

resources or undesirable environmental damages. Those resources which are non-subtractable (e.g., scenic view) cannot be exhausted by additional use intensity.

- Imperfect transferability: Property can be transferred from one owner to another in case of private property. Other goods and services cannot be transferred or only at high cost.
- Imperfect enforceability: Property is usually only protected from involuntary seizure if it is private property. The enforcement of property rights and entitlements for common pool resources and public goods is much more difficult.
- Rivalry: In the case of common pool resources, more than one user appropriates the resource and reduces the potential benefits for another user. In public goods and services (e.g. carbon sequestration, climate regulation or beauty), rivalry is less of a problem.[2]
- Heterogeneity, variability and complexity are typical attributes of biodiversity. Groups of resource users "are linked to each other and to multiple resources that occur across multiple scales through multi-level governance arrangements" (Janssen et al. 2003).
- Uncertainty: Farmers often do not know whether certain environmental occurrences will affect them or not. Diversity is an essential strategy for survival, e.g., by the distribution of risk. A drop in agricultural diversity increases the risk of crop failure by pathogens. This rule is usually known to farmers. Therefore, if farmers choose management alternatives with low biodiversity or those which decrease diversity, it can be assumed that their goals have changed. Instead of long-term risk minimisation they have now switched to short-term survival strategies. The portfolio of institutional arrangements in an uncertain and biodiverse world needs to be larger than that in a more certain world. The presence of possible surprises requires institutions and policies which change as social and ecological systems evolve and knowledge advances.
- Fuzziness: Biodiversity has a fuzzy nature. Depending on how it is looked at, it can be seen as an aggregation of resources or as a state and viewing it from different angles can lead to different perceptions of what is involved. Increased information on single system components is reverse proportional to better knowledge of system's behavior or functioning. The 'state' perspective of biodiversity refers to the basic conditions and drives the processes that sustain our very survival. Ecosystems' resilience and robustness is connected to the state nature of biodiversity and thereby to some important foundations of life on Earth. For this reason, and given the lack of knowledge on the extent of diversity necessary to sustain living systems, biodiversity should be conserved out of precaution.

Actors' Attributes and Social System Characteristics

Apart from the ecosystem attributes, the success of biodiversity conservation depends on the characteristics and objectives of the actors involved in decision making, as well as other stakeholders. This is not only true for individual actors whose values, interests and resources to exert influence (power) are very different, but also for groups of individuals like communities using organisations and networks to shape institutions according to their objectives. Actor's and community characteristics which affect the organisation and coordination capabilities of people have been extensively discussed (Ostrom et al. 1994; Edwards and Steins 1998; Poteete and Ostrom 2001; Hagedorn et al. 2002). By categorising different user groups and characteristics of actors, the analyst can identify how the members of a group:

- perceive the physical nature and value of the common pool resource system
- gain access to different levels of decision making with respect to allocation and management of the resource
- interact with their own and amongst other user groups
- adopt strategies
- respond to particular outcomes on the common pool resource system.

Hagedorn et al. (2002) distinguish categories of actors at different levels of society (such as policy makers, voters, and producers) and provide a comprehensive list of actor attributes which potentially affect the organisation of biodiversity conservation:

- Values, world-views and belief systems of the actors and their particular attitudes and perceptions that are relevant to their readiness to collaborate with other actors and to comply with rules and policy measures
- Actors' reputations, reliability and trustworthiness
- Resources for influencing the policy process
- Actors' ability to communicate and exchange knowledge and information
- The selection criteria actors use for deciding particular courses of action (Ostrom et al. 1994).
- Culture: The social environment and embeddedness of actors that affect their behaviour

In addition, rules and property rights play a significant role in organising biodiversity conservation. Property rights and duties refer to the streams of costs and benefits from the use of ecosystem resources and thereby describe a bundle of relationships between different users (in proximity or distance) and the resources. They are "lawful claims to possess, enjoy, and dispose of an item or good" (Bikers and Williams 2001: 102). The fundamental problem with property rights and ecosystem goods and services is the numerous potential and actual conflicts

between local and non-local actor/group claims on private and public goods and services. Biodiversity conservation can fail either because property rights are not well defined or because they are well defined but objectives of local and non-local groups are non-convergent (Swanson 2003).

Governance of Biodiversity Conservation

The fact that "private institutions alone will not do enough to protect biodiversity" (James et al. 2000: 120) is well known by now. This, however, should not lead to the misconception that private institutions per se are not able to contribute to maintaining biodiversity. An important implication of that finding by James et al. (although not directly stated) is that institutional diversity is better equipped to protect biological diversity. Single governance systems frequently fail to allocate ecosystem goods and services in a sustainable manner (ecologically sound, economically equitable, and socially fair). Private goods and services require different governance arrangements than public goods. Markets are better equipped for the allocation of private goods than for public goods and services. There are many situations where conditions do not exist for markets to function effectively. In these cases, markets fail and this failure is the primary justification for public policy intervention (Bikers and Williams 2001). One form of policy intervention is to compensate farmers and protect them from the conditions of uncertainty they are exposed to. Another is to protect nature from the impact of human use.

