

Stefan Mann

Forest Protection and Sustainable Forest Management in Germany and the P.R. China – A Comparative Assessment –



BfN – Skripten 311



2012



Forest Protection and Sustainable Forest Management in Germany and the P.R. China – A Comparative Assessment –

**Results and Documentation of a Comparative Study
and the “Fourth Sino-German Workshop
on Biodiversity Conservation”
29 June - 2 July 2011, Isle of Vilm**

organised by

**German Federal Agency for Nature Conservation (BfN)
Chinese Research Academy of Environmental Sciences (CRAES)**

Stefan Mann



Photo credits: S. Mann, S. Xiubo, K. Lehmann, C. Großheim

Author's address:

Dr. Stefan Mann
ECO Consulting Group
Hersfelder Strasse 17
36280 Oberaula
E-mail: Stefan.Mann@eco-consult.com

Scientific Supervision:

Christian Großheim
Kerstin Lehmann
Bundesamt für Naturschutz (BfN)
Federal Agency for Nature Conservation
FG II 3.1, FG I 2.3
Konstantinstrasse 110
53179 Bonn, Germany
E-mail: Christian.Grossheim@bfm.de
E-mail: Kerstin.Lehmann@bfm.de

Dr. Xiushan Li
Chinese Research Academy of Environmental Sciences
(CRAES)
8 Dayangfang BeiYuan Road
Chaoyang District, Beijing 100012, China
E-mail: xiushanli@craes.org.cn

N.B.: This report has been prepared on behalf of the Federal Agency for Nature Conservation (BfN). The views expressed herein are those of the author and do not necessarily reflect official opinions of BfN.

This publication is included in the literature database "**DNL-online**" (www.dnl-online.de)

BfN-Skripten are not available in book trade but can be downloaded in a pdf version from the internet at: http://www.bfn.de/0502_skripten.html

Publisher: Bundesamt für Naturschutz (BfN)
Federal Agency for Nature Conservation
Konstantinstrasse 110
53179 Bonn, Germany
URL: <http://www.bfn.de>

All rights reserved by BfN

The publisher takes no guarantee for correctness, details and completeness of statements and views in this report as well as no guarantee for respecting private rights of third parties. Views expressed in the papers published in this issue of BfN-Skripten are those of the authors and do not necessarily represent those of the publisher.

No part of the material protected by this copyright notice may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, recording or by any information storage and retrieval system without written permission from the copyright owner.

Printed by the printing office of the Federal Ministry of Environment, Nature Conservation and Nuclear Safety.

Printed on 100% recycled paper.

ISBN 978-3-89624-046-0

Bonn, Germany 2012

Contents

1	Preface	5
2	The German and Chinese Forest Sector – Basic Facts	8
2.1	Germany	8
2.2	China	9
2.3	Basic Similarities and Differences.....	12
3	Forest Governance: Legal-Regulatory & Organizational Framework Conditions.....	15
3.1	Germany	15
3.1.1	Legal and Regulatory Basics	15
3.1.2	Organizational Frameworks – Forest Sector Administrations	25
3.2	China	31
3.2.1	Legal-Regulatory Basics.....	32
3.2.2	Organizational Frameworks – Forest Sector Administrations	43
4	Forest Ownership	47
4.1	Germany	47
4.2	China	51
5	Forest Policy: Sustainability, multi-purpose Forestry, Forest Professionalism and the Forces challenging them	60
5.1	Germany	60
5.1.1	The Emergence of Forest Policy & Forest Policy Challenges	60
5.1.2	Sustainability – Origins and Trends of Development	61
5.1.3	Multi-purpose forest management – Changing Perceptions about Forest Functions, Goods and Services.....	63
5.1.4	The Stakeholder Landscape – Forest Professionalism, Group Interests, and Civil Society Participation	70
5.1.5	Policy Processes and Programs in Support of Forest Protection and SFM.....	72
5.2	China – Forest Policy Frameworks for Forest Protection and the Transition towards SFM	79
5.2.1	Forest-related Policies and Programs since 1949.....	79
5.2.2	The Mechanics of Forest Policy – from Formulation to Implementation.....	91
5.2.3	Reality Check: Key-Challenges for Promoting SFM in China.....	92
6	Synopsis.....	99
6.1	SFM Concepts in Germany and China.....	99
6.2	Options for mutual learning and cooperation	102
6.3	Approaches to SFM and their Significance for Biodiversity Conservation.....	104
7	Reference Literature.....	111

Listing of Acronyms

AAC	Annually Allowable Cut
ABS	Access and Benefit Sharing
A/R	Afforestation and Reforestation
AFPNet	Asia-Pacific Forest Rehabilitation and Sustainable Forest Management Network
AGDW	Arbeitsgemeinschaft Deutscher Waldbesitzerverbände (Umbrella Organization of German Forest Owners Associations)
AID	AID Infodienst Ernährung, Landwirtschaft, Verbraucherschutz (Information Service on Food, Agriculture and Consumer Protection)
ANW	Arbeitsgemeinschaft Naturgemäße Waldwirtschaft (Working Group for Close-to-Nature Forestry)
BCM	Bilateral Coordination Mechanism
BDF	Bund Deutscher Forstleute (German Association of Professional Foresters)
BfN	Federal Agency for Nature Conservation
BFU	Beijing Forestry University
BMELV	Federal Ministry of Food, Agriculture and Consumer Protection
BMU	Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMZ	Federal Ministry for Economic Cooperation and Development
BWI	Bundeswaldinventur (Federal Forest Inventory)
CAF	Chinese Academy of Forestry
CAS	Chinese Academy of Science
CASS	Chinese Academy of Social Sciences
CBEEEX	China Beijing Environmental Exchange
CCBA	Climate Community and Biodiversity Alliance
CCFB	Conversion of Cropland to Forests Program
CCFC	China Forest Certification Council
CCICED	China Council for International Cooperation on Environment and Development
CDM	Clean Development Mechanism
CFB	County Forestry Bureau
CGCF	China Green Carbon Foundation
C&I	Criteria and Indicators
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
CPC	Communist Party of China
CRAES	Chinese Research Academy of Environmental Sciences
CSR	Corporate Social Responsibility
DFV	Deutscher Forstverein (German Forestry Association)
DFWR	Deutscher Forstwirtschaftsrat (German Forestry Council)
DNR	Deutscher Naturschutzring (German Nature Conservation Circle)
EIA	Environmental Impact Assessment
EPBF	Environmental Public Benefit Forest
ENGO	Environmental Non-governmental Organization
EU	European Union
FCPF	Forest Carbon Partnership Facility
FEDRC	Forest Economics and Development Research Centre
FIBDP	Forest Industrial Base Development Program
FLEG	Forest Law Enforcement and Governance
FMA	Forest Management Association(s)
FMP	Forest Management Plan
FMPI	Forest Management Planning Inventory
FMU	Forest Management Unit
FoN	Friends of Nature
FSC	Forest Stewardship Council
FYP	Five Year Plan
GIZ	German Agency for International Cooperation
GONGO	Non-governmental Organization established by, or affiliated with Government Agencies
HCVF	High Conservation Value Forest
HRC	Household Responsibility Contract
IFCC	International Forestry Cooperation Center
IFF	Intergovernmental Forum on Forests
IGBAU	Industriegewerkschaft Bauen, Agrar, Umwelt (Workers' Union for the Construction, Agriculture and Environmental Sectors)
IKM	Information and Knowledge Management
INGO	International Non-governmental Organization
IPF	Intergovernmental Panel on Forests
IUCN	International Union for the Conservation of Nature
LIL	Low Impact Logging

MCPFE	Ministerial Conference on the Protection of Forests in Europe
MEA	Multilateral Environmental Agreement
MLR	Ministry of Land and Resources
MoEP	Ministry of Environmental Protection
MOFCOM	Ministry of Commerce
MoST	Ministry of Science and Technology
MRV	Monitoring, Reporting and Verification
MWR	Ministry of Water Resources
NATURA 2000	European Network of Protected Areas
NBS	National Biodiversity Strategy
NDRC	National Development and Reform Commission
NFI	National Forest Inventory
NFP	National Forest Program
NFPP	Natural Forest Protection Program
NGO	Non-governmental Organization
NLBI	Non-legally binding Instrument on all Types of Forests
NTFP	Non-timber Forest Product
OWCM	Office for Wetland Conservation and Management
PEFC	Program for the Endorsement of Forest Certification
PES	Payments for Environmental Services
PFD	Provincial Forestry Department
PFE	Permanent Forest Estate
PICLD	Program on Integrating Desertification Control in Karst Regions
RAMSAR	Convention on Wetlands of International Importance
R&D	Research and Development
RIL	Reduced Impact Logging
RMB	Chinese Currency Unit
SAC	Special Area of Conservation
SCFR	Southern Collective Forest Region
SD	Sustainable Development
SDW	German Association for Forest Protection
SFA	State Forestry Administration of the P.R. China
SFF	State Forest Farm
SFM	Sustainable Forest Management
SG-SFMP	Sino-German Project Sustainable Forest Management
SoFE	State-owned Forest Enterprise
SPA	Special Protected Area
TEEB	The Economics of Ecosystems and Biodiversity
UNCBD	United Nations Convention on Biodiversity
UNCCD	United Nations Convention on Combating Desertification
UNFCCC	United Nations Framework Convention on Climate Change
UNCED	United Nations Conference on Environment and Development
VER	Verified Emission Reductions
WCNRDP	Wildlife Conservation and Nature Reserve Development Program
WCRP	Wetlands Conservation and Rehabilitation Program
WWF	World-wide Fund for Nature

Listing of Tables

Table 1: German and Chinese Forest Resources at a glance – basic data	13
Table 2: Selected Constitutional Provisions relevant to the Forest Sector	15
Table 3: Comparison of selected Provisions for SFM from four Territorial States in Germany (paraphrased and abridged)	23
Table 4: The Forest Sector's Attachment to Governance Structures at the State Level	28
Table 5: Outcomes of the Reform of State Forest Administrations (example: Bavaria)	31
Table 6: Contextual Structure of the Forestry Law of the P.R. China	34
Table 7: Contextual Structure of the Law on the Protection of Wildlife	36
Table 8: Overview of Pertinent Regulatory Sources	42
Table 9: Forest Ownership Structure in present-day Germany.....	47
Table 10: Regional Differences between Private and Corporate Forests in four German States	49
Table 11: Tenure related Provisions of the Forestry Law of the P.R. China (1998, as amended)	53
Table 12: Static and Dynamic Concepts of Forest Sustainability.....	62
Table 13: Legally prescribed Forest Function Categories (example: Saxony)	64
Table 14: Phases and the Contextual Framework of the German NFP Process.....	74
Table 15: Thematic Areas and Salient Provisions of Germany's Forest Strategy 2020	77
Table 16: Nationally coordinated Reforestation Programs past 1978	82
Table 17: The Aichi Targets underlying the Strategic Plan for Biodiversity 2011-2020	105

Listing of Boxes

Box 1: Distinctions between Forest Conversion and Afforestation	18
Box 2: The Move towards Professionalism in Forestry	26
Box 3: Governance Layers in China.....	32
Box 4: Socio-economic Policy Goals underlying the Tenure Reform Process	55
Box 5: Decentralized Management by Households	56
Box 6: Age-class Structure of German Forests (2002)	69
Box 7: Focus and Goals of Germany's National Biodiversity Strategy (NBS)	75
Box 8: Structural deficiencies of China's forest resources	87
Box 9: The Gap between Theory and Practice	97

Listing of Figures

Figure 1: Impressions of Chinese forestry.....	7
Figure 2: Impressions of German forestry.....	7
Figure 3: Re-establishment of plantations.....	14
Figure 4: Seedlings in a recently established plantation	14
Figure 5: Use of "Non Timber Forest Products" (NTFP)	14
Figure 6: Local farmers converting to forest managers.....	46
Figure 7: Chinese men on a lake in Huayanxi State Forest Farm, Hunan Province.....	46
Figure 8: Stakeholder Participation in China	46
Figure 9: Fourth Sino-German Workshop	59
Figure 10: Results from the Working Groups	59
Figure 11: Day out during the Workshop.....	59
Figure 12: Workshop participants.....	59
Figure 13: Monitoring of site ecology	98
Figure 14: Women working in the tree nursery	98
Figure 15: Forest dynamics	110

1 Preface

The report at hand aims to compare the forest sectors of the Federal Republic of Germany and the People's Republic of China – two countries, which - for physical as well as political, economic, social, cultural and demographic reasons – must seem essentially non-comparable.

Considering the obvious differences between China and Germany, and the scale of research required for a comprehensive assessment of even one forest sector, any attempt at providing an exhaustive monograph would seem too ambitious. The report at hand must therefore contend with providing a snap-shot image, focused on a **limited set of topics**, including:

- **Forest policies, strategies and programs** promoting forest protection and biodiversity conservation in the context of sustainable forest management (SFM),
- **Legal-regulatory, administrative, and socio-economic framework conditions** determining forest governance and forest management,
- **Instruments and provisions** with a view to valorizing and rewarding various environmental services and promoting SFM, and
- The respective perception of sustainable forest management in Germany and China, including aspects such as the recognition of **multiple forest functions** and principal modes of forest protection, management and use.

This report aims primarily to foster exchange, discussions and mutual understanding between Chinese and German forestry professionals and scientists, pursuant to the Terms of Reference provided by BfN. To this end, it combines the description of present-day framework conditions for forest protection and SFM with historical retrospect in regard to forest sector development.

Commissioned in March 2011 by the German Federal Agency for Nature Conservation (BfN), the report contributes to the ongoing multi-annual cooperation between BfN and the Chinese Research Academy of Environmental Sciences (CRAES) on biodiversity conservation which, in recognition of the **United Nations International Year of Forests**, in 2011 addresses **biodiversity in the context of forest protection and sustainable forest use**.

The report draws on, and incorporates **three main components**:

- A desk-study of relevant literature,
- Findings gathered during a two-weeks' fact-finding mission to China in May/June 2011, and
- Outcomes of the Fourth Sino-German Workshop on Biodiversity Conservation: "Nature-oriented and Multifunctional Forest Management – Concepts, Approaches and Instruments for Conserving Biodiversity and Ecosystem Services", conducted from June 29th until July 3rd, 2011 at the International Academy for Nature Conservation on the Isle of Vilm (Germany). For the workshop program, refer to the Annex.

Group-work during the workshop focused on "*strengthening biodiversity and ecosystem services in forest ecosystems*", by means of two guiding questions:

- What are the future challenges (in China)?
- What are the potential areas of future cooperation?

On the first count, the workshop identified **five principal challenges**:

- Financial constraints: low funding levels overall, and a perceived lack of funding instruments tied to clear-cut conservation objectives,
- Technical constraints: knowledge gaps regarding biodiversity and ecosystem services (including underlying causes of degradation and valuation methods), and widespread capacity deficits in terms of forest protection and knowledge management,
- Disturbances: mounting human pressure on forest resources, including timber demand, energy demand, shifting land use patterns and urban sprawl, and changing lifestyles (e.g. tourism),
- Climate change: more frequent weather extremes, changing species composition and growth zones and, consequently, adverse effects on biodiversity and ecosystem services,
- Policy constraints: inherent conflicts between forest use and conservation, economic preferences, and a generally weak and less influential position of conservationist agendas in relation to other sectors or group interests.

Discussions during group-work sessions suggested that future options for cooperation would have to be focused on research with a view to **closing existing knowledge gaps**, and **providing application-oriented instruments**.

Participants proposed a total of **eight thematic clusters**: (i) economic instruments to promote investment by forest owners, (ii) instruments to defuse the conflict between biodiversity conservation and (socio-) economic development, (iii) capacity development as a cross-cutting issue, (iv) cross-sector coordination in support of biodiversity conservation, (v) interdisciplinary approaches to the development of conservation strategies, (vi) collection of environmental data and resource monitoring in a scientifically sound fashion, (vii) climate change mitigation and adaptation, and (viii) deepening the understanding of human-nature interaction and interdependency. The second and fourth thematic clusters were subsequently selected as the most important areas of cooperation by means of a ranking exercise. **Participants agreed that multi-purpose forest management would stand a better chance of resolving conflicts between biodiversity conservation and development**, while ensuring a steady and predictable flow of forest products and services to meet increasing societal demand.

In mid-July 2010, the German and Chinese heads of government confirmed the two countries' will to expand and develop their cooperation on **issues of mutual concern, specifically climate change, environmental protection, preservation of biological diversity, and renewable energy** beyond hitherto classical bilateral development cooperation.

The Chinese forest sector is in the midst of a far-reaching and highly dynamic reform process, aiming to promote SFM in reference to international agreements and processes to which China is a party (for details, see section 2.2). The long history of Sino-German forestry cooperation, dating back to the start of China's economic and societal transformation past 1978, underscores China's eagerness to benefit from the experience of third countries. **Germany, with its long-standing forestry tradition, is well positioned to support China in its transition towards SFM.**



Figure 1: Impressions of Chinese forestry: **Top left:** A typical "forest-fruit-fish" agroforestry system in southern China. **Top right:** *Pinus massoniana* (Chinese red pine): A very important native timber species distributed in the sub-tropical region of China. **Bottom left:** A succession process on its way: the main species is *Acacia auriculiformis* (Earleaf acacia) introduced from Australia. **Bottom right:** Bamboo as a key resource at Huayanxi State Forest Farm. **Reference:** pictures 1-3: Zhao; picture 4: Dr. Mann



Figure 2: Impressions of German forestry: **Top left:** Mosaic of cultural and natural landscapes in the National Park Kellerwald-Edersee. **Top right:** Beech forest in Eberswalde. **Bottom left:** *Picea abies* (European spruce) in the National Park Kellerwald-Edersee. **Bottom right:** Forest of Hessenhagen as an example of integrated forest management. **Reference:** pictures 1-3: Lehmann; picture 4: Dr. Mann

2 The German and Chinese Forest Sector – Basic Facts

2.1 Germany

Germany, as natural history teaches us, without human interference would be densely forested throughout – with the rare exception of large water-bodies and the highest alpine regions¹. The appearance and composition of undisturbed forests *prior to human settlement* was, in large measure, determined by successive glacial periods and the west-east orientation of Central Europe's principal mountain range, the Alps. It is for this reason that even undisturbed temperate forests in Central Europe would be less diverse in their species composition, than temperate forests in other parts of the world².

Present day forests in Germany are essentially man-made. Their occurrence, spatial distribution and composition are the result of roughly *two millennia of sustained human influence* on the previously natural vegetation³. If one is to understand the current status of forest resources as well as the institutional framework determining their management and use, historical retrospect is an indispensable requirement.

Today, about one third of the German territory (31 percent⁴) is covered with forests, a coverage rate roughly equivalent to that prevailing during the 13th century AD. This national average is somewhat put into perspective by regional distinctions between the German states, with forest cover rates ranging anywhere from 10 to 42 percent⁵.

The period between the apex of the medieval settlement and forest clearance (13th century) and the onset of forestry on a scientific basis (18th century) was marked by **successive stages of largely non-regulated overexploitation**. By the mid-18th century, mounting scarcity of forest products and the adverse effects of deforestation motivated the development of what has since become a hallmark of German forestry: sustainable forest management (SFM) on a scientific basis (see section 4.1.2), along with the emergence of a specific framework for forest sector governance (refer to section 3.1.2). Large-scale reforestation throughout the 19th century rapidly raised the forest cover – however, at the expense of effectively reversing the natural proportions of coniferous and broadleaved species.

Throughout recorded history, forestry development in Germany has, to a large extent, been driven by political, economic and societal dynamics outside the forest sector. Forest ownership patterns, the distinctly federalist set-up of forest governance, the lasting dominance of coniferous age-class forests over mixed, uneven-aged stands, and changing societal perceptions, beliefs and the related demand for forest goods and services all provide cases in point.

Industrialization in the 19th century spurred the recovery of German forests, due to the resultant energy-shift towards fossil fuels, large-scale migration to urban hubs, and the boost of agricultural productivity following the invention of synthetic fertilizers. Similarly, the aftermath of wars and reconstruction periods (including Germany's division during the period of confrontation) shaped the face of German forests and the German forest sector.

¹ Burschel, P. and Huss, J. (1987): Grundriss des Waldbaus. Paul Parey, Hamburg/Berlin; p.19

² Röhrig, E. and Bartsch, N. (1992): Waldbau auf ökologischer Grundlage – Vol. 1: Der Wald als Vegetationsform und seine Bedeutung für den Menschen. Paul Parey, Hamburg/Berlin; p. 166

³ Burschel, P. and Huss, J. (1987): Grundriss des Waldbaus. Paul Parey, Hamburg/Berlin; p.24

⁴ BMELV (2009): Waldbericht der Bundesregierung. Berlin; p. 8

⁵ Ibid. – Schleswig-Holstein 10,3 percent, Rheinland-Pfalz 42,1 percent

Forest sector development past 1949 – the year the Federal Republic of Germany came into being – has been marked by several noteworthy trends which, following the peaceful revolution of 1989 and Germany's reunification in 1990 – took hold also in the formerly east-German states:

- **Changing societal perceptions** about forestry, diversification of societal demand for forest goods and services – with preferences gradually shifting towards ecological, protective and social, including recreational forest functions⁶;
- **Structural changes** in the agricultural sector which promoted reforestation of hitherto agricultural areas, along with a resultant stable increase in forest cover by roughly 1 million hectares over the past four decades;
- **Mounting concern over novel forest diseases**, predominantly ascribed to the cumulative effects of airborne pollutants and – along with it – media interest and societal participation on an unprecedented scale;
- The **growing impact of European integration** as well as multilateral processes and regimes in pursuit of global public goods (e.g. biodiversity, climate change mitigation and adaptation).

Combined, the foregoing factors increased the dynamics of forest sector development and triggered responses on several fronts. The professional self-perception and the established mind-sets of German foresters (predominantly in public employ) were challenged by increased civil-society participation. The organisational set-up along with the mandates of – hitherto unified – state forest administrations underwent restructuring with a view to separating economic and executive roles (see also section 3.1.2.2). As societal demand for forest products and services continues to diversify, long-engrained paradigms such as multi-purpose forest management are called into question by the proponents of more segregative approaches. For details, refer to sections 4.1.3 to 4.1.5.

2.2 China

With a national territory of roughly 933 million ha, **the P.R. China is about 26 times larger than Germany** and might be more appropriately compared to the continent of Europe, up to the Ural mountain range. Its vast expanse stretches across several climate zones, with mountainous areas occupying roughly two thirds of the total territory. Western and north-western parts of China are characterized by vast deserts, meaning that considerable parts of China would not be forested regardless of anthropogenic disturbances.

China is **the world's most populous nation** with a citizenry of approximately 1.3 billion, 80 percent of which live east of the Heihe-Tengchong line (i.e. along the eastern seaboard and in south-central China). Of the total citizenry, about 1 billion Chinese live in rural areas. However, results of the last national census (conducted in 2010 and published in early 2011) suggest medium-term changes of rural livelihoods, owing to an aging society and rapid urbanization.

Similar to Germany, **present-day Chinese forests are essentially man-made**. Given the long history of Chinese civilization, forests have been subject to major human impacts (exploitation as well as conversion to other land-uses) for even longer historical periods than in Europe or Germany, for that matter. Agriculture emerged about 9,500 years ago, and controlled irrigation for the purpose of rice farming dates back roughly 5,000 years. With the on-

⁶ BMBF (2008): Delphireport – Die Zukunft der Waldnutzung in Deutschland. Forschungsprojekt Zukünfte und Visionen Wald 2100. Berlin; pp. 19-20

set of the historically first traceable dynastic monarchies some 3,000 years ago⁷, settlement, commerce and major infrastructural construction ensued, promoting rapid population growth. Comparisons of population figures suggest that China reached deforestation levels comparable to those of medieval Europe at a much earlier stage⁸.

Following this line of argument, forest development in China shares an **important similarity** with that of Germany (or other European nations, for that matter) in that persistent, demand-driven forest exploitation over long periods of time resulted in mounting ecological problems and a significant shortage of forest goods. Only thereafter, reforestation efforts caused forest cover rates to rebound, although at the expense of causing significant changes in terms of species composition and stand structures. Consequently, the development of forest cover in Germany and China seems comparable in that it followed a “U-shaped curve”, regardless of the historical timescales involved.

Even though, a **significant difference** seems to lie in the fact that while European countries (including Germany as a pioneer of SFM) achieved a transition from demand-driven exploitation towards production-oriented forest management roughly 250 years ago, deforestation in China continued well past the early modern period⁹. Studies of China’s historical development of forest tenure suggest that, even prior to 1949, remnants of natural wilderness areas were restricted to the remotest and least accessible parts of the country¹⁰. In present-day China, “natural forests” occupy roughly 66 percent of China’s total forested area¹¹, while even-aged plantations composed of a limited number of tree species account for the remaining 34 percent. However, the term “natural forest” should not be mistaken for wilderness areas or pristine forests free from human intervention. Natural forests for the most part resemble uneven-aged, mixed secondary (non-managed) forests displaying various levels of degradation. Classification of natural forests follows an area-based rationale, rather than being based on ecological parameters – specifically in relation to the Natural Forest Protection Program (NFPP). Substantial areas subject to implementation of the NFPP are reforested artificially, including by means of planting as well as aerial seeding¹².

Following the demise of imperial rule and the establishment of the Chinese Republic in 1911/12, wood-supplies gained heightened recognition as a resource crucially important to China’s modernization and industrial development. In 1914, a first national Forest Law was enacted, with large-scale tree-planting campaigns following shortly thereafter. However, following the death of China’s second president Yuan Shikai in 1916, the ensuing period of political instability and civil strife caused a hiatus for reforestation efforts¹³. Attempts to renew reforestation programs were largely frustrated by both, the Chinese civil war and the Sino-Japanese war past 1937. Following the conclusion of the second World-War in 1945, the civil

⁷ Fairbank, J.K. and Goldman, M. (2006) *China: A New History*. Harvard University Press, Cambridge (Massachusetts); pp. 33-36

⁸ Ruddiman, W. F. (2005): *Plows, Plagues and Petroleum – how Humans took Control of Climate*. Princeton University Press, Princeton NJ; pp. 70-90

⁹ Saito, O. (2008): *Forest History and the Great Divergence: China, Japan and the West*. Global COE Hi-Stat Discussion Paper Series 009. Research Unit for Statistical and Empirical Analysis in Social Sciences, Hitotsubashi University; pp. 10-13

¹⁰ Liu, J. and Zhao, L. (2009): *Have decollectivization and privatization contributed to sustainable forest management and poverty alleviation in China?* Forest Policy and Institutions Working Paper, Food and Agriculture Organization of the United Nations (FAO), Rome; p. 13

¹¹ Petry, M. and Zhang, L. (2009): *Report on China’s 7th National Forest Inventory*. Country report, USDA Global Agricultural Information Network (GAIN), Beijing / Washington D.C.

¹² IFCC [2011]: *China National Progress Report to the UNFF Secretariat on the implementation of the NLBI and other relevant resolutions*. UNFF liaison office, Beijing; p. 11

¹³ Songster, E. (2003): *Cultivating the Nation in Fujian’s Forests: Forest Policies and Afforestation Efforts in China, 1911-1937*. *Environmental History* Vol. 8, No. 3 July 2003; pp. 452-473

war resumed – ending with the defeat of Kuomintang forces and the foundation of the People's Republic of China in 1949.

