

Chapter 2

Paradigms of Tropical Forestry in Rural Development

Jürgen Pretzsch

Abstract The integration of tropical forestry in rural and general socio-economic development is reviewed from a historical perspective. Development is synthesized in six paradigms, whereby practice is integrated in theories and ongoing discourses. The paradigms are the basis for an outlook on future tropical forestry development models. The one-dimensional, static thinking prevalent in market-driven tropical forestry is complemented by more complex models; models in which the regulating and constituting functions of the state are revitalized and civil society and communities are involved in a balanced way. Future forestry development models have to be diversified, flexible and able to adapt to the increasing external influences exerted by the human ecological system.

Keywords Conceptions • Rural development • Paradigms • Historical stages • Development theories • History of tropical land use • Pre-colonial land use management • Colonial forestry • Capital formation • Growth orientation • Green economy • Knowledge systems • Globalization • Social capital

2.1 Introduction

Conceptions of the role of forestry in rural development have changed fundamentally over the last centuries. They oscillate around altering physical environments, increasing human impact, alternative models of political economy and ‘development trends’, which are often induced by short term politics. Although forestry is deemed to be the origin of the sustainability principle (Carlowitz 1713), there is a lack of dispute and conceptualization of the integration of forestry in socio-economic development, especially in tropical countries.

J. Pretzsch (✉)

Institute of International Forestry and Forest Products, Technische Universität Dresden, 1117,
Tharandt 01735, Germany
e-mail: juergen.pretzsch@forst.tu-dresden.de

In this chapter the changing conceptions of trees and forests and their interrelations between general socio-economic development models are outlined. The analysis focuses on tropical and subtropical countries. The historical and interpretative approach permits a classification in ‘paradigms’. Six consecutive and partly overlapping paradigms are differentiated. They represent a genesis of models for tropical forestry, rooted in contemporary development theories. The categorization as paradigms results in a high level of generalization, which limits their explanatory value for specific cases. Physical conditions, forest management strategies, historical development, traditions and policies in countries of the tropics and subtropics are rather site-specific and thus may deviate from the six paradigms derived. Furthermore, the large spectrum of development theories available, partly overlapping in time, may lead to fuzziness. For this reason the contribution focuses primarily on a discursive review of conceptions, paradigms and theories on a meta-level. In spite of these methodological limitations, this synthesis is believed to be worthwhile and necessary because it facilitates new insights into the dynamic interaction between forestry, rural development and national development strategies. The paradigm approach serves as an interpretative framework for this book. Important lessons can be learnt about future forestry development strategies. In the current situation of dramatic and ongoing destructive change to rural landscapes, a lack of theories, models and instruments that successfully reach the rural population is evident (Pretzsch 2005; Douglas and Simula 2010; Escobar 2012). Rural development theories need to include the highly complex environment with a low predictability of events, like climate change-based weather fluctuations. A profound discussion of governance strategies is necessary, addressing state intervention, endogenous experiences with the self-organization of communities and market orientation, as these are the foundation for the further development of tropical forest management strategies (Uphoff 1993; Cooper and Packard 2005).

2.2 Definitions and Conceptual Framework

Trees and forests represent an important physical component in the global landscape. In the framework of the Global Forest Assessment Project of the FAO, forests are defined as land use with a tree crown cover of more than 10 %, a minimum height of 5 m and a minimum area of 0.5 ha (FAO 2001, p. 363). Figures for the current global forest cover differ. Recent FAO estimates come to about four billion hectares (FAO 2010, p. 228). In their study of frontier forests in 1997, the World Resources Institute estimated global forest cover to be roughly 3.2 billion hectares (Bryant et al. 1997). The forest area prior to human intervention was calculated by Bryant et al. (1997) to be about 6.2 billion hectares, a bit less than half of the land surface area. The estimated present forest cover accounts for roughly 30 % of the terrestrial surface area. Although in recent years the forest area has increased in countries such as China and in the European region, globally there has been a net decline of roughly five million hectares per year in the last

decade (FAO 2010, p. 233). Due to eco-physical conditions, and the level of human intervention, the existing forests are unevenly distributed. In the tropical and subtropical regions the forest cover differs greatly, with 23 % in Africa, 19 % in Asia and 49 % in South America (FAO 2010, p. 225 et seqq.). The indicator ‘forest cover’ is not very precise, because the level of disturbance of the forests differs significantly and is poorly reflected in the available statistics. With the reduction of forest areas the existence of individual trees, groups of trees and agroforestry systems increases in importance for ecosystem services and for supporting livelihoods. In the transition theory the forest cover follows a Kuznets curve and the initial focus of forest use on market and survival-oriented product functions is, with increasing welfare in society, complemented by many social and ecological functions such as recreation and biodiversity conservation (Rudel et al. 2005). The conceptualization of the relationship society–forests has resulted in drawn out quarrels over definitions. Traditionally the term ‘forest functions’ was used to describe both direct and indirect values. The differentiation between eco-centric values related to the functioning of the ecosystems and anthropocentric, human demand-based values led to deviating concepts (Hanewinkel 2011). Viewed from an ecosystem perspective, De Groot (1992, p. 8) differentiated between regulation, carrier, production and information functions. The forest valuation, as viewed from the side of the demand by society, has led to the creation of the concept of ecosystem goods and services. The recent discussion of payments for environmental services (PES) has delivered a boom in publications, in which four types of environmental services are differentiated: provisioning, regulating, cultural and supporting services (Millenium Ecosystem Assessment 2005; Bizikova 2011). The definition provides a first insight into the importance of forests and tress as global land cover, for their ecosystem functions and as a means to satisfy human needs and their changes over time (Chap. 9).

Increasing global population and ecological disturbances have led to a high vulnerability of ecosystems and of social systems. Especially in tropical countries, forests and trees contribute to reducing this vulnerability and support coping strategies. Examples from an ecological point of view are the stabilization of the fragile tropical soils, support for the climatic cycles under changing land use, mitigation of climate change and carbon storage, increased water retention through reforestation programs and biodiversity conservation. Coping strategies include the contribution of forests to poverty alleviation and to livelihood development (Wunder 2001). People in and around forests use forest products directly as food, firewood and medicine, they transform them on a micro-level to sawn wood for use in construction, furniture, tools for agriculture or have local kilns for charcoal production (FAO 1998).

Differing claims to forest products and services lead to controversial discussions and a certain complexity with respect to integration in a general land use pattern. The parallel, and competing, development of agricultural and forestry institutions has hindered the formulation of a comprehensive landscape and livelihood-oriented rural development strategy. This is due in part to the specific characteristics of forestry, namely long planning cycles with a resultant inflexibility in short term decision making, the dual characteristics of forests as product and site of production

and the bulky nature of timber, which makes it difficult and expensive to transport. In the spectrum of forest uses, timber for long had the highest priority, because it was always the main cash provider. Furthermore, western forestry has always followed a specific ethos; traditionally it has been mainly state and administration-oriented, whereas agriculture was preferably linked to private farms. The integrative view of landscapes is challenging but necessary to tackle the future demands of rural areas and especially in terms of developing climate change adaptation and mitigation strategies. It broadens the conventional view of forestry. New challenges have given rise to agroforestry systems, short rotation energy plantations (Chap. 4) and the maintenance of individual trees in agricultural fields. From the point of view of the methods employed, policy and practical management, this integration is as yet not very advanced and further steps are necessary.

The specific role of forests and trees depends greatly on the eco-zones in general, and on the particular land use patterns, which have brought about an alteration of the original vegetation. There are marked differences between humid tropical lowland zones, savanna forest zones and dry land. In each of the different eco-zones, the dynamic development of land use systems follows different drivers. These are embedded in very specific sets of influencing factors, characterized by ecological conditions such as climate, soil and vegetation, as well as socio-economic parameters like markets, infrastructure, knowledge, extension services and technology. Tropical forestry is extremely site-specific and the corresponding knowledge is locally embedded. This is also applicable to the cultural dimension of forestry, which has been investigated more profoundly in recent times (Ritter and Dauksta 2011). In general, forests play an important role both as an important form of vegetation cover of the planet earth and as a land use system. It is assumed that to this very day policy makers responsible for rural and national development underestimate both values.

The term ‘**rural**’ is generally used as an antonym to ‘urban’, to refer to ‘things of the countryside’ (Wiggins and Proctor 2001, p. 427). Although any generalization may be misleading (Hoggart 1990), rural areas are often characterized by a relatively low population density (Moseley 2003, p. 1 et seqq.). The three following characteristics of rural areas were outlined by Galston and Baehler (1995, p. 3) as a contrast to urban areas: “(1) a dense relation to nature, (2) good social networks and (3) a well determined understanding of and integration into historical processes.” Wiggins and Proctor (2011) differentiated between peri-urban zones, the (middle) countryside and remote rural areas with a further separation between good and poor natural resources in the last two categories. Each of the resulting five categories is characterized by specific activities and development options. The character of rural areas changes with increasing urbanization. Similar to the intensity rings in the von Thünen model, peri-urban areas are strongly connected to urban activities. The intensity of commercial forest use increases with the distance from the centers (Thünen 1866). According to Wiggins and Proctor (2011, p. 433), forest production in peri-urban areas is focused mainly on recreation and ‘deconcentrated’ wood based industries such as sawmills and furniture factories. In the middle countryside and in remote rural areas forest production is restricted to primary activities with

limited added value and employment. In tropical and subtropical regions further characteristics of rural areas often include weak infrastructure and low market access. Strong traditions and a lack of capital and employment limit the development options available to young people. The resulting outward migration leads to a 'brain drain' as often it is the dynamic and well qualified young inhabitants who leave these rural areas.

This book deals with tropical and subtropical countries, mostly termed 'third world countries' or 'developing countries'. The denomination 'third world country' dates back to the Bandung Conference, where the countries of the south were placed in the context of the capitalist Western countries, denoted as 'first world' countries, and the countries of the socialist bloc, termed 'second world countries' (Rist 2002, p. 80 et seqq.). Representatives of the Southern countries never agreed with this denomination and since the end of the 'cold war' it has become obsolete. The emerging term 'Countries of the Global South' might come to substitute other denominations in the future, because it includes 'emerging countries' as well as the 'least developed countries', and it is neutral in relation to the development status of a country. Here the old fashioned term '**developing countries**' will be used because it is still common in most literature and the main contents of this chapter pertain to development models. At all stages there was a strong interaction between development in practice and models. Development models have always been much driven by Western thinking and at the same time they were used as driving force for 'planned change' in developing countries.

The meaning of '**development**' has changed fundamentally over time (Nederween Pieterse 2001, p. 5; Rist 2002). The meaning and indicators of development were strongly criticized in the 1970s because there was a primary focus on capital formation and economic growth (Seers 1979; Rist 2002). Over time a number of social and ecological indicators have been integrated and today the livelihood index permits a more complete assessment of development. In this publication development is perceived as a multi-faceted process which integrates economic as well as cultural, social and ecological elements. In the "postdevelopment" discourse a pluriverse, endogenously embedded development path is observed in some places (Escobar 1988; 2012).

The discussion of the so called **development theories** was initiated in the 1960s after the Second World War and with the beginning of the cold war. Due to their complex and often normative character they frequently lacked the character of 'theories'. In many cases they failed to or only just stood up to 'scientific verification'. It is preferable, therefore, to term these 'explanation models' (Nederween Pieterse 2001, p. 150; Rist 2002). It must be taken into account that most of the so-called development models for third world countries were deeply rooted in experiences from the so called developed countries, often following a purely Western philosophy. Thus, they did not fully reflect the reality in the tropics and respective traditions (Rist 1997, 2002, p. 69). Beginning with these development models, their application to tropical forestry development is reviewed and the respective interactions documented.

This leads to the formulation of **paradigms**, the meaning of which is similar to that of the German 'Leitbild'. Kuhn (1962, p. 175) defined paradigms as "the entire

constellation of beliefs, values, techniques, and so on shared by members of a given community”. Or “it denotes one sort of element in that constellation, the concrete puzzle-solutions which, employed as models or examples, can replace explicit rules as a basis for the solution of the remaining puzzles of normal science.” Hunt (1989, p. 4) and Kuhn (1962) highlighted four requirements of paradigms: (1) they are based on theories, (2) they have an impact on policies articulated by a clearly determined group of scholars and (3) and (4) they exert an influence in practice. The appearance of changing forest development models, rooted in guiding development policies and strategies, and which have a strong link with practical implementation and experiences, fully cover these requirements. The interpretation of paradigm change by Kuhn (1962) was frequently criticized for being too vague and for having an insufficient grounding on empirical data (Lakatos 1970; Fuller 2003). Here it permits a valuable means of reflection and exploration, helping to fully understand and interpret development processes and, based on this, to design strategies for the future.

2.3 Paradigm Shifts in Rural Development and Forest Policy

2.3.1 Review of Existing Studies and Literature

Three research and publishing spheres are relevant for the interpretation of paradigm shifts in tropical forestry and rural development: (1) literature on development theories and rural development approaches, their genesis and implementation with a special focus on the tropics and subtropics; (2) literature on tropical forest policies and politics with a strong linkage to their historical development and (3) literature on the interaction between rural development and tropical forestry in theory and practice.