Ostrom (1998a,b) provides examples of governance situations where "neither markets nor the state" prevails. She points to the fact that many indigenous institutions have endured for centuries. Some of these are being unwittingly destroyed under the guise of environmental conservation by national governments and international donors and organisations that have put more emphasis on physical facilities than on social capital—the shared knowledge, trust, and understanding among users that has sustained the productivity of natural resources for ages. Among numerous other authors, Agrawal (1996, 2000) provides evidence of governance alternatives which are neither market- nor state- driven. Many countries have launched the attempt to move away from centralised forest policies and increase local participation in the management of forests. Yet, without local sources of revenue which allow the building of local institutions to ensure sustainable use of forest resources, Agrawal (2000) predicts that the proposed cooperation between state governments and local communities will not be fruitful.

The success of the Ethiopian-German participatory forest management project may be explained by the fact that local revenues are generated. Farmers receive forest use rights and governments receive land rents. After recognising the problem of vanishing forests in the Bale mountains (Ethiopia) as a common access problem that evolved from legal uncertainties during the change of regime in the 1990s, the project organised forest user groups which were guaranteed use rights after signing a contract with local governments. The land rent farmers pay to

the local government depends on the area of open space so that having more open space is more expensive than having more forests. The amount of open land is monitored yearly. Together with other flanking activities (such as controlling for outsiders), this agreement between forest user groups and the government led to the regrowth of forest area.[3]

There is widespread agreement among scholars that governance should be dispersed across multiple centres of authority. But how should multi-level governance be organised for the provision of multiple environmental goods and services, of which some are private goods and others have public good characteristics? Although the reallocation of authority from central states (devolution, decentralisation) has drawn the attention of a growing number of scholars, there is not much agreement on how it should be organised other than at multiple levels. There is even less agreement on the question of which institutional design fits better in changing socio-economic environments and what effect the decomposition of authority has on the environmental function composition of agro-ecosystems.

Hooghe and Marks (2003) studied different types of governance and argue that centralised government is not well suited to accommodate ecological diversity. Ecological conditions vary from area to area. Preferences of citizens also vary sharply across regions within a state, and if one takes such heterogeneity into account, the optimal level of authority may be lower than what economies of scale dictate. In short, multi-level governance allows decision makers to adjust the scale of governance to reflect heterogeneity.[4] Tewolde (2004) reports from successful examples of collective action and community resource management during times of civil conflict and chaos: despite massive ethnic conflicts, communities at the Ethiopian/Eritrean border were successful in managing their resources sustainably because they had a chance to self-govern and collectively decide for themselves.

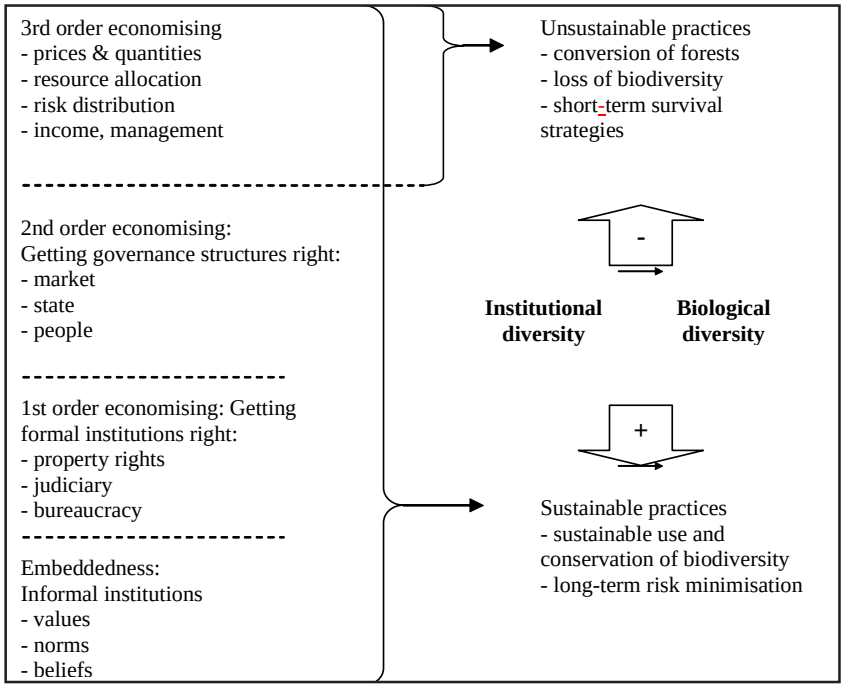
One of the dilemmas of multi-level governance is that, to the extent policies of one jurisdiction have negative or positive effects on other jurisdictions, coordination is necessary to avoid socially or environmentally perverse outcomes. This is a second-order coordination problem, because it involves the coordination of institutions, whose primary function is to coordinate human activity. Scharpf (1997, cited in Hooghe and Marks 2003) tested the conditions of second-order coordination and found, that "as the number of effected parties increases … negotiated solutions incur exponentially rising and eventually prohibitive transaction costs." In order to deal with this dilemma, two strategies can be pursued: 1) the limitation of the number of autonomous actors (Type I), and 2) the limitation of coordination costs by constraining interaction across jurisdictions (Type II). Hooghe and Marks (2003:240) develop design principles for each governance type in terms of functional specificity, flexibility, and membership and argue that "the gist of this line of thinking is that Type I and Type II governance are good at