China's forest sector development since 1949 may be broadly clustered into four successive stages¹⁴ coinciding with the nation's development, political changes and societal transformation¹⁵:

- **1950ies to 1960ies – focus on timber:** Post-war reconstruction and rapid industrialization caused an upsurge in demand for wood, with remaining natural forests as the principal source. Starting from 1949, China's forest resources were depleted rapidly – with annual logging rates of roughly 18 million m³. Even though, shelterbelt forests were established or rehabilitated across northern China, albeit on a limited scale.
- **1960ies to 1970ies – overexploitation:** Far-reaching political and economic changes exerted a significant impact on forest resources. Collectivist policies and campaigns aiming to boost the development of heavy industries not only spurred harvesting rates and consumption of forest products even further, but likewise affected agricultural production and rural development. Farmers' involvement in private forest management declined, and logging of remaining forests quickly outpaced forest growth. Forest inventories from 1962 and 1978 suggested annual logging rates of roughly 35 million m³. On the other hand, the establishment of plantation forests and shelterbelts accelerated in north-eastern and north-western China, across the loess plateau and in coastal areas prone to inundation. Such efforts were, however, brought to a halt by political instability and civil strife resulting from the Cultural Revolution. For details, refer to section 4.2.1.2.
- **1978 to late 1990ies – recovery:** Aiming for political reform and with a view to reinvigorating the economy, the Chinese government past 1978 embarked on a comprehensive program of economic liberalization, de-collectivization, and the improvement of rural livelihoods. A national tree-planting campaign emerged in 1981, followed by major reforestation programs. Forest sector development underwent a shift of focus from exploitation to forest rehabilitation, the success of which is documented through recurrent national forest inventories (in terms of both, the forest area and growing stock). China successfully reversed deforestation, turning itself into a world leader in plantation forestry. Forest recovery was facilitated by a combination of non-state involvement in forest management, new domestic timber trade and pricing policies and fiscal reforms. The Forestry Law of the P.R. China, first adopted in 1979, has since been amended twice (1984, 1998). For details, see section 4.2.1.3.
- **1990ies to present – transition towards sustainable development:** Mounting environmental concerns over land degradation and desertification, ecological decline and the associated loss of biodiversity, and widespread pollution caused China to pursue more integrative, cross-sector approaches to promote environmental protection and the use of natural resources. Following China's participation in the 1992 United Nations Conference on Environment and Development (UNCED), China ratified the conventions on biodiversity (UNCBD), combating desertification (UNCCD) and climate change (UNFCCC), and promulgated a wide range of national policies in response thereto: China's National Agenda 21 (1994), the "Forestry Action Plan for China's Agenda 21" (1995) as well as several other sector-action plans. These sectoral action plans were then synchronized with China's

¹⁴ Kong, F. et al. (1999): Evaluation of China's Forest Resources Management Policies. China National Forestry Economic and Development Research Centre (SFA-FEDRC), GCP/RAS/158/JPN, CSA Paper No. 2 (1997-1998); Beijing

¹⁵ Wang, C. and Chokkalingam, U., in: Chokkalingam, U. et al. (eds., 2006): Learning lessons from China's forest rehabilitation efforts. Center for International Forestry Research / Chinese Academy of Forestry / State Forestry Administration of the P.R. China; Jakarta; pp. 13-19

Five-Year-Plans. China likewise participates actively in UNFF activities, both as a host country for international conferences¹⁶ and with a view to implementing the Non-legally binding Instrument on all types of forests (NLBI)¹⁷.

Major flooding with disastrous consequences in 1998 prompted the launch of six high-level, centrally coordinated forest sector programmes which together determined the course of forestry development ever since – amounting to nothing less than a paradigm shift from timber production to forest protection. Following the joint resolution of the State Council and the CPC Central Committee “on Accelerating Forestry Development” (2003), China stepped up the pace of forest sector reforms on several fronts, including the restructuring of state-owned forest farms (see section 3.2.2) and tenure reform in collective forests, aiming for decentralized management by rural households (see section 3.4). Recognizing growing global responsibilities arising from an ever widening gap between domestic demand and supply, China adopted policies in regard to illegal logging, coupled with corporate-social-responsibility (CSR) rules for Chinese firms operating abroad as well as domestic green procurement policies. Although comparatively late in coming, forest certification (forest management certification as well as chain-of-custody verification) emerged around 2000. Growing global attention to climate change and its possible consequences past 2000 exerted a strong influence on Chinese policy decisions¹⁸. See also section 4.2.1.4.

Basic Similarities and Differences

Table 1 enables a quick comparison of basic data on the forest resources of Germany and China. The data indicate three significant distinctions: First, Germany – in spite of its long history of industrial development, urbanization and its relatively higher population density – has a distinctly higher forest cover rate. Second, **forest quality** – taking the growing stock per hectare as a basic reference – likewise is noticeably different. Third, forest resources expand far more rapidly in China.

¹⁶ <http://www.un.org/esa/forests/gov-unff.html>

¹⁷ IFCC (2011): China National Progress Report to the UNFF Secretariat on the implementation of the NLBI and other relevant resolutions. UNFF National Focal Point, Beijing.

¹⁸ Mann, S. (2010): Climate Change Adaptation in the Chinese Forest Sector. Occasional Paper Sino-German Technical Cooperation Project “Sustainable Forest Management”; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing.

Table 1: German and Chinese Forest Resources at a glance – basic data

Parameter	Germany ¹⁹	China ²⁰
National Territory [Mio. ha]	34.9	932.7
Citizenry [Mio.]	82.3	1,300
Population Density [persons/km ²]	230	139
Forest Cover [Mio. ha]	11.1	206.9
Forest Cover [%]	31	22
Forest Cover per capita [ha]	0.14	0.15
Forest Cover Change [Mio. ha/a]	0.0035	2.97
Growing Stock [billion m ³]	3.4	14.9
Growing Stock [m ³ /ha]	320	85
Macro-Economic Significance of the Forest Sector [% of GDP]	0.9	1.3

The rapid growth of forest resources in China results from **large-scale, centrally coordinated afforestation and reforestation programs on barren or degraded lands**. In Germany, forest cover changes may be ascribed primarily to **structural changes in the agricultural sector**. Roughly 97 percent of land dedicated to forestry (the permanent forest estate – PFE) is actually forested. In China, this figure stands at about 68 percent, in reference to 304 million ha of areas classified as “forest land”.

Most German forests are high forests, with the rare exception of historical relics such as coppice or coppice with standards. China, on the other hand, features extensive areas of bamboo forests and “economic forests” (dedicated to the production of fruit, rubber, tea and other non-timber forest products).

Owing to the ongoing transformation of even-aged monocultures into more structurally diverse, mixed forests, the relative share of **mixed forests** in Germany has grown to 73 percent with an increasing trend. Even though, the transformation of German forests into structurally diverse stands remains an unfinished, long term endeavour. Only 9.2 percent of German forests have currently reached a close-to-natural, uneven-aged state.

In China, the balance of “natural forests” (currently 66 percent) and **plantation forests** is shifting gradually in favour of even-aged pure stands, managed mostly with short rotations of between 15 to 40 years. This shift is caused primarily by different regeneration patterns: China relies primarily on artificial regeneration, whereas in Germany upwards of 80 percent of the 2.2 million ha of young-growth have been established through natural regeneration²¹.

¹⁹ Federal Forest Inventory – BWI² (2002),

²⁰ 7th National Forest Inventory (2009)

²¹ Sources: Federal Forest Inventory – BWI² (Germany), 7th National Forest Inventory (China), FAO State of the World’s Forests 2011



Figure 3: Re-establishment of plantations: *Cunninghamia lanceolata* (China fir) distributed in the sub-tropical region of China is one of the most important native timber species. The photo shows a one year old stand. The site was burned after clear cutting. **Reference:** Zhao



Figure 4: Seedlings in a recently established plantation: Recently established plantation of *Cunninghamia lanceolata* (China fir), in Qianyanzhou, Jiangxi Province. **Reference:** Zhao



Figure 5: Use of “Non Timber Forest Products” (NTFP): Resin collection in middle-aged plantations of *Pinus massoniana* (Chinese red pine) is a widespread occurrence in South-Central China. **Reference:** Dr. Mann

3 Forest Governance: Legal-Regulatory & Organizational Framework Conditions

3.1 Germany

Forest governance frameworks in Germany are primarily characterized by their **continuity and gradual evolution over time**. As sustainable forest management on a scientific basis emerged roughly 250 years ago, so did sector administrations and forestry as a profession in its own right.

Salient characteristics of the German forest sector – e.g. its broad and highly diverse ownership structure – cannot be adequately appreciated without due regard for their historic development. On the other hand, Germany, since its emergence as a nation state in 1871, has been subject to radical – sometimes catastrophic – change. **Among the factors ensuring the continued evolution of forest governance in spite of such external disturbances, legal frameworks and the rule of law probably stand out as the most significant.** The discussion of forest governance frameworks must hence depart from an overview of the legal-regulatory framework.

3.1.1 Legal and Regulatory Basics

3.1.1.1 Constitutional Provisions – the German Basic Law

Unlike in China, present day German forest governance is primarily determined by statutory legislation. The **German Basic Law**²² (the German Constitution) provides numerous fundamental provisions of relevance to the forest sector (see Table 2).

Table 2: Selected Constitutional Provisions relevant to the Forest Sector

Articles	Issues
14	Protection of the right to property and the right of inheritance as part of the charter of fundamental rights (Articles 1 to 19). Use of property must respect common welfare. Expropriation is permissible only for the public good and can only be ordered by or pursuant to a law which, at the same time, must provide for equitable compensation.
20 a	The state protects natural foundations of life and animals by legislation and, in accordance with law and justice, by governance and judicial action – with regard to its responsibility for the well-being of future generations.
23	European integration – Germany takes part in developing the European Union with regard to democratic, social and federal principles as well as in accordance with the rule of law and basic rights and in compliance with the principle of subsidiarity. Therefore, Germany can transfer sovereign powers. This article enables that European regulations are applicable in Germany.
24	Transfer of sovereign powers – the Federal Government may by law transfer sovereign powers to international organizations
28	Autonomy of municipalities – municipalities must be guaranteed the right to regulate all local affairs on their own responsibility, within the limits prescribed by the laws. This includes financial autonomy, as well as the right to levy charges and taxes at the communal level.
30	The exercise of state powers and the discharge of State functions is a matter for the States, except as otherwise provided or permitted by the Basic Law.
31	Federal law takes precedence over State legislation.
70	The states have the right to legislate insofar as the Basic Law does not confer legislative power on the Federation. Federal and State legislative competencies are governed by exclusive and competitive legislation.
72	Competitive legislation – States may legislate unless the Federal legislature exercises its constitutional

²² Grundgesetz für die Bundesrepublik Deutschland in der im Bundesgesetzblatt vom 23.05.1949, in der veröffentlichten bereinigten Fassung, das zuletzt durch Artikel 1 des Gesetzes vom 21. Juli 2010 (BGBl. I S. 944) geändert worden ist

Articles	Issues
	prerogative. Federal laws take precedence over State laws whenever necessary to maintain equal living conditions and economic development. States may legislate (within the boundaries of guiding principles set forth in Federal statutes) in regard to hunting, nature conservation, land-use and spatial planning, and water management.
73	No incidences of exclusive legislation related to forestry
74	Competitive legislation includes public promotion of forestry and agricultural production, hunting, nature conservation & landscape protection, land administration, coastal protection and water management.
80	Federal and State governments are authorized by law to issue statutory instruments. The content, purpose and scope of the authority conferred is specified in the law.
91 a	The federal government assists with State tasks insofar as those are of national significance. Specific reference is made to agricultural structure and coastal protection. The Federation finances in these cases at least on half of the expenditure.

The foregoing provisions are of fundamental importance for forest governance and forest sector development. They ensure the continued existence of a diverse forest ownership structure and provide tenure security for forest owners – including German States, communal administrations, and private landowners. The sharing of powers and legislative competencies, as prescribed in the Basic Law, enables the harmonious co-existence of the Federal Forest Act and Forest Laws promulgated by the individual States. Competitive legislation has the advantage of ensuring a unified framework of standards and conditions in all States of the Federation, while leaving sufficient room for the States to reflect their own specific circumstances in State laws.

3.1.1.2 Federal Legislation

The **Federal Forest Act**²³ provides a unified normative basis for the German forest sector. Up until its initial adoption in 1975, forest sector development and forest governance had been independently driven by the German States. This fact – surprising as it may seem at face value – can be explained in various ways. For one, Germany achieved nationhood only in 1871, which fact explains the traditionally decentralized character of German forestry. Secondly, attempts to forcibly centralize forest governance within the period 1933-1945 caused widespread disenchantment within the German States. Following the promulgation of the Basic Law in 1949 (along with the foundation of the Federal Republic of Germany with its decidedly federalist set-up), German States for decades remained highly reluctant to accept national legislation in regard to forestry. When the Federal parliament and the States' Council finally agreed on promulgating a Federal Forest Act, its purview was deliberately restricted to providing (i) a generic framework for sustainable forest management and (ii) a unified basis for public forest sector support.

The Federal Forest Act is structured by altogether five chapters (general provisions, preservation of forests, forest management associations, public promotion of forestry and obligatory disclosure of information, closing provisions).

Chapter 1 embodies fundamental beliefs, traditions and forest policy objectives rooted in 250 years of forestry development. Its stated purpose is threefold (Art. 1) and embodies basic forest policy convictions and goals of forest sector development in Germany:

- To preserve and extend forests for reasons of their economic, environmental and social significance²⁴, and to ensure their sustainable management;

²³ Gesetz zur Erhaltung des Waldes und zur Förderung der Forstwirtschaft (Bundeswaldgesetz (BWaldG) vom 2. Mai 1975, BGBl. I S. 1037, zuletzt geändert am 31 Juli 2010 Bundesgesetzblatt I S. 1050

²⁴ Specific reference is made to ecosystem functions, climate, water resources, air, soil fertility, characteristic landscapes & natural scenery, infrastructure, and recreation

- To support forestry development, and
- To reconcile the interests of forest owners with societal demand for forest goods and services.

The first chapter likewise holds relevant legal definitions (forest, forest ownership categories etc.) as together determine the interpretation, application and enforcement of forest legislation. The legal definition of forest reflects the notion of a permanent forest estate (PFE, including logged-over forest areas and areas void of forest cover). Accordingly, forests are areas of land dedicated to sustainable forest management as the sole permissible land use. Short-rotation plantations, areas dedicated to agro-forestry, and small areas with perennial woody vegetation locating in urban or agricultural areas do not qualify as forest. Reflecting historical development, the Federal Forest Act further distinguishes between three principal types of forest ownership:

- State-owned forests are forests owned by either the Federal Republic of Germany, one of the German States, or federally as well as state owned public law foundations or institutions;
- Corporate forests are forests owned by either self-governing municipalities (communes), inter-communal bodies or other corporate bodies under public law;
- Private forests are forests which qualify neither as state, nor as corporate forest, i.e. forests owned by private individuals, non-public cooperatives, or churches or other religious communities.

Chapter 2 is subdivided into two sub-sections, which together reflect **quantitative and qualitative aspects of forest preservation and sustainable management**. All provisions contained in the second chapter provide a generic framework of guiding principles, to be spelt out and operationalized by way of State legislation. By contrast, chapters of the Federal Forest Act dealing with forest management associations and public forest sector support – by virtue of the Federal legislative prerogative of competitive legislation – are framework provisions directly binding on the States, to be reflected in State laws and applied in forest governance.

Quantitative preservation of the PFE primarily hinges on cross-sector coordination by means of spatial and land use planning. All public undertakings with an impact on forests, by virtue of the Federal Forest Act, must be planned with due regard for forest functions as well as in consultation with relevant forest sector administrations. Legal requirements of this kind provide a safeguard against the requisitioning and conversion of forests, and ensure informed land use decisions. Here, the close interdependency between societal preferences and legal norms becomes apparent – highlighting the **significance of forest legislation as a transmission belt for the application and enforcement of policy goals**.

Box 1: Distinctions between Forest Conversion and Afforestation

The Federal Forest Act permits forest conversion only in cases of overriding public interest (e.g. construction of traffic infrastructure). Strict standards apply, compelling relevant authorities to deny conversion permits whenever forest preservation is deemed of overriding importance for society at large. **Forest conversion is deemed generally undesirable.** The Federal Forest Act therefore reflects the **societal preference for forest protection.**

By contrast, afforestation of hitherto non-forested areas is generally deemed socially desirable, unless in (rare) cases where e.g. nature conservation objectives, preservation of cultural landscapes, or agricultural considerations conflict with the further expansion of the PFE. Hence, provisions on afforestation aim to ensure **informed land use decisions** and due regard for **cross-sector coordination, while generally promoting afforestation.**

Qualitative aspects of forest preservation and management are rooted in the concept of sustainable forest management. Owing to the underlying rationale of framework legislation, the Federal Forest Act prescribes generic principles only, which are meant to guide State legislatures in the design of their respective State Forest Laws. For this reason, only minimum requirements (e.g. reforestation of clear-cut or degraded forest areas) are prescribed, and modes of forest management outlined by means of **indeterminate legal expressions** (e.g. “orderly” forest management or forest management “in due form”). Further provisions of the Federal Forest Act provide for the classification of forests for either protection or recreational purposes, with resultant restrictions on the exercise of clear-felling, hunting, and acquiescence of visitor-infrastructure by forest owners. Highlighting the societal significance of forests, the Federal Forest Act further stipulates free entry rights of the general public, at one’s own peril and subject to more specific State laws.

The **third chapter** deals with various, legally distinguished categories of **forest management associations (FMA)**. The underlying rationale behind FMA can be traced back to the age-old structural characteristics of private forest ownership in Germany (see section 0). Forest management associations pursuant to the Federal Forest Act form part of a policy rationale intended to support forest sector development and facilitate sustainable forest management by overcoming structural deficiencies such as small-scale fragmentation, insufficient management infrastructure and the like. Irrespective of their organizational structure and legal status, FMA in Germany by virtue of the Federal Forest Act share **basic common characteristics**: First, they are mostly voluntary-based and self-governed. Second, they must be officially recognized in order to be eligible for public funding support. Third, they operate as service providers for the benefit of their members. Fourth, they are addressees of public forest sector support. Fifth, they are subject to public supervision and enforcement of the effective forest laws and regulations.

The service portfolio of FMAs is characterized by at least one of the following aspects:

- Joint forest management planning and forest operations, including reforestation, tending, soil amelioration and forest protection;
- Joint harvesting, skidding, and marketing of forest products;
- Joint forest road construction and establishment of management-infrastructure;
- Joint procurement of equipment, machinery, expendable goods.

Aiming to promote joint forest management and production through FMAs, the Federal Forest Act specifically exempts FMAs from the purview of the Federal Statute against the Distor-

tion of Competition, thereby establishing a legal privilege entitling FMAs to advise their members on the determination of prices and sales conditions for forest products.

As forestry law forms part of the competitive legislation as defined in the German Basic Law, it binds the German States at the one hand and at the other authorizes the German States to lay down further regulations by law regarding FMA for specification.

Chapter 4 addresses **public support**, and ranks among the principal and most characteristic features of the Federal Forest Act. Public support to the forest sector is justified in reference to the multiple benefits, services and functions forests provide, and aims to cushion off foregone revenue and additional expenses borne by forest owners. Its specific purpose is to ensure the economic viability of sustainable forest management by means of economic, infrastructural, agrarian, social and fiscal policy instruments. Addressees of public support include FMA, individually owned and run forest enterprises, and private persons. The Federal Government, pursuant to the Federal Statute on Structural Improvements of the Agricultural Sector and Coastal Protection, co-funds forest sector support from the Federal budget.

Chapter 4 further provides for **recurrent national forest inventories**, with the purpose to provide an informational basis for forest governance (as well as to meet obligations arising from legally binding multilateral agreements or commitments to the European Union). The German States collect primary data. Subsequently, the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) compiles and analyzes them. Forest owners are bound to acquiesce to the collection of data on their properties, and obliged to disclose relevant information.

The fifth chapter, holding closing provisions, explicitly empowers the BMELV to enact regulatory provisions required for the application of the Federal Forest Act.

Several pieces of federal statutory legislation complement the framework established by the Federal Forest Act.

The **Law on Forest Reproductive Material**²⁵ serves to conserve and enhance forests by providing high-quality and source-identified reproductive material with a view to ensuring its genetic diversity and promoting forestry, subject to provisions on production and handling (Art. 1). Accordingly, the law provides for compulsory public approval with particularly tight restrictions on genetically modified organisms (Art. 4) and registration (Art. 6) of seeds or clones. Only officially recognized nursery facilities are eligible to produce reproductive material (Art. 7), subject to further provisions governing documentation of origin, mixture of, and labelling of reproductive material prior to shipment (Art. 8-10). Further sections of the law deal with, inter alia, marketing, quality requirements, marketing restrictions and related documentation (Art. 11-14), import and export (Art. 15-16), public supervision, including in cooperation with the European Union (Art. 17-21), and penal provisions (Art. 22-23).

The **Law on Compensation of extraordinary Forest Damages**²⁶ authorizes BMELV to limit the annual domestic timber production as well as timber imports in the event of exceptional and catastrophic damage caused by storms, snow-break, pests or similar causes, and resulting in significant and non-localized market distortions (Art. 1-2). Market interventions of this kind, restricting forest enterprises to production at 70 percent of the planned production vol-

²⁵ Forstvermehrungsgutgesetz vom 22. Mai 2002 (BGBl. I S. 1658), das zuletzt durch Artikel 37 des Gesetzes vom 9. Dezember 2010 (BGBl. I S. 1934) geändert worden ist (FoVG), <http://www.gesetze-im-internet.de/bundesrecht/fovg/gesamt.pdf>

²⁶ Forstschäden-Ausgleichsgesetz in der Fassung der Bekanntmachung vom 26. August 1985 (BGBl. I S. 1756), das zuletzt durch Artikel 10 des Gesetzes vom 1. November 2011 (BGBl. I S. 2131) geändert worden ist (Forst-SchAusglG), <http://www.gesetze-im-internet.de/bundesrecht/forstschausglg/gesamt.pdf>

ume, may remain effective for a period of up to three years past the occurrence of damages. With a view to cushioning off economic and financial impacts on the concerned forest enterprises, the law applies an array of fiscal privileges and rebates (Art. 3-7).

The **Law on the Common Task of Improving Agricultural Structures and Coastal Protection**²⁷ provides a statutory basis for public support to the forest sector, as referenced in the Federal Forest Act's fourth chapter. Its stated purposes in regard to forestry include (i) promotion of efficient enterprise structures, (ii) infrastructural improvements and (iii) promotion of management associations as well as marketing support (Art. 1). Public support is provided on the principle of ensuring the economic competitiveness of agricultural and forest enterprises in line with spatial planning, environmental protection and nature conservation as well as animal protection (Art. 2). Funding support (Art. 3) is provided pursuant to a framework plan (Art. 4-5), consolidated from the Federal States' individual recommendations for action (Art. 6-8).

Because forestry not only depends on, but likewise exerts an impact on soils and water resources, statutory laws covering the protection and management of either environmental resource hold provisions in regard to forestry operations.

The **Federal Soil Protection Act**²⁸ aims to protect or restore the functions of the soil on a permanent sustainable basis. This includes the prevention of harmful soil changes, rehabilitation of the soil, of contaminated sites and of waters contaminated by such sites; and precautions against negative soil impacts (Art. 1). It distinguishes ecological, archaeological and productive functions, including forestry (Art. 2). However, its purview in regard to forestry is purely supplementary, meaning that it applies only in so far as forest laws do not govern relevant impacts on soils (Art. 3). Similarly, forest owners or managers automatically meet the requirement for precaution and due diligence in soil management when exercising forest management in accordance with effective forest laws (Art. 7). Pursuant to the law, relevant authorities may, for the avoidance of detrimental impacts on soils, restrict the otherwise regular and lawful exercise of management operations – subject to compensation of the affected forest owners (Art. 10). Issuance of regulations under statutory empowerment requires consultation of, and participation by relevant sector administrations – including forestry (Art. 20).

The **Federal Water Act**²⁹ serves to ensure the sustainable management of water resources for their significance as an environmental component, habitat and key-resource for human consumption (Art. 1). The law applies to surface waters, coastal waters and groundwater resources (Art. 2). Property rights may be established neither in regard to free-flowing surface water, nor groundwater. The property rights of real estate owners adjacent to water bodies do extend neither to water uses that require public approval, nor any construction measures altering the course or flow-pattern of the water bodies in question (Art. 4). The law further prescribes a general obligation to prevent negative impacts on water resources (Art. 5). The use of water resources requires public approval, subject to tight procedural provisions (Art. 8-21). Respective provisions have a bearing on forestry operations, e.g. because

²⁷ Gesetz über die Gemeinschaftsaufgabe "Verbesserung der Agrarstruktur und des Küstenschutzes" in der Fassung der Bekanntmachung vom 21. Juli 1988 (BGBl. I S. 1055), das zuletzt durch Artikel 9 des Gesetzes vom 9. Dezember 2010 (BGBl. I S. 1934) geändert worden ist (GAKG), <http://www.gesetze-im-internet.de/bundesrecht/agrstruktg/gesamt.pdf>

²⁸ Bundes-Bodenschutzgesetz vom 17. März 1998 (BGBl. I S. 502), das zuletzt durch Artikel 3 des Gesetzes vom 9. Dezember 2004 (BGBl. I S. 3214) geändert worden ist (BBodSchG), <http://www.gesetze-im-internet.de/bundesrecht/bbodschg/gesamt.pdf>

²⁹ Wasserhaushaltsgesetz vom 31. Juli 2009 (BGBl. I S. 2585), das zuletzt durch Artikel 1 des Gesetzes vom 6. Oktober 2011 (BGBl. I S. 1986) geändert worden ist (WHG), http://www.gesetze-im-internet.de/bundesrecht/whg_2009/gesamt.pdf

permits pursuant to the Law on Water Resources are required for the wet storage of timber after large-scale storm or snow-break events. Trees in riparian buffer-strips may not be felled only in the exercise of regular and lawful forestry operations, and non-site adapted tree species may not be planted therein (Art. 38). Drainage of forest areas for management purposes does not require a specific permit (Art. 46). However, forests locating within designated water protection zones may be subjected to management restrictions above and beyond the otherwise legal minimum according to effective forest laws – entitling owners to financial compensation (Art. 52). Similar provisions apply to designated water retention areas (Art. 78), including the prohibition to transform natural swamp forests into other forest types.

The **Federal Nature Conservation Act**³⁰, last amended in October 2011, aims to protect, care for and develop nature and landscapes in recognition of their intrinsic value as well as for their significance for human life, health and wellbeing. More specifically, nature conservation aims to preserve biological diversity, the functioning of ecosystems and their services, including the ability of natural resources to regenerate and lend themselves to sustainable use, and the diversity, characteristic features and beauty of nature and landscape, as well as their recreational value (Article 1). The law explicitly recognizes sustainable forest management as a means of nature conservation, provided that (i) forests are established close-to-nature, (ii) managed sustainably without clear-felling, and (iii) a sufficient proportion of locally adjusted site-specific tree species is retained (Article 5). Pursuant to Article 30, certain types of natural forests are to be preserved as legally protected biotopes. The Federal Law on Nature Conservation holds an **exemption clause** to the effect that forest management, done in accordance with effective forest laws, good practice and with due regard for nature conservation and landscape protection does not constitute a harmful interference within the purview of the law (Article 14). Therefore, SFM remains exempt from more restrictive provisions governing ‘interventions in nature and landscape’. The Federal Nature Conservation Act emphasizes stakeholder participation and the consensual implementation of nature conservation measures, and prioritizes nature conservation by agreement over executive enforcement (Article 3).

Discussing Federal legislation of relevance to the forest sector, one must not overlook the significance of **legally binding norms emerging from the European level**. In 1992, the European Council passed the Habitats Directive³¹ with a view to supplementing the Birds Directive³² (1979) and providing for the establishment of a European network of protected areas (**NATURA 2000**), consisting of Special Areas of Conservation (SAC) and Special Protected Areas (SPA). Directives of this kind are directly binding on the European Union’s member states. Germany, in 1998, adopted national legislation giving effect to the aforementioned Council Directives. EU members were obliged to designate SACs and SPAs within their national territories, and to take measures for their protection and management. Identification of NATURA 2000 areas within Germany was completed by 2009³³. More than 800,000 ha (equivalent to 51 percent) of NATURA 2000 areas within Germany locate in forests. Management restrictions apply within NATURA 2000 areas, above legal minimum requirements emanating from either the Federal Forest Act or the various State Forest Laws³⁴ due to the concerned areas’ special protection status. Pursuant to Article 32 [3] of the Federal Law on

³⁰ Bundesnaturschutzgesetz vom 29. Juli 2009 (BGBl. I S. 2542), das zuletzt durch Artikel 2 des Gesetzes vom 6. Oktober 2011 (BGBl. I S. 1986) geändert worden ist (BNatSchG), http://www.gesetze-im-internet.de/bundesrecht/bnatschg_2009/gesamt.pdf

³¹ Council Directive 92/43/EEC on the Conservation of Natural Habitats of Wild Fauna and Flora, as amended by Council Directive 2006/105/EC

³² Council Directive 2009/147/EC on the Conservation of Wild Birds, replacing Council Directive 79/409/EEC

³³ http://www.bfn.de/0316_grundsaeetze.html

³⁴ http://www.bfn.de/0316_forstwirtschaft-natura2000.html

Nature Conservation, the German States are authorized to issue relating procedures, rules, prohibitions and directives, including provisions regarding financial support and compensation³⁵.