Abundant literature deals with general economic and social development models and their historical integration. The early models mainly focused on economic growth orientation (Boeke 1958; Hirschmann 1958; Hagen 1975; Hunt 1989; Thirlwall 1994; Todaro 1995, 1997; Cypher and Dietz 1997). Alternative studies focused on the origin of unequal exchange and dependencies (Mandel 1962; Perroux 1976; Frank 1977). After the Second World War, coinciding with the decolonization of many tropical countries, the Marshall Plan was viewed as a viable instrument to induce development. Preston (1996), among others, provides a comprehensive overview of the historical roots and the contents of the main development theories up to the 1990s. The development models of the 1960s and 1970s focused on capital accumulation, technology transfer and industrial and rural development, mostly assuming large production units. With the reorientation towards ‘redistribution with growth’ aspects such as basic needs, social justice and poverty alleviation gained ground (Hunt 1989). The negative consequences of pure market orientation were highlighted in dependence and dualism theories, which were rooted in the critical theory. Assuming that the pure market orientation had resulted in asymmetric power structures and structural dependencies with their

historical determination (Bernstein 1973; Prebisch 1950, 1980; Furtado 1984), the main way out was seen in a fairer distribution of the means of production such as land and capital, fair incomes and in a sharing of the benefits accrued from the outputs.

Development models are a useful means to understand and evaluate development strategies and to formulate scenarios for future development. The theories facilitate an indicator-based analysis of their performance. Various authors have criticized the fact that all stages of the development discourse and the respective models have been determined by western countries, thereby inhibiting the generation of local solutions based on alternative development models (Cowen and Shenton 1996; Escobar 2012; Sen 1999).

A more profound investigation of the link to rural development and its genesis occurred from the 1960s onwards, when rural development experienced a fashionable period. Ruttan (1984) outlined the historical perspective of rural development programs between the 1960s and 1980s. In a very comprehensive review, Ashley and Maxwell (2001) discussed the sequence of 'narratives' in the rural development debate. They reviewed the approaches adopted between the 1960s and 1990s and identified shifts from state to market orientation and between social objectives to business orientation and back to a limited social orientation. In the synoptic overview it is assumed that rural poverty is an ongoing problem and that a more intensive analysis of the underlying reason for the failure to achieve development targets has to be undertaken (Chambers 1983). The synoptic overview is underpinned by Ellis and Biggs (2001, p. 439), who interpreted the rural development ideas more specifically in the context of development theories. They placed development models in a timeline, demonstrating a sequence of 'ideas' pertaining to rural development. Extensive literature on agricultural development in the tropics and its contribution to development is also available. Special emphasis is placed on the political economy of peasants (Bernstein and Byres 2001). There are various controversial opinions concerning the future of small farms (McMichael 2006; Hazell et al. 2007).

There have been few studies of tropical forestry development on a macro-economic level to date. Comprehensive studies and publications on forest policy focus mostly on western countries (Ellefson 1992; Cubbage et al. 1993). Such studies are rare even for the large transition countries China, India and Brazil. In recent times there was a surge in forest policy studies addressing tropical countries, but in most cases these targeted specific aspects (Humphreys 1996, 2006; Palo and Mery 1996; Palo and Uusivuori 1999; Palo and Vanhanen 2000; Palo et al. 2001). The number of studies and publications with a focus on forest policy instruments implemented under the United Nations' conventions and addressing private sector activities has grown. Examples include studies of forest monitoring systems and payments for environmental services. Increasingly market orientation is the dominant issue and less emphasis is placed on the need for state intervention.

The analysis and modeling of the contribution of the forest sector to development has not been widely tackled and most of the studies do not permit either a systematic or a holistic understanding of macro forest policy structures and processes. Douglas (1983) presented an early review, using the situation in Bangladesh

as an example. His study took place in the context of the 1980s and the basic needs approach, contrasting with the growth orientation of industrial plantations and large scale timber industries. Romm (1986) developed a framework for the integration between development and forest policy and Westoby (1987) revised critically his previous position on capital induced forestry development. Based on document analysis, rooted in the abstracts of the World Forest Congress and the FAO forestry journal *UNASYLVA*, in the 1980s Steinlin and Pretzsch (1984) presented a study on changing forestry development models. Tropical forestry development was structured in five stages. These stages correlated strongly with the latest and most prominent development models of the time. Towards the end of the 1990s the five stage approach was complemented by a sixth stage (Pretzsch 2003, 2005), which refers to the era of globalization. The as yet mainly pragmatically constructed genesis of tropical forestry development processes is now underpinned by a theoretical construct. The six stages approach is used as a foundation for the following detailed interpretation of the linkages between development policy and forest policy development. The differentiation of the six main discourses, identified here as ‘paradigms’, follows a discourse-oriented historical analysis. The delimitation is rooted in the rich literature on development models, in the practical, empirically observed action adopted in tropical forestry and in the rich discussions held with numerous tropical foresters and scientists. Following the claims to paradigms, the underlying indicators used to review the six stages are the theoretical foundation, the value systems and practice. Changes to the models are interpreted as paradigm change.

A more empirically embedded analysis of changing paradigms of forest plantation is being developed (Szulecka et al. 2013). Studies on tropical forest politics have been enriched by contributions from political ecology. The origins go back to the 1970s and one of the main initiators was Blaikie (1985), with his study on the political economy of watershed management. The approach was further developed subsequently, focusing on the relations between political, social and ecological factors as driving forces and the outcomes of environmental management (Peet and Watts 1996; Walker 2005, 2006). The publication by Bryant and Bailey (1997) provides an excellent overview of this approach, which was mainly developed by geographers and sociologists. Many of the recent studies focus on natural resource management in tropical regions. Intensive studies on forestry contribute profoundly to the discourse on the linkages between the pre-colonial, colonial and post-colonial development of forestry and forestry institutions in the tropics (Peluso 1992; Fairhead and Leach 1995; Bryant 1997, 1998; Pye 2005). A number of authors from India have worked on the British colonial influence on the post-colonial forest administration (Gadgil and Guha 1992; Gadgil and Berkes 1991). The positive influence of the European forest management paradigm has been called into question, because often its implementation was not adapted to the local cultural and political situation (Shiva 1989).

The following elaboration upon six tropical forestry development stages follows four steps: (1) a short classification of the historical stage and an introduction to the availability of corresponding data; (2) an interpretation and model of development; (3) a review of tropical forestry development and (4) synthesis in a paradigm.

2.3.2 *Stage I: Trees and Forests in the Tropics in Pre-colonial Times*

2.3.2.1 Classification of the Historical Stage and Data Availability

This stage covers the relationship between forestry and the general development of tropical countries before colonization by European countries. Information on the use of forests and the perception of trees and forests in pre-colonial societies is scarce. Written documents from testimonies are available only in a few countries. The oral transmission of information can barely bridge long periods of time. With increasing interest in the reconstruction of traditional knowledge, the research community grew considerably, employing epistemological and interdisciplinary methods (Warren et al. 1995; Agrawal 1995). A surge in the number of publications has taken place in recent years (Posey 1985; Berkes 2008; Parotta and Trosper 2012).

2.3.2.2 Interpretation and Model of Development

The complex nature and interdisciplinary approach needed to understand and interpret pre-colonial societies is documented by a variety of theoretical explanation models. The relationship between humans and their natural environment in the tropics was first depicted by anthropologists, stemming from the disciplines cultural ecology (Steward 1972) and cultural and human ecology (Bennett 1976). Steward (1972) investigated socio-economic patterns relevant for human habitat use. Cultural ecology explains the diversity of land use systems and its integration in farm household systems with a strong focus on subsistence strategies (Bennett 1976; Bargatzky 1986; Little 1999). Bennett (1976) presented a broader interpretation of cultural and human ecology. He applied an anthropological approach to explain transitions in rural societies. Most of the explanation models were formulated in western countries. In the 1960s, the Brazilian anthropologist Darcy Ribeiro structured the socio-cultural development of civilization in a stages approach (Ribeiro 1983). He described the alteration process from hunting practices to intensive land use, differentiating between sustainable and unsustainable, and even nature-destroying land use practices. Pre-colonial governance systems are characterized by great diversity, ranging from subsistence based local economies to highly developed state structures with far reaching market integration. Thus, governance systems differed between strong, hierarchically ordered societies, bottom-up, self-organized communities and even diffuse, almost anarchic organization in some tropical rain forests (Sigrist 1979). Examples of strong hierarchical organizations include most of the societies that have reached a high level of technological achievement such as the Incas and Mayas in Latin America and the traditional Chinese society. Typical bottom-up structures are represented by the social organization of African pygmy tribes and indigenous Amazon communities (Demesse

1992). Rather sporadic social organization is characteristic of sparsely populated tropical forest regions. Sigrist (1979) characterizes Western African forest people as living in a society nearly without hierarchies, which he defines as anarchic.

Widely discussed, and often still contradictory, are the reasons put forward for the clash of civilizations. Analyses are based on assumptions, because the reconstruction of pre-colonial relations between civilization and ecosystems is only partly feasible (Ponting 1991; Diamond 2005). In addition to war, often ecological deterioration, overuse due to population pressure, overexploitation of the labor force and emergent diseases were drivers of the decline of cultures. Widely investigated examples include Easter Island, the early civilizations of the Euphrat and Tigris, the civilization of Angkor Wat in Cambodia (Masselos 2010) and the Maya and Inca civilizations.

2.3.2.3 Tropical Forestry Development

In pre-colonial times forest farmers availed of a large variety of forest goods and services. The short term provision of food and shelter was essential for the individual survival of the rural population. Household consumption products consisted of a broad portfolio of food items like vegetables, fruits, tubers and all types of animals, which covered the calorific and protein requirements of forest people. Up until today in India, the numerous traditional forest uses are denoted by the ‘five or six f’ referring to firewood, fruits, fodder, fiber, food and fertilizer. Cosmic and religious values have also played an important role. Often there were limits in terms of the market access and especially in tropical countries the storage of food was frequently difficult. The situation with regard to livelihoods differed profoundly between densely populated areas of intensive cultural development, such as civilizations in India and China, and societies located in rain forests with a low number of inhabitants and at the rural periphery. The variety in the consumption of forest products and services was complemented by complex institutional patterns of pre-colonial forest use, by which access, use and consumption was organized. The land tenure was mostly determined by common property, which Minsch (1992) denoted as *patrimonium*. Thus, the land was in the hands of the community under local chiefs or, like in many African countries, in the hands of the ancestors and future generations. Land users had no ownership rights and no land title; they merely possessed usufruct rights over land and vegetation, resulting in a stewardship or trustee relationship. The land had to be used in a sustainable way in order to guarantee that future generations would have the same land use options as the users of the present (Pretzsch 1986). With an increasing scarcity of forest products, and in order to ensure a continuous provision of food, some pre-colonial societies reacted by establishing rules, which were developed by the communities and chiefs. The rules contributed to reducing transaction costs. Land and resource access rights were restricted, the amount of resource use per capita was limited by quotas and communities agreed upon benefit sharing mechanisms. Often the institutional framework was complemented by religious and symbolic rules on an overarching

level. The systems were often quite complex and efficient, including rules for reciprocity, benefit sharing and the redistribution of benefits. Numerous studies on the organization of traditional cultures demonstrate the high level of social capital (Pretzsch 1986, 1987b; Sponsel 1995).

The institutions regulating forestry were partly top-down in nature, such as in kingdoms or in communities governed by chiefs or the Indian rajas; they were determined by feudalistic superiors or religious leaders, and served to define the roles of the different segments in society by means of very strict rules. There are also many examples of bottom-up forest management, rooted in self-organization and constructed on the basis of local knowledge accumulated on farms and at village level. Elements of a moral economy were evidenced by the subsistence orientation and based on the principle of reciprocity. There are interesting cases of endogenous governance structures guiding sustainable resource management systems, albeit where local development was far from being automatically nature conserving (Gadgil and Berkes 1991).

Techniques and technologies were mainly handcraft-based, and some pre-colonial societies possessed sophisticated natural resource management systems. Traditional forest management practices were based on observation. Often these practices were copied from nature (Posey 1985; Neugebauer 1986).

2.3.2.4 Paradigm

Anthropological theories were identified as the main explanation models. Authority-driven societies with a strong top-down order were identified as were societies with bottom-up decision-making. The institutionalization of development processes led to technology development, thereby permitting an increasing number of inhabitants to co-exist with nature in a more or less balanced way. Bottom-up decision making was based on local experience and traditions, and led to the formulation of informal rules for forest management. The era was characterized by multiple forest uses for subsistence purposes and for trade in markets. Anthropological theories and the forest use practices can be integrated in a co-evolution model, which perfectly explains the interaction between people and forests and forms a core element of this paradigm.

2.3.3 *Stage II: Forests and Trees in Colonial Times*

2.3.3.1 Classification of the Historical Stage and Data Availability

The majority of tropical countries were colonized by European states. The era of European colonization extended from the end of the fifteenth century to the decolonization of the last tropical countries in the 1970s. Knowledge of colonial development and colonial forestry in particular are well documented. Many of the

colonizing countries established precise documentation systems. Often the information collated was never assessed and to this very day is hosted in the colonial archives of the colonizing states. Documented information is biased for the view of the colonizers. Critical investigations of the philosophy and impacts of colonial forestry are still scarce (Shiva 1989; Blank 2006).

2.3.3.2 Interpretation and Model of Development

Europe's isolation within the bounds of the Atlantic Ocean to the west, Russia to the east, and the unknown African continent and the Islamic countries to the south and south east led to expansion activities in the fifteenth century in the form of expeditions and the installation of trade posts and markets. These were occupied as colonial territories in different stages (Fieldhouse 1965). The colonial occupation started with the 'voyage and discovery' of Christopher Columbus in 1492 and with Vasco da Gama's voyage to India in 1497–1498 (Preston 1996, p. 143; Fürstenberg 1966). In 1494 the colonial areas were split into Spanish and Portuguese domains under the Treaty of Tordesillas. The Aztec and the Maya territories were occupied and settlements were initiated around 1500. In Latin America colonization led to a far reaching destruction of local cultures. It was oriented towards the assimilation of the local administration and culture by the colonizing power. The establishment of agricultural plantations for the production of cash crops like sugarcane required a labor force. The native Indian population resisted and the transatlantic slave trade was initiated to meet the labor demand. With the colonizers struggling to produce agricultural crops in a reliable and efficient way the *encomienda* system was introduced, whereby local communities were forced to produce cash crops (Konetzke 1956). In 1564 the Spanish colonizers occupied territory of the Philippines; the first, and for some time the only, colonial territory in Asia. At that time the European states other than Spain and Portugal possessed only limited colonial territories. At the end of the eighteenth century French occupation was limited to but a few West Indian islands and bases in Africa. British colonies were established only in North America and in West Indian islands like Jamaica and Barbados, where, following the Brazilian model, plantation colonies were established. Further developments were accelerated by the foundation of the East Indian Trade Company, which was initially managed on a private basis. With the decline of the American colonies in the eighteenth century, colonial territories decreased before a new colonial era began in Africa and Asia (James 1998; Osterhammel 2009). Step by step the European capitalist system expanded to most tropical countries. Hobsbawn (1987) called this era "Age of Empire". Powerful administrations were established, undermining endogenous value systems and development paths (Preston 1996, p. 139; Escobar 2012).