different things, and co-exist because they are complementary. The result is a fluctuating number of relatively self-contained, functionally differentiated Type II jurisdictions alongside a more stable population of general-purpose, nested Type I jurisdictions."

How does multi-level governance cope with the challenges of governance in complex ecosystems? Ostrom (1998a) cites W. Ross Ashby (1960), a biologist, who developed the "Law of Requisite Variety", which states that any regulative system needs as much variety in the actions that it can take as exists in the system it is regulating. Furthermore, Ostrom (1998a) argues that complex resource systems and biodiversity can be successfully maintained by complex, polycentric, multi-layered governance systems that have a variety of response mechanisms. Large-scale centralised governmental units do not, and cannot, have the variety of response capabilities that multi-layered governance systems can have, because adequately responding to bio-physical change (e.g., deforestation) requires adequate and reliable mechanisms for data collection, understanding them and reacting appropriately (e.g., by (re-)formulating policies). This directly refers to the introduced concept of placing biodiversity conservation into the science-policy nexus.

The new institutional economists' reason for multi-level governance is (transaction) cost effectiveness at different levels of social analysis.[5] Obviously different strategies and coordination mechanisms are more or less costly in solving certain coordination and allocation problems. For example, the market is better suited to solve allocation problems of private goods than those of public goods. If people's behaviour is merely driven by the price mechanism and insufficiently embedded into social norms, institutions, and governance structures, the social and ecological system becomes increasingly vulnerable to external disturbance. This is just what can be observed in the Ethiopian case. As a result of the drop in coffee prices, (more) poor farmers convert coffee forests and grow maize or *khat* (*Catha edulis* Forsk., a plant used for its stimulant effects) which provide better cash income possibilities. Once the reliance on cash income becomes prominent, the market mechanism becomes the dominant mode of governance. Apart from fast cash from timber and non-timber forest products, farmers seek employment outside agriculture. This process is accompanied by the dissolving of traditional institutions and social networks. And these changes lead to environmental, human, and social degradation. Therefore, as a consequence of relying merely on one level of social analysis (like the market in the above example), the robustness of both the ecological and social systems suffer. Figure1 illustrates that an array of institutions across all levels of social analysis makes social and ecological systems less vulnerable. The arrows show that as institutional diversity increases, so do the chances to successfully conserve biodiversity and vice versa.

Figure 1
Multiple level economising for sustainable use of biodiversity



Source: Adapted from Williamson 2000

Mburu (2004: 1) notes that the "fence and fine" approach to wildlife conservation did not "condone wildlife consumptive utilisation and entailed high management costs for governments, with majority of the benefits not accruing to local communities." Population growth, shrinking state budgets and general subordination of environmental and natural resource issues to short-term economic goals eventually led to the "community governance" approach which transferred more rights and responsibilities to local communities. However, these approaches have also experienced low community participation and many "have failed to achieve their conservation and development objectives, and to produce sufficient benefits that can improve communities' living standards."

In response to that development, a third approach, the so-called "co-management" approach, was taken. Co-management is also referred to as participatory management, collaborative management, joint management, mixed, multi-stakeholder or round-table management and describes a situation "in which two or more social actors negotiate, define and guarantee amongst themselves a

fair sharing of the management functions, entitlements and responsibilities for a given territory, area or set of natural resources" (Borrini-Feyerabend 2000:1).

Mismatches between ecosystem properties and institutions, and deficiencies in governing this relation at multiple levels frequently occur. The reasons Young (2002) identifies for these mismatches lie in three clusters of variables: knowledge, institutional constraints, and rent-seeking. Young (2002) reminds us that matching social and ecological systems involves a political system and processes of awareness building, learning, and exchange of knowledge. The authors of the CEESA (Central and Eastern European Sustainable Agriculture) project, which aimed at identifying the preconditions for sustainable agriculture in Central and Eastern European (CEE) countries, support this argument and note that new forms of governance such as partnerships are necessary in maintaining environmentally friendly farming practices (Gatzweiler 2003). These new forms of governance and institutions, however, require a mature, independent civil society with access to information, democratic rights, and participation in decision making. These rights, in turn, need to be supported by an appropriate technical infrastructure. The first step taken towards this challenge in CEE countries has usually been by implementing new constitutions, setting up administrations, and initialising legal reforms at the national level. Although this has had little immediate effect on the ground, building institutions at the national level could be a first step for the purpose of biodiversity conservation. The example of the efforts made in Ethiopia to institutionalise the conservation of coffee forests is described below.