3.1.1.3 State Forest Laws

Pursuant to both, Constitutional provisions and the framework provided by the Federal Forest Act, all German States have enacted their own **State Forest Laws**. State Forest Laws in general reflect the basic structure and the main provisions of the Federal Forest Act, while differing in terms of, e.g. (i) the legal definition of SFM and minimum requirements for forest operations, (ii) safeguards for protective and social forest functions and Environmental Impact Assessment (EIA) requirements, (iii) provisions regarding protected forest areas, (iv) structural set-up, mandates, and responsibilities of forest sector administrations and state forest enterprises, (v) public support to the forest sector, and (vi) penal provisions.

Such differences are most distinct between city states (Berlin, Bremen, and Hamburg,) and territorial states (all other German States). For instance, the Berlin State Forest Law stipulates that all forests locating within the German Capital's territory qualify as both, protection and recreational forest (Art. 10 LWaldG Berlin). Similar provisions apply in Hamburg (Art. 7a, 8 LWaldG Hamburg). Given that private forestry is of little significance in the city states' territories, the State Forest Laws of Berlin, Bremen and Hamburg hold no provisions regarding forest management associations. Even though, the respective provisions of the Federal Forest Act apply, regardless of whether or not further specific provisions are included in the States' Forest Laws.

All State Forest Laws have in common that they aim to **define the qualitative essence of SFM** by way of **enforceable minimum requirements** which are **immediately and equally binding on all forest owners**. Together, such minimum requirements approximate otherwise indeterminate legal expressions such as "sustainable", "orderly", or "state-of-the-art" forest management.

The following comparison of the respective provisions in different State Forest Laws exemplifies and illustrates the scope of requirements which underpin the concept of SFM (see Table 3 overleaf). For this purpose, four territorial states have been selected, representing southern as well as eastern and northern German regions. Salient provisions of the respective State Forest Laws are referenced against what has become known as the "Seven Thematic Elements" of SFM³⁶. Together, these elements reflect the essence of various processes to identify criteria and indicators of SFM, and provide a crucially important and internationally recognized framework for the implementation of the NLBI by member states of the UNFF. In the following table, only the first six elements have been considered (the seventh requiring for countries to provide legal, policy and institutional frameworks for forest governance – which, in the case of Germany and China, may safely be considered fulfilled).

³⁵ Wagner, S. und Jönsson, A. (2001): Einschränkungen der Waldbewirtschaftung durch Naturschutzauflagen am Beispiel des europäischen Schutzgebietssystems NATURA 2000. Gutachten im Auftrag der Arbeitsgemeinschaft deutscher Waldbesitzerverbände (AGDW)

³⁶ <http://www.fao.org/forestry/sfm/24447/en/>

Table 3: Comparison of selected Provisions for SFM from four Territorial States in Germany (paraphrased and abridged)

Thematic Elements of SFM	Bavaria ³⁷	Baden-Württemberg ³⁸	Saxony ³⁹	Mecklenburg-Vorpommern ⁴⁰
1 Extent of Forest Resources	<ul style="list-style-type: none"> • Preservation and enhancement of forest areas for multiple benefits (Art. 1, 5) • Participation of the forest administration in all public planning exercises with an impact on forests (Art. 7) • Maintenance of forest registries, and periodical forest inventories (Art. 8) • Tight restrictions on forest conversion, EIA in certain cases (Art. 9) • Promotion of afforestation with regard for land use planning (Art. 16) 	<ul style="list-style-type: none"> • Preservation and enhancement of forest areas for multiple benefits (Art. 1) • Forest framework planning as a contribution to cross-cutting spatial planning, to be considered by other public plans (Art. 5-8) • Tight restrictions on forest conversion, compulsory EIA for areas upwards of five ha, compensational reforestation or financial compensation (Art. 9-11) • Promotion of afforestation of surplus lands and marginal agricultural areas (Art. 23) 	<ul style="list-style-type: none"> • Preservation and enhancement of forest areas for multiple benefits (Art. 1) • Forest framework planning as a contribution to cross-cutting spatial planning; forest functions have to be taken into consideration by other public plans and forest authorities have to be involved in the planning process (Art. 6, 7) • Tight restrictions on forest conversion, compensational reforestation or other protective/improving measures or financial compensation (Art. 8, 9) • Promotion of afforestation with regard for land use planning (Art. 10) 	<ul style="list-style-type: none"> • Preservation and enhancement of forest areas for multiple benefits (Art. 1) • Maintenance of forest registries (Art. 3) • Forest framework planning as a contribution to cross-cutting spatial planning, to be considered by other public plans (Art. 8-10) • Tight restrictions on forest conversion, compensational reforestation or other protective/improving measures or financial compensation (Art. 15) • Promotion of afforestation of hitherto non-forested areas (Art. 24)
2 Biological Diversity	<ul style="list-style-type: none"> • Preservation and enhancement of biological diversity, including close-to-nature management and tolerable game populations (Art. 1) • Forest function planning as a means of ensuring multiple forest functions with an optimal balance (Art. 5, 6, 7) • Designation of non-managed forests as references for undisturbed ecosystems (Art. 12a) 	<ul style="list-style-type: none"> • Protection of fauna, flora, habitats, landscapes, preservation of structurally diverse forest fringes (Art. 22) • Designation of forests for biotope protection with resultant restrictions (Art. 30a) • Regulatory designation of protected forest areas (forest reserves), either non-managed or with tight restrictions (Art. 32) 	<ul style="list-style-type: none"> • Forest management with due regard for fauna and flora, protection of habitats, landscape protection, avoidance of game damage, preservation of structurally diverse forest fringes (Art. 24) 	<ul style="list-style-type: none"> • Regulatory designation of protected forests with resultant restrictions (Art. 21) • Observance of relevant EC-Regulations in NATURA 2000 areas, protection of habitats of wild fauna and flora (Art. 12)
3 Forest Health and Vitality	<ul style="list-style-type: none"> • Protection of forest soils (Art. 9, 14) • Preference for site adapted and indigenous trees and natural regeneration, avoidance of synthetic fertilizers and pesticides, restrictions on clear-felling (Art. 14) 	<ul style="list-style-type: none"> • Preservation of forest soils, protection against pests and diseases and environmental hazards, site-adapted forests (Art. 14) • Restrictions on clear-felling (Art. 15) 	<ul style="list-style-type: none"> • Preservation of forest soils, protection against pests and diseases and environmental hazards, promotion of close-to-natural forests with adequate shares of indigenous trees, protection of soil water and adequate shares of deadwood (Art. 18) • Restrictions on clear-felling (Art. 19) 	<ul style="list-style-type: none"> • Preservation of forest soils, due regard for nature conservation, promotion of mixed and site-adapted forests, avoidance of agrochemicals and non-degradable lubricants, promotion of structurally diverse forest fringes, protection of deadwood and soil water (Art. 12) • Restrictions on clear-felling and protection of immature stands (Art. 13)

³⁷ http://by.juris.de/by/WaldG_BY_2005_rahmen.htm

³⁸ <http://www.landesrecht-bw.de/jportal/?quelle=jlink&query=WaldG+BW&psml=bsbawueprod.psml&max=true&aiz=true>

³⁹ <http://www.forsten.sachsen.de/wald/index.html>

⁴⁰ http://mv.juris.de/mv/WaldG_MV_rahmen.htm

Thematic Elements of SFM	Bavaria ³⁷	Baden-Württemberg ³⁸	Saxony ³⁹	Mecklenburg-Vorpommern ⁴⁰
	<ul style="list-style-type: none"> • Reforestation of logged-over or damaged forest areas (Art. 15) • Prohibitions for fire prevention (Art. 17) 	<ul style="list-style-type: none"> • Protection of immature forests (Art. 16) • Reforestation of areas void of forest cover (Art. 17) • Protection against forest fires or natural hazards (Art. 18, 41) 	<ul style="list-style-type: none"> • Reforestation of logged-over or degraded areas (Art. 20) • Protection against fire and natural hazards (Art. 28) • Designation of areas affected by airborne pollutants, measures for forests affected by air pollution (Art. 32) 	<ul style="list-style-type: none"> • Reforestation of logged-over or degraded areas (Art. 14) • Prohibition of forest destruction or waste disposal (Art. 18) • Protection against fire and natural hazards (Art. 19)
4 Productive Forest Functions	<ul style="list-style-type: none"> • Sustainable production of timber and other goods (Art. 1) • Promotion and expansion of timber production and accumulation of growing stock, efficient utilization of forest products in State Forests (Art. 18) 	<ul style="list-style-type: none"> • Promotion of forest production and forestry (Art. 1) • Optimized production of high-value timber with due regard to the preservation of soil fertility, promotion of efficient joint management of fragmented small-holdings (Art. 6) • Perpetual achievement of all forest functions (Art. 13) 	<ul style="list-style-type: none"> • Sustainable forest management, perpetual achievement of all forest functions (Art. 17) • Optimized production of high-value timber (Art. 45) 	<ul style="list-style-type: none"> • Promotion of forest production as part of the notion of multi-purpose forest management (Art. 1) • Promotion of sustainable timber production (Art. 12)
5 Protective Forest Functions	<ul style="list-style-type: none"> • Regulatory designation of forests required for protection against natural hazards, with resultant management restrictions (Art. 10, 11, 14) 	<ul style="list-style-type: none"> • Designation of soil-protection forests or emission-protection forests with resultant management restrictions (Art. 29-31) 	<ul style="list-style-type: none"> • Regulatory designation of protection forests or protected forests with resultant management restrictions (Art. 29, 30) 	<ul style="list-style-type: none"> • Regulatory designation of protection forests or protected forests with resultant management restrictions (Art. 21)
6 Socio-economic Forest Functions	<ul style="list-style-type: none"> • Public support for forest owners and self-help organizations, compensation of additional expenses or foregone revenue (Art.1, 20-24) • Regulatory designation of recreation forests, requiring acquiescence of visitor-infrastructure by forest owners (Art. 12) • Public right of free entry for recreational purposes (Art. 13) 	<ul style="list-style-type: none"> • Designation of recreational forests with resultant management restrictions and acquiescence of visitor-infrastructure by forest owners (Art. 33) • Compensation of infringements of property rights (Art. 35) • Public right of free entry for recreational purposes (Art. 37) • Promotion of FMA (Art. 61) 	<ul style="list-style-type: none"> • Public right of free entry for recreational purposes and rules of conduct (Art. 11-14) • Regulatory designation of recreation forests with resultant management restrictions and acquiescence of visitor-infrastructure by forest owners (Art. 31) • Compensation of infringements of property rights (Art. 33) • Public support for forestry (Art. 34, 49) 	<ul style="list-style-type: none"> • Regulatory designation of recreation forests with resultant management restrictions and acquiescence of visitor-infrastructure by forest owners (Art. 22) • Public right of free entry for recreational purposes and rules of conduct (Art. 28-31) • Public support for private and communal forests, promotion of FMA (Art. 43, 46) • Compensation of infringements of property rights (Art. 47)

3.1.2 Organizational Frameworks – Forest Sector Administrations

3.1.2.1 Administrative Roles, Mandates and Responsibilities at the Federal Level

BMELV is charged with coordinating functions in regard to forest governance. The ministry spearheads **forest policy development** in terms of both, national German forest policy and Germany's participation in the international forest policy dialogue and related processes. In doing so, BMELV is nevertheless bound to observe the constitutional division of authority between the Federal, and the States' governments. Hence, national forest policy initiatives primarily aim to shape cross-cutting legal-regulatory as well as socio-economic framework conditions for SFM and forest sector development. Noteworthy examples include, inter alia, Germany's National Forest Program (NFP), the national charter for the promotion of wood as an environmentally friendly resource⁴¹, and Germany's Forest Strategy 2020 (for details on the foregoing examples, refer to section 4.1.5).

BMELV likewise coordinates **data collection and information management** on a national scale. Federal forest inventories (BWI) are a key instrument for forest resource monitoring. The first national inventory took place in 1987, with a second inventory following in 2002 after Germany's reunification. The third BWI is being conducted in 2011 and 2012, the results of which will also form part of Germany's climate change reporting. BMELV annually publishes the national Forest Condition Survey, a periodical assessment of forest health and vitality, including the effects of airborne pollutants on forests and forest soils (e.g. acidification, nutrient balances). With a similar focus, BMELV likewise coordinates recurrent assessments of forest soils to gauge the cumulative effects of land-use change and the deposition of pollutants, a task necessitated not only by forest monitoring, but likewise by obligations arising from the Kyoto-Protocol and the Federal Law on Soil Protection⁴². Likewise related to the monitoring of forest health and stability is the nationwide network of permanent sample areas aimed at measuring air quality in forest eco-systems. Moreover, BMELV regularly publishes timber market statistics and economic data gathered by means of a network of pilot-enterprises⁴³.

Determining guiding principles and overall coordination of **public support to private and corporate forest owners** ranks among BMELV's key responsibilities, pursuant to the Federal Forest Act and the Law on the Common Task of Improving Agricultural Structures and Coastal Protection⁴⁴.

The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) performs a coordinating role – national as well as internationally – in regard to Germany's commitments emanating from both, the UNCBD (e.g. national reporting, implementation of the program of work on forest biodiversity) and UNFCCC (e.g. promotion of REDD+ measures and contributions to the Forest Carbon Partnership Facility, jointly with the Federal Ministry for Economic Cooperation and Development - BMZ). It spearheaded the develop-

⁴¹ BMELV (2004): Verstärkte Holznutzung zugunsten von Klima, Lebensqualität, Innovation und Arbeitsplätzen (Charta für Holz). Berlin

⁴² BMELV (2007): Zielsetzung und Konzeption der zweiten Bodenzustandserhebung im Wald. Berlin; pp. 8-9

⁴³ <http://www.bmelv.de/SharedDocs/Standardartikel/Landwirtschaft/Wald-Jagd/WaldBodenZustand/Holzmarktberichte.html>

⁴⁴ Gesetz über die Gemeinschaftsaufgabe "Verbesserung der Agrarstruktur und des Küstenschutzes" in der Fassung der Bekanntmachung vom 21. Juli 1988 (BGBl. I S. 1055), das zuletzt durch Artikel 9 des Gesetzes vom 9. Dezember 2010 (BGBl. I S. 1934) geändert worden ist Law on the Common Task of Improving Agricultural Structures and Coastal Protection (GAKG), <http://www.gesetze-im-internet.de/bundesrecht/agrstruktg/gesamt.pdf>

ment of Germany's National Biodiversity Strategy (NBS), and – jointly with BMELV – co-administrates the newly established Forest Climate Fund⁴⁵ (earmarked for, inter alia, climate change adaptation measures, preservation and rehabilitation of swamp forests, establishment of reference areas, promotion of forest carbon management, and research as well as knowledge management and knowledge transfer in reference to the foregoing items).

3.1.2.2 Forest Governance Structures and Organization at the State Level

Owing to historical reasons and Germany's federalist set-up, forest governance functions primarily vest in the German States. Here lie the roots of professionalism in forestry, and of the major influence of State Forest Administrations on forest management and forest sector development as a whole.

Dedicated sector-administrations in charge of forestry, staffed with qualified professionals acting in the capacity of public servants, are a relatively new phenomenon, with origins dating back to the late 18th and early 19th century⁴⁶. Before, forestry matters had mostly been co-administrated by either the demesnes administrations of territorial rulers, or economic sectors with a significant demand for, and dependency on wood as raw material or a source of energy (e.g. salt-works, mines etc.).

During those eras, **officials in charge hardly had any professional background in forestry**. They were recruited from the ranks of noble courtiers (often charged with hunting services), military officers, the fiscal services, or specialized economic fields such as mining. Until the mid-18th century, high-level positions in charge of forestry were almost exclusively reserved for nobles – a practice to be abandoned only during the 19th century's first half.

Such framework conditions did not facilitate the development of sustainable, science-based forest management, bred weak governance, corruption and the abuse of power, and contributed to widespread resentment among the rural population. Not only were public administrations of that time unable – or unwilling – to check the precipitous decline of forest resources, they likewise were regarded as oppressive agents of the respective territorial rulers.

Eventually, professionals of common descent gained access to the forest service, in parallel with the development of specialized public administrations and the rise of the civil servant.

Box 2: The Move towards Professionalism in Forestry

In 1717, the Margrave of Baden-Durlach appointed Friedrich Jacob Kissling, a commoner credited with the design of innovative forest inventory methods, to the position of “senior hunter” – according to legend, by saying:

“Listen, Kissling, I appoint you senior hunter in Pforzheim and direct you to take good care of my forests there, if you value your life. I might have appointed one of my cavaliers instead, but should he fail his duties, there would be little I could do. But you I could hang, should you prove dishonest”.

To which Kissling famously replied:

*“If your highness can find nobody else more deserving to hang, the gallows will remain empty”.*⁴⁷

⁴⁵ http://www.bmu.de/klimaschutz/nationale_klimapolitik/doc/47577.php

⁴⁶ Hasel, K. (1985): Forstgeschichte. Paul Parey, Hamburg / Berlin; pp. 132-151

⁴⁷ Ibid., p.142

Towards the end of the 18th century, **education in forestry** gradually attained academic status, through the establishment of specialized institutes. Georg Ludwig Hartig (1764-1837), Johann Heinrich Cotta (1763-1844), Friedrich Wilhelm Leopold Pfeil (1783-1859), Johann Christian Hundeshagen (1783-1834), Carl Heyer (1797-1856) and Gottlob König (1779-1849) all established forestry colleges, conducted forest research, and spearheaded the development of forest science as a discipline in its own right. Graduates of what was to become university-grade institutes of forest science henceforth provided the personal basis for the development of dedicated forest administrations.

State-level forest governance in present-day Germany vests in different **ministries**, reflecting the States' competence to organize and structure governments at their own discretion (see Table 4).

Public forest sector administrations of the German States are traditionally characterized by a complexly intertwined portfolio of political, executive, economic and social tasks, the respective significance of which has been (and continues to be) subject to changing political convictions, societal perceptions and values, and the ever diversifying demand for forest goods and services. Initially, public forest administrations served a dual purpose of (i) administering and managing state forests, and (ii) public supervision and law enforcement similar to a police force⁴⁸. Over time, their quasi-exclusive authority in regard to forests gave way to more integrated, cooperative, and service-oriented modes of forest governance. The emergence of spatial and land-use planning increasingly required forest authorities to engage in, and provide expertise on diverse kinds of spatial development with a likely impact of forests (settlement, industrial development, construction of public infrastructure). Growing environmental awareness, along with the emergence of dedicated authorities in charge of environmental protection and nature conservation likewise necessitated cross-sector coordination and collaboration. Moreover, growing societal pluralism and the emergence of civil society prompted State Forest Administrations to re-define both, their executive role and the choice of policy instruments. Direct, top-down enforcement of legal-regulatory norms gradually gave way to more flexible and participatory and less coercive approaches (e.g. stakeholder consultation, incentives, support, information and planning). In consequence, modern forest sector administrations gradually attained a role of service providers for forest sector stakeholders and society as a whole.

Given the differences between German States, forest administrations responded differently to the foregoing challenges, and adopted different organizational models. Most commonly, a dedicated department of a State ministry (see also Table 4) serves as the supreme forest authority in charge of all forest governance functions, with subordinate forest administrations at lower levels of State governance. Supreme forest authorities may likewise incorporate staff units such as educational services, R&D units, or State agencies for forest inventory and planning.

⁴⁸ Krott, M. (ed.): Strategien der staatlichen Forstverwaltung – Praxiserfahrungen im europäischen Vergleich 1991-2000. EFI Proceedings No. 40, 2001; p. 11

Table 4: The Forest Sector's Attachment to Governance Structures at the State Level

State	Ministry	Forestry
Baden-Württemberg	Ministry of Rural Areas, Food and Consumer Protection	Dept. 5 Forestry, State-owned Forest Enterprise ForstBW
Bavaria	Bavarian State Ministry of Food, Agriculture and Forestry	Dept. F Forests, Forestry and Forest Administration
Berlin	Senate Administration of Urban Development	Dept. 1E Nature Conservation, Landscape Planning & Forestry
Brandenburg	Ministry of Infrastructure and Agriculture	Dept. 3 Rural Development, Agriculture and Forestry
Bremen	Senator of Environment, Construction and Traffic	Section Environment, Dept. 30 Green Space Planning, Protected Areas, Ecological Agriculture, Forestry and Hunting
Hamburg	Senate Administration of Economy, Traffic and Innovation	Dept. A Agriculture
Hesse	Ministry of Environment, Energy, Agriculture and Consumer Protection	Dept. 6 Forestry and Nature Conservation
Lower Saxony	Ministry of Food, Agriculture, Consumer Protection and Regional Development	Dept. 4 Administration, Legal Affairs, Forestry
Mecklenburg-Vorpommern	Ministry of Agriculture, Environment and Consumer Protection	Dept. 2 Sustainable Development, Forestry and Nature Conservation
Northrhine-Westfalia	Ministry of Climate Protection, Environment, Agriculture, Nature Conservation and Consumer Protection	Dept. 3 Forestry and Nature Conservation
Rhineland-Palatinate	Ministry of Environment, Agriculture, Food, Viticulture and Forestry	Dept. 5 Forestry
Saarland	Ministry of Environment, Energy and Traffic	Dept. D-5 Forestry, Hunting and Fishery Dept. D-6 Private and Communal Forests, Supervision, Forests in Rural Areas
Saxony	Saxonian State Ministry of Environment and Agriculture	Dept. 3 Agriculture and Forestry
Saxony-Anhalt	Ministry of Agriculture and Environment	Dept. 4 Forestry, Nature Conservation and International Cooperation
Schleswig-Holstein	Ministry of Agriculture, Environment and Rural Areas	Dept. 5 Nature Conservation, Forestry, Hunting
Thuringia	Ministry of Agriculture, Forestry, Environment and Nature Conservation	Dept. 2 Rural Areas, Forestry

The attachment of forest sector administrations to State ministries underwent several changes over time: Initially, forest departments were often attached to State ministries of finance, and later transferred to ministries of agriculture and/or forestry. Reflecting changing societal perceptions about the significance of forests, forest departments in present-day Germany often form part of ministries in charge of environmental protection, rural/regional development and nature conservation. Local forest authorities may either exist as district forest offices, or may alternatively be merged into county-administrations (or county-level city governments). Bavaria established cross-sectoral administrations at the county-level (Offices for Food, Agriculture and Forestry - AELF).

However, the most basic distinction between States lies in the extent to which State Forest Administrations **combine different governance functions**: (i) administration and management of state-owned forests, (ii) optional co-administration and management of communal forests, (iii) application and enforcement of forest laws and related rules and regulations vis-à-vis non-state forest owners as well as the general public, and (iv) public support (advice, technical assistance, and funding) for non-state forest owners⁴⁹. As a general rule, owing to historic reasons, a regional distinction emerged between northern and southern German

⁴⁹ Nießlein, E. (1985): Forstpolitik – ein Grundriß sektoraler Politik. Paul Parey, Hamburg/Berlin; pp. 106-112

States: In northern Germany, Chambers of Agriculture (a type of corporation under public law) provide public support to private forest owners⁵⁰. In southern Germany, the concept of “**unified forest governance**” emerged during the 19th century, whereby District Forest Offices of the States’ Forest Administrations performed management, executive, and service functions in parallel.

This basic distinction remained valid until the mid-1990ies when, owing to political as well as financial reasons, State Forest Administrations all across Germany embarked on a course of **fundamental reform and restructuring**⁵¹. This process coincided with wider discussions about the role and mandates of state administrations at large, about public intervention in economic sectors, and a general desire to replace bureaucratic structures with “lean governance”⁵². The emerging reform of State Forest Administrations therefore applied concepts of “New Public Management”, seeking to raise the efficiency of public governance by adopting management principles common to the private sector⁵³. **Calls for the re-structuring of State Forest Administrations arose from three basic framework conditions**⁵⁴:

- Growing operational deficits, requiring additional funding from the States’ general budget; and corresponding calls for a separation of executive roles and entrepreneurial operations.
- Changing societal perceptions about forest management, with a distinct preference for ecological, protective, and recreational functions.
- Calls for more self-reliance and independence in the management of private and communal forests, particularly by means of strengthened self-governance and the promotion of forest owners associations.

Such initiatives never went unchallenged and rarely proceeded in a linear and straightforward fashion. Calls for a more production-oriented and economically focused conduct of state forest management met with widespread criticism and concerns regarding the continued provision of environmental and social services and functions. In some cases, civil-society coalitions challenged reform initiatives of the State governments by initiating public referenda⁵⁵. Even though, by 2005, most German States had accomplished (or were in the process of implementing) far-reaching reforms in regard to state forest management and administration:

- **Restructuring the management of State forests:** In Bavaria, Lower Saxony, and Mecklenburg-Vorpommern, the management of State Forests was entrusted to corporations under public law. The States of Saarland, Rhineland-Palatinate, Northrhine-Westfalia, Hesse, Saxony, and Saxony-Anhalt newly formed State-owned Enterprises – pursuant to their State Budgetary Regulations – for the management of State for-

⁵⁰ E.g. Lower Saxony: Art. 17 of the Law on Forests and Landscape Regulation (2009, as amended)

⁵¹ Meskauskas, E. (2004): Reformprozesse in staatlichen Forstverwaltungen. Dissertation, Universitätsverlag Göttingen; p. 1

⁵² Ibid., p. 2

⁵³ Krott, M. (ed.): Strategien der staatlichen Forstverwaltung – Praxiserfahrungen im europäischen Vergleich 1991-2000. EFI Proceedings No. 40, 2001; p. 11

⁵⁴ Nüßlein, S. (2005): Alles im Fluß – Forstreformen in der Bundesrepublik Deutschland. Deutscher Forstwirtschaftsrat (DFWR). Präsentation anlässlich der Konferenz „Forstreform – Chance der Zukunftsgestaltung?“. Evangelische Akademie Tutzing, 18.-20. Februar 2005

⁵⁵ In Bavaria, a coalition movement of environmental NGOs, the Confederation of German Trade Unions (DGB), small private forest owners and other groups launched a referendum against what they perceived as “privatization of forest governance” and a “one-sided preference for economic benefits”. The referendum, conducted in November 2004, missed the constitutional quorum by a slight margin – for further detail, see <http://www.nabu.de/themen/wald/hintergrundinfos/02686.html#1>

ests⁵⁶. Baden-Württemberg, in 2005, first integrated all separate sector administrations into the general governance structure of administrative regions, counties, and county-level cities, and likewise established a State-owned Enterprise for the management of State forests⁵⁷. Following the reorganization, State-forest enterprises have become financially independent with regard to the management of State-forests, and may accumulate capital from the proceeds of their commercial operations.

- **Streamlining administrative structures:** Most German States simplified their forest governance structure by adopting a two-tier system of supreme and lower forest authorities – and either disbanded middle-level administrative structures, or merged them into the regional administration. In parallel, all German States significantly reduced the number of Forest Management Units (FMU) and forest beats – along with a significant reduction of staffing levels.
- **Separating management, executive, and service functions:** A common denominator of the reform of State Forest Administration lies in the separation of functions, resulting in the emergence of new territorial structures to replace the “classical set-up” of district forest offices as agents of unified forest governance. In Bavaria, new territorial Offices of Food, Agriculture and Forestry replaced the traditional set-up of district forest offices. In Baden-Württemberg, executive functions of the lower State Forest Administrations were integrated into county-level governments. Saxony established 12 regional “forest districts”, each with separate functional units for State-forest management and services for private and communal forest owners.
- **Adopting new bookkeeping and financial controlling procedures:** Traditionally, State Forest Administrations (being part of the general public administration) applied single-entry bookkeeping systems designed to keep track of public cash-flows. With the establishment of State-owned forest enterprises largely independent from budget-funding, double-entry bookkeeping and financial controlling gained access to the public forest sector. This was primarily justified by the need for a more transparent management of finances, with separate calculations for commercial operations and public service functions. State-owned forest enterprises are likewise bound to publish annual performance records.