The colonial systems differed in their strategies with respect to the implementation of local organizations. The French colonizers followed the direct rule system, which led to a complete substitution of the local administration by colonial staff (Pretzsch 1986, p. 21). Meanwhile, under the British indirect rule system, the local

structure was partly taken over by the colonial ruler, integrating it within the colonial administration. All systems were based on unequal power structures and a one way flow of communication in a system of law and order (Hobsbawn 1987). The colonial occupation advanced hand in hand with the slave trade, which led to a far reaching brain drain and destruction in many topical countries (Loth 1981). Even more damaging than the physical power was the forced dissemination of European value systems. The existing social order, including the traditional resource management systems, were disrupted and replaced by external rules and practices. Imperialistic attitudes, continuous suppression and the extreme exploitation of the colonies led to increasing resistance against the colonizers, which finally resulted in struggles for independence and ultimately liberation.

2.3.3.3 Tropical Forestry Development

Huge parts of the colonial territories were covered by forests and the question of their use or conservation was a central issue. Forestry was greatly affected during the colonization process (Tucker and Richards 1983). Although each colonizer practiced its own specific ways of colonization, the final outcomes were similar. The early colonization of the Americas was much oriented towards the exploitation of timber for ship building, construction and a number of other uses. In spite of this economic importance attributed to the forests, the colonial legislation, the ‘Leyes de los Indias’, made no reference to forest use (Fürstenberg 1966, p. 158). With the establishment of the authoritarian colonial administration, traditional rights to forest use were negated and the traditional links between rural people and nature destroyed (Fürstenberg 1966). During the later colonization of Africa and Asia similar strategies led to comparable outcomes. Direct colonization by France resulted in the widespread destruction of local institutions and knowledge systems dealing with forest use (Pretzsch 1986). Although local institutions remained partly untouched under the British system of ‘indirect rule’, the rights of the local population to forest use were restricted. Most colonial interventions led to the alienation of local people from their forest environment. Accompanied by transatlantic slavery, the colonization process led to a far reaching destruction of local land use and management systems, often including the forest and tree components.

Forestry was subjugated to western philosophies and knowledge systems. In this way, the relatively complex and holistic human–nature interactions and the respective forest use systems were substituted by one-dimensional concepts of financial forest benefits and the creation of pure conservation areas. Early influence came from German academic forestry schools. The German Royal Forest Academy in Tharandt was one of the first academic institutions, transferring middle European scientific forestry models to tropical countries (Pretzsch 1994; Uibrig 2007). Much emphasis was placed on the development of mono-cyclical natural forest management systems. Especially under the French and the British colonial forest service, experimental plots were established with a number of silvicultural homogenization models (Dawkins and Philip 1998; Lamprecht 1990). Due to high labor inputs, low

production per hectare and high complexity, most of the systems were far from operational (Pretzsch 1998, 2003). Adhering to the needs and interests of the colonizing countries, the ‘modern’ forestry referred to above made little account for subsistence production and was mostly oriented towards markets. The diversity of forest uses of pre-colonial times was replaced by an orientation towards the production of a small number of commercial crops for export, including coffee, cacao, oil palm and rubber. Forests were also seen as a land reserve for mainly plantation production. The forest use rights of the local population were drastically reduced. Following the Roman tradition, private property land titles were introduced. Minsch (1992) referred to this as *dominium*. Under French colonization local land users had to prove that the land had been under cultivation for at least 10 years. This was hardly the case in the traditional shifting cultivation systems, but the European settlers, working with permanent agriculture, got property rights (Pretzsch 1986). In this way a two-class society was created, consisting of people with and people without title to land. Other forest use rights such as the collection of non-timber forest products and firewood were placed under strict control.

The previous concept of ‘ownership’ over specific forest products and services was lost and often local people acted against colonial forest administrations (Blank 2006; Shiva 1989). The substitution of traditional rules by the paradigm of modern European forestry, which at that time was based on the maximization of the timber production, led to a partial rupture of the traditional relationship between people and their natural environment. The bureaucracy concept of Max Weber, with single line organizations, and the Prussian top-down approach and the respective law and order-based forest administration was often implemented (Rist 2002, p. 48 et seqq.). As Shiva (1989) illustrated, the post-colonial forest management paradigms barely referred to pre-colonial experiences but were instead dominated by western philosophy.

2.3.3.4 Paradigm

The theoretical foundations to explain this era are imperialism theories and analytical models explaining colonialism and related power structures. It is necessary to generalize as colonial expansion took place at different times and to different intensities in Latin America, Africa and Asia. The colonization practices of the colonizing country also varied. The basic principles and consequences were similar, however. Apart from direct forest destruction, colonization took place profoundly in the mind. Western value systems were imposed and traditional rules on how to treat and use the forest ecosystems were replaced by simple state control. Local people became alienated from traditional forest use.

2.3.4 Stage III: Independence and Capital Formation

2.3.4.1 Classification of the Historical Stages and Data Availability

The decolonization process extended from the time of independence of the Latin American countries until that of the African and Asian countries in the 1960s and 1970s. The era is characterized by remaining relicts of the strong bi-national linkages, which were either peaceful or characterized by post-colonial struggle. In the case of some countries it is difficult to obtain information for this era, because often the colonial administration's archives were taken over by the new national government, leading to a gap in the documental information.

2.3.4.2 Interpretation and Model of Development

The decolonization phase was still much dominated by value systems and structures implemented in colonial times. The colonial heritage led to a certain path dependence (Fieldhouse 1981) and it took time for own, endogenous development strategies to develop. Many of the higher government representatives had been educated in European countries, Soviet Union or United States of America. Their education was based on the latest scientific knowledge and belief systems of these countries. Their understanding of development strategies, and especially rural development and forestry, were primarily based on western development models (Rist 2002, p. 103). Most of the newly formed governments voted for a market oriented governance system, and integration in the world market. Development was almost exclusively measured by the level and the increase of the gross domestic product. After the Second World War the main economic orientation followed the assumption that capital accumulation is the main precondition for economic growth. Preston (1996, p. 154) summarized four main influencing factors that determined this era: “(1) the theoretical and practical impact of the Keynesian revolution, (2) increasing global influence of the USA in prescribing development strategies, (3) the reconstruction of western Europe with the Marshall Plan and (4) demand of new national states towards their own independent and nationalist development.” The positive experiences of the Marshall Plan, a large investment made by the allied forces to reconstruct Germany after the war, were simply transferred to tropical countries (Nurkse 1953; Rosenstein-Rodan 1961). Development theories were formulated offering paths to overcome underdevelopment. Important in the context of understanding the spirit of this time is the Rostow model (Rostow 1960; Kuznets 1963). Similar to Marx's development stages, he proposed a sequence of five stages from traditional society, the preconditions for take-off, take-off, the drive to maturity and finally the age of high mass consumption (Rostow 1960, p. 4; Kuznets 1963; Thirlwall 1994, p. 61). It was assumed that the shift from traditional society to preconditions for take-off was determined by the availability of capital and entrepreneurial potential. This approach was the origin of

the so called third world development theories (Rist 2002). In practice the model was difficult to implement because in the majority of post-colonial tropical countries the necessary capital was lacking. Productive industries, which might have permitted a nationally relevant formation of capital, did not exist in most countries. Savings and 'forced savings' in the form of taxes could barely be tapped. Capital, therefore, had to come either from outside the country or from nationally exploitable natural resources. Given the lack of capital, technologies and know-how, the resources were often exploited by international enterprises without any added value accruing within the country.

Only a small number of countries followed the path of import substitution, in most cases only temporarily, prioritizing the refinement of the available resources nationally and placing restrictions on imports. One such example is Ghana under Nkrumah. In socialist Tanzania under Julius Nyerere, a concept of local community development was initiated with the objective of improving the local production structure. Similar concepts were realized in Indonesia and Brazil, as well as under the international trade boycott in Cuba. These years were an important time for nation building after decolonization (Cypher and Dietz 1997, p. 65). Euphoria arose in part at the idea of recovering development by means of rapid modernization (Preston 1996, p. 153 et seqq.). A number of neo-colonial imperialism theories appeared (Mommensen 1987), dealing with unequal center and periphery relations, power relation in the world system, decreasing terms of trade and income imbalances between industrial and developing countries and cultural imperialism.

2.3.4.3 Tropical Forestry Development

In the decolonization stage, tropical forestry strictly followed the general economic development models. The newly independent forest authorities were acquainted with western forest administration and forestry development models. Even the few academic institutions in which scientific forestry was taught had been founded by western countries and the contents of the curricula were entirely oriented towards European concepts of modern forestry. At the same time there was great pressure to generate income for the newly established National Forest Services and for national development in general. Under these circumstances Rostow's (1960) theory, and the respective European interpretation, served as a justification to accelerate tropical forest exploitation, driven mainly by European enterprises (Westoby 1962). At the sixth World Forest Congress in Madrid, Zivnuska (1966, p. 561) argued that under the conditions of initial growth and transition towards industrialization, the principle of sustainable forest management would be not applicable: "Here it must be recognized that, despite its central role in the doctrines of forest regulation, sustained yield is a concept which is economically justifiable only under a particular set of economic circumstances. The sustained yield concept is not applicable to the conditions of rapid growth". The liquidation of natural forest resources was seen as one of only a small number of options available to contribute to the formation of national capital and to induce development. It was assumed, that the massive

exploitation of forest resources, a subsequent investment of the raised capital in timber industries, and a later re-investment in forest plantations, would lead to growth of the forestry sector and the wood industry (Zivnuska 1966). It was even argued that this might become a 'leading sector' in the national economy, similar to the experiences made in Scandinavian countries such as Finland and Sweden, and also in Canada (Palo 1988). As a consequence, natural forest exploitation for timber production increased rapidly in most tropical countries. As the state forest administrations possessed neither the proper logging machines, nor the know-how and the necessary financial capital, the forests were handed over to concessionaires for logging. They mostly worked with capital from Europe and later on from Japan, Russia and other industrialized countries, and engaged in forest exploitation with a short term orientation, maximizing the rent from forest stands. Critical scientifically based analyses of these practices only emerged belatedly (Pretzsch 1987a; Repetto and Gillis 1988).

In general, the management of state forest administrations was largely top-down, following a hierarchical line organization principle. As a colonial relict, it was similar to the Prussian type of forest organization propagated by Weber (Weber 1922). This opened the door to corruption and often the rights and interests of small forest farmers were ignored. The research into tropical forestry also mostly adhered to the old colonial practices, with the majority of the forestry research taking place in research stations and under experimental conditions. The findings were of limited applicability in practice and on a large scale (Lamprecht 1988). Most of the silvicultural models proved to be too complex, labor intensive and of little financial benefit (Pretzsch 1998, 2003).

2.3.4.4 Paradigm

The paradigm follows a rather simplified interpretation of development, as proposed by Rostow (1960). It was adopted by a whole generation of development economists from both the north and the south, and centered on the need to overuse forests for the formation of financial capital to initiate economic development (Zivnuska 1966). The implicit western model of growth orientation is still a part of many agendas today. The situation in the decolonized territories was rather different from the reality in Europe, however. The textbook ideas about sustainable forest management, which focused on western countries, did not fit with the situation in most tropical countries. After decolonization the new national states were de-capitalized and partly suffered from the brain drain caused by slavery. The traditional knowledge of the subsistence use of tropical forests had been negated and the scientific knowledge available with respect to tropical forest management was rather unsophisticated (Dawkins and Philip 1998).

2.3.5 *Stage IV: The Internationalization of Forestry*

2.3.5.1 Classification of the Historical Stage and Data Availability

The dissolution of bilateral colonial links happened at different speeds. The new nationalist governments struggled for independent and autonomous development, but experience with development models and their implementation in practice was lacking. In this situation the old colonial links were replaced in part by blue print concepts of western countries and international organizations. There was a boom in the number of publications on development, including forestry, with a focus on technologies, industrialization and economic growth.

2.3.5.2 Interpretation and Model of Development

It was an era of expanding international cooperation, based on relatively simple and linear blue print concepts related to the assumption that large scale rural development is feasible. The underlying thinking was still rooted in the prioritization of capital accumulation for industrialization, combined with the emerging modernization theories (Preston 1996). A strong dichotomy between traditional societies and modernization was assumed. Modernization was interpreted solely in the western sense, as entrepreneurship, and denied most of the historical facts experienced in developing countries. Still adhering to Rostow's stages of economic growth, the traditional stage had to be overcome using savings and with the formation of productive capital (Preston 1996, p. 167). This stage was accompanied by large scale investment in technologies in the primary sector and in industrialization and infrastructure. Modernization projects were often planned in a growth-oriented and technocratic way, with little consideration given to ecological and social impacts. The local stakeholders affected were in most cases not involved in decision making. Possible negative social consequences of large scale investments were invalidated using the argument of strong trickle down effects, which would reach and benefit the rural poor. Innovations were propagated following the linear technology transfer approach (Leeuwis and van den Ban 2004; Rogers 2003). Examples include the implementation of the green revolution based on agricultural inputs like fertilizer and improved seed in India, large scale colonization projects in the Amazon and the transmigration project in Indonesia. International agencies such as the United Nations' bodies and the World Bank strongly propagated this approach and implemented a huge number of projects (Goldman 2005). Land use planning was rooted in far reaching instrumental thinking, which led to the implementation of relatively uniform large scale projects with a technocrat orientation and a focus on hardware.