Ethiopian Coffee Forests

Points of Threat

In Ethiopia, the annual rate of forest cover loss between 1990 and 2000 was 0.8%. During this period, 40,000 ha of forest vanished. Today, less than 3% of the entire country is covered with forest, compared to 40% a century ago (WRM 2002; FAO 2003). In the 1980s, the most important forest areas were grouped into 58 National Forest Priority Areas (NFPAs) for management purposes. The total area of these NFPAs in 1993 was about 4.8 million ha. But the mere designation of NFPA does not automatically halt the extinction of forest areas. Such "creation of institutions at will" (North 1998) lack integration with earlier mentioned institutional levels and merely reflect the legal definition of forest areas. The NFPAs have not been gazetted and no management plans have been implemented—a situation which has contributed to uncontrolled, illegal cutting and clearing of forest land for crop production and grazing (Mogaka et al. 2001).

Wild populations of *Coffea arabica* grow naturally in the undergrowth of the montane rainforests in southwest Ethiopia at altitudes between 1,400 and 1,900 m. All wild populations are highly endangered by settlement and land-use pressures

on the montane rainforests (Tadesse et al. 2001). With deforestation progressing at rapid rates, the existence of the wild coffee populations is highly threatened. This development is alarming, as, on the one hand, coffee production and consumption is of considerable economic and social importance to Ethiopia. On the other, the genetic erosion of *C. arabica* is irreversible, potentially leading to high consequential costs for international coffee breeding and production. Simultaneously, the world production of coffee has risen dramatically in the past three years mainly due to production increase in the two world leaders, Brazil and Vietnam. At the same time, roasters and traders of coffee have concentrated into larger corporations, with increased market power on the demand side. A new technology of steaming the coffee bean has been developed, and roasters can now process coffee of lower quality. Together, these factors have driven the price down. Lower coffee prices have changed livelihood strategies and forced many coffee smallholders to convert coffee forests into more intensive land use forms and to use timber and non-timber forest products in an unsustainable fashion (Shibru 2004).

In addition to price fluctuations, changes in politics and governments have also had a disturbing influence on human-environmental relations in the coffee forests of Ethiopia. It has been reported that, during the pre-socialist period, forests in the Amhara region of Ethiopia were under common management. This was a result of their biophysical features (inaccessibility and utility) and traditional management practices (based on exclusion and use rules of the prevailing tenure system) and being embedded into the local judicial-administrative apparatus. In addition, community cohesiveness and homogeneity contributed to the enforcement and maintenance of resource management rules. The MARENA project found that as a result of nationalisation of land (March 1975 Proclamation) and the re-organisation of rural communities, various actors began to treat common forests as open access resources, leading to their destruction (MARENA 2004). After the fall of the regime there has been no profound change in land tenure. The binding laws for natural resource management and utilisation are Articles 40 and 52 of the Constitution, issued in August 1995, which say that the right to ownership of land is exclusively with the state and that it cannot be subject to sale or other means of exchange. Peasants, however, have the right to obtain land without payment.

Such environmental and social changes in the coffee sector have (to some extent) raised the awareness of consumers and their demand for products which are environmental and labour friendly (Gresser and Tickel 2002), which the specialty coffee sector has responded to by product quality differentiation. The quality concepts for coffee range from physical characteristics of the coffee itself (origin, variety, color, size), sensorial characteristics (body and aroma, taste, smell), environmental (shade coffee, forest or wild coffee, bird-friendly coffee) and social characteristics (income, labour conditions, child labour). Presently, most of the coffee harvested from the Ethiopian montane rainforests, which have at least two of the mentioned quality characteristics, is sold together with sun-grown coffee,

resulting in the loss of a potential premium price. Although farmers, NGOs, the government, and the coffee business are linked to one another in the coffee production, processing, and marketing chain, the different actors and sectors all have different goals, interests, and mandates with respect to biodiversity conservation. Therefore, Stolton et al. (2000) conclude that sustainable agricultural use in protected areas calls for strategic alliances among nature conservation (by the state) and ecological agriculture organisations (NGOs).

Detangling Ethiopia's Coffee Forest Conservation Playing Field and Starting Points for Action

In the previous sections I have explained the importance of institutional diversity and multiple governance for the purpose of biodiversity conservation. This required diversity results from the specific features and functions of biodiversity goods and services and also from the attributes of the actors involved. The following paragraphs will take a closer look at the Ethiopian coffee forests and work out recommendations with regard to starting points for action and the role of the government. The message so far is not the creation of institutional diversity per se. Rather, allowing institutional diversity to evolve responds better to socio-ecological conditions and provides the planner or manager of biodiversity conservation with a portfolio of options. Specific patterns of institutional diversity evolve within the specific context of each conservation problem. For example, in some cases traditional local institutions may have a more prominent role to play than state institutions. The same problem at a different point in time may require stronger involvement of institutions which mediate between local users and the state.