The restructuring of what used to be State Forest Administrations remains an ongoing process, subject to public scrutiny, and lingering criticism regarding actual performance in reference to the various reforms’ official goals⁵⁸. Critics maintain that the long-term nature of sustainable forest management, along with the need to mobilize forest management by private and communal forest owners, and multiple public service functions cannot be adequately reflected and addressed by lean and commercially focused State-forest enterprises. Similar concerns are voiced regarding the increased mechanization of forest management (with its resultant loss of employment opportunities, especially in structurally disadvantaged rural areas). Critics further challenge the realism of forecast cost-reductions, citing legal-regulatory requirements for state forest management with particular regard to public welfare⁵⁹. Re-

⁵⁶ Nüßlein, S. (2005): Alles im Fluß – Forstreformen in der Bundesrepublik Deutschland. Deutscher Forstwirtschaftsrat (DFWR). Presentation at the conference „Forstreform – Chance der Zukunftsgestaltung?“. Evangelische Akademie Tutzing, February 18-20, 2005

⁵⁷ Reger, M., Panknin, B. and Unthelm, H. (2010): Ziele und Organisation des Landesbetriebs ForstBW. AFZ-Der Wald, 15/2010; pp. 4-5

⁵⁸ Kaiser, B. (2008): Zu Tode reformiert? Anmerkungen zur Forstpolitik in Deutschland. Address to the convention of delegates of the Association of Forest Professionals, Northrhine-Westfalia (BDF-NRW), April 3rd, 2008.

⁵⁹ Bündnis 90/Die Grünen (2008): Wald ist mehr als die Summe seiner Bäume – Grüne Positionen zur Forstpolitik. For details, see www.reinhold-pix.de/wald-wild-und-fischerei/grune-positionen-zur-forstpolitik

sponding to such criticisms, State Governments seek to assess, and justify the course of ongoing reforms by commissioning external evaluations. The example of Bavaria displays a differentiated snap-shot image of the reform’s progress, achievements and weaknesses:

Table 5: Outcomes of the Reform of State Forest Administrations (example: Bavaria)⁶⁰

<p>Achievements</p> <ul style="list-style-type: none"> • SoFE successfully established • Restructuring almost completed • More efficient & transparent operations • Improved economic performance and productivity • Demonstrated sustainability of State-forest management in an exemplary fashion • Successful modernization of structures for timber production and timber marketing • Long-term forecast: 25-30 Mio. Euro annual profits for disbursement to the State budget 	<p>Weaknesses</p> <ul style="list-style-type: none"> • Political objectives achieved only in part (social dimension of SFM) • Internal conflicts and acceptance problems – particularly in regard to the reduction of forest beats and the new definition of service portfolios • Insufficiently clarified and quantified ecological and social objectives • Conflicts of interest between commercial & public service functions • Objectives for the establishment of new business areas (biomass for renewable energy) not yet achieved • Unrealistic expectations – forecast operating profit margin of 15 percent
<p>Required responses</p> <ul style="list-style-type: none"> • New sustainability concept with provisions for a strategic orientation on ecological & social goals • Added value through functional differentiation and optimized structures and processes • Risk-mitigation to integrate non-state forest management, with a view to avoiding market distortions • Expanded controlling of ecological and social functions to gauge progress in terms of forest transformation and biodiversity conservation • Strategic investment into equipment and infrastructure, human resources, forest health and stability; accumulation of cash-reserves 	<p>Risks</p> <ul style="list-style-type: none"> • Risks arising from climate change & the ongoing transformation of coniferous forests to more structurally diverse, mixed stands • High populations of game (cloven-hoofed ruminants) threaten the transformation of forests

As the reform of State Forest Administrations remains an unfinished process, subject to changing policies at the State level and driven by forces outside the forest sector (restructuring of general administrative systems and budgetary policies), its future direction and development are hard to anticipate.

3.2 China

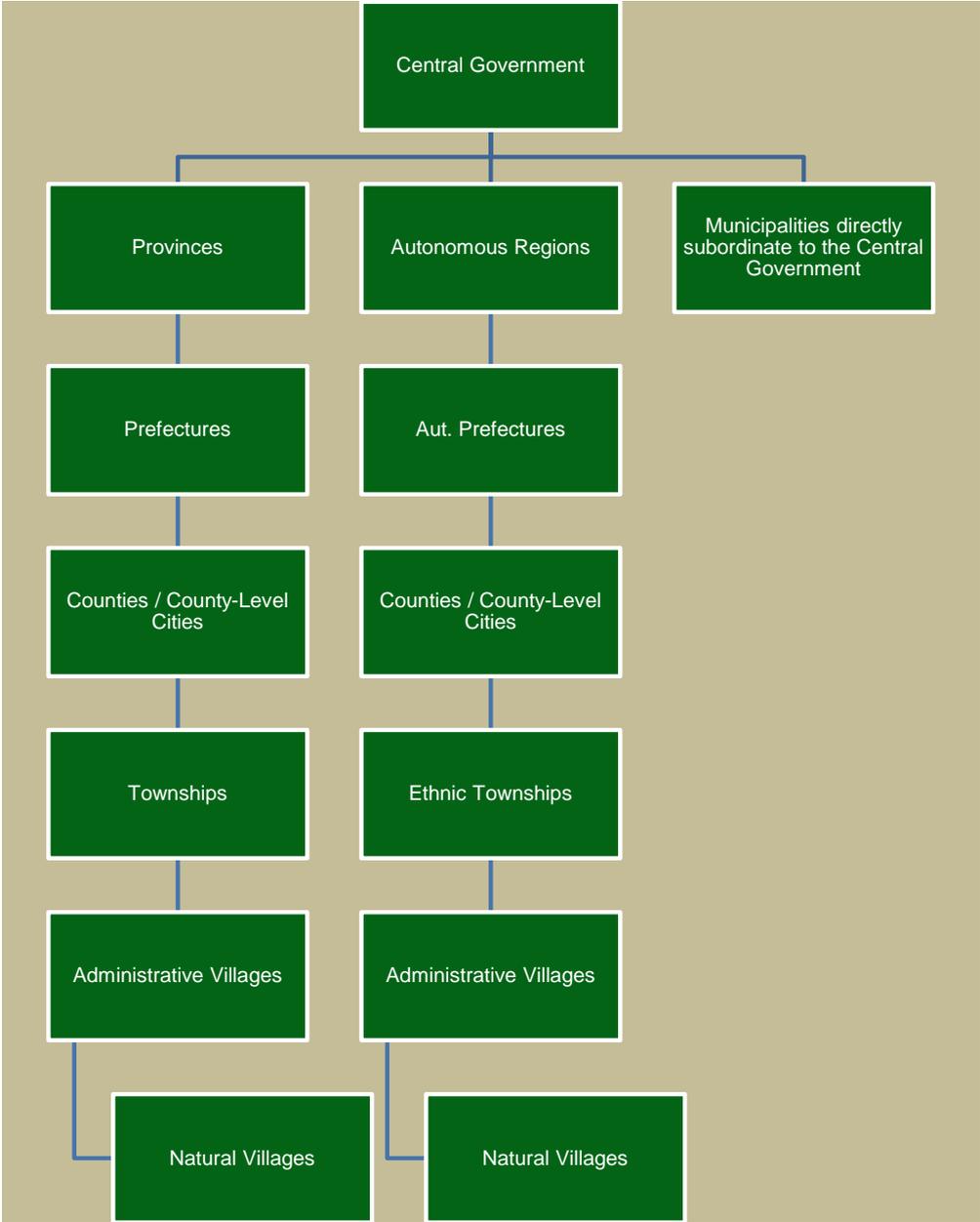
As shown already in the introductory overview of Chinese forest sector development trends, China is in the midst of a highly dynamic forest sector reform process. Its principal direction since the year 2000 may be characterized as China’s gradual move towards, and adoption of internationally recognized principles and protocols of sustainable forest management. This process takes place on a variety of fronts, foremost including the evolution of political, legal-regulatory, administrative, and (socio-)economic as well as fiscal framework conditions.

⁶⁰ BayStMELF (2010): Überprüfung der Forstreform – Erfolge der Forstreform festigen! Ergebnisbericht – ARF Gesellschaft für Organisationsentwicklung mbH, München/Nürnberg; pp. 17-25

3.2.1 Legal-Regulatory Basics

The P.R. China, by virtue of its Constitution (1982, as amended) is a “socialist state under the people’s democratic dictatorship” (Article 1), adhering to the “principle of democratic centralism” (Art. 3). Concurrently, China applies a multi-layered system of governance (Article 30).

Box 3: Governance Layers in China



Pursuant to Article 5 of the Constitution, China “exercises the rule of law, building a socialist country governed according to law”.

Starting in 1978, China embarked on a far-reaching process of economic liberalization and societal transformation (also known as “China’s opening to the outside world”). This process aims to transform China into a “socialist market-economy”. Therefore, while upholding in principle basic tenets of a socialist state, China gradually granted flexibility, legal security and decision-making rights to the private sector (including entrepreneurs and investors as well as rural households). Part and parcel of this transformation process is the recognition of private property, including in regard to means of production. Successive constitutional amendments

(1988, 1993, 1999, 2004) gradually institutionalized societal transformation, and provided a basis for comprehensive legal-regulatory reforms.

The Chinese forest sector is in the midst of a highly dynamic process of legal-regulatory development and review, aiming to harmonize China's legal-regulatory frameworks for forest governance and forest management with international processes and agreements. China is eager to benefit from the experience and lessons learnt of third countries⁶¹, as exemplified by the decade-long history of international cooperation in the forest sector. German technical as well as financial cooperation have played a crucial role in this regard and progressed to the point of promoting enabling political, legal-regulatory, organizational and socio-economic framework conditions of SFM in dialogue and collaboration with national level decision-makers⁶².

3.2.1.1 Constitutional Provisions – Constitution of the P.R. China

Several provisions of the Chinese Constitution refer to natural resources, including forests.

Article 9 introduces two basic categories of land ownership (state and collective) and provides for the "rational use" as well as protection of natural resources (including rare and endangered species of wild fauna and flora).

Similarly, Article 26 makes environmental as well as ecological protection and improvement a public duty, including public promotion and organization of forest protection and reforestation.

Numerous constitutional Articles address rights of access and use, rural land tenure, and benefit sharing. For details, refer to section 3.4.

3.2.1.2 The Forestry Law of the P.R. China

The Forestry Law of the P.R. China (1998, as amended⁶³) forms the centrepiece of forest sector legislation. It is structured into seven chapters, with a total of 49 Articles. First promulgated in 1984, the Forestry Law was last amended in 1998. Given China's active involvement in both, the 1992 United Nations Conference on Environment and Development (UNCED) and various forest-related multilateral post-Rio processes, it does not seem surprising that the Forestry Law well reflects sustainable development (SD) and basic tenets of sustainable forest management (SFM).

⁶¹ In 2006, the SFA Department of Policy and Legislation commissioned a comparative analysis of the legal-regulatory frameworks of 14 different countries, with a view to providing an input for the internal Chinese review of the State Forestry Law of the P.R. China. See also: Mann, S. (2006): Promoting the Reform of the Chinese Forest Law - Results of the Analysis and Comparison of a sample of Forest Laws. In: Chinese Academy of Forestry & Sino-German Program on Forests for Sustainable Development (eds.): Workshop on Comparative Study of Chinese and Foreign Forest Acts; Proceedings. Beijing.

⁶² Mann, S. (2009): Sino-German Technical Cooperation in China's Forestry Sector – Stewardship for global Public Goods. Deutsche Gesellschaft für technische Zusammenarbeit (GTZ) GmbH; Beijing.

⁶³ http://www.china.org.cn/environment/2007-08/27/content_1207457.htm

Table 6: Contextual Structure of the Forestry Law of the P.R. China

Chapter and Caption	Salient Provisions
1 General Provisions	<ul style="list-style-type: none"> • Forest protection, reforestation, sustainable use • Recognition of multiple forest functions • Distinction, and protection of land ownership and various types of resource property rights, registration of titles • Forest classification⁶⁴ • Logging quota system • Public forestry funds (e.g. afforestation fund, ecological benefit compensation) • Multi-layered forest governance system (from national to county level) • General obligation of the public to participate in afforestation programs
2 Forest Management and Administration	<ul style="list-style-type: none"> • Forest inventories and forest resource monitoring • Transfer of tenure rights in regard of commercial forests • Conflict resolution of tenure disputes • Long-term (strategic) forest sector planning and forest management planning at the level of FMUs or nature reserves • Protection of forests and forest land against conversion into other land-use types (quantitative protection of the permanent forest estate)
3 Forest Protection	<ul style="list-style-type: none"> • Decentralized mandates and responsibilities for forest protection against man-made and natural hazards • Appointment of forest guards with defined legal rights, to assist public security organs (including forest police services) • Protection of forests against fires, pests and diseases • Establishment of a protected area network (nature reserves) in natural or typical forest areas, habitats of rare and endangered species of wild fauna and flora, tropical forests • Prohibition of hunting of wildlife under state protection
4 Tree Planting and Afforestation	<ul style="list-style-type: none"> • Obligatory reforestation of areas surrounding public infrastructure, barren or waste-lands or other suitable areas • Expansion of forest cover as a universal obligation • Natural regeneration by means of cordoning off mountainous or hilly areas (“mountain closure”) • Establishment of tenure rights (resource property, management and use rights) by way of afforestation (<i>who plants, owns the trees established</i>)
5 Forest Felling	<ul style="list-style-type: none"> • Quota system: annual logging must remain below the annual increment; logging quota are to be locally applied for, consolidated by intermediate governance levels, and approved by the State Council • Unified and centralized national timber production plan at or below the approved logging quota • Restrictions on logging in line with local conditions, compulsory reforestation within one year • Prohibition of commercial logging (except regeneration and tending) in shelter forests and certain types of special use forests • Blanket prohibition of logging in historical sites or nature reserves • Logging permits required for any logging operations, to be issued by competent authorities upon inspection and approval of logging plans and further documentation • Transport permits required for moving timber out of forest areas • Protection of rare and endangered tree species, requirement of approval and clearance for exports of rare and endangered species or species subject to international law
6 Legal Liability	<ul style="list-style-type: none"> • Penal provisions and compensation rules against forest conversion, illegal logging, forest destruction • Safeguards against the abuse of power or negligence in forest governance
7 Supplementary Provisions	<ul style="list-style-type: none"> • Empowerment of the competent department of forestry under the State Council to enact executive regulations • Differentiated application of the Forestry Law in regard to ethnic minorities

⁶⁴ The Forestry Law distinguishes five basic functional categories of forests: shelter forests, timber forests, economic forests (dedicated to the production of non-timber forest products), fuel forests, and special use forests (including areas dedicated to the national defense, scientific research, landscape protection and nature conservation). In practice, these five categories are clustered as either commercial forests or ecological public benefit forests (EPBF).

China, pursuant to high-level decisions taken by the national government during the 1990ies (for details, refer to section 4.2.1.4) aims to reference her forest governance frameworks against internationally recognized principles and protocols of SFM. Viewed from this angle, the Forestry Law – however comprehensive – displays **several aspects that invite discussion**.

- Despite various references to the forest resources' multiple ecological and socio-economic functions and values, multi-purpose forest management (defined as the parallel pursuit of various forest functions in time *and* space) remains hard to achieve in practice. The categorization of forests as serving *either* commercial *or* protective and social purposes (“classified forest management”) amounts to a **spatial segregation of forest functions**.
- Classified forest management likewise perpetuates the sharp **distinction between “natural forests” and forest plantations**. Commercial timber production typically relies on a limited number of fast growing tree species, subject to **age-class management with short rotation periods**. Natural forests, on the other hand, are subject to various protection regimes. The notion of multi-purpose forest management with a focus on mixed and structurally diverse forest stands (selectively managed for the production of large-dimensional, valuable timber) continues to face serious obstacles.
- Chinese laws and regulations provide for a system of forestry funds (see Table 6), earmarked for reforestation after logging, and the compensation of “ecological public benefits”. The afforestation fund operates as a revolving fund, fuelled by surcharges levied on gross timber sales revenues. Forest management units receive area-based subsidies for the procurement of regeneration material, planting, and tending of young-growth within a defined period. Eco-benefit compensation likewise is an area-based subsidy, intended to compensate foregone revenues from forest production in Ecological Public Benefit Forests (EPBF) where commercial logging is either restricted, or prohibited outright. The operation of public forestry funds displays several critical features. First, **area-based (instead of performance-based) subsidies** are insufficiently tied to forest policy goals, and rather inflexible in practice. The afforestation fund fails to provide differentiated incentives for the establishment of mixed forests or the use of indigenous tree species. Second, administratively fixed rates for EPBF compensation – despite a recent increase to 10 RMB/Mu⁶⁵ in 2010 – remain **too low to provide a viable compensation for forest production revenues**. Neither does it provide an incentive for the protection of natural forests *by means of* sustainable use. Public funding support as yet does not ensure the economic viability of SFM to the extent desirable, nor does it sufficiently reflect the concept of **payments for environmental services (PES)**, including environmental protection, biodiversity conservation, or climate change adaptation and mitigation.
- Statutory provisions on (i) the logging quota system as well as (ii) the general requirement of logging permits for individual logging operations curtail flexible and locally based management decisions on the level of FMUs. SFM would require for logging operations to be based on the calculation of the annually allowable cut (AAC), determined in reference to an FMU's net-production area (based on forest function mapping and management zoning). The requirement for case-based logging permits tends to create **unnecessary red-tape and higher operational expenses** than management based on a publicly approved forest management plan.

⁶⁵ One Mu equals 667 m² (1/15 ha)

As of 2011, China's State Forestry Administration (SFA) is in the process of reviewing the Forestry Law. In April 2011, the SFA administrator reported to the standing committee of the National People's Congress on the progress of forest sector reforms. Representatives called for a swift amendment of the Forestry Law, which is likely to be completed within the 12th FYP period. The most pressing issues include (i) reform of the logging quota system, (ii) climate change mitigation & adaptation and (iii) giving more rights and freedoms to managers of commercial forests, while strictly protecting EPBF⁶⁶. Since 2006, a national guideline on SFM is under development and has reached an advanced stage. SFA is in the process of revising the logging quota system with the aim of allocating logging quota to FMUs on the basis of publicly approved FMPs with defined AACs⁶⁷, piloting in several provinces has already commenced. SFA likewise is in the process of drafting a new national guideline on EPBF management, aiming to introduce a more differentiated system with three classes of EPBF. Accordingly, strict protection shall apply to the first class, whilst in the second and third classes, selective management and non-consumptive forest uses (e.g. forest-based tourism) shall be promoted⁶⁸.

3.2.1.3 Other Laws of Relevance

The **Law of the P.R. China on the Protection of Wildlife** (2004, as amended⁶⁹) is closely related to biodiversity conservation and the establishment of protected area networks. The departments of forestry and the fisheries administration under the State Council are mandated to respectively govern the protection of terrestrial and aquatic wildlife (Article 7).

Table 7: Contextual Structure of the Law on the Protection of Wildlife

Chapter and Caption	Salient Provisions
1 General Provisions	<ul style="list-style-type: none"> Activities within the law' purview include protection (in-situ conservation), domestication and breeding (ex-situ conservation), development and utilization, scientific research State ownership of wildlife resources, state protection of the rights and interests of parties involved in development and utilization Multi-layered governance structure, including the department of forestry and the fisheries administration under the State Council (national level), departments of forestry administration under the governments of provinces, autonomous regions and municipalities under the Central Government (intermediate level), governance structures within autonomous prefectures, counties and municipalities (local level) to be determined by the intermediate level.
2 Protection of Wildlife	<ul style="list-style-type: none"> Classification and listing of wildlife resources: Special State Protection (classes 1 and 2 – lists to be approved by the State Council); State Protection of Species with beneficial properties, economic significance or scientific value (list to be promulgated by the SFA Dept. of Wildlife Protection); Special Local Protection (lists to be approved by intermediate level governments) Establishment of nature reserves for wildlife protection (national as well as intermediate level), and public environmental monitoring Requirement for EIAs for construction projects with a likely impact on wildlife protection Compensation of damages (e.g. crops) caused by wildlife to be compensated pursuant to regulations issued by intermediate level governments
3 Administration of Wildlife	<ul style="list-style-type: none"> Recurrent inventories and monitoring of wildlife resources Prohibition of (i) hunting wildlife under Special State Protection (exceptional permits to be issued for scientific, breeding or other special purposes), (ii) hunting within nature reserves, (iii) sales of wildlife under Special State Protection (exceptional permits to be issued for scientific, breeding or other special purposes) promotion of domestication and breeding of wildlife, subject to licensing; licensed breeders to market wildlife species through purchasing entities appointed by government; public supervision of sales (with specific restrictions on exports)

⁶⁶ SFA Department of Policy and Legislation – oral notice, May 31st, 2011

⁶⁷ SFA Department of Forest Resources Management – oral notice, March 12th, 2010

⁶⁸ SFA Department of Forest Resources Management – oral notice, June 2nd, 2011

⁶⁹ <http://www.lexadin.nl/wlg/legis/nofr/oeur/lxwechi.htm>

Chapter and Caption	Salient Provisions
	<ul style="list-style-type: none"> Local governments to take preventive action with a view to averting damage caused by wildlife and undue impacts on agriculture and forestry
4 Legal Responsibility	<ul style="list-style-type: none"> Various penal, compensational and administrative provisions against breaches of the provisions of the law Rights of appeal and legal redress
5 Supplementary Provisions	<ul style="list-style-type: none"> Prerogative of international treaties to which the P.R. China is a signatory party Empowerment of different governance levels to issue regulations for the enforcement of statutory provisions

From the angle of SFM, the Law on the Protection of Wildlife is noteworthy in several respects. First, the law unifies governance responsibility for both, forestry and wildlife (biodiversity) conservation under the State Forestry Administration and the intermediate as well as local forest authorities. Second, it stipulates compulsory EIAs for all development projects (infrastructural or otherwise) that might adversely affect wildlife protection. Third, it provides for the establishment of protected area networks which, given that most terrestrial wildlife occurs in forests (natural forests in particular) holds implications for forest management⁷⁰. Fourth, the law provides a basis for compensating damages caused by wildlife to croplands and forests, and obliges local governments to take preventive action against undue impacts on agriculture and forestry.

The **Environmental Protection Law of the P.R. China** (1989⁷¹) provides a unified legal basis for environmental protection. Within its purview are all natural resources, including – inter alia – forests, wildlife, and protected areas (Article 2). The law stipulates that environmental protection is to be mainstreamed into “*the national economic and social development plans*” (Article 4, in conjunction with Article 12). It establishes a multi-layered structure of environmental governance, consisting of the Ministry of Environmental Protection (MoEP), intermediate as well as local environmental protection administrations, and specific mandates for sector-administrations in related fields (including the forestry administration, charged with supervisory, monitoring and protection duties within its field of competence – Article 7). To this end, methodologies, criteria and standards for the assessment of environmental quality and the effectiveness of environmental protection are to be developed (Articles 9, 11, 14) as a means to promote environmental monitoring. The Environmental Protection Law provides for the protection of unique and representative natural ecosystems, including – inter alia – aspects of biodiversity conservation and the protection of major water sources (Article 17). It further safeguards areas under special protection (including nature reserves) against industrial development projects with a high risk of pollution, and subjects other development projects to tight technical and procedural specifications (Article 18). It likewise prescribes a general requirement for EIAs in regard to all development projects with a potentially high environmental risk (Article 13). Urban and rural development planning (i.e. spatial planning) by virtue of Articles 22 and 23 are bound to observe environmental protection (vegetation, water resources and natural landscapes in particular) in an integrated, holistic manner (cross-sector coordination). Similar to the Law on the Protection of Wildlife, the Environmental Protection Law references relevant international law by means of a prerogative for international treaties to which China is a signatory party (Article 46).

⁷⁰ Pursuant to Article 31 (3) of the Forestry Law of the P.R. China, nature reserves constitute logging exclusion zones.

⁷¹ <http://tradeinservices.mofcom.gov.cn/en/b/1989-12-26/8111.shtml>

The **Environmental Impact Assessment Act** (2003, as amended⁷²) aims to “prevent and mitigate the adverse impact of development activity on the environment in order to achieve the goal of environmental protection” (Article 1). Pursuant to Article 5, “*the development or use of land for agriculture, forestry, fisheries or livestock*” is subject to EIA requirements. This, however, does not apply to the management of existing forests, but rather to intended land-use changes (e.g. afforestation of hitherto unstocked areas).

The **Seed Law of the P.R. China** (2004, as amended⁷³) governs the selection, production, quality assurance and registration of regeneration material of agricultural crops and forest trees as well as related commercial utilization and marketing (Articles 1 and 2). With regard to forest tree species, the law confers governance authority on national as well as intermediate and local forest administrations (Article 3). The Seed Law prohibits seed collection or the felling of seed-trees except for research and other purposes mandated by the law, pending administrative approval (Article 8). Seed resources are state-owned (Article 10), to be managed pursuant to official plans and seed registries (Article 9). Research and selection are reserved for state-appointed entities (Article 11). The Seed Law provides for compensation to holders of tenure rights in the event that the establishment of seed-stands, trial sites etc. results in management restrictions and loss of income (Article 13). Production, distribution and use of genetically modified regeneration material is subject to safety assessments and public approval (Art. 14), requiring special labelling (Art. 35) and applying special provisions for the import of relevant material (Art. 50). Regeneration material is subject to obligatory examination and public approval (Article 15), with lists of approved varieties to be regularly updated and published (Article 16). Non-approved regeneration material may not be used or exchanged (Article 17). Seed production is based on a licensing system (Article 20), requiring applicants to demonstrate sufficient expertise, handling and disease control capacity, and economic capacity (Article 21). Seed operation, including handling and market transactions, likewise requires official licenses (Article 26), with an exemption for “*ordinary seeds produced by farmers*” (Article 27). Forest regeneration material to be used for publicly funded afforestation projects (e.g. establishment of shelterbelts) or by state forest farms or enterprises must consist of improved varieties as specified by competent forest authorities (Article 40), subject to national industry standards and quality assurance specifications (Article 43). Additional to numerous operational specifications, the Seed Law provides for detailed and comprehensive penal provisions (Articles 59 to 73).

The **Law of the P.R. China on Water and Soil Conservation** (1991, as amended⁷⁴) governs the prevention of, and rehabilitation after soil erosion caused by natural or man-made factors (Article 2). Highlighting afforestation as one of the principal preventive measures, the law stipulates the enlargement of forest cover (Article 12). It obliges collective as well as state-owned economic units to engage in afforestation and prescribes the closing off of sloped terrain for reforestation and recovery of grassland. Forest conversion in areas prone to erosion – particularly those with an inclination steeper than 25° - is prohibited (Articles 13 and 14). Logging operations are to observe local conditions, including tight restrictions on clear-felling and skidding as well as obligatory reforestation after logging, to be referenced in logging plans. Logging in protection forests (water and soil conservation, windbreaks, shelter forests etc.) is permissible only for rehabilitation purposes (Article 16). Site preparation prior to afforestation, tending of young-growth, and the cultivation of non-timber forest products must likewise observe water and soil conservation requirements (Article 17). Afforestation

⁷² www.lexadin.nl/wlg/legis/nofr/oeur/lxwechi.htm

⁷³ www.fdi.gov.cn/pub/FDI_EN/Laws/GeneralLawsandRegulations/BasicLaws/P020060620319148289365.pdf

⁷⁴ www.fdi.gov.cn/pub/FDI_EN/Laws/GeneralLawsandRegulations/BasicLaws/P020060620319780000472.pdf

likewise features as a principal means of rehabilitation in areas affected by wind erosion and desertification (Article 22).