One of the consequences was the increasing indebtedness of many developing countries. The large scale projects acted as debt traps. Frequently only a part of the available funding was donated and many projects did not permit repayment of debt,

composed of the principal and the interest. Payer (1974) reviewed the World Bank activities of that time and criticized the generally low long term efficiency of these studies.

2.3.5.3 Tropical Forestry Development

Tropical forestry adhered strongly to the modernization model. With the noticeable improvements to communication networks and the international trade infrastructure, the tropical timber trade channels diversified and timber production and the timber industries entered a stage of increasing internationalization. With the main focus remaining the initiation of national growth by means of capital formation, the bilateral colonial links were gradually replaced by multilateral market contacts. Colonial governance shifted to the domain of international organizations such as the United Nations bodies, the World Bank and the International Monetary Fund. The idea of the 'homogenization' of natural forests, following European experiences, was investigated in many research stations and propagated in many tropical countries.

Funds urgently needed by developing countries for improvement led to the continuous increase in the exploitation of natural forests. It became increasingly lucrative for private concessionaires, who assumed for the nation states the tasks of logging and selling timber. Forest concessions were rented on a short term basis, leading to a volatile capital investment. Due to high calculated logging costs and a corresponding underestimation of stumpage values, windfall profits were created and forest revenues for the national states were low. Also in the majority of the cases the national investment strategy failed because of the weak institutional structure, lack of know-how and political will and corrupt misuse of the financial capital generated. Thus, these concepts posed a severe threat to local people and their livelihoods. Due to deficiencies in the institutional framework, most of the capital released left the locality, the region and even the country, and incentives for local development were minimal (Pretzsch 1990; Vincent 1990; Vincent and Binkley 1992).

Once the natural forests had been destroyed by over-logging, the transformation to large scale forest plantations was suggested. The World Bank was a major proponent of this. The planning of these mostly large scale projects followed a strict top-down approach. Often the projects failed because of the adoption of techniques and technologies not adapted to the purpose, or a lack of acceptance by the local people resulting in resistance. In many cases plantations were established with the aid of low interest loans provided by international organizations. The failure of large scale forest plantation projects has contributed to the international debts of some tropical countries (Payer 1974; Pretzsch 1986; Goldman 2005).

Large scale and multinational enterprises appeared on the market and entered third world countries. Private investors established large scale forest plantations. The investment in the Jari Project in the Amazon by Daniel Ludwig in 1967 demonstrates the spirit of that time. He bought 1.6 million hectares of forest for

an amount of \$1.6 million and invested a total of \$1 billion installing a pulp factory he had shipped from Japan. This gigantic project was largely a failure and he sold the whole consortium for \$280 million in 1981 (Fearnside and Rankin 1982, 1985; Russel 1987; Lins 1994).

As in agriculture, most forestry projects followed the technology transfer concept, which granted high priority to exogenous technology development. Local knowledge was rarely availed of. The utopia of the ‘homogenization’ of natural forest similar to European forest experiences further dominated the thinking of tropical foresters. It was assumed that through the homogenization of the natural forests, the growth rates of commercially useable timber could be increased considerably. Many silviculture systems were developed based on the classical European system but in most cases the corresponding experiments took place in research stations and not in the field. Large scale implementation often failed because of financial and technological limitations. Meanwhile, the establishment of plantations led to technological innovations and private enterprises especially entered the charcoal, pulp and paper sectors.

The ongoing destruction of the forests led to the creation of an ad hoc working group, created as an output of the FAO Committee on Forest Development in the Tropics in 1983. Together with the World Bank and the World Resources Institute (WRI) a 5-year program was drafted in 1985, coined the Tropical Forestry Action Plan (TFAP). A corresponding organizational unit was set up within the FAO. Seventy countries had joined the TFAP by 1990. In that same year, however, it became obvious that deforestation in the tropics had not slowed down. The TFAP had followed a very technocratic and sector-oriented approach and its implementation was typical of the final stage of internationalization and large scale planning in tropical forestry. The procedure was strongly criticized by the WRI, citing the following deficits: (1) too restrictive top-down planning; (2) no participation of local actors and NGOs and (3) the lack of sector integration. Funding was stopped and a fundamental reorientation process started, which resulted in the creation of the National Forest Action Plans and later on the National Forest Programs (Winterbottom 1990; Humphreys 1996, p. 31 et seqq; Glück et al. 1999).

2.3.5.4 Paradigm

Although the traditional colonial links were still strong in some countries, guiding concepts for forestry development were now increasingly the domain of international organizations such as the Food and Agriculture Organization of the United Nations and the World Bank. Both international organizations and large forest enterprises followed one common paradigm: tropical forest management and plantation development are feasible within the framework of good planning and require above all technological skills. The modernization theory was applied for forestry. Following the strategy of the World Bank, natural tropical forests were now logged over on a large scale based on concessions. This very much favored international concession enterprises, which appropriated large parts of the forest rent. A certain

euphoria towards large scale projects gained ground. Still following the lack of capital for growth model, it was argued that development incentives should not focus on the poor, because their first preference would be consumption. Consequently, they would not in a position to save money for investment. A certain level of support for the poor would be ensured by the trickle down from the leading growth sectors. All components of this concept led to a disregard for the livelihoods of local people.

2.3.6 Stage V: Polarization

2.3.6.1 Classification of the Historical Stage and Data Availability

The shift towards the diversification of thinking and models in development cannot be sharply determined within a particular timeframe. It was a gradual process starting in the mid of the 1970s and continuing up to the time of the Rio Conference in the 1992. The new era is characterized by a fundamental widening of the perceptions of rural development, including tropical forest management. This is manifested by a multiplication of the actors involved, the sources of information and the number of field projects (Chambers 1983). New economic development models such as the basic needs approach were tested and documented. Publications from emerging NGOs indicated increasing involvement and activities on the part of the civil society in projects and in national environmental policies (Lane 1995).

2.3.6.2 Interpretation and Model of Development

The majority of third world countries followed the growth models propagated by western countries. Although an overall rise in economic growth was registered, the distribution of income became increasingly unequal with a steadily rising Gini-coefficient. As was mentioned previously, large scale investment projects mostly failed or, like the green revolution in India, benefited only a part of society. Social and ecological problems increased dramatically. Many countries suffered under a policy of austerity, prescribed by the International Monetary Fund, which also served to put additional pressure on natural resources (Choussudovsky 1997). The origins of international debts were often the aforementioned large international projects, which were badly planned and failed to deliver the calculated returns (Payer 1974). The idea of a leading sector, which accelerates development across the entire national economy by means of a 'trickle down' effect to the poor segments of society, did not work in practice. At the same time, however, only very few practical examples of the implementation of endogenous development strategies, such as import substitution, existed. Often, these too were unsuccessful (Thirlwall 1994, p. 13).

In 1973, during the era of McNamara's presidency of the World Bank, the development policy shifted from a growth orientation to 'redistribution with

growth' (Chenery et al. 1979). This reorientation led to the implementation of the basic needs approach (Streeten and Burki 1978; ILO 1977). Apart from taking care to cover the basic needs such as food, shelter, health and education of poor farmers and laborers, it focused on the implementation of labor-intensive technologies, which permitted a maximum provision of labor to the rural poor. The basic needs approach was justified partly on the basis of ethical arguments for poverty alleviation. It was also based on the insight that poor segments of society contribute to economic development, because they satisfy the demand of the poor for consumption goods like mopeds and televisions, although basic needs are not covered. Further reasons were the reduction of population growth through the satisfaction of basic needs and the assumption that an increasing number of poor households would lead to political instability and ecological destruction. The approach was assessed controversially. The general improvement to livelihood conditions contrasted with strong limitations in technology development (Hunt 1989). It was argued that because of the low inputs in terms of capital and technology, labor productivity might not increase significantly, which would lead to the perpetuation of a life of poverty (Hunt 1989). The approach was also criticized for being expensive and potentially leading to greater resort to credit and accumulation of debt in developing countries.

The shift from a growth orientation towards a more ecological and social thinking was manifested in an enlargement of the development community by civil society organizations such as interest groups and non-governmental organizations (Uphoff 1993). Criticisms of destructive government projects, funded using international money, spread in the NGO community. The partial failure of the modernization approach led to a rapid diversification of development models, approaches and discourses. The failure of the linear growth model initiated a critical discourse on how to 'induce' development. New ideas and concepts developed independently of western influences. An example is the Indian 'environmentalism', which is characterized by a high level of cultural identity and site-specific local value systems (Gadgil and Guha 1992, 1994; Poffenberger and Gean 1996). With the diversification of development philosophies and actor constellations the ground for the Rio Conference was prepared. The process led to the drafting of international conventions.

2.3.6.3 Tropical Forestry Development

Negative developments in tropical forestry led to a basic rethinking and reshaping of forest politics. The negative factors included the lost revenues from tropical forest exploitation, the ongoing deforestation linked to large scale forest conversion for agricultural purposes, and finally the failure of the Tropical Forest Action Plan as a powerful instrument for tropical forestry development. Belatedly it was demonstrated that the revenues from the tropical forest exploitation of the last 20 years had barely affected the national budget, as had been assumed in the Zivnуска model (1966). Studies by the World Resources Institute have shown

that a large part of the stumpage value from tropical forests was transferred to western countries and Japan, where most of the large timber trade enterprises were based (Repetto 1988). These so called 'windfall profits' were a consequence of a lack of knowledge of the cost structure of local forest administrations. The foreign capital based enterprises overestimated the costs, which led to a rather low calculated rent for the resource. In many cases the conversion of natural forests to agricultural cash crop plantations like soybean, rubber and coffee, or to pasture for cattle grazing, was not successful in the long term. The ecological consequences were negative and often the local population was barely involved in land use decisions. Colonization and mining projects in tropical rain forest areas, like the Polonoroeste Project implemented by the World Bank and the Carajas Project in the Amazon, were assessed negatively and, in part, their implementation was stopped. In Asian countries, the green revolution led to the segregation of society into winners and losers. With the Transmigration Project in Indonesia, involving the transmigration of peasants from Java to Kalimantan, it became obvious that often large scale technocratic projects led to increased destruction and the social marginalization of a large segment of the rural population, as was also the case with the conversion of exploited forest concessions to large scale forest plantations in West Africa. The Tropical Forestry Action Plan, launched in the mid-1980s and quietly abandoned in the early 1990s, had followed the conventional technocratic forestry philosophy (Winterbottom 1990). Fundamental criticism of the conventional development models led to a rapid emergence of new social forces such as communities, interest groups and different types of grassroot and non-governmental organizations (Kolk 1996). Often these were more active and efficient than state forest services and governmental projects.

All of these negatively perceived factors led to resistance by the many new groups active in civil society and the partial blocking of development initiatives. One of the consequences was a reorientation and diversification of land use systems, including tropical forest management. There was a shift towards the use of more flexible planning systems, the integration of a multitude of other sectors relevant for forestry, the reestablishment of a link to local knowledge and the proactive inclusion of conflict management mechanisms. The negative consequences of tropical forest exploitation led to a boycott of tropical timber. European NGOs initiated this boycott, which was successfully adopted in public and municipal administrations in Germany and Britain. The private sector was much slower to react. In a further step, the Forest Stewardship Council (FSC) was founded and forest certification became a complementary instrument in the implementation of sustainable forest management. Forest certification represents a typical instrument of this era. It resides between civil society and private engagement, and represents the search for alternatives to government action (Meidinger et al. 2003).

More and more actor-oriented approaches appeared, explaining forest use based on actor interest. The myth of a linear link between population growth and forest destruction, following the Malthusian explanation model, was critically analyzed, indicating the importance of an sufficient number of active rural population per area for the initiation of land use innovations (Boserup 1965; Heilig 1996). An

increasing number of political ecology studies focused on tropical forestry, including the analysis of power structures and conflicts between actors. It became more and more obvious that thinking in linear and large scale dimensions would not lead to success. The concept ‘small is beautiful’ was realized in micro-enterprises, which were developed to transform forest products (Schuhmacher 1973). The new national forestry program concept, and later on the national forest plans, related closely to local agendas, the UNCED process and finally to the outcomes of the Rio Conference.

The revival of local and traditional forestry knowledge from the mid-1980s onwards was also significant, as were the adoption of site-specific and historically rooted land use alternatives. Rich knowledge still exists within rural populations in tropical and subtropical countries, although in many places the knowledge systems are being gradually lost as the knowledge is only transferred orally. The guiding management principles often derived from natural cosmic visions (Chap. 7).

Many elements of the pre-colonial paradigm, site-specific local knowledge and the importance of community institutions formed the basis for the emerging paradigm of ‘social forestry’, which developed in parallel with the purely utilitarian paradigm of industrial forestry. The basic needs model and the livelihood approach contributed to the further development of community and social forestry, providing a third way between state and private activities.

In this polarization stage, a third path besides the industrial forestry and social forestry paths took shape, whereby the conservation activities introduced in a top-down manner during colonial times were broadened in their perspective, taking into account the needs of the local population and integrating these needs within the landscape.