There is no blueprint available. There are, however, well established general institutional design principles. These include: 1) devise rules that are congruent with ecological conditions; 2) define the boundaries of the resources and the user groups; 3) devise accountability mechanisms for monitors; 4) apply graduated sanctions for violations; 5) establish low-cost mechanisms for conflict resolution; 6) involve interested parties in informed discussion of rules; 7) allocate authority to allow for adaptive governance at multiple levels; and 8) employ mixtures of institutional types (Dietz et al. 2003).

How would the pattern of institutional diversity look like in the Ethiopian case? Before new institutions are built or old ones modified, it is necessary to take stock of the actual state of affairs in the present field of actors, the rules they use (institutions), and the games they play (governance). Therefore, in order to define starting points for institutionalising biodiversity conservation, the CoCE (Conservation and use of wild populations of *Coffea arabica* in the montane rainforests of Ethiopia) project has undertaken the attempt of disentangling the arena of biodiversity conservation in the Ethiopian coffee forests.[6] This requires the identification of various actors, the uncovering of their goals and the institutions by which they operate. Based strongly on the sixth design principle of Dietz et al.,

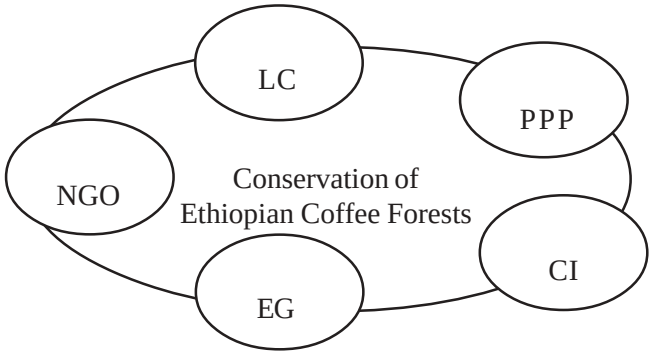
(2003) the establishment of a forum in which various actors define a common vision and develop strategies for the conservation of the Ethiopian coffee forests is part of the process.

The main players in the Ethiopian coffee forest conservation field are:

1) The (post-socialist) government of Ethiopia (**GE**) has designated protected forests in three areas in southwest Ethiopia: Geba-Dogi, near Metu; Boginda-Yeba, near Bonga; and Kontir-Berhan, near Mizan Teferi. With support from the EU-funded Coffee Improvement Programme, the areas are being fenced and guards are employed to control access. Access is restricted to locals and use rights given only for collecting a few products, such as firewood. The guards do not receive regular salaries and they do not carry out their task effectively.
2) The local communities (**LC**) have customarily defined forest use rights and forest plots which belong to them. Traditionally they perceive themselves as owners, although the constitution defines all land as public. Sale of land is prohibited. Only recently the government has introduced land certificates which enable some exchange of land. How this will affect the forest areas is still unclear.
3) The coffee industry (**CI**), especially small private coffee businesses, buy forest coffee from local cooperatives and sell it as specialty coffee in the German market. Although no special label has been developed yet, the idea is that farmers receive higher prices for their forest coffee which serves as an incentive not to convert the forest into agricultural land.
4) An **NGO**-driven participatory forest management project facilitates the formation of forest user groups who sign contracts with the local government on the use of designated forest areas.
5) A Private-Public Partnership (**PPP**) aims at improving the quality of the coffee production and marketing process in cooperation with local coffee cooperatives and in the long run establish a type of Coffee Forest National Park. The idea of the PPP is that through improved quality of the coffee, farmers receive higher incomes and thereby an incentive to protect the coffee forests from conversion to intensive agriculture. Whereas the large private companies are interested in quality improvement and marketing of mainstream coffee, smaller companies aim at developing coffee specialty markets, and the civil society organisations aim at improving environmental and social conditions.

The Ethiopian Coffee Forest Forum was set up (Figure 2) to create a platform for exchanging and developing conservation strategies. It was established by stakeholders who have individual but also common interests to sustain the coffee forests.

Figure 2
Members of the Ethiopian coffee forest forum



Most of the actors mentioned above took part in a workshop to better understand the complexity of issues surrounding the coffee forest conservation issue and formulated a common vision for sustaining these forests. Where to go from here? Although collaborative efforts are required, we provide arguments for the government to take the role of an initiator and facilitator in actions towards conserving the Ethiopian coffee forests. With the establishment of the Ethiopian Coffee Forest Forum, the first step towards collective action has been taken. The activities of the various stakeholders and the foreseen role of the government show how a specific pattern of institutional diversity can emerge.