The **Land Administration Law of the P.R. China** (2004, as amended⁷⁵) operates on the basic principle of socialist public land ownership (Article 1), based on either state or collective property (Article 2). It provides for the registration of ownership titles as well as for the issuance of ownership certificates, pursuant to sectoral legislation, including the Forestry Law (Article 11). The land administration law prescribes the contracting of collective land (“*shall be contracted*”) to members of the respective collectives for purposes such as farming, forestry or livestock production under a uniform 30 years’ term of title (Article 14). It likewise creates the options (“*may be contracted*”) of contracting out state-owned land to units or individuals, or collective land to non-members of the respective collectives – however, without specifying a term of title for either option (Article 15). Article 14 raises questions about **legal coherence and inter-normative harmonization**, considering that the Rural Land Contracting Law (2003, for details, refer to section 3.4) stipulates a term of tenure ranging from 30 to 70 years for the contracting of forest land. The Land Administration Law further prescribes procedures for the resolution of tenure disputes, ranging from negotiation to administrative arbitration and litigation (Article 16). Furthermore, the law places tight restrictions on land reclamation, and explicitly protects forest resources (Article 39).

Forest sector reforms in China, aiming to promote forest protection and sustainable forest management as well as the mobilization of domestic timber supplies (with a view to promoting the development of timber industries, socially equitable rural development, and the livelihood significance of forests) strongly emphasize the decentralization and devolution of resource tenure, management and use rights, and access and benefit sharing (ABS). Statutory laws enacted past the year 2000 (the **Rural Land Contracting Law – 2003** and the **Property Rights Law of the P.R. China – 2007**) are pivotal to this end. For details, refer to section 3.4.

3.2.1.4 The Regulatory Framework

Chinese sectoral laws as referenced in the foregoing sections are less specific and somewhat more programmatic than one would commonly expect from sectoral legislation. They tend to stipulate strategic commitments or “visions” rather than operational and directly applicable norms (as exemplified by Article 5 of the Forestry Law of the P.R. China: “*Forestry construction pursues the policy of universal forest protection, afforestation in a big way, combination of felling and cultivation and sustainable exploitation with afforestation as the basis*”; similar statements are to be found in Article 4 of the Law on the Protection of Wildlife). This cross-cutting characteristic of forest-related statutory laws firstly necessitates a **tightly woven regulatory framework** (regulations, codes of practice and technical standards, administrative directives etc.), and secondly leaves ample room for interpretation and **administrative action by competent branches of the executive**. This, of course, is consistent with the constitutional order, attaching a very prominent role to the executive on various governance levels.

Likewise, **high-level policy decisions** by the State Council as well as **strategic planning documents** (e.g. sector-plans derived from the FYP) may be considered part of the regulatory framework because they are immediately enforceable – exerting an impact on, and governing the actions of various stakeholders in the forest sector. For details, refer to section 4.2.1.4 and 4.2.2.

⁷⁵ www.fdi.gov.cn/pub/FDI_EN/Laws/GeneralLawsandRegulations/BasicLaws/P020060620320252818532.pdf

The regulatory framework pertaining to forestry operations as well as to nature conservation and environmental protection in a wider sense is **too broad and multi-faceted to be exhaustively covered within the report at hand**. It includes national norms as well as those promulgated by intermediate governments and sector administrations. Moreover, while authoritative translations of Chinese statutory laws are comparatively easy to obtain (either in print, or from the Internet), English versions of regulations, codes of practice, technical standards or administrative directions are few and far between. For these reasons, **only a sample of the most pertinent regulations may be featured at this juncture**.

Giving effect to relevant sector legislation, the **Regulation for the Implementation of the Forestry Law**⁷⁶ was adopted in 2000. Its structure closely resembles that of the Forestry Law, consisting of seven chapters (General Provisions, Operation and Management of Forests, Forest Protection, Tree planting and Afforestation, Forest Felling, Penal Provisions, Supplementary Provisions). The regulation adds further detail and procedural guidance to the corresponding provisions of the Forestry Law, in terms of, e.g. the legal definition of forests and forest land, forest governance mandates and responsibilities of various governance levels, forest resource monitoring, forest planning, determination and review of logging quota, issuance of permits for logging and transportation, forest tenure registration etc. The regulation itself makes reference to, and provides for the promulgation of further rules, technical standards and guidelines with a higher degree of resolution.

A similar **Regulation of the Protection of Terrestrial Wildlife** (1992⁷⁷) was enacted with a view to providing more detailed procedural provisions on wildlife protection (including inventories and species monitoring), hunting and catching of wildlife, breeding and domestication of wildlife species under state protection, administration and business operation, and penal provisions.

In 1993, the national **Regulation for the Management of Forest Parks** introduced forest parks as a category of protected forest areas, dedicated to the conservation of landscape resources and the promotion of forest based tourism. Forest parks are defined as areas with representative ecosystems, rare and/or endangered wildlife, or unique landscape features requiring special protection. Forest parks may be classified as being of either national, provincial or local (county level) significance. Their management and operation is governed by an Overall Plan for Forest Park Management, subject to the approval of Provincial Forestry Departments (PFDs). Pursuant to the Forest Park Design Code (1996), an elaborate zoning system with altogether nine management zones applies to forest parks, resulting in tight restrictions on (commercial) forest management. Where forest parks intersect spatially with regularly managed forest areas, the Overall Plan takes precedence over forest management plans.

In 2004, SFA issued the **Technical Regulation on the Continuous National Forest Inventory**, detailing standards for sampling, technical criteria, methodologies, data processing and statistics, quality assurance and publication of inventory results. Successive National Forest Inventories (NFI) form part of China's three-tier inventory system, consisting of NFI, forest management planning inventories (FMPI), and forest operation design inventories required for the issuance of logging permits⁷⁸.

⁷⁶ <http://www.asianlii.org/cn/legis/cen/laws/>

⁷⁷ <http://www.asianlii.org/cn/legis/cen/laws/rftiotpotw755/>

⁷⁸ Xiaokui, X. et al. (2011): Application of China's National Forest Continuous Inventory Data Base. Online Publication Environmental Management DOI 10.1007/s00267-011-9716-2, Springer Science and Business Media (http://research.iae.ac.cn/web/UploadFiles_6498/201108/2011083009531592.pdf)

FMPI are governed by the national **Technical Guidelines on Forest Resource Design and Survey** (2006), promulgated by the SFA in reference to both, the Forestry Law and the Regulation for the Implementation of the Forestry Law. The guidelines provide detailed specifications on, inter alia, organization of and qualification requirements as well as eligibility criteria for the conduct of forest management planning inventories, forest (land) and site classification, forest management zoning pursuant to the concept of classified forest management, forest resource assessment including the determination of the growing stock, statistics and mapping, quality assurance, and presentation of survey results. In 2009, SFA promulgated the **Code for Compilation and Implementation of a Forest Management Plan**, which – as of 2011 – remains a draft for field trials.

Forestry operations are governed by both, the national **Code of Forest Harvesting** (an Industry Standard of the P.R. China, promulgated by SFA in 2005⁷⁹) and the **National Code for the Ecological and Environmental Management of Industrial Plantations in China** (promulgated by SFA in 2009⁸⁰). Both documents apply to the planning, organization and implementation of forestry operations within their respective purview, in reference to a broad array of further related regulations, codes, and national standards.

Regulatory schedules annexed to, or referenced in the two aforementioned documents provide a vivid impression of the **complexity and comprehensiveness of the regulatory framework** pertaining to the forest sector.

⁷⁹ SFA (2005): Code of Forest Harvesting LY/T 1646-2005

⁸⁰ SFA (2009): The National Code for the Ecological and Environmental Management of Industrial Plantations in China – draft for approval as a national standard for the forestry sector, applicable for trial since October 1st, 2009

Table 8: Overview of Pertinent Regulatory Sources⁸¹

Type	Title (year of promulgation or reference code)
Operational Regulations	On prognoses and forecast of forest disease and insect pest (2002, as amended)
	On forest fire control (2008, as amended)
	Forest disease & pest control (1989)
	Land-use management (1999, as amended)
	Protection of terrestrial wildlife (1992)
	Operating of water & soil conservation (1993)
	Nature reserves (1994)
	Operating regulations on quarantine for animal & plants (1997)
	Protection of wild plants (1997)
	Safety regulations for dangerous chemical goods (2002)
Sector Regulations	Nature reserves for forest and wildlife (1985)
	On timber harvesting and regeneration (1987)
	Quarantine approval procedure for introduction of exotic species (1993)
	Registration of forest & forest land tenure (2001)
	Provisional regulation on quality supervision of forestation (2002)
	Comments to further intensifying control of forest pest by SFA (2005)
	Disposition on instant event of forest pest damage (2005)
Guidelines and Technical Standards	Construction Guideline of Eco-benefit Forest (GB/T18337.1)
	Technical standards for Construction Eco-benefit Forest (GB/T18337.2)
	Planning and Design Principles for Construction Eco-benefit Forest (GB/T18337.3)
	Safety Principles for Timber Logging and Transportation (GB/T14192)
	Afforestation Code (GB/T15776)
	Code of Closing Hillsides (sand) to Facilitate Afforestation (GB/T15163)
	Forest Tending Code (GB/15781)

The foregoing Table 8 is purely exemplary and **by no means exhaustive**. Its principal purpose is to illustrate the breadth and depth of the regulatory framework that forestry decision makers as well as practitioners need to observe in forest governance and forest management. Adding to the overall complexity is the fact that national regulatory documents may be further specified by provincial governments or sector administrations. Moreover, the highly dynamic nature of forest sector reform results in frequent amendments and revisions.

Combined, the foregoing factors amount to a **formidable forest governance challenge**, necessitating the cross-referencing of numerous regulatory sources, and placing forest practitioners at the risk of inadvertently breaching pertinent rules and standards. This problem is

⁸¹ Based on legal schedules referenced in the Code of Forest Harvesting and the National Code for the Ecological and Environmental Management of Industrial Plantations in China

widely understood, as shown by the following quotation from section 2 of the Code of Forest Harvesting: “*For the quoted documents with a noted date, any revision clauses or revision editions (not including the correction of printing errors) are not applicable to this code. But, it is encouraged that all the sides agreeing on this code discuss whether to adopt the latest editions of these documents or not. For the quoted un-dated documents, their latest editions are applicable to this code*”.

SFA currently is in the process of drafting a **National Guideline for Sustainable Forest Management in China** (2006, draft). This document has reached an advanced stage of development and is expected to be published shortly.

3.2.2 Organizational Frameworks – Forest Sector Administrations

Public governance in China takes place basically on six levels which together reflect the administrative structure of the P.R. China. These include, from top to bottom, the national government, the governments of provinces, autonomous regions and municipalities directly under the central government, prefectures, counties, townships, and administrative villages. Administrative villages commonly consist of several natural villages, with village leaders (e.g. village heads, accountants, party-secretaries, women’s leaders etc.) appointed from the ranks of the villages’ population. Unlike administrators at or above the township level (who draw regular salaries as civil servants), village leadership members receive public compensation for services rendered⁸².

The **State Council** is China’s highest executive body, consisting of the premier, vice premier, ministers and other members of cabinet rank⁸³. Several ministries’ portfolios include aspects of environmental protection and nature conservation and natural resources management. These include

- The National Development and Reform Commission (NDRC), tasked to promote sustainable development in a general and cross-cutting perspective, as well as to facilitate the coordination of policies to promote a resource saving economy as well as policies, plans and strategies supporting environmental protection and ecological improvement; and to coordinate China’s contribution to climate change mitigation and adaptation⁸⁴,
- The Ministry of Science and Technology (MoST), in charge of, inter alia, coordinating R&D efforts with a view to promoting rural development, social equity and the advancement of rural livelihoods⁸⁵,
- The Ministry of Land and Resources (MLR), responsible for the “planning, administration, protection and rational utilization of natural resources such as land, mineral and marine resources”⁸⁶,
- The Ministry of Environmental Protection (MoEP), in charge of environmental protection and nature conservation, including policy formulation, planning and strategy development, as well as the formulation of relevant laws and regulations⁸⁷,
- The Ministry of Water Resources (MWR)⁸⁸.

⁸² Xu, J. and Ribot, J. (2004): Decentralization and accountability in Forest Management – case from Yunnan, Southwest China. *European Journal of Development Research*, Vol. 16, No. 1

⁸³ http://www.gov.cn/english/2008-03/16/content_921792.htm

⁸⁴ <http://en.ndrc.gov.cn/mfndrc/default.htm>

⁸⁵ <http://www.most.gov.cn/eng/organization/Mission/index.htm>

⁸⁶ <http://www.mlr.gov.cn/mlrenglish/about/mission/>

⁸⁷ <http://english.mep.gov.cn/>

⁸⁸ <http://www.mwr.gov.cn/>

Forest governance in the narrower sense on the national level rests with the **State Forestry Administration of the P.R. China (SFA)**⁸⁹, an organization directly under the State Council⁹⁰. The SFA, first established in 1949 as the Ministry of Forestry and Farming, in 1998 emerged from the previous Ministry of Forestry⁹¹. According to its mission statement, SFA is “*the competent authority for China’s forestry*”⁹². It consists of main departments⁹³, numerous institutions directly under the SFA, and executing agencies for international conventions (CITES, UNCCD, RAMSAR).

Sub-national forest governance rests with the forestry departments of provinces (PFDs), autonomous regions and municipalities directly under the Central Government, regional forestry bureaus as well as forestry bureaus in (county-level) cities and counties (including the forest police service)⁹⁴. Township forestry stations represent the “grassroots level” of forest governance.

Part and parcel of forest sector reforms in China is the deliberate **separation of administrative and (commercial) forest management roles and responsibilities in state-owned forests**⁹⁵. State-owned forest areas are crucial in several respects: (i) many locate in ecologically sensitive areas, (ii) most nature reserves and forest parks have been established in state-owned forests, (iii) depending on their location, they may serve important functions beyond the forest sector (peri-urban forests, forests for defence purposes, trial-sites etc.)⁹⁶. Two categories of state forest management can be distinguished: State-owned forest enterprises (SoFE, 135 at present) in key-state owned forest areas of China’s northeast and Inner Mongolia), and state-forest farms (SFF, > 4,000) in other parts of China.

Aside from their respective sizes, a major distinction between SoFEs and SFFs lies in their administrative attachment to either SFA (as in the case of SoFEs), or the various PFDs (as in the case of SFFs). The management of state-owned forests faces two basic, closely related challenges: First, an “**ecological crisis**”, resulting from decade-long demand-driven exploitation and exhaustion of forest resources, and, second, an “**economic crisis**” materializing through operational deficits, lack of funds for investment, overstaffing, and generally poor living conditions of the workforce⁹⁷.

These challenges are the result of past decisions on rural settlement and industrial development. Following the establishment of the P.R. China in 1949, large numbers of unemployed workers and de-mobilized soldiers sought new occupations, while economic development required huge quantities of raw material, including timber and wood as a source of energy. Consequently, the central government proceeded to establish SoFEs in areas with abundant

⁸⁹ <http://english.forestry.gov.cn/web/index.do>

⁹⁰ http://www.gov.cn/english/2005-08/05/content_20790.htm

⁹¹ http://en.wikipedia.org/wiki/State_Forestry_Administration_of_the_People's_Republic_of_China

⁹² SFA (2001): Forestry in China. Beijing; pp. 4-5

⁹³ General Office, Dept. of Policy and Legislation, Dept. of Afforestation and Greening, Dept. of Forest Resources Management, Dept. of Wildlife Conservation and Nature Reserve Management, Department of Rural Forestry Reform and Development, Dept. of Reform of State Forest Enterprises, Forest Public Security Bureau/Office of National Forest Fire Prevention Headquarters, Dept. of Development Planning and Assets Management, Dept. of Science & Technology, Dept. of International Cooperation, Dept. of Human Resources, Party Committee, Bureau for Retired Officials Affairs; see also:

<http://english.forestry.gov.cn/web/article.do?cid=200911151026402848>

⁹⁴ Li, X. (1998): Forestry Policy in China – the past, present and future. Proceedings of the IGES International Workshop Forest Conservation Strategies for the Asia and Pacific Region (July 21st-23rd, 1998, Kanagawa, Japan); pp. 134-147

⁹⁵ <http://www.rightsandresources.org/espanol/blog.php?id=152>

⁹⁶ SFA Dept. of Reform of State Forest Enterprises; oral notice, June 1st, 2011

⁹⁷ SFA Dept. of Policy and Legislation; oral notice, May 31st, 2011

forest resources, thereby attracting rural settlement with urban structures, general administration, public infrastructure, social amenities, and even traffic infrastructure (including railways) run or administrated by SoFEs. By comparison, most parts of China outside key-national forest areas were effectively void of forest cover. Responding to reforestation needs, the central government very early initiated centrally coordinated reforestation programs – leading to the establishment of SFFs all across China (often in parallel with the establishment of CFBs), with the principal task of reforesting barren or non-used lands.

Faced with mounting economic as well as ecological problems related to the management of state-owned forests, the Chinese government initiated a comprehensive reform program with three salient aspects: (a) a **shift from exploitation to reforestation and forest management**, (b) **separation of management and governance functions**, and (c) **separation of social and public services as well as operational management**. The six national forest sector programs launched in 1998 (for details, refer to section 4.2.1.4) were, at least in part, motivated by the increasingly pressing problems associated with the management of state-owned forests. In 2006, the State Council resolved to initiate the contracting out of up to 60,000 ha of state-owned forests for non-state management (as an experimental measure), and – following general trends of decentralization – devolved direct control over SoFEs to provincial governments. In May 2010, the State Council resolved to conduct a comprehensive investigation of lessons learnt from previous trial-stages of the reform process. As part of its program of work under the 12th FYP, SFA intends to accelerate the reform of state-forest management from 2011 onwards⁹⁸.

⁹⁸ SFA Dept. of Reform of State Forest Enterprises; oral notice, June 1st, 2011



Figure 6: Local farmers converting to forest managers: Creating enabling framework conditions for SFM by smallholders requires not only for tenure security and decision-making rights, but likewise for public support to improve the value-added from forest production; Sanyanshu Village, Hunan Province. **Reference:** Dr. Mann



Figure 7: Chinese men on a lake in Huayanxi State Forest Farm, Hunan Province: SFM requires balanced considerations of productive, protective and social forest functions. Water protection forests safeguard valuable assets, e.g. fish resources for local residents. **Reference:** Dr. Mann



Figure 8: Stakeholder Participation in China: Forest management planning against the backdrop of Tenure Reform necessitates consultation of, and participation by smallholders. **Reference:** Dr. Mann

Forest Ownership

3.3 Germany

In a general perspective, German forestry has been traditionally characterized by its diverse ownership structure – rooted in history and pre-dating Germany's existence as a sovereign nation state. German concepts of ownership spring from the civil law tradition of Roman descent, where all incidents of ownership⁹⁹ are focused in the owner (with the exception of mineral resources and natural water-bodies). In regard to forests this means that forest ownership includes both, ownership of forest land and ownership of forest resources as well as forest infrastructure.

The overall forest-ownership structure in contemporary Germany is as follows:

Table 9: Forest Ownership Structure in present-day Germany¹⁰⁰

Ownership Category	Acreage [Mio. ha]	Relative share [%]
Federal	0,4	4%
State	3,3	30%
Corporate (i.e. municipal)	2,2	20%
Private	4,8	43%
Trusteeship	0,4	4%
Total	11,1	100%

Federally owned forests mostly locate on military installations and training grounds, as well as adjacent to Federal highways or water-ways. Their administration and management vest in the Federal Forest Service, a subsidiary branch of the Federal Agency of Real-Estate Management. From a forest sector perspective, their significance is marginal.

Contemporary **State forests** are the property of the 16 German States, with historical roots dating back to the middle-ages¹⁰¹. Emerging from the partition of the Franconian kingdom, the Holy Roman Empire of German Nations from the 10th century onwards applied the practice of granting fiefdoms to noble vassals and the clergy as a means of assuring their allegiance (the principal trait of the feudal social order). By the 13th century, distribution of imperial lands had effectively eroded the imperial authority, and resulted in the emergence of largely independent territorial rulers (the German princedoms). Hence, fiefdoms held in trust from the imperial crown gradually changed into quasi-exclusive property of a vast, and ever changing number of ruling dynasties. However, a qualitative distinction soon emerged between the seigniorship (i.e. properties associated with a ruler's sovereign authority), and the allodial property of a ruling family (i.e. their exclusive property).

From the 18th century onwards, subject to changing values and beliefs during the age of enlightenment, this distinction became even more pronounced. When, following Germany's defeat in the First World War, ruling dynasties were forced to abdicate, and replaced by republican governments, the newly formed German States claimed the seigniorship as public

⁹⁹ "Ownership" is commonly understood as *the exclusive legal right to a thing*, its incidents being (i) the right to possess, (ii) the right to exclusive use, (iii) the right to manage and / or dispose of property, (iv) the right to security, (v) the absence of term, and (vi) liability to execution.

¹⁰⁰ BMELV (2009): Waldbericht der Bundesregierung. Berlin; pp. 37-38

¹⁰¹ Hasel, K. (1985): Forstgeschichte. Paul Parey, Hamburg / Berlin; pp. 65-67

property – the States' forests. By contrast, allodial estates largely remained the exclusive property of the former ruling dynasties. What eventually became State Forest over time has been enlarged at several instances: Following the onset of religious reformation in the 16th century when territorial rulers seized land properties of the clergy, and likewise in the early 19th century during the Napoleonic era (following the demise of the Holy Roman Empire of German Nations, and the subsequent restructuring of territories in the French-dominated western parts of Germany).

Present-day **Corporate Forests** (communal forests) are owned, for the most part, by “territorial corporations under public law”. Simply put, they are assets owned by cities, townships and municipalities, subject to the constitutional privilege of communal self-governance (see section 3.1.1.1). Corporate forests rank among the oldest categories of forest property in German-speaking parts of Central Europe¹⁰², dating back to the Carolingian era of the Franconian kingdom. Franconian laws of the 7th century already refer to “*silva communis*”, denoting forests used collectively by the inhabitants of a given village.

The territory occupied by villages during the medieval period was typically sub-divided into three zones: (i) the village settlement, (ii) arable land tied to individual farmsteads, and (iii) the “commons” – a more or less densely forested area used collectively for livestock grazing and the harvesting of timber, fuelwood and other forest products. The emergence of village communities as self-governing bodies was closely tied to the dynamics of the medieval settlement, and only growing scarcity of land eventually necessitated the demarcation of village boundaries. Depending on whether or not village territories located in areas claimed by a noble overlord, village communities enjoyed varying degrees of discretion in settling their own affairs – including the right to regulate access and use of the commons. Throughout the middle-ages and the renaissance period, communal self-governance continually diminished to a point where virtually all authority and control over village resources (including forests) became vested in the landed gentry. Such developments facilitated **negligent use and widespread devastation of the commons**.

The age of enlightenment and the emerging influence of liberalism identified common property as one of the underlying causes of the destruction of communal forests¹⁰³, and consequently strove to solve the problem by dividing the commons among the village households. Another option was to transfer the commons into the custody of the emergent communal governments, i.e. public bodies charged with various self-governance functions and the administration of communal assets.

Such strategies were highly regionalized, explaining – in part – the characteristic pattern of forest ownership in present day Germany. While some regions (e.g. Bavaria¹⁰⁴, Hanover, Saxony¹⁰⁵) proceeded to divide communal forests on a massive scale (resulting in a high percentage of private smallholdings), others favoured communal forest governance (e.g. Baden-Württemberg¹⁰⁶, Rhineland-Palatinate¹⁰⁷).

¹⁰² *Ibid.*, pp. 89-97

¹⁰³ *Ibid.*, p. 94: „*quod communiter geritur, communiter neglegitur*“ – what is commonly owned falls victim to common negligence; this phenomenon is widely referred to as the “tragedy of the commons”, see also Hardin, G. (1968): The Tragedy of the Commons. Science, Vol. 162, No. 3859

¹⁰⁴ http://www.forst.bayern.de/forstpolitik/wald_in_zahlen/28096/index.php

¹⁰⁵ <http://www.forsten.sachsen.de/wald/131.htm>

¹⁰⁶ <http://www.forstbw.de/landesbetrieb-forstbw/wald-im-land/zahlenwunder/waldbesitzarten/>

¹⁰⁷ <http://www.wald-rlp.de/index.php?id=187>

Table 10: Regional Differences between Private and Corporate Forests in four German States

Ownership Category	Bavaria	Baden-Württemberg	Rhineland-Palatinate	Saxony
Federal	2	1	2	6
State	30	24	26	39
Corporate (i.e. municipal)	10	38	47	8
Private	58	37	25	
Trusteeship	0	0	0	47
Total	100	100	100	100

Private forests in themselves constitute a highly diverse ownership category. It first emerged from the distinction between the seignior and the allodial property of territorial rulers; taking the form of private – exclusive – property of noble families and providing them with a significant source of revenue. Up until the foundation of the first German republic in 1919, private forest owned by the landed gentry frequently remained subject to certain restrictions intended to secure their continued function as a basic source of their proprietors' welfare (e.g. prohibition to sell, divide, or mortgage forests). Political changes affecting the status of noble elites consequently also had an impact on their forest property. The restructuring of German territories under French influence during the early 19th century meant that numerous smaller German princedoms ceased to exist as sovereign territories, while others grew at the expense of their lesser neighbours¹⁰⁸. To compensate former territorial rulers for their loss of status, they received assets (including lands and forests) which had previously been confiscated from the clergy¹⁰⁹. These developments occurred particularly in the western and southern German territories as had fallen under French dominance shortly after the year 1800 (Baden, Württemberg, Bavaria). The abolishment of the German monarchy following the First World War heralded even more momentous changes for the landed gentry and the large estates they owned. However, the constitution of what has become known as the "Weimar Republic" protected private property, placed tight restrictions on expropriation, and mandated compensation. This assured the continued existence of large private forests throughout the tumultuous post-war period. A similar situation developed following the German defeat in the Second World War, when the victorious allies within their respective zones of occupation proceeded to effect land reforms. However, post-war frictions between the Soviet Union and her western allies set off eastern and western parts of Germany on divergent courses of development. The foundation of the Federal Republic of Germany in 1949 once more assured continuity for forest ownership in west-German States, by virtue of the Basic Law's constitutional order. By contrast, east-German states under Soviet occupation experienced a radically different development, with land reforms initiated by the Soviet military administration past 1945¹¹⁰, and the establishment of the "German Democratic Republic" in 1949. Emulating the example of the Soviet Union, private estates larger than 100 ha were summarily expropriated without compensation, and agricultural lands as well as forests initially distributed among smallholders and landless refugees from Germany's eastern provinces. From 1952 onwards, collectivization resulted in the establishment of agricultural cooperatives, which henceforth also managed collective forests (subject to supervision and control by District Forest Offices). From 1976 onwards, State Forest Enterprises attained exclu-

¹⁰⁸ Mediatization

¹⁰⁹ Secularization

¹¹⁰ Küster, K. (2004): Entwicklung der land- und forstwirtschaftlichen Arbeitsverfassung in Ostdeutschland – Konsequenzen für die heutige Arbeitswelt. In: Lewark, S. & Kastenholz, E. (eds.): Wald Arbeitspapier No. 5, Institut für Forstbenutzung und forstliche Arbeitswissenschaft, Freiburg i. Br.; pp. 4-5

sive control and management authority over virtually all forests in east-Germany¹¹¹ (see also below section on forests under public trusteeship).

Ever since the emergence of sustainable forest management on a scientific basis, **large private** forest estates have been characterized by their spatial consolidation and professional management by private forest enterprises, staffed with fully qualified forest professionals and operating on terms similar to those of state forests. In present-day Germany, they continue to operate in this fashion – resulting from legal requirements to employ professional foresters and to manage forests in line with periodical as well as annual forest management plans (see Table 3, Art. 20 Baden-Württemberg and Art. 11 Mecklenburg-Vorpommern).