2.3.6.4 Paradigm

With the shift away from the internalization of tropical forest policy to the polarization paradigm, forestry development strategies diversified in three directions. With a concentration in large international timber enterprises, the focus on forest-based industrialization gained further ground. This development was embedded in conventional growth theories and the theorem of competitive advantage in the world market. In many rural areas of the tropics, locally oriented rural development, in which forestry plays an important role in livelihood development, the alleviation of rural poverty and local income generation, replaced the linear development models and the industrialization strategy. Various development models, such as the basic needs approach, dualism and dependency theories, laid the groundwork for the expanding strategies of social and community forestry. Within local development strategies, instruments for a ‘third way’ of development, based on the creation of social capital, evolved. The discourse on tropical forest conservation intensified.

2.3.7 Stage VI: Globalization

2.3.7.1 Classification of the Historical Stage and Data Availability

The historical review reveals the expansion of international market networks, rapid multiplication of multinational enterprises and increasing acculturation, following western, Islamic or eastern Chinese philosophies. A qualitative advance appeared with the end of the 'cold war' at the beginning of the 1990s. Market forces dominate financial transactions, labor markets and the organization of commodity and service markets even in the public sphere. The availability of data has improved, although often the data do not portray the increasingly complex reality. Dense and unfathomable inter-sector relations, the multiplicity of actors and the volatile information policy of large multinational enterprises make data collection difficult and often diffuse. In many sectors, and specifically in tropical forestry, case study research is commonplace and most of the tropical forestry activities, excluding the private enterprise sector, are well documented. However, often the synthesis of case studies towards an overall theoretical explanation model is lacking.

2.3.7.2 Interpretation and Model of Development

Globalization is a multi-faceted process, which has strong cultural, social and economic dimensions and impacts. The interaction between various spheres makes it difficult to apply only one analytical tool (Beck 1986, 2007; Rehbein and Schwengel 2012). From the viewpoint of development policy, and focusing preferentially on economic targets, the globalization era is characterized by deregulation. The predominance of market mechanisms over state interventions, increasing power of large multinational enterprises and banks result in an antagonism between international and global plans and strategies and their implementation on a local level. Methodological definitions of the new global development paradigm are still not very precise. A generalization under the heading 'neo-liberal' has caused misunderstanding (Rapley 2004; Thorsen 2011). The term neo-liberal is generally used with an overall negative connotation, and without enough theoretical abstraction. Examples of populist autocratic governments like Chile under Pinochet, influenced by M. Friedman, or China under Deng Xiaoping, which were partly interpreted as neo-liberal, do not contribute to a theory-oriented clarification either (Nonini 2008). From the perspective of development theory, two controversial schools are relevant. An extreme neo-liberal school focuses on the preference for a self-regulating market with an extremely high level of entrepreneurial freedom and absolutely minimal state interference. It is characterized by far reaching deregulation; state activities are limited to just a few areas such as national defense and police (Hayek 1960, 1988). Meanwhile, the moderate liberal approach represented by the Freiburg school of national economy, deals with the ordoliberal principles of regulating and constituting functions of the state. It is assumed

that market forces need to be directed and limited by a comprehensive system of rules and regulations (Eucken 1990). The neo-liberal policy is one practical component of the present implementation of globalization, but it is poorly theoretically embedded. Globalization may also advance based on other economic foundations (Giddens 1998). Although many authors see the globalization effects as most positive (Stiglitz 2006); the most dramatic and negative consequence of the current neo-liberal policy is the increasing imbalance and inequality between social classes and nations (Rapley 2004). The global economic community does not take into account the fact that the starting positions of different nations are unequal as a result of historically determined events and politics, including colonialism, the slave trade and austerity policies dictated by the International Monetary Fund (Sen 1999). From the “postdevelopment” view after the Second World War development processes in the South were completely determined by the North (Escobar 1995; Goldman 2005). Increasingly, part of the developing countries is placed in a dependent and subordinate position, with a rapid decrease in the development options available. Economic growth is only feasible at the expense of social justice and subject to the short term overuse of natural resources. There are few opportunities to strive towards sustainable development targets, taking into account growth and distributional justice as well as a non-destructive management of natural resources. The underlying, unrealistic targets were mostly formulated by western countries. A discourse on this injustice, its socially and ecologically destructive consequences, and the need to reformulate these targets, is necessary in order to find a compromise in negotiations over common global goods like water, climate, biodiversity and forests (Ziegler 2002, 2005). The simple focus on market mechanisms and the espousing of the sustainable development principle as a superficial dogma can be interpreted as being the end of any development theory. An increasing number of studies focus on the limits of growth on a global level. In the meantime, however, creative, innovative and proactive theoretical models on the integration of developing countries in the future world economy are poorly developed (Preston 1996, p. 254). China and other former developing countries offer development aid in Africa, partly following rather mechanistic models (Michel and Beuret 2008). The changing power constellations on a global level will result in rather differing development options and chances for the future (Ferguson 2012). A respective discourse is necessary, including Eastern and Oriental thinking (Said 1978). Strategies on a green economy focus mostly on development in Western countries and barely address the consequences for developing countries (Jackson 2009; Fücks 2013).

The lack of adequate development models makes it difficult to implement social and ecological targets in rural development sustainably. The emerging paradigm has a new dimension, namely the supranational exchange of the production factors labor and capital, the run on limited land resources as well as increasing knowledge and commodity exchange. Mechanisms of self-compliance, corporate social responsibility and the drafting of a code of conduct under the global compact are not convincing if there are no legally binding rules (Humphreys 2009).

2.3.7.3 Tropical Forestry Development

After the Rio Conference 1992 the attention granted to tropical forestry issues gradually waned. Negotiations on the forest convention were without success because of controversial positions adopted with regard to the nature of tropical forests as a private or a common good. Although global deforestation declined, in most tropical countries forests were still being destroyed for alternative land uses, land speculation or for urbanization and large scale projects like dams. Poverty remained an important driving force of forest destruction and degradation. This negative development was overcome unexpectedly and rapidly with the increasing recognition of the importance of tropical forestry in climate change mitigation and in the context of the overall scarcity of and rising demand for forest products and services, which is related to the increasing world population. The substitution of fossil fuels by renewable sources of energy created an additional demand for wood as a source of energy, resulting in an increase in prices. Shifts can be detected in the organization of tropical forestry. Embedded in the institutional triangle between state, private actor and communities, a shift towards private actors and community or forest user group organization can be partly explained by the aforementioned neo-liberal influences. Many state forest administrations failed to implement forest policies benefiting rural and national development. They were not able to regulate access to forest products and services by the local population or to integrate international enterprises in forest management strategies ensuring adequate, long term revenues for the state. State forest administrations were gradually replaced by independent state forest enterprises operating according to a full cost calculation and controlling relatively independent budgets.

Mechanisms of deregulation and privatization have led to the outsourcing of many activities to private service enterprises, and in some cases to a partial delegation or even total privatization of forestry activities. The main objectives of these activities are cost reduction, and in line with this the reduction in the number of permanent employees. The negative consequences are lower social standards and poorly trained workers with greater incidences of accidents (Poschen 1997, 2001). In many post-socialist countries land reforms, which were often supported by the World Bank and other international organizations, led to the redistribution of former state forest. It was divided into small plots and handed over to small landowners. This adheres fully to the neo-liberal philosophy, but often has negative impacts for the quality and productivity of the forest resources. It is difficult to formulate management plans for small farm forest plots and to conduct sustainable forest management. The liberalization of access rights to land and forests on an international level has led to the growing establishment of large international forest enterprises in tropical countries. In a few model cases, relative transparency is assured by means of certification and open access to comprehensive documentation, as is at least partly the case for the Precious Woods shareholder company (Frattini 2006). The great majority of large forest enterprises working in the tropics, however, are rarely audited with respect to their management plans and destructive

practices are widespread. In some countries use rights are delegated for the time span of one or two forest rotation cycles.

In parallel, rules for the use of forest under common property use regimes were developed further (Schmithüsen 1986). This ‘third way’ of granting rights to forest use to local communities is deemed to be a viable alternative to privatization. The important social function and, above all, the contribution towards poverty alleviation can be satisfied in conjunction with timber production and other market functions (FAO/DFID 2001). The corresponding devolution of forest management rights to local communities and the increasing participation of civil society in forestry decisions, having started with examples such as the forest user groups in Nepal, is extending to many tropical countries. This process can lead to the empowerment of local communities, but may also be counterbalanced by negative effects. Transition processes are often organized too superficially, decentralized forests become degraded and the need to initiate training and to plan the necessary funds are often overlooked. The decentralization of any form of forest use requires prior training and education, so that the communities or households affected are well prepared and informed with regard to the respective rules. The land or forest in question must also be in a state that permits the extraction of benefits sufficient to cover at least the cost of organization and management. Ostrom (1990) referred to the principle of congruence in this point; the activity must generate more outputs than the inputs required in their generation, usually in the form of labor and small investments. New forms of forest organization such as partnership agreements like joint forest management and leasehold forestry are important tools for rural development. A number of new instruments have emerged, most of which are rooted in market mechanisms. Examples are the mechanisms under the United Nations Convention on Climate Change, the clean development mechanism (CDM), reduced deforestation and degradation (REDD) and payment for environmental services (PES) schemes related to biodiversity, water and many forest products. These mechanisms are designed to implement the increasingly complex forest use and conservation systems in tandem. The strong orientation towards market forces puts an emphasis on products and services with market values. As a consequence, the increasing ‘commoditization’ of forestry may lead to an unbalanced valuation of forest services (Kosoy and Corbera 2010). Furthermore, recent experiences with PES demonstrate that because of the public good or open access character of many forest goods and services, the options to operate within market mechanisms are rather limited. Most of the payments for forest services are still based on state budget transactions (Chap. 9).

From the perspective of cultural determination and epistemology, forestry is extremely site-specific and locally embedded. With colonial expansion, valuable forest management traditions disappeared. Part of this traditional knowledge is being restored today. With the further expansion of global knowledge systems, the risk is the establishment of one dominant western scientific school of modern forestry and sustainability, which will again come to suppress local, experience-based knowledge.

2.3.7.4 Paradigm

Since the end of the cold war priority has been given to market mechanisms. A guiding theoretical foundation was neo-liberalism, which had a considerable impact on tropical forestry, with a trend towards privatization, the outsourcing of certain activities by forest enterprises to service providers and the improvement of accounting systems within state forest enterprises. The relationship between forestry and development suffers from a concentration of development thinking on market forces and related instruments. Overarching theoretical constructs are lacking and there is no solution as to how to proceed with international negotiations on global environmental problems. The dysfunctions between hypothetical neo-liberal market mechanisms and the reality of dependence and power relations has led to failures in international negotiations.

2.3.8 *Lessons from the Paradigms and Their Changes*

The six stages discussed may overlap and strict timeframes cannot always be assigned. They have the character of discourses and storylines and cannot always be exactly proved scientifically. Apart from this fuzziness, they follow entirely the retirements for paradigms outlined by Hunt (1989, p. 3): (1) each of the stages is backed by theoretical models explaining socio-economic development, more or less interrelated with tropical forestry development concepts; (2) all six stages are characterized by beliefs and perceptions of the empirical reality; (3) they are articulated by a clearly determined group of scholars and (4) the respective models have a strong link to practice in the field.

The transition between the stages discussed involves paradigm shifts, which characterize dynamics in theory development and demonstrate the linkages between theoretical approaches and practice, their strengths and weaknesses. The following interactions between the six historical stages and the corresponding paradigms demonstrate the reflective character of tropical forestry development. In the pre-colonial stage subsistence production was most common in rural areas, being linked to the use of multiple forest products and services. In colonial times imperialist policies dominated land use through control over land ownership, use rights, crop selection and forced labor. Forest production was geared towards the interests of the western colonizers and employed their techniques and technologies, although often these did not fit. Site-specific local knowledge was negated and lost. Tropical forest management mostly followed Western silvicultural models. With decolonization tropical forests were generally perceived as a financial resource to build up national economies. They were overexploited and destroyed on a large scale. The examples of many tropical countries in South East Asia and Africa demonstrate that the appropriation of natural resources by western countries extended beyond colonial times. The models on the non-applicability of the

sustainability approach at this stage of economic growth proposed by Rostow and Zivnuka were propagated by international organizations and influenced a whole generation of tropical foresters. This influence is still present in many discourses taking place in tropical countries and contrasts with the sustainable development principle propagated today. Similarly, during the growth stage in most western industrial countries capital formation from natural resources was ranked higher than sustainable yield principles. In the 1970s the stage of modernization thinking followed, accompanied by large scale technocratic projects and top-down planning mechanisms. Tropical forestry was increasingly driven by international organizations. Multilateral international business employing large wood transformation units such as pulp, paper and plywood factories spread. Increasing negative ecological and social consequences of large scale interventions like colonization and land conversion projects led to the initiation of the stage of polarization. This stage is characterized by new power constellations, the gradual involvement of civil society actors in decisions on development and forest management together with the incubation of new ideas, institutions and technologies. With a strong reflective link to pre-colonial forestry, social forestry advanced and complemented industrial forestry by re-discovering traditional practices and local knowledge. The many new ideas found their expression in the Rio Conference, which also represented a turning point in terms of the importance of tropical forestry because agreement on a global forest convention was not reached and funding sources decreased. Many innovations from this era form a toolbox for future tropical forestry development: experience of public participation, ideas on community development as a third way, new production systems such as extractive reserves, joint forest management and forest user groups (Chap. 5). During the globalization stage the broad spectrum of development models is gradually replaced by a unique market model, following neo-liberal policies. In this stage a critical review of the modernization paradigm may contribute to finding adequate ways to address the bio-economy and the related large scale forest plantations. In the current globalization stage tropical forestry is undergoing a basic structural change, initiated by the polarization stage, under which it is now being re-oriented towards market mechanisms and partly supplemented by the further development of decentralized community and association structures. This current stage is characterized by a lack of new and innovative development theories. It is assumed that only theories which are embedded in the endogenous empirical reality permit the necessary discourse on development options. Theories are necessary because the complexity is reduced and the causal relationships are visible.