Presently Ethiopia is decentralising authority from the centre to the regions. Until recently the responsibility for biodiversity conservation was under the government-controlled Institute for Biodiversity Conservation. Now it has been shifted to the regions. Juetting (2003:8) analysed 20 country case studies in order to understand the relationship between decentralisation and poverty. The results show that in the poorest countries, decentralisation can actually make matters worse: "In an environment where the central state hardly fulfils basic functions and is not interested in giving more power to local tiers of the government, decentralisation should not be a priority … ." Similarly, we argue that natural resource management and biodiversity conservation can go from bad to worse, especially in countries with weak institutions and weak capacities to locally carry additional tasks from decentralisation.

When the responsibilities of biodiversity conservation were passed on from the Institute of Biodiversity Conservation (IBC) to the regions, there was no National Biodiversity Strategy nor Action Plan available. According to the last available national report to the Convention on Biological Diversity, both are in "early stages

of development". In the meantime, however, the Ethiopian Wildlife Conservation Organisation (EWCO), which was responsible for all protected areas, has been dissolved and transformed into a department at the Ministry of Agriculture and Rural Development. The previous duties and responsibilities of IBC and EWCO have been passed on to the regions without giving them a plan for guidance or the financial as well as human resources to meet the requirements. This process of decentralisation, accompanied by a simultaneous shift of responsibilities, has created confusion instead of being beneficial for biodiversity conservation.

Similar to the findings of Gatzweiler et al. (2002) who studied the transformation and accession process of the post-socialist countries in Central and Eastern Europe, this example confirms that the "creation of institutions at will" (North 1998) cannot always cope with the institutional requirements of biodiversity conservation. The question is not so much whether the government should play a role or not. Rather, how it should play its role. In Ethiopia, the government needs to play a key role in conserving coffee forest areas because: 1) it requires time for an authoritarian and post-socialist regime to evolve into a functioning federal democracy, and 2) it requires resources to develop the local capacities needed to carry additional responsibilities. The attitude of waiting for and carrying out orders is still rooted deeply in the society at all levels. Trust needs to be re-established, assuring farmers of their basic rights of self-governance. State officials need to place themselves as partners and facilitators of a rural development process instead of "commanders and controllers". The conventions and traditions when kings ruled the country and slavery was an institution, as well the norms and values of socialism, are still deeply rooted and require time to change.[7]

CONCLUSION

Theory on institutional change suggests that "once property rights have been defined and their enforcement assured, the government steps aside…and the marvel of the market works its wonders" (Williamson 2000: 598). For the purpose of biodiversity conservation, this kind of institutional change does not work in Ethiopia. Although the government "steps aside" by passing on responsibilities and duties to the regions, it has not paved the ground for putting biodiversity conservation into action by recognising local institutions and property rights or by endowing the regions with the financial and human resources they need to fulfill the additional duties. Here the market forces are left alone to "work their wonders", but in doing so they create incentives for the conversion of forests into agricultural land and for harvesting of forest products with high market value.

The Ethiopian process of decentralisation has not only created institutional diversity but also overall confusion in the midst of which the government escapes from many of its public responsibilities to set clear guidelines to enable, endow and facilitate the regions to master their new duties with respect to biodiversity

conservation. The Ethiopian case has also shown that biodiversity conservation requires concerted action and that the emergence of institutional diversity led to the need to establish the Ethiopian Coffee Forest Forum, involving the government, the private sector and the communities.

Current approaches to biodiversity conservation entail the listing of plant and animal species; the exploration of ecosystem dynamics through computer modeling; the harnessing of traditional plant medicines and the promotion of "semi-wild" plants. Approaches which recognise the importance of institutions in biodiversity conservation often advocate the market, the state or the community as the most suitable form of governance. None of these is the solution for biodiversity conservation. Institutional diversity occurs as a result of the varied features and functions of biodiversity and the attributes of the actors. Specific patterns of institutional diversity will evolve from specific contexts, which also define the starting points for action. Therefore, what is necessary is coordinated collective action among the involved interest groups.

Notes

1. Throughout the text we refer to in situ conservation, not ex situ conservation.
2. Pure public goods are neither rivalrous nor exclusive, whereas common pool resources are rivalrous and non-excludable (Bikers and Williams 2001).
3. Personal interview with Tsegaye Tadesse, GTZ, Ethiopian-German Forest Management Project, Addis Ababa, 8 July 2004.
4. Other hypothesised benefits of multi-level governance are that it provides more complete information of constituents' preferences, is more adaptive in response to changing preferences, is more open to experimentation and innovation, and facilitates credible commitments (Hooghe and Marks 2003).
5. Birner and Wittmer (2000) attempt a transaction cost economic approach to determine the efficient boundaries of the state which takes into account "the technological specificities of natural resource management, the institutional and political peculiarities of the public sector, and the variability of state and society in developing countries." The problem with such an approach is: 1) at the embeddedness level (Figure 1), we lack understanding of what needs to be optimised; 2) cost effectiveness is not always desirable when it comes to collective decision making, as high costs for reaching consensus need to be regarded as investments in institution building; 3) the process of institution building is also a spontaneous and evolutionary process which often cannot be predicted and which involves learning from making mistakes and exchanging knowledge.
6. CoCE – Conservation and sustainable use of wild *Coffea arabica* populations in the montane rainforests of Ethiopia, is a research project funded by the Ministry of Education and Research (BMBF) of the Federal Republic of Germany.