A second category of private forests – dominant in terms of both, the total area and the number of proprietors involved – are **private smallholdings** typically attached to farming households (farmers' forests). Unlike larger private forest estates, smallholdings of this kind are a relatively new phenomenon, first emerging during the late medieval settlement in hitherto unsettled mountainous or otherwise remote areas¹¹². The share of smallholder forests grew significantly also during the late 18th and early 19th century, in parallel with the division of village commons (see foregoing paragraph on corporate forests).

Smallholder forestry has traditionally been characterized by its specific outlook on forest ownership and forest management. To begin with, smallholdings in their vast majority comprise of less than 5 ha forest – an area too small to enable either continued forest management, or to sustain the forest owner's livelihood. Fragmentation, spurred by distribution among heirs and co-heirs, is a characteristic trait and structural challenge of farmers' forests in Germany. Next, forest smallholdings thus provide **supplementary income** only, and typically serve as a kind of **private savings-bank**. Farmers tend to manage their forests seasonally, depending on the workload of farming operations. Domestic consumption of timber and fuelwood likewise are an important aspect of smallholder forestry. Unlike large private forest estates which, owing to tradition as well as to legal-regulatory requirements, have, for the most part, been professionally managed by qualified forest personnel, forest smallholdings are typically managed by non-professionals lacking explicit knowledge, skills, and specific machinery.

Moreover, smallholder forestry is particularly susceptible to **societal and economic change**, especially in terms of the development of the agricultural sector. Agricultural concentration processes, ongoing for decades, radically affected the historically close ties between smallholder forestry and agriculture. Interestingly, smallholders who cease farming operations tend to remain closely attached to their forest property – resulting in the emergence of what has been dubbed "**urban forest owners**"¹¹³. Estimates from Bavaria suggest that, by 2030, as much as 60 percent of forest smallholders may have lost their traditional ties with agriculture. Such developments herald significant forest-political challenges – not only in terms of growing needs for advisory support, technical assistance, and management associations to ensure sustainable management of forest smallholdings, but likewise in regard to the mobilization of wood-resources growing in private forests¹¹⁴.

¹¹¹ Ibid.; pp. 28-29

¹¹² Hasel, K. (1985): Forstgeschichte. Paul Parey, Hamburg / Berlin; p. 89

¹¹³ Krause, E. (2010): Urbane Waldbesitzer – Analyse der Perspektiven Bayerischer Beratungsförster und nicht-bäuerlicher Waldbesitzer zum Thema urbane Waldbesitzer anhand motivationspsychologischer Theorien. Dissertation, Wissenschaftszentrum Weihenstephan für Ernährung, Landnutzung und Umwelt, Technische Universität München; p. 1

¹¹⁴ Wippel, B., Becker, G. & Borchers, J. (2008): Holzmobilisierung im Kleinprivatwald – Ergebnisse der Pilotprojekte in Eifel und Lausitz. Abschlußbericht, Holzabsatzfonds, Bonn; p. 22

Finally, **forests under public trusteeship** deserve mentioning as a **unique and transitory phenomenon** resulting from the history of east-German States during the 20th century's latter half. Following the peaceful revolution of 1989 and the demise of the "German Democratic Republic", the German States of Brandenburg, Mecklenburg-Vorpommern, Saxony, Saxony-Anhalt and Thuringia were re-established. Simply put, Germany's re-unification in 1990 meant the restored east-German States' accession to the area of application of the Federal Republic of Germany's Basic Law. Consequently, east-German States not only enacted State Forest Laws subject to the framework provisions of the Federal Forest Act, but likewise strove to **restore their historically diverse forest ownership structure**. While this was comparatively easy in regard to State and communal forests, the restoration of private forests created considerable challenges¹¹⁵.

A simple process of restitution proved impossible due to the fact that post-war land-reforms, for political reasons, were not reversed. Consequently, forest estates with a territory smaller than 100 ha in 1945 were eligible for restitution, as were smallholdings resulting from the distribution of expropriated estates larger than 100 ha (provided that claimants undertook to engage in agriculture and/or forestry). Former owners of large private estates remained excluded from restitution, but became eligible for the purchase of their former property at preferential conditions, pursuant to the Laws on Unresolved Property Claims¹¹⁶ and Compensation and Settlement of Claims¹¹⁷. Further problems arose from claims filed by persons who had fled the territory of the "German Democratic Republic" prior to 1989, resulting in the forfeiture of their property. The dissolution of rural collective units ("agricultural production co-operatives", de-collectivization) likewise proved difficult.

With a view to enabling an orderly transition process, settling conflicting claims and mitigating conflicts, and compensating past injustices, a trusteeship organization was established in 1990, mandated to settle property claims. Its subsidiary body, the Federal Land Administration and Disposal Ltd.¹¹⁸ (founded in 1992), is tasked to dispose of agricultural and forest areas subject to unresolved property claims by means of either **restitution** or **privatization**.

Initially, forests under trusteeship awaiting privatization or restitution were either contracted out for management by the restored State Forest Administrations of east-German States, or leased out for management by third parties. By the end of 2009, roughly 600,000 ha of forests had been privatized, and ca. 200,000 ha restored to their former owners¹¹⁹. Forests under trusteeship – as a separate ownership category – will eventually vanish and be replaced by private property.

3.4 China

Prior to the founding of the P.R. China in 1949, lands and forests were, for the most part, privately owned by either landlords or more affluent farmers^{120 121}. After 1949, China em-

¹¹⁵ Küster, K. (2004): Entwicklung der land- und forstwirtschaftlichen Arbeitsverfassung in Ostdeutschland – Konsequenzen für die heutige Arbeitswelt. In: Lewark, S. & Kastenholz, E. (eds.): Wald Arbeitspapier No. 5, Institut für Forstbenutzung und forstliche Arbeitswissenschaft, Freiburg i. Br.; pp. 13-17

¹¹⁶ Gesetz zur Regelung offener Vermögensfragen (VermG, 2009, as amended)

¹¹⁷ Entschädigungs- und Ausgleichsleistungsgesetz (EALG, 2005, as amended)

¹¹⁸ <http://www.bvvg.de/>

¹¹⁹ <http://www.bvvg.de/INTERNET/internet.nsf/HTMLST/GRUNDSAETZE>

¹²⁰ Liu, J. (2009): Reconstructing the History of Forestry in Northwestern China, 1949-1998. *Global Environment – A Journal of History and Natural and Social Sciences*; No. 3, 2009; Naples; p. 197

barked on a fundamental land reform, including expropriation and subsequent re-distribution of real estate properties to the rural poor, i.e. landless farmers (1950-1953).

This process proved short-lived and was superseded by **rural collectivization** past 1953, a process resulting in the establishment of rural collective economic units. From 1958 onwards until the inception of policy reforms past 1979, collectivization was further intensified through the establishment of rural communes, claiming exclusive tenure over land and natural resources in line with the enforcement of a strictly regulated, centrally planned economy.

Following the onset of what has since become known as China's "open-door policies" (also: "China's opening to the outside world" – a program of economic liberalization, decentralization and gradual devolution of decision-making rights), de-collectivization policies were first introduced to the agricultural sector. Demonstrated success in terms of improved livelihoods and a marked increase in agricultural production motivated the application of similar policies also to the forestry sector (albeit on an experimental scale). The 1981 State Council Resolution on "Issues concerning Forest Protection and Development" introduced the "**Three-Fixes Policy**", simultaneously aiming to (i) settle forest land ownership claims between the state and collectives, (ii) allocate management and use rights over forests to private households, and (iii) promoting forest management with clear mandates and responsibilities. However, mounting concerns over rapid forest destruction in 1987 caused the Chinese government to temporarily suspend, and reconsider its forest tenure reform agenda¹²².

In 2003, a **unified statutory basis** pertaining to cropland, forests and grassland was adopted (the Rural Land Contracting Law, for details see below), and the State Council and the CPC Central Committee issued a joint resolution "On accelerating Forestry Development"¹²³. Besides reconfirming continuous implementation of the six national forest programmes and highlighting the Chinese government's commitment to restructuring national timber industries, the joint resolution added several strategic foci to forest sector development. It emphasized the need for legally secure resource tenure by farmers and private investors and promoted non-state forest management, it called for organisational restructuring of state-owned forest enterprises as well as for a clear separation of administrative roles and management, it emphasized further decentralisation of forest governance, and proclaimed the government's continuing commitment to the promotion of sustainable forest management by means of state support schemes, tax preferences and similar incentives, legal reform and standard-setting, and the promotion of forest certification. Both, the Rural Land Contracting Law and the State Council and CPC Central Committee Joint Resolution proved instrumental for the resumption of forest tenure reform in its present-day setting.

De-collectivization of forests emerged along three basic avenues: It started with the allocation of small "family plots" for subsistence purposes, providing full resource ownership rights (similar to those of trees planted on homesteads). So-called "responsibility forests" were subsequently allocated through a bidding process, involving resource property rights with a fixed term. "Contracted forests" emerged from the allocation of barren land to farming house-

¹²¹ Zhang, Y. (undated): Relative Scarcity, Institutions and China's Environment – Special Reference to the Forest Sector. Faculty of Forestry, University of Toronto (undated Web-Publication: <http://www.cerdi.org/uploads/sfCmsContent/html/192/Zhang.pdf>); p. 10

¹²² Liu, J. and Zhao, L. (2009): Have decollectivization and privatization contributed to sustainable forest management and poverty alleviation in China? Forest Policy and Institutions Working Paper, Food and Agriculture Organization of the United Nations (FAO), Rome; p. 13

¹²³ Li, S. (2006): The reform of Property Rights in China. State Forestry Administration of the P.R. China; Beijing.

holds for reforestation, likewise by means of bidding (against the backdrop of the Four Wastelands Policy past 1993)¹²⁴.

Present-day China avails of an **interlocking legal framework** pertaining to rights of tenure over land and natural resources, including forests. Its emergence reflects trends of development since 1949, which are marked by successive policy shifts and societal transformation. Consequently, tenure rights to land and natural resources underwent successive stages of reform.

Pursuant to Article 9 of the **Constitution of the P.R. China**, “*all mineral resources, waters, forests, mountains, grassland, unreclaimed lands, beaches and other natural resources are owned by the state ... with the exception of the forests, mountains, grasslands, unreclaimed lands and beaches that are owned by collectives in accordance with the law*”, subject to protection and rational use. Article 13 protects the Chinese citizens’ right to own “*lawfully earned income, savings, houses and other lawful property*”, including the right to inheritance. Members of rural collectives, by virtue of Article 8¹²⁵, are entitled to “household contract management” on cropland and hilly lands allocated for private management and use. Article 10 stipulates that land may be requisitioned only in the public interest, according to law and subject to compensation¹²⁶.

The **Forestry Law of the P.R. China** (1998, as amended) holds numerous provisions on forest tenure:

Table 11: Tenure related Provisions of the Forestry Law of the P.R. China (1998, as amended)

Article	Provisions
1	Livelihood significance of forests as a justification of multi-purpose forest management
3	<ul style="list-style-type: none"> Individual ownership of forest resources and individual use-rights to forest areas; Registration and certification of tenure rights
7	<ul style="list-style-type: none"> Legal protection of “legitimate” tenure rights of farmers against any forms of infringement, including illegal collection of fees, fines and unlawful fund-raising; Legal protection of the collectives’ right to enter into contracts for afforestation
15	<ul style="list-style-type: none"> Tenure rights may be transferred (including to shareholding or cooperative bodies, as well as to joint-ventures) in regard to timber forests, economic forests and fuel-wood forests only; Effective logging permits may be simultaneously transferred
17	<ul style="list-style-type: none"> Resolution of tenure disputes must be sought according to effective laws; Parties to a dispute who reject settlement by local governments enjoy the right to legal redress; Logging in disputed forest areas is prohibited

Article	Provisions
27	<ul style="list-style-type: none"> Forests planted by collectives are owned by the said collectives; Trees planted by individuals on homesteads or areas allocated for management and use shall be owned by the said individuals; Where collectives or individuals reforest state-owned or collectively owned barren hills or wastelands under contract, the contractors enjoy ownership of the ownership of trees,

¹²⁴ Nolte, C. (2008): Property Rights and Payments for Watershed Services from Forests in China: An exploratory Case Study of Beijing’s Miyun Reservoir. Master Thesis, Humboldt University, Berlin; p. 21

¹²⁵ As amended, 2nd Session of the 9th NPC, March 15th, 1999

¹²⁶ As amended, 2nd Session of the 10th NPC, March 14th, 2004

Article	Provisions
	subject to contractual provisions
32	<ul style="list-style-type: none"> • Rural inhabitants felling trees locating on their homesteads or areas allocated for subsistence purposes are exempt from the universal requirement for logging permits; • Permits for logging in collective forests shall be issued by competent forestry departments at the county level; • Permits for logging in forests subject to individual tenure rights shall be issued by competent forestry departments at either the county, village or township level, subject to applicable regulations;

Provisions illustrated in Table 11 are noteworthy in several respects:

- The Forestry Law of the P.R. China clearly **separates land-ownership and ownership of forest resources**;
- The Forestry Law of the P.R. China provides for a **differentiated and diverse system of forest tenure**;
- The concept of forest tenure reform implies the establishment of full **resource property rights**;
- The Forestry Law of the P.R. China applies the principle that forest tenure – i.e. property rights in regard to forest resources – may be established through investment in reforestation; that is to say that groups or individuals undertaking to reforest barren lands or waste lands thereby establish forest resource property rights.

China past the year 2000 proceeded to enact statutory legislation intended to provide a legal framework for the ongoing tenure reform process. In 2003, China promulgated the **Rural Land Contracting Law**, establishing a unified basis for the assignation of tenure rights in regard to collectively owned agricultural lands, forests and grasslands. It is based on “decentralised management” as a means of (i) promoting long-term tenure security of peasants, (ii) safeguarding legitimate rights of third parties, and (iii) promoting rural development and social stability (Art. 1). The statute applies to collectively owned arable land, forests and grassland (Art. 2). “Household Contracts” are stipulated as the principal means of decentralised management, save in exceptional circumstances where other instruments apply (Art. 3, in conjunction with Articles 44-50).

The Rural Land Contracting Law preserves the collective land ownership of lands within its purview, and confers the authority to establish household tenure upon Village Committees or Collective Economic Organizations occurring within a village, depending on the circumstances (Art. 12, 1st paragraph). Transferring tenure by means of Household Contracts is to be based on a Contracting Plan, subject to the consent of the Village Assembly or villagers’ representatives (two-thirds majority quorum, Art. 18 [3]). Contracts are to be registered by People’s Governments at or above the County Level, and contractors are entitled to receiving a certificate of title (to be issued, in the case of “Forest Ownership Certificates” by the relevant forest authorities, subject to notification of the concerned local governments – Art. 23, 1st paragraph, in conjunction with Art. 3, 2nd paragraph of the Forestry Law of the P.R. China). Holders of Household Contracts (i.e. Peasants living within the Collective handing out the Household Contracts, Art. 15) may, for the purpose of more efficient management, “pool” their respective tenure rights by way of establishing cooperative or share-holding arrangements (Art. 42 of the Rural Land Contracting Law of the P.R. China – whereas this clause explicitly refers to agricultural production only, one may assume that it applies, by way of analogy, also to forests and grasslands).

From the perspective of the report at hand, *the principal feature of interest* is that tenure rights established by means of Household Contract (or collective tenure, where collective land owners do not pursue individual contracting) may be “circulated”¹²⁷ (Articles 32-43 of the Rural Land Contracting Law) by way of “*sub-contracting, lease, exchange, transfer or other means*” (Art. 32). Practically speaking, the Rural Land Contracting Law authorises the holders of a Household Contract to alienate varying degrees of interests or estates in the land to which they hold title at their own discretion (Art. 33 [1]), with the proviso that (i) the term of circulation may not exceed the term of the Household Contract (Art. 33 [3]) and that (ii) transfer may be effected only upon the collective land owner’s consent (Art. 37, 2nd sentence). Furthermore, the party circulating their tenure rights are entitled to receiving an “*appropriate compensation*” for investments to improve of the productive capacity of the land in questions prior to the circulation (Art. 43).

The law stipulates procedural minimum requirements for circulation:

- Written deed (Art. 37, 1st paragraph, 1st sentence),
- The land owner’s consent in case of transfer (Art. 37, 1st paragraph, 2nd sentence), and
- Mandatory clauses for circulation contracts¹²⁸ (Art. 37, 2nd paragraph, numerals 1 to 7).

The Rural Land Contracting Law provides qualitative guidance for the exercise of rights conferred upon the holder of a Household Contract, specifically to (i) use the land “*rationally*”, (ii) refrain from causing “*permanent damage to the land*” (Art. 17 [2]) and (iii) abide by other applicable “*laws, administrative rules and regulations*” (Art. 17 [3]). From the perspective of the analysis at hand, this means that holders of “Forest Ownership Rights” are bound to observe all relevant norms pertaining to forest protection, forest management, and forest use. The Rural Land Contracting Law **marked a new stage of tenure reform** and, compared to tenure related provisions of the Forestry Law, stands out in several respects. First, it transcended the sectoral focus, applying even standards to different rural land resources. Second, it is underpinned by a clear socio-economic rationale, as stated in Article 1.

Box 4: Socio-economic Policy Goals underlying the Tenure Reform Process

Article 1 (statement of purpose), Rural Land Contracting Law (2003):

*In accordance with the Constitution, this Law is enacted for the purposes of stabilizing and improving the two-tier management system that combines centralized and decentralized management on the basis of household contractual management, granting to the peasants **long-term and guaranteed land-use right, safeguarding the legitimate rights and interests** of the parties to land contracts in rural areas, and **promoting the development of agriculture and rural economy and social stability** in the countryside.*

Third, the Rural Land Contracting Law for the first time prescribes household management of collective lands as the norm, restricting other forms of tenure and contracting to exceptional cases where lands are deemed non-suitable for household management (Article 3, 2nd paragraph).

¹²⁷ Roughly equivalent to German term “Waldgrundstücksverkehr”, except that land ownership remains unchanged

¹²⁸ 1) Names and domiciles of the parties, 2) name, location, area and quality grade of land concerned, 3) term of circulation and the beginning/end dates, 4) purpose of the concerned land use, 5) rights and obligations of parties to the contract, 6) price for the right circulated and modalities of payment, 7) liabilities for breach of contract

Box 5: Decentralized Management by Households

Article 3, 2nd paragraph, Rural Land Contracting Law (2003):

Land contract in rural areas shall take the form of household contract within the collective economic organizations in the countryside, while such land in rural areas as barren mountains, gullies, hills and beaches, which are not suited to the form of household contract, may be contracted in such forms as bid invitation, auction and public consultation.

Fourth, the Rural Land Contracting Law introduced land-title circulation, thereby creating the basis for the emergence of a vibrant rural real-estate market. Collective households unwilling or incapable of managing allocated plots may part with their tenure rights partly or in full, in a transparent manner, and against monetary compensation that far more reflects market dynamics and real estate value, than any other system based on administratively fixed compensation rates. Land resources may thus be pooled for more efficient management, and land-title circulation provides households with a means to raise capital for investment. Moreover, land-title circulation provides a foundation for voluntary-based, self-governed co-management or cooperative arrangements, pivotal to the aim of mitigating fragmentation of hitherto consolidated collective forests.

Fifth, the Rural Land Contracting Law applies differentiated terms for tenure rights over different types of resources, reflecting their specific production cycles (Article 20). The term of forest tenure ranges from 30 to 70 years, with the option to extend the term even further (pending approval by the State Forestry Administration) in case “special trees” necessitate longer periods. This goes a long way in ensuring tenure security for farming households engaged in forestry, and in safeguarding investments with an inter-generational perspective. Given the normal range of rotation periods for forest plantations in China’s Southern Collective Forest Region (SCFR), terms of 30 to 70 years roughly equate two to five production cycles. Viewed from the angle of sustainable (close-to-nature, multi-purpose) forest management, fixed-term tenure of 30 to 70 years nevertheless has its drawbacks: It tends to perpetuate the dominance of fast-growing, short-rotation timber plantations over selectively managed natural forests.

China in 2007 proceeded to enact the **Property Rights Law of the P.R. China**, which approaches the issue of private property (movable as well as non-moveable) on an even higher and more aggregate level. The Property Rights Law identifies full and secure property rights as a determining factor underpinning China’s transition to a “socialist market economy” (Article 1) and assigns the exercise of property rights to the realm of civil law relations (Article 2, 1st paragraph). The meaning of property rights is defined as the exclusive, secure and full entitlement to control, dispose of, use property and reap associated benefits within the bounds of effective laws (Article 2, 2nd and 3rd paragraphs), subject to social responsibility (Article 7). Whilst confirming the overall dominance of public (state) property in economic development, the Property Law makes it official policy of the state to promote and encourage non-public economic sectors (Article 3). As regards collectively owned crop-lands, grasslands and forests, the Property Rights Law upholds in full the provisions of the earlier Rural Land Contracting Law (Articles 124 to 134). Moreover, it clarifies that household tenure titles to collectively owned lands may not be mortgaged (Article 184), but allows mortgage in regard to collective lands deemed non-suitable for household contracting (Article 133).

Summing up the foregoing discussion of Chinese legal provisions pertaining to forest tenure, it appears safe to conclude that **present day legal frameworks afford the highest level of tenure security and transparency enjoyed by rural collectives and individual house-**

holds since 1949. However, the question arises as to whether available forest governance and law enforcement capacities are sufficient to meet the challenge posed by forest tenure reform. Practical aspects of this kind are particularly hard to gauge for the following reasons: (i) tenure reform, though well advanced, remains an ongoing process; (ii) tenure reform in the past progressed not in a uniform fashion, but with different approaches and procedures being tested in different parts of the SCFR¹²⁹; (iii) local authorities – forestry authorities as well village leadership – exert strong influence on the progress and eventual outcome of forest tenure reform, sometimes for the worse. Recent studies confirm the multi-faceted reality of forest tenure reform, and suggest a mixed picture of successes and problems^{130 131}.

Accordingly, **demonstrated successes** of forest tenure reform include, inter alia:

- A rapid increase in forest cover, and improved quality of forest stands,
- Increased revenues for collective units which serve to cover investments in public infrastructure and the provision of social benefits to community members,
- Increased household income (including by means of sub-contracting of tenure rights), along with a general improvement of rural livelihoods,
- Increased involvement of non-state stakeholders in the forest sector, translating into wider awareness and dissemination of knowledge and skills in regard to forestry,
- Increased involvement of the private sector, resulting in mobilization of capital, improved access to technology.

On the other hand, a **range of problems** has been observed in the wake of the tenure reform process:

- Tenure security seems highest in affluent coastal regions with a vibrant private sector. By contrast, forest title holders in more remote regions or areas with a high ecological value are less sure to exercise their property rights.
- National forest sector programmes – the NFPP and CCFP in particular – while being effective in protecting forests and raising forest cover, also affected the security and robustness of tenure titles, and rural livelihoods overall¹³². Similar effects have been observed in regard to the World Bank's Forestry Development Project in Poverty Areas.
- Early attempts at developing tenure circulation procedures prior to the enactment of the Rural Land Contracting Law raised concerns over equitability, as financially potent private investors corralled large tracts of collective forest land bought up from small-holding households at rock-bottom prices. Tensions grew locally over what farmers perceived as unfair and non-transparent dealings of influential investors.
- Whether or not tenure reform actually promotes the improvement of rural livelihoods seems to depend, to a large measure, on the educational background, social status

¹²⁹ As of 2009, 28 provinces had issued policies and regulatory documents on tenure reform, while 30 had appointed responsible organizations. Tenure reform had passed a first, experimental stage in five provinces, while 15 provinces, following previous trials, had initiated full-fledged tenure reform. Li, S. (2009): Collective Forest Tenure Reform in China. Power-Point Presentation, delivered in Yaounde (May 25th, 2009);

<http://www.slideshare.net/YaoundeTenureConference/23collective-forest-tenure-reform-in-china>

¹³⁰ Liu, J. and Zhao, L. (2009): Have decollectivization and privatization contributed to sustainable forest management and poverty alleviation in China? Forest Policy and Institutions Working Paper, Food and Agriculture Organization of the United Nations (FAO), Rome; pp. 21-34

¹³¹ See also: Wang, X. (2006): China's Forest and Forest Land Tenure. World Forest Institute, slide presentation available at www.cof.orst.edu/cof/international/XiaoliWang.pdf

¹³² See also: Rozelle, S. et al. (2000): China – From Afforestation to Poverty Alleviation and Natural Forest Management – Evaluation Country Case Studies. The World Bank, Washington D.C.

and income situation of households and individuals. Unless backed up by institutional support, tenure reform may actually increase social disparity¹³³.

- Collectives as well as smallholders experience difficulties in having logging quota allocated to them, as well as in obtaining logging permits.
- Owing to the complex past development of tenure reforms in rural China, widespread lack of boundary records, and the general absence of visible boundary markers in the field, disputes over tenure are both frequent and widespread.
- Insufficient management and governance capacities at the local level, aggravated by cumbersome and rigid procedural requirements, and sometimes contradictory directives from upper governance levels (regulatory coherence).

Among the direct results of collective forest tenure reform, a distinct **diversification of management arrangements and patterns** (including associations with elected leaderships and shareholding cooperatives) stands out as one of the most significant. Even though, roughly half of the collective forests subject to tenure reform continue to be managed independently by household smallholders¹³⁴. One option to overcome fragmentation of hitherto consolidated collective forests would be to promote **voluntary, self-organized and self-governed management associations**, including shareholding cooperatives with ideal shares as well as co-management. This view is shared by Chinese forest authorities, clearly aware of the need to mitigate fragmentation. However, Chinese rural households remain hesitant to pool their forest resource, being wary of infringements of their decision-making rights and entitlement to benefits. This creates a formidable challenge for the promotion of SFM. It must be noted that measures to promote SFM by smallholders cannot be focused on them alone. **Forest tenure reform, above all, is a governance issue** creating institutional challenges. Without institutional capacity development – including a re-assessment of relevant sector-administration's roles and mandates, it cannot succeed. Forest authorities in particular need to attain a more service-oriented, supportive role vis-à-vis non-state entities involved in forestry operations¹³⁵. Tenure reform, though well advanced in several Chinese provinces, to this day remains an unfinished, open process, requiring continued government attention and support¹³⁶.

¹³³ Liu, S. and Cannon, C. (2011): Impact of socio-economic status on the implementation of China's collective forest tenure reform in Zhang Guying Township, Hunan: potential for increasing disparity. *Forestry, An International Journal of Forest Research*; Institute of Chartered Foresters.

¹³⁴ Liu, J. and Zhao, L. (2009): Have decollectivization and privatization contributed to sustainable forest management and poverty alleviation in China? *Forest Policy and Institutions Working Paper*, Food and Agriculture Organization of the United Nations (FAO), Rome; p. 37

¹³⁵ Mann, S. (2008): Promoting Sustainable Forest Management against the Backdrop of Forest Tenure Reform – Challenges and Determinants of Success. Report No. 8, Sino-German Technical Cooperation Project Sustainable Forest Management (Deutsche Gesellschaft für Internationale Zusammenarbeit – GIZ). Paper presented to the International Conference on SFM, Huangshan, Anhui Province (September 18th-20th, 2008). See also: Sunderlin, W.D., Hatcher, J. and Liddle, M. (2008): From Exclusion to Ownership? Challenges and Opportunities in Advancing Forest Tenure Reform. Rights and Resources Initiative, Washington D.C.; p. 33

¹³⁶ Xiao, W., Dai, G. and Zhang, S. (2010): China's Strategy and Financing for Forestry Sustainable Development. Country case study for the UNFF Ad Hoc Expert Group on Forest Financing. Beijing; p. 3

4 Forest Policy: Sustainability, multi-purpose Forestry, Forest Professionalism and the Forces challenging them

4.1 Germany

4.1.1 The Emergence of Forest Policy & Forest Policy Challenges

Sustainable forest management on a scientific basis emerged roughly 250 years ago, against the backdrop of large-scale deforestation and forest degradation, and the resultant manifest scarcity of wood and other forest products. Initially, its goals were simple and straightforward: Reforestation of devastated forest areas with a view to providing timber in a sustained manner.