In summary, the following outcomes may be derived from the paradigm-based historical analysis:

Learning from paradigms

The six paradigms facilitate 'learning' in relation to the diversity of interpretations of tropical forestry development and the partly dysfunctional linkages between tropical forestry and development policies. Learning and understanding lay the groundwork for the development of future strategies and action. Experiences gleaned from different historical stages about the relationship between

state and people, the consequences of different types of interventions, the success or failure of institution building, the involvement of different actor constellations and the overall contribution to rural development are transferable to other contexts. Often they are relevant for current decision-making, because similar situations and instruments appear. The review of past development stages provides insights into the consequences of theoretical approaches to development and their implementation.

Deficits in theory and model building

The transferability of experiences can only be ensured with a fundamental theory orientation (Weber 2012). Theories and models permit abstraction from a specific practical case. Tropical forestry was characterized by action based on site specific practices, which were, as demonstrated previously, embedded in development theories. The current situation is again characterized by the implementation of practical instruments but the theoretical discourse on an overall sector integration and on forestry development strategies is still weak. In the context of the present globalization stage this is especially critical because recent development discourses have focused primarily on market orientation, relying on simple market mechanisms. Tropical forestry has sought to adapt to this, but without a proper theory and merely adhering to instruments such as reduced deforestation and degradation and payments for environmental services steps ahead are hardly feasible. It is unrealistic to assume that the main driving mechanism for tropical forest management might solely be market-based, without a strong emphasis on the constituting and regulating principles of the state and communities.

External determination of tropical forestry

Most of the techniques and value systems in tropical forestry were introduced from western industrialized countries and often they followed a rather simple, linear development model (Fals-Borda and Mora-Osejo 2003). Much emphasis was placed on the principle of sustainable forest management. The applied perspective was very technical, with the European way determined by a strong preference for economic growth in line with sustainable forest management. This concept was even defended by international organizations in the 1960s. The simplified adoption of this European model of sustainability led to the imposition of forestry interventions not at all beneficial for local forest people in the tropics.

Short term waves and fashions determine the discourse on tropical forestry

The western domination of the discourse on tropical forestry is underlined by short term ‘fashions’, which dominate international cooperation and often bear little relation to local practice. New tropical forest management instruments emerge when the last instruments fall out of fashion (Pretzsch 2005). Most of these instruments are imposed on tropical countries from the outside. This may be justified to some extent, as institutional change needs to be induced from outside to overcome innovation barriers. Too often, however, local target groups are not involved in instrument development. Often they ‘identify’ with these instruments only a form of strategic behavior adopted to receive international funding.

Forest policies do not reach the people

The discourses initiated by western countries and adopted by international organizations often fail to reach local communities. This can be observed in relation to UN conventions such as the UNCBD and the UNFCCC especially. The objective of the policy level is to reach international environmental targets; the corresponding discourse takes place during international conferences and occupies staff at research institutions. Frequently, however, often it does not really contribute to the development of rural areas in the long term. Much of the recent discussion on sustainable development follows this rationale and does not tackle the problems facing the rural majority in many counties. Often the instruments are not integrated in an overall global forest development model.

2.4 Paths to the Future

It was demonstrated that in the past, tropical forestry mainly followed general development models and there was a lack of pro-active theory building. Many development models served to enrich tropical forestry, such as the dualism, basic needs and dependency approaches. Today the situation is more difficult. Since the 1990s the absolute preference for market orientation has led to a deficit in the generation of development models beyond market instruments. Learning from the past, and a reflective integration of the large variety of models practiced, may open the door to the development of approaches for the future; including some not adhering to the neoliberal mainstreams of current development policies.

The development of future concepts is challenging because the complexity of the factors influencing tropical forestry has increased considerably. The global population is rising towards about ten billion. The demand for food, energy and other nature-based services, like recreation, is increasing dramatically; especially to supply the growing urban population with forest products and services. With the need for the substitution of fossil sources of energy, there is a rising competition for land for use in the production of food, renewable sources of energy such oil palm and fast growing trees, timber and other industrial raw materials like rubber and gum. This competition between different products and services will continue to increase steadily and trade-offs may lead to greater conflict. The ecological challenges associated with climate change, biodiversity conservation and man-made catastrophes render ecological and social systems more vulnerable. As a consequence, future development will be much less predictable and even within the long planning horizons of the forestry sector flexible, adaptive structures will be required (Williams 2011). A future development strategy for tropical forestry must adhere to the principles of flexibility, keeping future options open and integrating all members of society and be based on rather different development models. Much greater emphasis must be placed on endogenous development strategies with a high level of local ownership (Escobar 2012).

A strong emphasis must also be placed on the involvement of all three of the actor groups that have proved to be important for the development of tropical

forestry, namely (1) state institutions, (2) private, market-oriented actors and (3) organizations of the civil society.

1. The strong criticism of inefficient state administration and policy making has been outlined in detail. Nevertheless, state participation in tropical forestry is essential. First of all strong rules are required; rules that cannot be left solely to certification procedures and self-compliance. The state must implement strong constituting and regulating principles, especially with respect to tropical forestry (Eucken 1990; North 1990; 1991). These must be innovative and formulated in discussion with different actor groups. The national forest programs have shown that a dialogue concerning target setting in tropical forestry involving various actors from society is feasible in many situations. The multiple services provided by tropical forestry, especially in the field of poverty alleviation, in supporting health by providing medicinal products and also recreation should not be placed in the market domain and should be readily accessible to all members of society. State forestry should also be in a position to control price structures in natural forest logging and plantation management. Experience has shown that in the tropics the private sector has profited from extremely high windfall profits in the past, because state bureaucrats were unable to estimate stumpage values and rents. Practical experiences gleaned by the state in relation to tropical forestry are extremely important for strategic planning and agenda setting. Strong control over land use is necessary in order to avoid land grabbing and large scale bio-economy projects with little contribution to long term rural development. The lessons learnt from the plantation boom in 1970s and its far reaching failures are important.
2. In many rural areas of the tropics, markets do not work in the way assumed by the economic theory. There is no transparency, competition is lacking and transaction costs are extremely high. Furthermore, because of the nature of traditional property rights, often land is not transferable. In this situation it is important that the local actors engage in the market and learn about its functioning. Endogenous value chain development can contribute to the formation of local capital and the establishment of adapted transformation units. The engagement of private tropical forestry concerns should focus on local strategies and a corresponding empowerment of local market actors. Small farms continue to play an important role in tropical countries (Killick 2001; Hazell et al. 2007). Often forestry and trees are part of the farm and, compared with plantations managed by large enterprises, the biodiversity is high. With the ongoing globalization processes and the lowering of international trade barriers the future for these farms is uncertain. Although the subsistence component is often considerable, these farms still host a large part of the world food production and provide products and services for the local economy especially. New forms of social capital need to be developed as a coping strategy for the survival of these units. This capital might be based on a further development of traditional cooperatives and user groups to allow rural areas to compete with urban areas in economic terms. The current tendency towards an increasing influence of the global market leads to the destruction of local institutions and social structures,

because they cannot compete with the external market power. On the other hand, there are huge market potentials in tropical forestry, which can only be developed with integration in international markets.

3. A significant part of the global forest area is managed by communities under the traditional common property regime, the *patrimonium*. Over a long period of time the state sought to integrate this type of management within the conventional state administration. In most countries where this has occurred it has not produced any solutions; often the actors felt suppressed or controlled and the motivation to participate in sustainable forest management was rather limited. In some countries, like India, cooperation models between the state and communities were implemented (Poffenberger and McGean 1996). Increasingly theories relating to rules and structures for community development were developed (Oakerson 1992). Experiences are rapidly growing about this third way of development with the roots in the works of Ostrom (1990) and their further extension in different networks like the program on Collective Action and Property Rights (CAPRI; www.capri.cigiar.org). In forestry the rather specific acquisition rights towards land, land cover, products and services have to be taken in account (Agrarwal and Ostrom 2001).

The following lessons should also be taken on board for future strategy development:

Endogenous and integrative tropical forest management strategies

In most stages of tropical forestry development local people were not involved in decision-making to any significant degree. In future-oriented forestry development strategies co-management with all of the groups involved is essential. The focus must be put on local knowledge and strategies so as to avoid the multiple failures associated with external interventions (Fals-Borda and Mora-Osejo 2003; Escobar 2012). The diversity of the local techniques and technologies available represents a valuable foundation for improvements with the highest possible degree of flexibility. The interaction between state, private and community forestry must be extended further in the form of partnerships and associations.

Reduce the gap between global policies and local people

In forestry communication between public administrations and local people has always been difficult and characterized by an asymmetry in the flow of information, different understandings and interpretations of messages and limitations in the diffusion of information. The gap between global discourses and conventions, and their implementation on a local level, continues to increase. On the local level better cooperation instruments need to be developed; these must permit the integration of local narratives, images and positions (Roe 1994). The creation of socio-economic field laboratories can contribute to a better interaction between the two levels (Lindner and Pretzsch 2013). First of all, however, the at times utopian global discourses must be brought down to a tangible level.

Theory building

Tropical forestry suffers from a lack of theoretical orientation. This often results in merely instrumental approaches that are not integrated in overarching

rural development strategies and models. Given the current market orientation, the lack of theory building leads to a 'reductionist' view of rural development and as a result needs are barely addressed at a practical level. Prominent example is the dominance of market approaches in the implementation of the United Nations' Framework Convention on Climate Change. Innovative theory building integrating different development models and especially different types of communities as actor groups is necessary.

Pro-active agenda setting

Although forests cover around 30 % of the global land area, in many cases the development of forest management strategies was a reaction to the emergence of framework conditions such as development policies or followed on from short term trends initiated by international organizations or resulting from policies. Few important impulses, and hardly any agenda setting, were initiated by the forestry community. Pro-active and constructivist engagement in model building for problem solving is an urgent task for the future (Berger and Luckman 1967).

Flexible planning and adaptive management

Lessons learned from the six tropical forestry paradigms have shown that often tropical forestry was planned in a technocratic way over long periods of time. Although rich experiences have been made in the domain of social forestry, this is only now slowly also becoming the case for other sectors and in state forest administration. The negative experiences of large scale planning in the 1970s must be evaluated carefully, especially as they relate to similar modern initiatives such as bio-economy projects. This inflexible form of planning is currently evident in rubber plantation projects in South East Asia, for example. An important objective of flexible and adaptive planning in tropical forestry is to maintain development options for the future (Williams 2011).

Building social capital

The complexity of forest management is increasing while human behavior is becoming ever more individualistic. This is partly due to the emergence of the information society, which substitutes traditional social family links (Sennet 2012). On the other hand strategies are needed to cope with the increasing vulnerability of small production units, brought about by market volatility or climate change effects. Individual forest farms hardly will be able adapt individually; collective action requires the formation of new forms of social capital.

Integration in a green economy

The task for the future is to initiate a next step in theory building and in practice, towards the integration of tropical forestry in a green economy (Jackson 2009; UNEP 2011). Theory building is important given the emergent interactions of the forestry sector with medicine and health, energy and recreation. Forestry provides an increasing variety of raw materials for different industries and the development of corresponding value chains can prompt rural development. Furthermore, the dynamic relationship between the rural and the urban requires further theoretical foundations, which must be integrated in development models. Cultural practices and experiences enrich forestry and rural development especially on a local, site specific level. Experiences from the

East as well as from the orient require more attendance. Green economies have to be developed in a “pluriverse” way (Escobar 2012), based on the huge amount of development options, available on a local, regional and national level.

References

- Agrarwal A, Ostrom E (2001) Collective action, property rights and the devolution of forest and protected area management. In: Meinzen-Dick R, Knox A, Di Gregorio M (eds) Collective action, property rights and devolution of natural resource management. Exchange of knowledge and implications for policy. Proceedings of the international conference held from 21–25 June in Puerto Azul. DSE/ZEL Feldafing
- Agrawal A (1995) Dismantling the divide between indigenous and scientific knowledge. *Develop Change* 26:413–439
- Ashley C, Maxwell S (2001) Rethinking rural development. *Dev Policy Rev* 19(4):395–425
- Bargatzky T (1986) Einführung in die Kulturökologie. Umwelt, Kultur und Gesellschaft. Reimer, Berlin
- Beck U (1986) Risikogesellschaft. Auf dem Weg in eine andere Moderne. Suhrkamp, Frankfurt
- Beck U (2007) Weltrisikogesellschaft. Auf der Suche nach der verlorenen Sicherheit. Suhrkamp, Frankfurt
- Bennett JW (1976) The ecological transition: cultural anthropology and human adaptation. Pergamon, New York
- Berger PL, Luckman T (1967) The social construction of reality. A treatise in the sociology of knowledge. Doubleday and Middlesex, Garden City
- Berkes F (2008) Sacred ecology, 2nd edn. Routledge, New York/London
- Bernstein H (ed) (1973) Underdevelopment and development. The third world today. Penguin, Harmondsworth
- Bernstein H, Byres T (2001) From peasant studies to agrarian change. *J Agrar Change* 1(1):1–56
- Bizikova L (2011) Understanding the contribution of the environment to human well-being: a review of literature. IISD Report, International Institute for Sustainable development, Winnipeg
- Blaikie P (1985) The political economy of soil erosion in developing countries. Longman, London
- Blank W (2006) Die kolonialwirtschaftliche Forstnutzung der ehemaligen Kolonie Deutsch-Ostafrika. Masterarbeit Technische Universität Dresden; Institut für Internationale Forst- und Holzwirtschaft, Dresden
- Boeke JH (1958) Economics and economic policy in dual societies. Institute of Pacific Relations, New York
- Boserup E (1965) The conditions of agricultural growth. Aldine, Chicago
- Bryant RL (1997) The political ecology of forestry in Burma 1824–1994. Hurst, London
- Bryant RL (1998) Power, knowledge and political ecology in the third world: a review. *Prog Phys Geogr* 22(1):79–94
- Bryant RL, Bailey S (1997) Third world political ecology. Routledge, London
- Bryant D, Nielsen D, Tengley L (1997) The last frontier forests. Ecosystems and economies on the edge. World Resources Institute, Washington
- Carlowitz CV (1713) Sylviculture Oeconomica oder haußwithliche nachricht und Naturgemäße Anweisung zur Wilden Baum-Zucht, Johann Friedrich Braun 2. Leipzig
- Carney D (2003) Sustainable livelihoods approaches: progress and possibilities for change. Finesse Print, Toronto
- Chambers R (1983) Rural development: putting the last first. Longman, London/Lagos/New York
- Chenery HB (1979) Structural change and development policy. Oxford University Press, New York/Oxford