7. Figure 1 locates norms at the embeddedness level. Here, according to Williamson (2000) institutional change occurs over centuries.

REFERENCES

Ashby, W.R. 1960. *Design for a Brain: The Origin of Adaptive Behavior*. John Wiley, New York.

Agrawal, A. 1996. The community vs. the market and the state: Forest use in Uttarakhand in the Indian Himalayas. *Journal of Agricultural and Environmental Ethics* 9:1-15.

Agrawal, A. 2000. Small is Beautiful, but is Larger Better? Forest-Management Institutions in the Kumaon Himalaya, India. In: *People and Forests. Communities, Institutions, and Governance*. (eds. C. Gibson, M.A. McKean, and E. Ostrom), pp. 57-85. The MIT Press, Cambridge, Mass.

Bikers, K. and J.T. Williams. 2001. *Public Policy Analysis. A Political Economy Approach*. Houghton Mifflin, New York, Boston.

Birner, R. and H. Wittmer. 2000. *Co-management of Natural Resources: A Transaction Cost Economics Approach to Determine the "Efficient Boundaries of the State"*. Paper presented at the Annual Conference of the International Society of the New Institutional Economics (ISNIE), Tuebingen, Germany.

Borrini-Feyerabend, G. 2000. Co-management of Natural Resources Organising, Negotiating and Learning-by-Doing. IUCN, Yaoundé, Cameroon.

Costanza, R., R. d'Arge, R. de Groot, S. Farber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R.V. O'Neill, J. Paruelo, R.G. Raskin, P. Sutton, and M. van den Belt. 1998. The Value of the World's Ecosystem Services and Natural Capital. *Ecological Economics* 25:3-15.

De Groot, R.S. 1997. *Valuing natural ecosystems: From local services to global capital*. Position Paper for the European Symposium on Environmental Valuation. Centre d'Economie et d'Ethique pour l'Environment le Developpement, University der Versailles, Domaine des Vaux de Gernay, France.

De Groot, R.S., J. van der Perk, A.Chiesura and S. Marguliew, 2000. Ecological Functions and Socio-economic Values of Critical Natural Capital as a Measure for Ecological Integrity and Environmental Health In: *Implementing Ecological Integrity: Restoring Regional and Global Environmental and Human Health* (eds. P. Crabbe, A. Holland, L.Ryszkowski and L.Westra), pp. 191-214. NATO Science Series, IV. Earth and Environmental Sciences Vol.1, Kluwer Academic Publ., Dordrecht, Boston, London.

De Groot, R.S., M.A.Wilson and R.M. J. Boumans. 2002. A typology for the classification, description and valuation of ecosystem functions, goods and services. *Ecological Economics*: 41:393-408.

Dietz, T., E. Ostrom, and P.C. Stern. 2003. The struggle to govern the commons. *Science* 302:1907-1912.

Edwards, V.M. and N.A. Steins 1998. *Multiple-use Commons: An Analysis of Management Regimes for Complex, Multiple-Use Common Property Resources*. Cambridge University Press, Cambridge, UK.

Fairhead, J. and M. Leach. 2003. Practising "Biodiversity" in Guinea: Nature, Nation and an International Convention. *Oxford Development Studies*, Vol. 31:427-439.

FAO. 2003. *The State of the World's Forests*. Food and Agriculture Organisation. Rome.

Fukuyama, F. 1995. *Trust: The Social Virtue and the Creation of Prosperity*. The Free Press, New York.

Gatzweiler, F. 2003. *The Changing Nature of Economic Value*. Indigenous Forest Garden Values in Kalimantan, Indonesia. Shaker, Aachen.

Gatzweiler, F. and K. Hagedorn. 2002. The evolution of institutions in transition. *International Journal of Agricultural Resources, Governance and Ecology* 2:37-58.

Gatzweiler, F., R. Judis, and K. Hagedorn. 2002. *Sustainable Agriculture in Central and Eastern European Countries. The Environmental Effects of Transition and Needs for Change*. Shaker, Aachen.

Gresser, C. and S. Tickel 2002. *Mugged. Poverty in Your Coffee Cup*. OXFAM International.