Owing to the political and societal conditions of that era, forest governance was essentially state-driven and characterized by authoritarian control and enforcement. In consequence, scholars of forest science mainly spoke of “forest police” instead of forest policy, and highlighted the provision of forest products with a distinctly macro-economic focus¹³⁷. Towards the end of the 19th century, authors increasingly spoke of “forest economic policy”, referring to **forestry as an economic sector** in its own right, and stressing the forest sector’s significance from the angle of national economics.

During the first half of the 20th century, forest scientists began to appreciate the importance of **non-economic forest values** as driving forces of forest sector development, including political, cultural and social aspects. Rapid industrialization and urbanization throughout the 19th century’s latter half likewise led to growing societal awareness for the squandering of natural resources, and facilitated the emergence of nature conservation movements. In consequence, **societal demand for forest goods and services** diversified considerably and quickly outgrew forestry’s traditional focus on timber, while the forest sector’s economic significance continued to decline relative to industrial production and the service sector.

Such trends gained further momentum throughout the second half of the 20th century, in reference to various factors which may broadly be summarized as (i) economic challenges, (ii) policy challenges, and (iii) societal change, including:

- A steadily widening gap between labor cost and timber prices, while timber remained the forest sector’s principal commodity;
- Market distortions caused by cheap imports of timber and (half-)finished goods;
- Growing societal demand for forest services, resulting in management restrictions, additional expenditure and reduced revenues for forest enterprises;
- Increased risks from airborne pollutants, pests and diseases, and more frequent weather extremes (storms in particular), damages caused by oversized game populations;
- Tightening environmental, and nature conservation rules and regulations (establishment of protected areas and management exclusion zones, management restrictions);
- Growing media and civil society criticism of forest management practices (“monocultures”, dominance of coniferous trees, lack of old-growth forests etc.).

¹³⁷ Nießlein, E. (1985): Forstpolitik – ein Grundriß sektoraler Politik. Paul Parey, Hamburg/Berlin; p. 12

Combined, the foregoing factors created significant forest policy problems and increasingly challenged established perceptions and beliefs within the forest sector. For one, forest enterprises came under economic stress, resulting in operational deficits particularly in State-forests. On the other hand, especially private forest owners – faced with ever diversifying societal requests – called for increased public support to compensate environmental and recreational services which would otherwise have no market value. Moreover, the traditionally near-exclusive competence of forestry professionals gave way to broad-based and pluralistic civil society participation and mounting criticism (for further detail, refer to section 4.1.3).

In consequence, forest policy lost its narrowly sectoral focus on governance and economics, and adopted a more holistic and integrative outlook. Present-day forest policy may be understood as a type of **sector policy which aims to establish, maintain, and develop specific institutional frameworks, whereby human interest in forest resources may be organized, reconciled, and satisfied in an optimal manner**. As such, forest policy addresses the interrelation between public forest governance and forest sector stakeholders, along with its implications for economics, science and research, and other aspects.

4.1.2 Sustainability – Origins and Trends of Development

Ever since the onset of forest management on a scientific basis about 250 years ago, “sustainability” has been a defining characteristic as well as a guiding principle of German forestry. **In its literal sense, sustainability is but a concept of time, denoting continuity or perpetuity – attaining the status of an action-guiding principle only when applied to concrete management goals.**

The notion of sustainable forest management emerged during the early 18th century, motivated by widening awareness of the adverse consequences of purely demand-driven forest exploitation. It was for the first time put down in writing in 1713 by the Saxonian supervisor of mines, Hans-Carl von Carlowitz, in recognition of an impending critical shortage of mine props and wood-fuel. Given that forests as a natural resource are capable of regenerating and of cushioning off external disturbances, sustained forest use in its simplest meaning limits the extraction of forest goods to a level at or below the forests’ capacity to regenerate. More generally, sustainable use means to restrict current consumption in favor of securing a supply basis for the indeterminate future.

German forestry and German forest science cannot claim to have invented the concept. Current self-restraint to safeguard the future usability of natural resources predates the onset of sustainable forest management (as exemplified by hunting rituals, three-field crop rotation etc.). However, **German forestry is justly credited with creating, for the first time, a sound methodological as well as empirical basis for its practical application**, by means of a wide range of measuring, valuation and planning approaches and instruments. Sustainability has since evolved into the undisputed, focal concept of German forestry, expanding into both, a legally binding obligation and the chief criterion defining the self-perception of forestry professionals and forest owners alike.

As the author of a textbook for the academic education of future foresters, the Prussian chief conservator of forests, Georg Ludwig Hartig coined a timeless definition of sustainable forest management, to wit: *“Continued forestry is inconceivable unless timber extraction from the forests observes the bounds of sustainability. Prudence requires for forest administrations to appraise a state’s forests without delay, and to strive for the highest possible use that at the same time preserves at least as much benefit for future generation, as the current generation*

*appropriates for itself*¹³⁸. This notion of **inter-generational equity** is the defining trait of sustainability concepts to the present day, as exemplified by the United Nations Report “Our Common Future” by the Brundtland Commission in 1987: “*sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”¹³⁹.

Practical application of sustainable forest management hinges on **two preconditions**:

- If forest use is to observe the limits of forest regeneration, such limits must be empirically assessed. This requires sufficiently accurate methods and instruments for assessing and valuating forest resources, as well as for planning management interventions.
- Management objectives must be sufficiently clarified and operational, and free from contradictions. Competing goals call for either prioritization by means of ranking, or selection.

Diversification of societal demand for forest goods and services means that **forestry management objectives are subject to constant change and redefinition, increasing their complexity**. Hence, the concept of sustainable forest management as such remains dynamic, along with changing perceptions about forests and the context-specific appreciation of forest benefits. Over time, two complementary concepts of forest sustainability evolved from the advancement of forest science: (i) continuity of a defined state (static sustainability), and (ii) continuity of a defined benefit or service (dynamic continuity). The following Table 12 illustrates both concepts in comparison.

Table 12: Static and Dynamic Concepts of Forest Sustainability¹⁴⁰

Concepts of sustainability in forestry	
“static”	“dynamic”
Forest area	Rate of increment
Site productivity	Timber yield (quantity and quality)
Growing stock	Financial returns
Value of growing stock	Profitability
Capital of an FMU	Environmental and social services
	Multiple benefits

Present-day forestry in Germany adheres to the concept of **dynamic sustainability**, striving for the provision of **multiple benefits** (multi-purpose forest management, see section 4.1.3).

¹³⁸ Hartig, G.-L. (1804): Anweisung zur Taxation und zur Beschreibung der Forste. Bd. 1 – Theoretischer Teil (2., ganz umgearbeitete und vermehrte Auflage), Heyer, Gießen.

¹³⁹ United Nations General Assembly (March 20, 1987). "Report of the World Commission on Environment and Development: Our Common Future; Transmitted to the General Assembly as an Annex to document A/42/427 - Development and International Co-operation: Environment; Our Common Future, Chapter 2: Towards Sustainable Development; Paragraph 1". United Nations General Assembly. <http://www.un-documents.net/ocf-02.htm>.

¹⁴⁰ Speidel, G. (1972): Planung im Forstbetrieb – Grundlagen und Methoden der Forsteinrichtung. Paul Parey, Hamburg/Berlin; p. 54 (adapted & abridged)

4.1.3 Multi-purpose forest management – Changing Perceptions about Forest Functions, Goods and Services

German forestry is characterized by the **parallel provision of a wide range of goods and services, simultaneously in time and space**. Forest policy science worked to systematically analyze their kinds, types and interrelations particularly during the 20th century's latter half. Victor Dieterich is credited with conceptualizing a theory of **forest functions** in 1953¹⁴¹ – primarily in regard to “objective” features of forests. By contrast, contemporary forest policy adopts a more people-centered perspective, analyzing forest functions in reference to social contexts of forest stakeholders and societal perceptions and demand¹⁴².

In practice, three basic functional categories are distinguished which have likewise found entry into both, the Federal Forest Act and the States' Forest Laws¹⁴³: (i) economic use – including revenues or income, employment, and capital assets; (ii) protection – reflecting the ecological and physical significance of forests for maintaining natural as well as human environments; and (iii) recreation – with a focus on human well-being.

The **relative significance of forest functions depends on various site-specific conditions**, including, inter alia, location (e.g. rural areas, urban agglomerations), topography and relief (e.g. plains, sloped or mountainous terrain), forest soils, water resources (e.g. ground or surface water), regulatory provisions (e.g. protected areas, protection or recreation forests), status (age, health, vitality) and composition of forest resources, the category of forest ownership (state, communal, or private) etc. Combined, the foregoing factors suggest a choice of management objectives and silvicultural alternatives, providing a binding framework which determines concrete management decisions by forest owners.

Pursuant to the States' Forest Laws, State Forest Administrations are tasked to conduct **Forest Function Mapping**¹⁴⁴ – as an official duty and subject to a national guideline¹⁴⁵ ensuring comparability of results. It applies to all forests, irrespective of their type of ownership. Forest functions have evolved into a highly detailed and multi-faceted concept, and strongly reflect cross-sectoral linkages (see Table 13).

¹⁴¹ Ibid.; p. 13

¹⁴² Ibid.; p. 49

¹⁴³ Krott, M. (2001): Politikfeldanalyse Forstwirtschaft – eine Einführung für Studium und Praxis. Parey, Berlin; p.20

¹⁴⁴ E.g. Art. 7(4) State Forest Law Baden-Württemberg; Art. 5(1), 6 State Forest Law Bavaria

¹⁴⁵ Arbeitsgemeinschaft Forsteinrichtung/Arb.-Grp. Landespflege (1982): Leitfaden zur Kartierung der Schutz- und Erholungsfunktionen des Waldes (Waldfunktionenkartierung). J.D. Sauerländer, Frankfurt.

Table 13: Legally prescribed Forest Function Categories (example: Saxony¹⁴⁶)

Legally Prescribed Forest Function Categories in Saxony					
Function Category	Corresponding Type of Area	Legal Basis	Authorities in charge	Designation, legal status	Remarks
Environmental Protection	Soil				
	Soil Protection Forest	S. Forest Law	lower For. Auth.	by act of law	after consultation of forest owner, Communal govt., relevant authorities (including spatial planning)
	Infrastructure Prot. Forest	S. Forest Law	lower For. Auth.	exec. reg.	
	Road Protection Forest	F. Law on Highways	State Road Auth.	declaration	upon consent by lower For. Auth.
	Water				
	Water Protection Area	F. & S. Laws on Water	lower Water Auth.	exec. reg.	
	Mineral Spring Protection Area	as above	as above	as above	upon consent by lower Health Authority
	Flood Protection Area	as above	as above	exec. reg.	
	Flood Prevention Area	as above	supreme Water Auth.	by act of law	
	Water Protection Forest	as above	lower For. Auth.	exec. reg.	after consultation of forest owner, Communal govt., relevant authorities (including spatial planning)
	Air				
	Climate Protection Forest	S. Forest Law	lower For. Auth.	exec. reg.	after consultation of forest owner, Communal govt., relevant authorities (including spatial planning)
	Immission Prevention Forest	as above	as above	as above	as above
Noise Prevention Forest	as above	as above	as above	as above	
Nature Conservation	Biodiversity				
	National Park	F. & S. Laws on Nat. Cons.	supreme Nat. Cons. Auth.	exec. reg.	
	Flore-Fauna-Habitat Protection Area	as above	notification by the State Government	declaration	publication in the National Gazette
	Birdlife Protection Area	as above	as above	as above	as above
	Nature Reserve	as above	lower Nat. Cons. Auth.	exec. reg.	
	Natural Monument	as above	as above	as above	
	Natural Forest Reference Area	S. Forest Law	lower For. Auth.	declaration	upon consent by concerned & adjacent forest owners
	Protection Forest inside Protected Areas	as above	as above	as above	as above
	Wildlife Protection Area	S. Law on Hunting	lower Hunting Auth.	exec. reg.	upon consent by lower Nature Conservation Authority
	Protected Biotope	F. & S. Laws on Nat. Cons.	lower Nat. Cons. Auth.	by act of law	
Nature Conservation	Landscape				
	Landscape Protection Area	F. & S. Laws on Nat. Cons.	lower Nat. Cons. Auth.	exec. reg.	
Cultural & Social Functions	Culture				
	Biosphere Reserve	F. & S. Laws on Nat. Cons.	supreme Nat. Cons. Auth.	exec. reg.	
	Monument Protection Area	S. Law on Monuments	Communal Government	charter	upon consent by Monument Protection Authority
	Archeological Excavations	as above	lower Monument Prot. Auth.	exec. reg.	
	Archeological Reserve	as above	supreme Monument Prot. Auth.	as above	
	Cultural Monument	as above	none	by act of law	
	Recreation				
	Recreation Forest	S. Forest Law	lower For. Auth. or Communal Govt.	exec. reg. or charter	upon consent by lower Forest Authority
Nature Park	F. & S. Laws on Nat. Cons.	lower Nat. Cons. Auth.	exec. reg.		

F = Federal, S = State, For. = Forest, Nat. Cons. = Nature Conservation, Auth. = Authority, exec. reg. = executive regulation

¹⁴⁶ Staatsbetrieb Sachsenforst (2010): Waldfunktionenkartierung – Grundsätze und Verfahren zur Erfassung der besonderen Schutz- und Erholungsfunktionen des Waldes im Freistaat Sachsen. Pirna; pp. 70-71

Any given forest area may be subject to a variety of different functions, and additional categories or sub-categories may be defined as and when required. **The concept of multi-purpose forest management obliges forest owners to observe all locally relevant functions and to abide by the related management restrictions.** While this general principle gained widespread acceptance over several decades¹⁴⁷, its practical application is challenging. It requires careful prioritization of management objectives and the constant balancing of societal demand against the legitimate rights of forest owners. **Medium-term forest management planning** on the scale of individual FMUs is pivotal to this end, because it builds directly on the outcome of forest function mapping and the regulatory designation of corresponding area types. Forest management plans translate forest function mapping results and the designation of specific functional areas (as shown in the second column of Table 13) into operational guidance for FMUs, giving effect to management restrictions with a view to prioritizing protective, ecological or social forest functions over commercial use.

Up until the 1970ies, German forestry largely denied the existence of contradictions between commercial, protective, environmental and social forest functions, arguing that non-marketable forest functions would follow *in the wake* of regular forest management in line with legal-regulatory requirements. This theory in essence amounted to an **ideological postulate of functional harmony**, and proved largely ineffective for the management of manifest land-use conflicts over recreational or ecological functions¹⁴⁸.

Such conflicts are often spearheaded by stakeholders outside the forest sector (for details, see section 4.1.4), against the backdrop of changing societal values and beliefs since the late 1960ies. What is commonly referred to as the “post-materialistic change of values”¹⁴⁹ gained particular momentum in Germany throughout the 1980ies, due to public concerns about the novel forest die-back syndrome, a complex disease ascribed primarily to the cumulative effects of airborne pollutants. The forest sector, struggling to cope with waning profitability of forest production, thus found itself exposed to unprecedented public scrutiny, growing demands for a shift of focus towards ecological and social priorities, and calls for tighter and more restrictive standards of sustainable forest management¹⁵⁰ (including logging exclusion zones to facilitate undisturbed development of forest ecosystems) – in other words: a more ecologically focused and legally binding standard to replace indeterminate legal expressions such as “orderly forest management”, “established practice” or “recognized, state-of-the-art forest principles” (see also Table 3, Art. 12 Baden-Württemberg, Art. 16 Saxony, Art. 11 Mecklenburg-Vorpommern).

Demands for more operational SFM standards are of immediate consequence for forest enterprises and forest owners. All forest owners are equally bound to observe legal minimum-requirements, and entitled to compensational payments only in those cases, where societal demand for non-marketable ecological and recreational services creates a disproportionate burden in terms of reduced revenues or additional expenses¹⁵¹ (equivalent to an infringement of property rights). Accordingly, any **tightening of legal-regulatory minimum-standards** for multi-purpose SFM would simultaneously erode the justification of additional funding support

¹⁴⁷ Krott, M. (2001): Politikfeldanalyse Forstwirtschaft – eine Einführung für Studium und Praxis. Parey, Berlin; p.20

¹⁴⁸ Ibid.; p. 27

¹⁴⁹ Inglehart, R. (1977) The silent Revolution – Changing Values and Political Styles among Western Publics. Princeton, New Jersey.

¹⁵⁰ Weber, N. und Mann, S. (1997): Der postmaterialistische Wertwandel und seine Bedeutung für die Forstwirtschaft. Forstarchiv 68; pp. 19-24

¹⁵¹ Volz, K.-R. (1992): Über die Zumutbarkeit von Artenschutzprogrammen im Wald. Forstwissenschaftliches Centralblatt 111, Paul Parey, Hamburg/Berlin; pp. 243-254

to off-set economic encumbrances borne by forest enterprises in the pursuit of public-interest goals and objectives.

Faced with this dilemma, scholars of forest science came to argue that forests had evolved into a “**collective good**” – a “key-resource” of macro-economic significance justifying public intervention (regulation as well as monetary transfers to the forest sector)¹⁵². Other authors argued in favor of “**production-oriented forestry**”, calling for public intervention with a view to valorizing hitherto non-marketable ecological and recreational services, and promoting state-intervention so as to facilitate the development of markets for ecological and social services¹⁵³.

In the more recent past, the economic use function regained its significance – not merely because of growing demand and related price increases for timber, but likewise in recognition of **wood as a renewable, environmentally friendly resource**. This trend is further spurred by international concerns about **climate change**. European forests continue to expand in terms of both, their area and stocking volumes, while forestry production realizes only about 65-70 percent of the potential sustainable harvesting volume¹⁵⁴. Since the mid-1980ies, Germany’s forest cover expanded at an average rate of 3,500 ha annually. Among European countries, Germany stands out with the highest growing stock in terms of both, absolute (ca. 3.4 billion m³) and relative (ca. 320 m³/ha) values. These figures are unprecedented and herald significant potentials as well as risks. The annual increment (1987-2002) stands at roughly 95 Mio. m³, equivalent to an average value of 12 m³/ha*a. During the same reference period, annual logging-volumes stood at 50-55 Mio. m³¹⁵⁵.

Such observations informed **policy decisions to promote a significant increase in domestic wood production and consumption**. Official forest policy aims to raise the per-capita consumption of domestically produced wood from 1.1 m³ to 1.3 m³ annually over a period of 10 years¹⁵⁶. This goal is to be achieved by means of three derived objectives with corresponding activities: (i) increase demand for domestic wood; (ii) optimize domestic wood supply in qualitative and quantitative terms; (iii) promote research, development, and relevant education¹⁵⁷.

The combined effects of **policy interventions and market-trends** (investment into modernization and expansion of wood-industry capacities) materialize in several ways:

- First, annual logging volumes past 2002 increased to an annual average of close to 70 Mio. m³; subject to annual variation resulting from massive storm damage in 2007 and reduced logging rates in the following years¹⁵⁸.
- Second, wood-fuel experienced an unprecedented renaissance against the backdrop of both, rising prices for fossil fuels and climate-change policies that promote renewable energy sources, biomass in particular. Wood-energy is expected to account for a

¹⁵² Volz, K.R. (1995): Zur ordnungspolitischen Diskussion über die nachhaltige Nutzung der Zentralressource Wald. Forst & Holz; p. 163

¹⁵³ Mantau, U. (1996): Öffentliche Güter und staatliches Handeln. Forst & Holz 51; pp. 102-107

¹⁵⁴ Schmidhüsen, F. et al. (2003): Unternehmerisches Handeln in der Wald- und Holzwirtschaft. Deutscher Betriebswirte Verlag, Gernsbach; pp. 27-28

¹⁵⁵ BMELV (2002): Bundeswaldinventur II. www.bundeswaldinventur.de

¹⁵⁶ BMELV (2004): Verstärkte Holznutzung zugunsten von Klima, Lebensqualität, Innovation und Arbeitsplätzen (Charta für Holz). Federal Ministry of Food, Agriculture and Consumer Protection, Berlin; p. 19

¹⁵⁷ Ibid.; pp. 20-22

¹⁵⁸ Seitsch, B. (2010): Holzbilanzen 2006 bis 2009 für die Bundesrepublik Deutschland. Arbeitsbericht 03/2010, Johann Heinrich von Thünen Institut/Institut für Ökonomie der Forst- und Holzwirtschaft Universität Hamburg, Hamburg; pp. 2-4

significant share of the forecast increase in domestic wood consumption, pursuant to the European Union's goal to supply, by 2020, about 20 percent of the total energy consumption from renewable sources¹⁵⁹. For instance, wood-fuel consumption in Bavaria increased from ca. 2 Mio. m³ to upwards of 3.5 Mio. m³ within the period 2000-2006¹⁶⁰. In consequence, growing market demand for biomass fuels creates considerable market pressure for the consumers of industrial wood (e.g. particle board production, pulp & paper etc.), with forecast supply deficits by 2020¹⁶¹.

- Third, rapidly growing demand for wood motivates the search for more effective and output-oriented silvicultural approaches, including more intense thinning, utilization of logging debris, cultivation of short-rotation plantations etc., while promoting non-managed forests on marginal sites or retention of old-growth reference areas¹⁶².

The foregoing development adds both, momentum and a new facet to the forest policy dialogue between forest sector stakeholders and nature conservationists (both public agencies and civil society). Arguing in favor of exempting a certain – politically determined – share of forest areas from forest management (with a view to allowing undisturbed forest development), conservationists have come to challenge the “old-growth equilibrium” hypothesis (to the effect that only managed forests would contribute to the active sequestration of carbon dioxide)¹⁶³. Simply put, proponents of this hypothesis argue that non-managed forests – while representing high stores of carbon due to biomass accumulation over time – would reach a steady state with a net-production rate close to zero, rendering them, in effect, carbon-neutral. Newer studies cast doubt on both, the old-growth equilibrium hypothesis and policy recommendations based thereon. In consequence, proponents of non-managed forest areas (to be set aside as reference ecosystems and safe-havens for threatened biodiversity) not only refute climate-change policies framed around increased wood consumption and substitution of non-wood materials and fuels, but likewise suggest that non-managed forests would, for considerably long periods, retain their net-sequestration potential in regard to carbon dioxide¹⁶⁴. However, discussions of this kind, being focused on above-ground biomass only, ignore other, likewise significant carbon-pools such as below-ground biomass and carbon stored in forest soils.

In summary, **whilst adhering to the concept of multi-purpose forest management for the present, the German forest sector is amidst a controversial discussion about the limits and future development of its integrative paradigm.** While the eventual course and outcome of this discussion are hard to anticipate, some general observations at this juncture suggest themselves:

- First, one observes an inherent competition between the goals of (i) biodiversity conservation and (ii) mobilizing the carbon sequestration potential of German forests. This raises questions about policy coherence, and highlights the significance of cross-sector coordination and multi-stakeholder dialogue in regard to forests. The novel for-

¹⁵⁹ http://europa.eu/legislation_summaries/energy/renewable_energy/l27065_de.htm

¹⁶⁰ Bauer, J. (2007): Holzpotentiale und Holzstoffströme in Bayern. Cluster-Initiative Forst und Holz Bayern. Presentation March 26th, 2007; Straubing.

¹⁶¹ Anon. (2010): Energiegewinnung aus Holz wird weiter zunehmen – Herausforderungen für die stoffliche Holznutzung. Holzzentralblatt Nr. 6; pp. 162-163

¹⁶² Bausch, J. (2010): Was kann moderner Waldbau? Präsentation, 3. Symposium Waldstrategie 2020 (12. April 2010), BMELV. See also: <http://www.fnr-server.de/cms35/fileadmin/allgemein/pdf/veranstaltungen/waldstrategie/2010/Bausch.pdf>

¹⁶³ <http://www.sciencedaily.com/releases/2008/09/080922175137.htm>

¹⁶⁴ Enssle, J. (2010): Ist ungenutzter Wald schlecht für das Klima? Die unterschätzte Senkenleistung dynamischer Naturwälder. Naturschutzbund Deutschland (NABU), Berlin. NABU Hintergrundpapier.

est carbon fund may in the future offer the opportunity to financially reward the reservation of non-utilized forests, subject to ongoing consultations between BMELV and BMU.

- Second, societal demand for forest goods and services may indeed have diversified to a point where the long-established paradigm of multi-purpose forest management can no longer be expected to reconcile public perceptions about forestry with the expectations and the outlook of forest owners and forest enterprises. This may require a thorough re-thinking of extant public support schemes.
- Third, reservation of non-managed forest areas depends more on policy negotiation and bargaining, than on “objective” parameters. Current policy goals calling for the setting aside of up to 5 percent of Germany’s forests for undisturbed natural forest development by 2020 (10 percent in public forests)¹⁶⁵ are aspirational policy goals, rather than operational directives. Their opponents claim that roughly two-thirds of German forests already are subject to at least one protection category (from protected areas defined by either nature conservation or forest legislation, to areas recognized under the European protected area network NATURA 2000). This, however, does not mean that forests subject to protection would not be harvested, and provides no valid measure for the extent of forests that are actually non-managed (and hence qualify as reference areas for undisturbed ecosystem dynamics). Even though, the goal implies that 95 percent of German forests would remain subject to regular forest management. Given this fact, the sometimes heated debate about the reservation on non-managed areas bears witness primarily of the dynamics of forest policy formulation (the politics dimension) in a pluralistic society with a strong, professionally organized and vociferous stakeholder landscape.
- Fourth, structural changes within the forest sector proper (e.g. the emergence of private forest owners detached from the actual management of their properties, see also section 3.3) may help to defuse related disputes in the long-term.

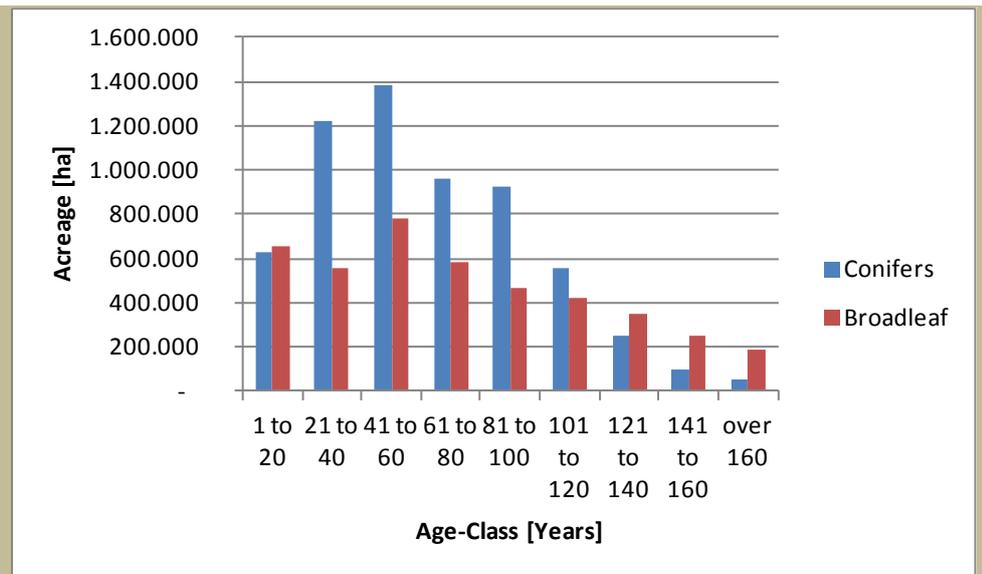
At present, the parallel and balanced achievement of multiple forest functions faces a number of **structural challenges**, arising primarily from silvicultural developments in Germany’s recent past. Large-scale destruction of forest resources during the closing stages of the second World-War and post-war logging for reparations as well as for reconstruction efforts left significant tracts of forest land void of forest cover and necessitated rapid reforestation. This development reinforced the dominance of fast-growing and highly productive conifers (spruce in particular) over a wider range of suitable and more site-adapted broad-leaved species, as well as a marked preference for age-class management of single-storey monocultures.

Similar responses followed in the wake of large storm events, causing massive loss of forest cover and triggering rapid reforestation. Moreover, it must not be overlooked that, in spite of lessons learnt from the management risks associated with even-aged coniferous monocultures throughout much of the 20th century (and corresponding responses by forest science, e.g. close-to-nature forest management and perpetual forest models), German forestry for economic reasons continued to favor conifers over broadleaved species well into the recent past.