- Choussudovsky M (1997) The globalisation of poverty: impacts of IMF and World Bank reforms. Third World Network, Penang
- Cooper F, Packard R (2005) The history and politics of development knowledge. In: The anthropology of development and globalization. From classical political economy to contemporary neoliberalism. Blackwell, Malden/Oxford/Carlton, pp 126–139
- Cowen MP, Shenton RW (1996) Doctrines of development. Routledge, London/New York
- Cubbage FW, O’Laughlin J, Bullock CS III (1993) Forest resource policy. Wiley, New York
- Cypher JM, Dietz JL (1997) The process of economic development. Routledge, London
- Dawkins HC, Philip MS (1998) Tropical moist forest silviculture and management. A history of success and failure. CAB International, Oxon/New York
- De Groot RS (1992) Functions of nature. Evaluation of nature in environmental planning, management and decision making. Wolters-Nordhoff, Groningen
- Demesse L (1992) Technique et économie des Pygmées Babinga. Insitut d’Ethnologie, Musée de l’Homme, Paris
- Detten RV (2011) Sustainability as a guideline for strategic planning? The problem of long-term forest management in the face of uncertainty. *Eur J Forest Res* 130:451–465
- Diamond J (2005) Collapse. How societies choose to fail or to succeed. Viking, New York
- Douglas JJ (1983) A re-appraisal of forestry development in developing countries, *Forestry sciences* 8. Martinus Nijhoff/Dr. Junk Publishers. The Hague
- Douglas J, Simula M (2010) The future of the world’s forests. Ideas vs. ideologies. Springer, Dordrecht
- Ellefson PE (1992) Forest resources policy. Process participants and programs. McGraw-Hill, New York
- Ellis F (1998) Household strategies and rural livelihood diversification. *J Dev Stud* 35:1–38
- Ellis F, Biggs S (2001) Evolving themes in rural development 1950s–2000s. *Dev Policy Rev* 19 (4):437–448
- Escobar A (1988) Power and visibility: development and the intervention and management of the third world. *Cult Anthropol* 3(4):428–443
- Escobar A (2012) Encountering development, 2nd edn. Princeton University Press, Princeton and Oxford
- Eucken W (1990) Grundsätze der Wirtschaftspolitik, 6th edn. J.C.B. Mohr, Tübingen
- Fairhead J, Leach M (1995) False forest history, complicit social analysis: rethinking some West African environmental narratives. *World Dev* 23(6):1023–1035
- Fals-Borda O, Mora-Osejo LE (2003) Context and diffusion of knowledge. A critique of euro-centrism. *Act Res* 1(1):29–37
- FAO (1989) Forestry and food security, FAO forestry paper 90. FAO, Rome
- FAO (2001) Global forest resources assessment 2000. Main report, FAO forestry paper 140. Rome
- FAO (2010) Global forest resources assessment 2010. Main report, FAO forestry paper 163. Rome
- FAO/DFID (2001) How forests can reduce poverty. FAO, Rome
- Farah HI, Vasapollo L, coordinadores (2011) Vivir bien: Paradigma no capitalista? CIDES/UMSA, La Paz
- Fearnside PM, Rankin JM (1982) The new Jari: risks and prospects of a major Amazonian development. *Interciencia* 7(6):329–339
- Fearnside PM, Rankin JM (1985) Jari revisited: changes and the outlook for sustainability in Amazonia’s largest silvicultural Estate. *Interciencia* 10(3):121–129
- Ferguson N (2012) Civilization. The six killer apps of Western power. Penguin Books, London
- Fieldhouse DK (1965) Die Kolonialreiche seit dem 18. Jahrhundert. Fischer Weltgeschichte, Bd 29. Fischer, Frankfurt a. M.
- Frank AG (1977) L’accumulation mondiale 1500–1800. Calmann-Lévy, Paris
- Fratini M (2006) Dauerhafte Naturwaldbewirtschaftung in Amazonien: Perspektive für Holz verarbeitende Unternehmen? Schriftenreihen des Instituts für Internationale Forst- und Holzwirtschaft 12, Technische Universität Dresden, Tharandt
- Fücks R (2013) Intelligent Wachsen. Die Grüne Revolution. Hanser, München

- Fuller S (2003) *The struggle for the soul of science. Kuhn vs. Popper*. Icon, Cambridge/Toronto
- Fürstenberg P von (1966) *Formen der Waldnutzung im spanischen Nord- und Mittelamerika während der Kolonialzeit (16. – 18. Jahrhundert): dargestellt an Beispielen aus dem ehemaligen Vizekönigreich Neu-Spanien einschließlich der Audiencias Guatemala und Santo Domingo*. Diss., Universität Göttingen
- Furtado C (1984) *Cultura e desenvolvimento em época de crise. Paz e Terra*, Rio de Janeiro
- Gadgil M, Berkes F (1991) Traditional resource management systems. *Resour Manage Optim* 8 (3/4):127–141
- Gadgil M, Guha R (1992) *This fissured land. An ecological history of India*. Oxford University Press, New Delhi
- Gadgil M, Guha R (1994) Ecological conflicts and the environmental movement in India. In: Ghai D (ed) *Development and environment sustaining people and nature*. UNRISD, Oxford, pp 101–136
- Galston W, Baehler HJ (1995) *Rural development in the United States. Connecting theory, practice, and possibilities*. Covelo, Washington, DC
- Galtung J, O'Brien P, Preiswerk R (eds) (1980) *Self-reliance: a strategy for development*. Institute of Development Studies, Geneva
- Giddens A (1998) *The third way. The renewal of social democracy*. Polity Press, Cornwall
- Glück P, Oesten G, Schanz H, Volz K-R (1999) *Formulation and implementation of national forest programmes*. Vol. I: theoretical aspects; Vol. II: state of the art in Europe; vol. III: international experiences; EFI Proceedings No. 30, European Forest Institute, Joensuu
- Goldman M (2005) *Imperial nature. The World Bank and struggles for social justice in the age of globalization*. Yale University Press, New Haven/London
- Habermas J (1988) *Theorie des kommunikativen Handelns*, Bd. 1 and 2. Suhrkamp, Frankfurt
- Hagen EE (1975) *The economics of development*. R.D. Irwin, Homewood, rev. Ed
- Hanewinkel M (2011) Multifunktionalität des Waldes. In: Eidgenössische Forschungsanstalt WSL, Birmensdorf, Forum für Wissen S. 7–14
- Hardin G (1968) The tragedy of the commons. *Science* 162:1243–1248
- Hayek F (1960) *The constitution of liberty*. Routledge & Kegan Paul, London
- Hayek F (1988) *The fatal conceit: the errors of socialism*. Routledge, London
- Hazell P, Poulton C, Wiggins S, Dorward A (2007) *The future of small farms for poverty reduction and growth*. International Food Policy Research Institute, 2020 Discussion paper 42, Washington, DC
- Heilig GK (1996) How many people can be fed on earth? In: Lutz W (ed), *The future population of the world. What can we assume today?* Revised edition. Earthscan, London, pp 196–249
- Hirschman AO (1958) *The strategy of economic development*. Yale University Press, New Haven
- Hobsbawm EJ (1987) *The age of empire 1875–1914*. Weidenfeld and Nicolson, London
- Hoggart K (1990) Let's do away with rural. *J Rural Stud* 6(3):245–257
- Humphreys D (1996) *Forest politics. The evolution of international cooperation*. Earthscan, London
- Humphreys D (2006) *Logjam. Deforestation and the crisis of global governance*. Earthscan, London
- Humphreys D (2009) From corporate social responsibility to the democratic regulation of transnational corporations. *Int J Environ Cult Econ Soc Sust* 5(4):208–217
- Hunt D (1989) *Economic theories of development. An analysis of competing paradigms*. Harvester Wheatsheaf, Hertfordshire
- ILO International Labour Organisation (1977) *The basic needs approach to development*. International Labour Office, Geneva
- Jackson T (2009) *Prosperity without growth? The transition to a sustainable economy*. Sustainable Development Commission, London
- James L (1998) *The rise and fall of the British empire*. (First published 1994). Abacus, London
- Kay C (2008) Reflections on Latin American rural studies in the neoliberal globalization period: a new rurality? *Dev Change* 39(6):915–943

- Killick T (2001) Globalization and the rural poor. *Dev Policy Rev* 19(2):155–180
- Kolk A (1996) Forests in international environmental politics. Environmental Organizations, NGOs and the Brazilian Amazon. International Books, Utrecht
- Konetzke R (1956) Süd- und Mittelamerika I. Die Indianerkulturen Altamerikas und die spanisch-portugiesische Kolonialherrschaft. Fischer Weltgeschichte, Band 22 (Edition 1986). Fischer Taschenbuch verlag, Frankfurt a. M
- Kosoy N, Corbera E (2010) Payment for ecosystem services as commodity fetishism. *Ecol Econ* 69:1228–1236
- Kuhn TS (1962) The structure of scientific revolutions. University of Chicago Press, Chicago
- Kuznets S (1963) Notes on the take-off. In: The economics of take-off into sustained growth. Macmillan, London, pp 22–43
- Lakatos I (1970) Falsification and the methodology of scientific research programmes. In: Lakatos I, Musgrave AP (eds) Criticism and the growth of knowledge. Proceedings of the international colloquium in the philosophy of science, London, 1965, vol 4. Cambridge University Press, pp 91–196
- Lamprecht H (1988) Über Grenzen und Möglichkeiten forstlicher Entwicklungshilfe in den Feuchttropen, *Allg. Forst- u. J.-Ztg* 159(6):103–107
- Lamprecht H (1990) Silviculture in the tropics, Gesellschaft für Technische Zusammenarbeit. TZ Verlag, Rossdorf
- Lane J (1995) Non-governmental organizations and participatory development: the concept in theory versus the concept in practice. In: Wright S, Nelson N (eds) Power and participatory development: theory and practice. London, pp 181–191
- Leeuwis C, van den Ban A (2004) Communication for rural innovation: rethinking agricultural extension, 3rd edn. Blackwell Science, Oxford, pp 22–48; 55–56; 247–259; 292–301
- Lindner A, Pretzsch J (2013) An international network on climate change impacts on small farmers in the tropical Andes – global conventions from a local perspective. *Sust Agr Res* 2(2):92–98
- Lins C (1994) Jari. 70 Anos de História, 2nd Edn. Dataforma, Rio de Janeiro
- Little PE (1999) Environments and environmentalisms in anthropological research. *Annu Rev Anthropol* 28:253–284
- Ljungman L, Nair CTS (2001) Changing perceptions on technical assistance in support of sustainable forest management. In: Workshop-paper on financing sustainable forest management. Oslo, 22–25 Jan 2001, available (accessed Nov. 2013) <http://www.cifor.cgiar.org/fsfm/Papers/01Ljungman.pdf>
- Loth H (1981) Sklaverei. Die Geschichte des Sklavenhandels zwischen Afrika und Amerika. Hammer, Wuppertal
- Mandel E (1962) *Traité d'économie marxiste*. Julliard, Paris
- Masselos JE (2010) Imperien Asiens. Von den alten Khmer bis zu den Meiji. Theiss, Stuttgart
- McCarthy J, Prudham S (2003) Neoliberal nature and the nature of neoliberalism. *Geoforum*, <http://dx.doi.org/10.1016/J.geoforum.2003.07.003>
- McMichael P (2006) Peasant prospects in the neoliberal age. *New Polit Econ* 11(3):407–417
- Meidinger E, Elliott C, Oesten G (eds) (2003) Social and political dimensions of forest certification. Kessel, Remagen-Oberwinter
- Michel S, Beuret M (2008) La Chinafrique Pékin à la conquête du continent noir. Grasset, Paris
- Millenium Ecosystem Assessment (2005) Ecosystems and human well-being: biodiversity synthesis. World Resources Institute, Washington, DC
- Miller B (1992) Collective action and rational choice: place, community, and the limits to individual self-interest. *Econ Geogr* 68:22–42
- Minsch J (1992) Ethik der Ressourcennutzung – ökonomische Aspekte. In: Schweizer Zeitung für das gesammelte Forstwesen. 143:893–907
- Mommsen WJ (1987) Imperialismustheorien, 3rd edn. Vandenhoeck & Ruprecht, Göttingen
- Moseley MJ (2003) Rural development. Principles and practice. Sage, London/Thousand Oaks/New Dehli