Hagedorn, K., K. Arzt., and U. Peters. 2002. Institutional Arrangements for Environmental Co-operatives: A Conceptual Framework. In: *Environmental Cooperation and Institutional Change: Theories and Policies for European Agriculture* (ed. K. Hagedorn.), pp. 2-35. Edward Elgar, Cheltenham, UK.

Hooghe, L. and G. Marks. 2003. Unraveling the central state, but how? Types of multi-level governance. *American Political Science Review* 97:233-243.

Janssen, M.A., J. M. Anderies and E. Ostrom. 2003. *Robustness of socio-ecological systems to spatial and temporal disturbance regimes*. Paper presented at the workshop on "Resiliency and Change in Ecological Systems at the Santa Fe Institute, New Mexico.

James, A., K.J. Gaston and A. Balmford. 2000. Why private institutions alone will not do enough to protect biodiversity. *Nature* 404:120.

Juetting, J. 2003. *Institutions and development: A critical review*. OECD Technical Papers No. 210, www.oecd.org/dev/Technics.

MARENA Project. http://www.geog.sussex.ac.uk/research/development/marena/#working School of African and Asian Studies, Arts C, University of Sussex Falmer, Brighton BN1 9SJ, United Kingdom, Tel: +44 1273 877090 Fax +44 1273 620662, Email: R.Black@sussex.ac.uk.

Mburu, J. 2004. Wildlife Conservation and Management in Kenya: Towards a Co-Management Approach. Nota di Lavora, FEEM, http//:ssrn.com/abstract = 524543.

Mogaka, H., G. Simons, J. Turpie, L. Emerton and F. Karanja 2001. Economic Aspects of Community Involvement in Sustainable Forest Management in Eastern and Southern Africa. *Forest and Social Perspectives in Conservation* No. 8. IUCN Eastern Africa Programme.

North, D. C. 1998. Where have we been and where are we going? In: *Economics, Values and Organization* (eds. A. Ben-Nur and L. Putterman), pp. 491-509. Cambridge University Press, Cambridge.

Ostrom, E. 1998a. Scales, Polycentricity, and Incentives: Designing Complexity to Govern Complexity. In: *Protection of Global Biodiversity: Converging Strategies* (eds. L.D. Guruswamy, and J.A. McNeely), pp. 149-67. Duke University Press, Durham, North Carolina.

Ostrom, E. 1998b. *The Comparative Study of Public Economies*. Acceptance Paper, The Frank E. Seidman Distinguished Award in Political Economy, 1997. Seidman Foundation, Memphis, Tenn.

Ostrom, E. 1990. *Governing the Commons*. Cambridge University Press, Cambridge, UK.

Ostrom, E. and J. Walker. 2003. *Trust and Reciprocity*. Interdisciplinary Lessons from Experimental Research. Russell Sage, New York.

Ostrom, E., R. Gardner and J. Walker. 1994. *Rules, Games, and Common Pool Resources*. The University of Michigan Press. Ann Arbor, Mich.

Poteete, A., and E. Ostrom. 2001. An Institutional Approach to the Study of Forest Resources. Working Paper, WOl-8, Workshop in Political Theory and Policy Analysis, Indian University. In: *Human Impacts on Tropical Forest Biodiversity and Genetic Resources* (ed. John Poulson), Center for International Forestry Research (CIFOR). CABI Publishing, New York.

Scharpf, F.W. 1997. *Games Real Actors Play: Actor-Centered Institutionalism in Policy Research*. Westview Press, Boulder, Colorado.

Shibru, A. 2004. Change in the land use system of wild or forest coffee populations at Geba-dogi and Berhan-Kontir montane forests in Ethiopia. Paper prepared for the Tropentag, Goettingen, Germany.

Stolton, S., B. Geier and J. A. McNeely. 2000. Introduction. In: The Relationship between Nature Conservation, Biodiversity and Organic Agriculture. (eds. S. Stolton, B. Geier and J. A. McNeely). pp. 5-11. IFOAM, Germany.

Swanson, T. 2003. Introduction to property rights and biodiversity conservation: Convergence or conflict? *Land Economics*, 79:457-459.

Tadesse W., M. Denich, D. Teketay and P.L.G. Vlek. 2001. Human impacts on *Coffea arabica* genetic pools in Ethiopia and the need for its in situ conservation. In: *Managing Plant Genetic Diversity* (eds. R. Rao, A. Brown and M. Jackson), pp. 237-247. CAB International and IPGRI.

Tewolde, Berhan Gebre Egziabher. 2004. Personal interview at the Environmental Protection Authority of Ethiopia, Addis Ababa.

Williamson, O. 2000. The new institutional economics: Taking stock, looking ahead. *Journal of Economic Literature* 38:595-613.

WRM. 2002. *Bulletin* No. 55. World Rainforest Movement.

Young, O.R. 2002. *The Institutional Dimensions of Environmental Change. Fit, Interplay and Scale.* The MIT Press, Cambridge, Mass.