- Nederweert Pieterse J (2001) Development theory. Deconstructions/reconstructions. Sage, London/Thousand Oaks/New Dehli
- Neugebauer B (1986) Der Wandel kleinbäuerlicher Landnutzung in Oxkutzcab, Yucatán. Todtmoos
- Nonini DM (2008) Is China becoming neoliberal? *Crit Anthropol* 28:145–170
- Norgaard RB (1994) Development betrayed the end of progress and a coevolutionary revisioning of the future. Routledge, London/New York
- North DC (1990) Institutions, institutional change and economic performance. Cambridge University Press, Cambridge
- North DC (1991) Institutions. *J Econ Perspect* 5(1):97–112
- Nurkse R (1953) Problems of capital formation in underdeveloped countries. Blackwell, Oxford
- Oakerson JR (1992) Analysing the commons. A framework. In: Bromley DW (ed) Making the commons work. Theory, practice and policy. ICS Press, San Francisco, pp 41–59
- Osterhammel J (1997) Colonialism: a theoretical overview. Markus Wiener Publishers, Princeton
- Osterhammel J (2009) Die Verwandlung der Welt. Eine Geschichte des 19. Jahrhunderts. Beck, München
- Ostrom E (1990) Governing the commons: the evolution of institutions for collective action. Cambridge University Press, New York
- Palo M (1988) The forest-based development theory revisited with a case study of Finland and prospects for developing countries. In: Deforestation or development in the third world? Volume II. Finnish Forest Research Institute, Helsinki, pp 13–157
- Palo M, Mery G (eds) (1996) Sustainable forest challenges for developing countries. Kluwer, Boston/London/Dordrecht
- Palo M, Uusivuori J (eds) (1999) World forests, society and environment, vol I, World forests. Kluwer, Dordrecht/Boston/London
- Palo M, Vanhanen H (eds) (2000) World forests from deforestation to transition? vol II, World forests. Kluwer, Dordrecht/Boston/London
- Palo M, Uusivuori J, Mery G (eds) (2001) World forests. Markets and policies, vol III, World forests. Kluwer, Dordrecht/Boston/London
- Parotta JA, Trosper RL (2012) Traditional forest-related knowledge: sustaining communities, ecosystems and biocultural diversity, vol 12, World Forest. Springer, Heidelberg
- Payer C (1991) Lent and lost. Foreign credit and third world development. Zed Books, London/New Jersey
- Peet R, Watts M (1993) Introduction: development theory and environment in an age of market triumphalism. *Econ Geogr* 69(3):227–235
- Peet R, Watts M (1996) Liberation ecologies. Environment, development, social movements. Routledge, London/New York
- Peluso N (1992) Rich forests, poor people. Resource control and resistance in Java. Berkley, Los Angeles/London
- Perroux F (1976) Les entreprises transnationales et le nouvel ordre économique du monde. Institut des Sciences Sociales Appliquées, Lyon, p 112
- Poffenberger M, McGean B (eds) (1996) Village voices, forest choices. Joint forest management in India. Oxford University Press, Oxford
- Polanyi K (1944) The great transformation. Octagon Books, New York
- Ponting C (1991) A green history of the world. The environment and the collapse of great civilisations. Penguin, New York
- Poschen P (1997) 'Forests and employment – much more than meets the eye'. In: Invited paper XI world forestry congress, Antalya, 13–22 Oct 1997, proceedings vol 4, p 61–79
- Poschen P (2001) 'Globalisation and sustainability – the forestry and wood industries on the move' with Mattias Lövgren. ILO, Geneva
- Posey D (1985) Indigenous management of tropical forest ecosystems: the case of the Kayapo Indians of the Brazilian Amazon. *Agroforest Syst* 3:139–158

- Prebisch R (1950) The economic development of Latin America and its principal problems. Lake Success, New York
- Prebisch R (1980) Towards a theory of change. CEPAL Rev 10:155–208
- Preston PW (1996) Development theory, an introduction. Blackwell Publishers, Oxford
- Preston PW (2011; first published 1987) Rethinking development. Essays on development and Southeast Asia. Routledge library editions: development, vol 109, Abingdon
- Pretzsch J (1986) Traditionelle Bodenbewirtschaftung, weltmarktorientierte Plantagenproduktion und Tropenwaldzerstörung in der Republik Elfenbeinküste. Eine Untersuchung über die Folgewirkungen einseitig exportorientierter Landnutzung auf lokale Gesellschaftsstrukturen, Produktionsverhältnisse und Ökosysteme. Schriftenreihe des Instituts für Landespflege, Heft 8, Freiburg
- Pretzsch J (1987a) Die Entwicklungsbeiträge von Holzexploitation und Holzindustrie in Ländern der feuchten Tropen. Dargestellt am Beispiel der Elfenbeinküste. Schriftenreihe des Instituts für Landespflege, Heft 11, Freiburg
- Pretzsch J (1987b) Sichtweise und Nutzung des tropischen Feuchtwaldes in traditionellen Kulturen, unter Kolonialverwaltung und nach der Unabhängigkeit. Forschungsauftrag der FES, Heidelberg unpublished manuscript
- Pretzsch J (1990) Contributions to the development of timber exploitation and the wood-processing industry in countries of the humid tropics. The case of Ivory Coast. In: Natural resources and development 31:7–21
- Pretzsch J (1994) Kontinuität und Bruch. Tropenforstliche Ausbildung und Forschung in Tharandt. Der Wald Berlin 44(5):148–152
- Pretzsch J (1998) Chances and limits of tropical forest management from the socio-economic view: Status quo and perspectives. In: Plant research and development 47/48:88–97
- Pretzsch (2003) Methodological aspects of tropical forest management research. Contribution to the XII world forestry congress, Quebec City, <http://www.fao.org/DOCREF/Article/WFC/XII/0791-C4.HTM>. Last access 5 Jan 2013
- Pretzsch J (2005) Forest related rural livelihood strategies in national and global development. Forest Trees Livelihoods 15:115–127
- Pye O (2005) Khor Jor Kor. Forest politics in Thailand. White Lotus Press, Bangkok
- Rapley J (2004) Globalization and inequality. Neoliberalism's downward spiral. Lynne Rienner, Boulder/London
- Rehbein B, Schwengel H (2012) Theorien der Globalisierung, 2. Aufl. UTB, Konstanz
- Repetto R (1988) The forest for the trees? Government policies and the misuse of forest resources. World Resources Institute, Washington, DC
- Repetto R, Gillis M (eds) (1988) Public policies and the misuse of forest resources. Cambridge University Press, Cambridge
- Ribeiro D (1983) Der zivilisatorische Prozeß. Suhrkamp, Frankfurt
- Rist G (2002) The history of development from Western origins to global faith, 2nd edn. Zed Books, London/New York
- Ritter E, Dauksta D (eds) (2011) New perspectives on people and forests. Springer, Heidelberg/London/New York/Dordrecht
- Roe E (1994) Narrative policy analysis. Theory and practice. Duke University Press, Durham/London
- Rogers EM (2003) Diffusion of innovations, 5th edn. Free Press, New York
- Romm J (1986) Forest policy and development policy. J World Forest Resour Manage 2:85–103
- Rosenstein-Rodan PN (1961) International aid for underdeveloped countries. In: Review of economics and statistics XLIII:107–138
- Rostow WW (1960) The stages of economic growth: a non-communist manifesto. Cambridge University Press, Cambridge
- Rudel TK, Coomes OT, Moran E, Achard F, Angelsen A, Xu J, Lambin E (2005) Forest transitions: towards a global understanding of land use change. Glob Environ Change 15:23–31

- Russel CE (1987) Plantation forestry. In: Jordan CF (ed) Amazonian rain forests. Springer Verlag, New York, pp 76–89
- Ruttan VW (1984) Integrated rural development programmes: a historical perspective. *World Dev* 12(4):393–401
- Sachs J (2006) The end of poverty. Economic possibilities for our time. Penguin Press, New York
- Said EW (1978) Orientalism. Routledge & Kegan Paul, London
- Schmithüsen F (1986) The impact of land-tenure on rural forestry development. In: Schmithüsen F (ed) Forestry legislation. Report of the IUFRO working party S4.06.-04, Forstwissenschaftliche Beiträge. ETH-Zentrum, Zürich, pp 121–140
- Schuhmacher EF (1973) Small is beautiful. A study of economics as if people mattered. Blond and Briggs, London
- Scott JC (1985) Weapons of the weak. Everyday forms of peasant resistance. Yale University Press, New Haven/London
- Seers D (1979) The meaning of development. In: Lehmann D (ed) Development theory – four critical studies. Bournemouth, pp 9–33
- Seligson MA, Passé-Smith JT (eds) (2003) Development and underdevelopment. The political economy of global inequality. Lynne Rienner Publishers, Boulder
- Sen A (1999) Development as freedom. Oxford university press, Oxford
- Sennet R (2012) Zusammenarbeit. Was unsere Gesellschaft zusammenhält. Hanser Berlin, Berlin
- Shiva V (1989) Staying alive: women, ecology and development. Zed Books, London
- Sigrist C (1979) Regulierte Anarchie. Untersuchungen zum Fehlen und zur Entstehung politischer Herrschaft in segmentären Gesellschaften Afrikas. Syndicat, Frankfurt
- Silva DE (1997) Why institutional reforms in forestry? Lessons from international experience. *Nat Res Forum* 21:51–60
- Sponsel L (ed) (1995) Indigenous peoples and the future of Amazonia. An ecological anthropology of an endangered world. University of Arizona Press, Tucson/London
- Steinlin H, Pretzsch J (1984) Der tropische Feuchtwald in der internationalen Forstpolitik. In: *Holz-Zentralblatt* 110(138):20–20
- Steward JH (1972) Theory of culture change: the methodology of multilinear evolution. University of Illinois Press, Urbana
- Stiglitz JE (2006) Making globalization work. New York/London
- Streten P, Burki SJ (1978) Basic needs: some issues. World Bank Reprint. Series 53. World Development 6, Washington, DC
- Sunderlin WD, Dewi S, Puntodewo A, Müller D, Angelsen A, Epprecht M (2008) Why forests are important for global poverty alleviation: a spatial explanation. *Ecol Soc* 13(2):24 (online, last access Nov. 2013) :<http://www.ecologyandsociety.org/vol13/iss2/art24/>
- Szulecka J, Pretzsch J, Secco L (2013) Paradigms in tropical forest plantations: a critical reflection on historical shifts in plantation approaches. *International Forestry review*, Vol. 15 (4) in press
- Thirlwall AP (1994) Growth and development, 5th ed. MacMillan Press TTD, London
- Thorsen DE (2011) The politics of freedom. A study of the political thought of Isaiah Berlin and Karl Popper, and the challenges of Neoliberalism. Ph.D. thesis, Dept. of Political Science, University of Oslo, Oslo
- Thünen v JH (1966) Thünen's isolated state (trans: Hall P). Pergamon, London (first German edition 1826)
- Todaro MP (1995) Economics for a developing world. An introduction to principles, problems and policies for development, 3rd edn. London/New York, Longman
- Todaro MP (1997) Economic development, 6th edn. New York, Longman
- Toynbee A (1998) Menschheit und Mutter Erde. Die Geschichte der großen Zivilisationen. Ullstein, Berlin
- Tucker RP, Richards JF (eds) (1983) Global deforestation and the nineteenth-century world economy. Duke University Press, Durham
- Uibrig H (2007) Chronik des Tharandter Tropenforst- und Holzwirtschaftlichen Institutes 1963–2007, Schriftenreihe des Institutes für Internationale Forst- und Holzwirtschaft. Tharandt

- UNEP (2011) Green Economy Report. Towards a green economy: pathways to sustainable development and poverty eradication. <http://www.unep.org/greeneconomy/GreenEconomyReport>. Free release 2011, last access October 2013
- Uphoff N (1993) Grassroots organizations and NGOs in rural development: Opportunities with diminishing states and expanding markets. *World Dev* 21(4):607–622
- Vincent JR (1990) Rent capture and the feasibility of tropical forest management. *Land Econ* 66(2):212–223
- Vincent JR, Binkley CS (1992) Forest-based industrialisation: a dynamic perspective. In: Sharma NP (Hrs) *Managing the world's forests: looking for balance between conservation and development*. Kendall/Hunt Publishing Company, Dubuque, pp 93–175
- Walker PA (2005) Political ecology: where is the ecology? *Prog Hum Geogr* 29:73–82
- Walker PA (2006) Political ecology: where is the policy? *Prog Hum Geogr* 30:382–395
- Warren DM, Slikkerveer LJ, Brokensha D (1995) *The cultural dimension of development. Indigenous knowledge systems*. Intermediate Technology Publications, London
- Weber M (1922) *Wirtschaft und Gesellschaft*. Verlag. J. C. B. Mohr, Tübingen
- Weber N (2012) Reflections on theories in forestry policy: testing, combining or building? *Forest Policy Econ* 16:102–108
- Weischet W, Caviedes CN (1993) *The persisting ecological constraints of tropical agriculture*. Longman Scientific & Technical, Essex
- Westoby JC (1962) Forest industries in the attack on economic underdevelopment. *UNASYLVA* 16(4):168–201
- Westoby (1987) *The purpose of forests. Follies of development*. Basil Blackwell Inc. New York, Oxford
- Wiggins S, Proctor S (2001) How special are rural areas? The economic implications of location for rural development. *Dev Policy Rev* 19(4):427–436
- Williams BK (2011) Adaptive management of natural resources – framework and issues. *J Environ Manage* 92:1346–1353
- Winterbottom R (1990) *Taking stock: the tropical forestry action plan after five years*. World Resources Institute, Washington, DC
- Wunder S (2001) Poverty alleviation and tropical forests – what scope for synergies? *World Dev* 29:1–17
- Ziegler J (2002) *Les nouveaux Maitres du Monde et ceux qui leur resistante*. Fayard, Paris
- Ziegler J (2005) *L'Empire de la honte*. Fayard, Paris
- Zivnуска JA (1966) The integration of forest development plans and national development plans. How to make the forestry case at the national level. In: *Proceedings of the 6th World Forest Congress, Madrid*

Forests and Rural Development

Pretzsch, J.; Darr, D.; Uibrig, H.; Darr, D. (Eds.)

2014, XVI, 393 p. 55 illus., 18 illus. in color., Hardcover

ISBN: 978-3-642-41403-9