The consequences become apparent in the age-class structure of German forests, as documented by the second BWI in 2002.

¹⁶⁵ BMU (2007): National Strategy on Biological Diversity. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Berlin; p. 31

Box 6: Age-class Structure of German Forests¹⁶⁶ (2002)



The age-class structure is clearly tilted in favor of young to middle-aged forests, with a distinct dominance of conifers. Broadleaved species dominate in higher age-classes, however, with a much lower acreage. Forests established during the past two decades reflect changing silvicultural concepts, with a significantly higher proportion of broadleaves. These are also forests which in their overwhelming majority have been established through natural regeneration.

The characteristics shown in Box 6 reflect challenges in several respects. Mature and old forests with a range of habitats for endangered species are clearly underrepresented, complicating the achievement of biodiversity conservation goals. At the same time, middle-aged forests with a high proportion of coniferous stands require careful management and risk-mitigation efforts, so as to reduce their vulnerability to extreme weather, storms and snow-break in particular. The need for more structurally diverse, mixed forests is widely understood in forestry circles, and echoes in societal preferences as reflected through civil-society participation. The gradual transformation of German forests towards mixed, uneven-aged forests features prominently in the silvicultural strategies and programs of both, State forest authorities and State-owned forest enterprises. Even though, it is a medium to long-term endeavor that can only be achieved through management of extant forests. Moreover, given Germany's diverse ownership structure as well as the antagonisms of civil-society participation by interest groups with a wide variety of sometimes highly specific agendas, advancements of forest science and policy commitments take time to percolate downwards to local implementation levels. Generally high levels of public environmental awareness, professional expertise and managerial capacity nevertheless facilitate the move towards more resilient and ecologically valuable forests.

¹⁶⁶ Federal Forest Inventory – BWI² (2002)

4.1.4 Stakeholder Landscape – Forest Professionalism, Group Interests, and Civil Society Participation

The German forest sector is characterized by its multi-faceted stakeholder landscape and stakeholder participation, including civil society.

This has not always been the case, as the gradual evolution of forest policy – from concepts of executive enforcement to sectoral economic policy to cross-sectoral public debate and involvement – readily suggests (see also section 4.1.1). Any discussion of forest policy would hence remain incomplete without taking into consideration structural group interests existing within and beyond the forest sector, as well as the organizational and procedural preconditions for their expression and representation. Such aspects relate to the **procedural** (politics) and **institutional** (polity) **dimensions of forest policy**.

In a wider sense, civil society participation occurs at the interface of public governance (the “state”) and market forces, in what contemporary social science appropriately refers to as the “third sector”. Civil society participation typically aims to propagate, voice, represent, and defend structural group interests (i.e. common goals, shared perceptions and values of defined segments of society) in the political arena. Neither do interest groups compete directly for public office by way of elections, nor do they aim for commercial gains or profit. Such characteristics assign organized interest groups to the realm of not-for-profit, non-governmental organizations (NGO) – the typical (and often legally recognized) proponents of civil society participation¹⁶⁷.

Civil society participation in Germany derives its justification from Article 9 of the German Basic Law, explicitly protecting the **right to freely form associations and societies**, including for the promotion of labor conditions and economic development of all professions. Organized interest groups harness, rationalize, negotiate and resolve societal conflicts, arising from the existence of structurally determined, divergent group interests as principal drivers of social progress and development¹⁶⁸. Accordingly, much of what determines civil society participation within the German forest sector must be understood as the expression of manifest as well as manifold antagonisms¹⁶⁹. This observation marks a **critical distinction between the German and Chinese forest sectors** in terms of how forest policy agendas are set (see also section 4.2.2).

Interest groups within the German forest sector may broadly be clustered into the following categories:

1. Associations of (non-state) forest owners,
2. Professional representations of employees in the forest sector,
3. Associations with agendas focused on management-related issues (silviculture, forest protection etc.),
4. Associations aiming to promote the production, utilization and marketing of forest products,

¹⁶⁷ Alemann, U. (1996): Was sind Verbände? In: Informationen zur politischen Bildung, No. 253, Bundeszentrale für politische Bildung; Bonn

¹⁶⁸ Endruweit, G. and Daheim, H.-J. (eds.): Moderne Theorien der Soziologie. Enke, Stuttgart; p. 92; see also: Niedenzu, H.-J. (1993): Konflikttheorie: Ralf Dahrendorf. In: Morel, J. et al. (1993): Soziologische Theorie, 3. überarbeitete Auflage, Oldenbourg, München & Wien; p. 174

¹⁶⁹ Mann, S. (1998): Konflikte in der deutschen Forstwirtschaft – Konflikttheoretische Analyse der forstpolitischen Diskussion über die Krise der Forstwirtschaft. Shaker, Aachen

5. Umbrella associations claiming to represent the forest sector vis-à-vis other economic sectors.

Examples of the first category include both, the Working Group of German Forest Owners Associations (**AGDW**¹⁷⁰) and its 13 State chapters. The second category includes the German Association of Foresters (**BDF**¹⁷¹, affiliated with the German Association of Civil Servants – DBB) as well as its 16 State chapters, and the Workers' Union for the Construction, Agriculture and Environmental Sectors (**IGBAU**¹⁷², affiliated with the General Association of German Workers' Unions - DGB). The third category consists of the German Forestry Association (**DFV**¹⁷³) with its 11 State chapters, the Working Group for Close to Nature Forestry (**ANW**¹⁷⁴, 13 State chapters), as well as the German Association for Forest Protection (**SDW**¹⁷⁵). The fourth category is highly diverse, including the principal certification organizations Forest Stewardship Council Germany (**FSC**¹⁷⁶) and the Program for the Endorsement of Forest Certification Germany (**PEFC**¹⁷⁷), as well as numerous associations providing information, market promotion, and consumer relation services with a view to promoting the use of wood as a renewable, environmentally friendly material and source of energy (e.g. the Association for Market Evaluation and Information for Agriculture, Food and Forestry - AID¹⁷⁸, the Working Partnership for Wood – ARGE Holz¹⁷⁹, and various associations of wood and timber industries). The German Forestry Council (**DFWR**¹⁸⁰) reflects the fifth category, combining the voices of numerous associations from the foregoing four categories as well as State Forest Administrations, communal representatives, research and educational institutions, and technical associations with a view to representing the forest sector as a whole vis-à-vis other sectors and society at large. All of the foregoing examples came into being after the Second World War, even though several can trace back their history to pre-war organizations of a similar nature. The various associations cooperate in the form of networks, and maintain close ties and working relationships with like-minded non-forestry associations and groups.

Numerous interest groups **outside the forest sector, but with a strong and distinct forest-related agenda** gained importance, political leverage and widespread societal recognition over the past thirty to forty years. These associations foremost include **environmental and nature conservation associations** (ENGOS) promoting the protection of nature, landscapes and natural resources as well as the conservation of biodiversity.

The unprecedented rise of environmental and nature conservation associations since approximately the late 1970ies is widely associated with the emergence of “new social movements”, seeking societal transformation through civil society participation on the basis of alternative lifestyles and changing values. Ecology thus gained a distinctly political connota-

¹⁷⁰ <http://www.waldbesitzerverbaende.de/>

¹⁷¹ <http://www.bdf-online.de/>

¹⁷² <http://www.igbau.de/db/v2/frameset.pl>

¹⁷³ <http://www.forstverein.de/>

¹⁷⁴ <http://www.anw-deutschland.de/>

¹⁷⁵ <http://www.sdw.de/>; the SDW is likewise recognized as a nature conservation association pursuant to Art.

63 of the Federal Nature Conservation Law

¹⁷⁶ <http://www.fsc-deutschland.de/>

¹⁷⁷ <http://www.pefc.de/>

¹⁷⁸ <http://www.aid.de/>

¹⁷⁹ <http://www.argeholz.de/>

¹⁸⁰ <http://www.dfwr.de/>

tion¹⁸¹. With mass-media coverage of, and **high societal attention for novel forest diseases ascribed to the cumulative effects of airborne pollutants** (“forest die-back syndrome”), forest protection came into the focus of mainstream politics. Widespread scrutiny and criticism of established forest management practices garnered public support for nature conservation movements on a grand scale, and motivated far-reaching demands for, inter alia, ecologically focused forest management, designation of non-managed forest areas, and tighter restrictions on silvicultural regimes and management practices. By 1997, representative opinion polls revealed that significant shares of respondents were favorably inclined towards forest protection and wood in general, whilst rejecting forestry and forest management as a potential cause of forest destruction¹⁸². ENGOs have been instrumental in harnessing mounting public concern about the course of forest protection and forest management for political action, thereby gaining opinion leadership on many forest-related issues¹⁸³.

ENGOs – when recognized by the Federal or the States’ governments – by virtue of Article 63 of the Federal Nature Conservation Law (2011, as amended) enjoy far-reaching **rights of participation and consultation** in regard to public governance, including regulation, (spatial) planning, approval of public projects, and granting of exemptions from restrictions pertaining to nature reserves. They may likewise seek legal redress against public governance decisions, including the initiation of litigation (Article 64 of the Federal Nature Conservation Law). In May 2011, the European Court of Justice confirmed the environmental NGOs’ privilege to file lawsuits on the general public’s behalf¹⁸⁴. Comprehensive lists of officially recognized environmental and nature conservation associations are published by the BMU¹⁸⁵ as well as by the German States’ ministries in charge of environmental protection and nature conservation.

Environmental and nature conservation NGOs are too numerous to be exhaustively referenced within the report at hand, including German NGOs as well as German chapters of international NGOs (INGOs, e.g. Greenpeace, WWF, IUCN, Friends of the Earth, etc.). The German Nature Conservation Circle (DNR) serves as an umbrella organization for a total of 96 relevant NGOs¹⁸⁶.

4.1.5 Policy Processes and Programs in Support of Forest Protection and SFM

In present day Germany, the formulation of public forest policy is characterized by **public debate, civil society participation and a consensus-oriented culture of consultation and negotiation**, notwithstanding sometimes heated disputes among stakeholders within, and related to the forest sector.

Contemporary forest policy processes have, to a large measure, been shaped by course of the international forest-policy dialogue in the wake of the 1992 United Nations Conference on

¹⁸¹ Sonderegger, R. (1997): Werte, Identität und Neue Soziale Bewegungen. Online Publications Social Movements, Pressure Groups and Political Parties; Soziologisches Institut der Universität Zürich (http://socio.ch/movpar/t_rsonder1.htm)

¹⁸² Pauli, B., Suda, M. and Mages, V. (1998): Das Schlachthausparadox oder das Dilemma der forstlichen Öffentlichkeitsarbeit. LWF Aktuell, No. 13/1998; pp. 10-14

¹⁸³ Essmann, H. (1993): Forstwirtschaft und Naturschutz – Unterschiede und Übereinstimmungen in Theorie und Praxis. Allgemeine Forstzeitung 48; 522-525

¹⁸⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2011:204:0006:0006:DE:PDF>

¹⁸⁵ <http://www.bmu.de/naturschutz/biologische/vielfalt/doc/40462.php>

¹⁸⁶ <http://www.dnr.de/>

Environment and Development (UNCED) as well as by Germany's integration within the European Union^{187 188}.

The European Union in 1998 adopted the **European Forest Strategy** in reference to both, UNCED and the pan-European policy process in support of SFM (Forest Europe, also known as the Ministerial Conference on the Protection of Forests in Europe – MCPFE¹⁸⁹). It emphasizes sustainable, multi-purpose forest management as a means for, or contribution to, inter alia, biodiversity conservation, climate protection, environmentally friendly production and socio-economic development. However, the European Forest Strategy does not amount to a common forest policy document, in recognition of the member states' prerogative for forest policy formulation subject to the subsidiarity principle. In consequence, the European Union plays a supportive role¹⁹⁰. A review of the EU Forest Strategy was initiated in April 2011¹⁹¹. Member states of MCPFE at the ministerial conference in Oslo (June 2011) resolved to initiate negotiations towards a Legally Binding Agreement on European Forests. This agreement, once in place, will reflect a binding consensus on SFM across the 46 signatory member states of MCPFE¹⁹².

Intergovernmental negotiations with a view to concretizing the forest related outcomes of UNCED – the Intergovernmental Panel on Forests, IPF (1995-1997) and the Intergovernmental Forum on Forests, IFF (1997-2000) – resulted in both, approximately 270 proposals for action in support of SFM, and the concept of **national forest programs** (NFPs) as a means for their implementation¹⁹³. Germany, having committed itself to promoting the application of the IPF/IFF results, in 1999 launched an NFP process¹⁹⁴ (also with a view to demonstrating the value of NFPs, and promoting their replication). Several German States (Baden-Württemberg, Bavaria) likewise initiated NFP processes¹⁹⁵.

Spearheaded by the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), Germany's NFP thus far proceeded through three phases by means of a series of thematic round-table discussions with the widest possible range of stakeholders. The second phase was based on revised procedural rules taking into account stakeholder criticism in regard to the first phase's result-orientation, transparency and overall efficiency.

¹⁸⁷ Werland, S. und Morisse-Schilbach, M. (2008): Die Bäume, aber den Wald nicht sehen – was bedeutet die Internationalisierung der Waldpolitik für Sektor und Wissenschaft? Forst und Holz 63, No. 9; pp. 12-16

¹⁸⁸ Schraml, U. et al. (2008): Waldzukünfte – Herausforderungen für eine zukunftsfähige Waldpolitik in Deutschland. Ergebnisband des BMBF Forschungsvorhabens Waldzukünfte 2100, Berlin; p. 47

¹⁸⁹ <http://www.foresteurope.org/>

¹⁹⁰ Council Resolution 1999/C 56/01

¹⁹¹ http://ec.europa.eu/agriculture/fore/events/15-04-2011/report_en.pdf

¹⁹² [http://www.foresteurope.org/eng/What we work for/Legally Binding Agreement/](http://www.foresteurope.org/eng/What_we_work_for/Legally_Binding_Agreement/)

¹⁹³ Liss, B.-M. (1999): Nationale Waldprogramme – Konzept für einen Politik- und Planungsrahmen zur nachhaltigen Bewirtschaftung der Wälder. GTZ/TWRP, Eschborn

¹⁹⁴ <http://www.nwp-online.de/>

¹⁹⁵ Häusler, A. und Scherer-Lorenzen, M. (2002): Nachhaltige Forstwirtschaft in Deutschland im Spiegel des ganzheitlichen Ansatzes der Biodiversitätskonvention. BfN-Skripten 62, Bundesamt für Naturschutz, Bonn; p. 33

Table 14: Phases and the Contextual Framework of the German NFP Process

Phase	Period	Topics addressed
1	1999-2000	<ul style="list-style-type: none"> • forests and society • forests and biodiversity • significance of forests for global carbon cycles • wood as a renewable material • contribution of forestry and wood-industries to rural development
2	2001-2003	<ul style="list-style-type: none"> • forests in international cooperation and trade • biodiversity, forest management and nature conservation • forest policy instruments • economic significance of the forest sector • new perceptions and societal functions of forests
	2004-2006	Systematic monitoring, aiming to follow up on the implementation of the NFP proposals for action
3	2006-?	<ul style="list-style-type: none"> • innovative forest products • intensified utilization of wood • segregative approaches to forestry and nature conservation

The **NFP process produced 182 proposals for action**, addressing Federal and State governments, sector administrations, and civil-society stakeholders in regard to their complementary roles, mandates as well as strengths and weaknesses. Entering its third phase in 2006, the NFP process continued with two round table discussions in 2006 and 2007, respectively. Since then, no follow-up discussions have taken place, and stakeholder participation – particularly by environmental and nature conservation NGOs - waned^{196 197}. The NFP process is considered valuable and successful in a general perspective. However, conflicts arising over demands for intensified production and utilization of wood vs. reservation of non-managed forests as reference areas for the undisturbed development of forest ecosystems prevailed, threatening set-backs for nature conservation agendas¹⁹⁸.

Recognizing the significance of sustainably sourced wood for climate protection, sustainable development and employment, the German government in 2004 adopted the **National Wood Promotion Charter** with the goals of (i) promoting demand for, and consumption of domestically produced wood, (ii) optimizing domestic wood supplies in terms of both, quantity and quality, and (iii) promoting research and development with a view to fostering product diversification and technical innovation¹⁹⁹. Accordingly, Germany aims, by 2014, to substantially raise domestic wood production and consumption with a view to contributing to climate change mitigation, promoting commerce, and stimulating employment in structurally disadvantaged rural areas²⁰⁰. Responding to an interpellation before the Federal parliament in 2009, the German government reported on the progress of implementing the National Wood Promotion Charter. Accordingly, the per-capita wood consumption in 2005 had risen from 1.1 (before adoption of the National Wood Promotion Charter) to 1.2 m³ (target value: 1.3 m³ by 2014), with a wood-fuel consumption of almost twice the amount of the year 2000. The Ger-

¹⁹⁶ BMELV (2006): Protokoll der Sitzung des 18. Runden Tisches des Nationalen Waldprogramms Deutschland. Retrieved from: www.nwp-online.de/fileadmin/redaktion/dokumente/Tisch-18/tisch-183a.pdf

¹⁹⁷ BMELV (2006): Protokoll der Sitzung des 19. Runden Tisches des Nationalen Waldprogramms Deutschland. Retrieved from: www.nwp-online.de/fileadmin/redaktion/dokumente/Tisch-19/tisch-193a.pdf

¹⁹⁸ Häusler, A. und Scherer-Lorenzen, M. (2002): Nachhaltige Forstwirtschaft in Deutschland im Spiegel des ganzheitlichen Ansatzes der Biodiversitätskonvention. BfN-Skripten 62, Bundesamt für Naturschutz, Bonn; p. 36

¹⁹⁹ BMELV (2004): Verstärkte Holznutzung zugunsten von Klima, Lebensqualität, Innovation und Arbeitsplätzen (Charta für Holz). Federal Ministry of Food, Agriculture and Consumer Protection, Berlin; pp. 20-23

²⁰⁰ Ibid.; p. 19

man government took measures to promote forest certification and revised public procurement rules accordingly. Research with a view to increasing biomass as a climate-friendly source of energy had been markedly intensified²⁰¹. However, implementation of the National Wood Promotion Charter provoked heated criticism by environmental and nature conservation NGOs, claiming that sustainable forest management with an ecological perspective would require a reduction of domestic wood consumption, rather than its deliberate promotion²⁰².

In November 2007, the Federal government adopted Germany's **National Biodiversity Strategy (NBS)**²⁰³, developed under the auspices of the BMU in response to Article 6 of the **UNCBD**. The strategy's structure and content are closely aligned with both, Germany's National Strategy on Sustainable Development and the European Union's Strategy on Biodiversity Conservation. Designed to guide Germany's efforts in regard to biodiversity conservation for at least four legislative periods, the strategy departs from a systematic stock-taking of current risks and potentials, and unfolds a vision for the future protection and sustainable use of Germany's natural resources.

In regard to forests and forestry, the strategy highlights **important – though localized – deficits** in terms of (i) the lack of old-growth forests, (ii) insufficient retention of dead-wood and protection of critical habitats, (iii) use of non-indigenous tree species, and (iv) detrimental effects of mechanized forest management and logging²⁰⁴. Whilst acknowledging the achievements of sustainable forest management regarding reforestation and the gradual transformation of age-class forests into structurally diverse, mixed stands, the strategy nevertheless highlights the lack of representative forest areas in an undisturbed state, old-growth forests and historically significant forest types (e.g. coppice) as a critical threat to forest biodiversity. In response thereto, the strategy stipulates the following goals:

Box 7: Focus and Goals of Germany's National Biodiversity Strategy (NBS) ²⁰⁵

- preservation of **large, non-fragmented forest areas**,
- preservation and development of **natural and close-to-natural forests on 5 percent of the total forest area by 2020** (10 percent of the total area of public forests),
- protection of **old-growth forests** and expansion of forests managed pursuant to **historically significant land-use types**,
- promotion of **nature conservation by agreement** in non-public forests on 10 percent of the total area,
- development of Federal and State strategies for exemplary consideration of biodiversity conservation in the management of public forests by 2010, and implementation by 2020,
- **clarification of SFM procedures and protocols** by means of an amendment of the Federal Forest Act by 2010,
- **forest certification** on 80 percent of the total forest area according to high ecological standards by 2010,
- harmonization of forest regeneration and game populations by 2020,
- **climate change adaptation** by means of structurally diverse mixed forests,

²⁰¹ www.bundesregierung.de/nn_23130/Content/DE/Archiv16/Artikel/2006/07/2006-07-19-charta-f_C3_BCr-holz.html

²⁰² www.greenpeace.de/themen/waelder/nachrichten/artikel/kuenasts_charta_fuer_holz_ist_mangelhaft/, www.ngo-online.de/2004/09/3/waldschutz/, www.pro-regenwald.de/news/2011/04/07/Falsche_Freunde

²⁰³ http://www.bfn.de/0304_biodivstrategie-nationale.html

²⁰⁴ BMU (2007): Nationale Strategie zur biologischen Vielfalt. Berlin; p. 17

²⁰⁵ Ibid.; p. 32

- no use of genetically modified organisms in forestry,
- preservation of riparian forests and swamp forests,
- **reorientation of public support instruments and fiscal policies** with a view to promoting biodiversity conservation,
- promoting of **carbon-sequestration** by means of afforestation of suitable areas.

Not surprisingly, the adoption of the NBS was accompanied by spirited public debate involving a wide range of the stakeholders referenced in section 4.1.4. Representatives of the forest sector criticized particularly the goal of setting aside five percent of German forests as non-managed reference areas²⁰⁶, while environmental and nature conservation NGOs perceived the NBS as insufficient and half-hearted²⁰⁷. The recent amendment of the Federal Forest Act in July 2010 failed to replace indeterminate legal requirements for “sustainable” and “orderly” forest management with more detailed and binding principles and protocols of SFM. Other issues, however, including the need for a reduction of damages caused by game species, climate change adaptation, and the promotion of the forests’ carbon-sequestration potential were met with wide consensus and reflect the range of shared goals and perceptions among foresters and conservationists alike.

Divergent interests and perceptions aside, implementation of the NBS in Germany’s forest sector faces the challenges of policy coherence and governance coordination within a federalist system. This includes horizontal coordination between the NBS and other national programs and strategies as well as vertical coordination with the forest policy visions and organizational reforms of the 16 German States²⁰⁸.

In 2008, the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV) initiated a multi-year consultative process with the goal of formulating a comprehensive long-term strategy for forest sector development in Germany. Successive national symposia within the period 2008-2010, combining the perspectives of science and numerous stakeholders, set the stage for the eventual adoption of the German **Forest Strategy 2020**²⁰⁹ in September 2011. The strategy builds on the outcomes of a macro-economic assessment of the combined forest and timber industry sectors²¹⁰, and references key-results of the German NFP-process²¹¹. It is framed around nine thematic areas with corresponding recommendations for action (see Table 15 overleaf).

²⁰⁶ DFWR (2007): Forstwirtschaft kritisiert massiv die Nationale Strategie der biologischen Vielfalt. Pressemitteilung vom 07. November 2007.

²⁰⁷ BUND (2007): Entwurf der nationalen Strategie zur biologischen Vielfalt – Stellungnahme des Bund für Umwelt und Naturschutz Deutschland (BUND).

²⁰⁸ BfN (2010): Dialogforum Öffentlicher Wald und Nationale Biodiversitätsstrategie. Tagungsband – Vilm, 19.-21. Mai 2010, Bundesamt für Naturschutz, Bonn; pp. 6-7

²⁰⁹ <http://www.bmelv.de/SharedDocs/Standardartikel/Landwirtschaft/Wald-Jagd/Waldstrategie2020.html>

²¹⁰ Mrosek, T., Kies, U. und Schulte, A. (2005): Clusterstudie Forst und Holz Deutschland 2005. Holzzentralblatt Nr. 84

²¹¹ BMELV (2011): Waldstrategie 2020: Nachhaltige Waldbewirtschaftung – eine gesellschaftliche Chance und Herausforderung. Berlin, p. 6

Table 15: Thematic Areas and Salient Provisions of Germany's Forest Strategy 2020

Thematic area	Salient provisions
Climate protection and adaptation to climate change	<ul style="list-style-type: none"> • carbon sequestration and adaptation of forests to climate change as a contribution to German climate protection and (renewable) energy policies • recognition of wood and wood products in national carbon-accounting • evaluation of the adaptive potential of non-managed forests as a silvicultural reference
Property, employment and income	<ul style="list-style-type: none"> • promotion of framework conditions that underscore the significance of economically viable forest enterprises and FMAs • promotion of framework conditions that ensure self-determination, market orientation and sustainable operation by forest owners • increased public advisory support services to forest owners with a view to balancing diversified societal demand for multiple goods and services
Raw materials, utilization and efficiency	<ul style="list-style-type: none"> • increased forest harvesting up to the level of the mean annual increment, in reference to climate protection commitments of the German government (approx. 100 Mio. m³ annually) whilst maintaining the forests carbon sequestration potential • resource-saving production and consumption, recycling of wastes, improved efficiency rates through technical innovation, promotion of the use of biomass for combined heat and power generation, corresponding incentive schemes • development of innovative incentives and support schemes with a view to mobilizing hitherto non-realized productive potentials
Biodiversity and nature conservation in forests	<ul style="list-style-type: none"> • measures to rationalize and mitigate existing conflicts between biodiversity conservation and forest production, including promotion of non-managed forests, dead-wood, wilderness areas and NATURA 2000 protected area networks in reference to the NBS, particularly in public forests (in private forests subject to voluntary agreements and financial compensation) • re-orientation of public support instruments in an ecological perspective, evidence-based quantification and valuation of environmental services • promotion of payments for environmental services (PES), including the development of EU agricultural policies
Silviculture	<ul style="list-style-type: none"> • preservation and expansion of forest cover, reduction of forest conversion, promotion of site-adapted forests composed of indigenous tree species • promotion of forest health and stability and risk mitigation through structurally diverse mixed forests, tending and thinning, protection of genetic diversity • no short-rotation plantations within the PFE, exploration of options for biomass production in the course of reforestation and forest transformation
Hunting	<ul style="list-style-type: none"> • wildlife management to ensure natural regeneration and uninhibited growth of structurally diverse, mixed forests • intensified stakeholder participation and conflict resolution • habitat improvement, wildlife protection, mitigation of recreational pressure
Protection of soils and water resources	<ul style="list-style-type: none"> • further reduction of airborne pollutants (esp. high nitrogen deposition caused by agriculture, traffic, and power generation) and continued public support for measures to counter soil acidification; no use of fertilizers to stimulate production • avoidance of clear-felling subject to State Forest Laws • reduced/low impact logging (RIL/LIL) by means of adapted technology and mechanization, and diligent biomass production • compensation of water supply services
Recreation, health and tourism	<ul style="list-style-type: none"> • visitor direction with a view minimizing disturbance of ecologically sensitive areas • financial compensation of professionally managed, commercial recreational activities • innovative concepts of forest-based tourism and environmental awareness building
Education, public relations and research	<ul style="list-style-type: none"> • intensified public awareness building and sensitization of the general public • research foci: (i) climate change impacts, mitigation and adaptation, (ii) forest and biodiversity monitoring, (iii) development of more efficient approaches to biodiversity conservation in managed forests, (iv) assessment of future demand for forest goods and services, including biomass production outside forests, (v) product diversification, down-stream processing, resource-saving consumption • cross-sector research, coordination of research on EU, Federal and State levels

Similar to other policy processes and programs referenced within this section, drafting and adoption of the Forest Strategy 2020 were accompanied by intense debate and evoked praise as well as criticism from a wide range of stakeholders. The German Forestry Council (DFWR) characterized the strategy as a “*viable compromise to reconcile changing energy supply policies, climate protection and biodiversity conservation*”²¹². Forest owners’ representatives, on the other hand, harshly criticized the proposed expansion of non-managed forest areas, in reference to the fact that two thirds of German forests were already subject to at least one legal category of nature conservation regimes²¹³. Environmental and nature conservation NGOs voiced major concerns in regard to the Forest Strategy’s alleged focus on intensified forest production, insufficient consideration of the National Biodiversity Strategy, noncommittal provisions on the reservation of non-managed forests, insufficient consideration of qualitative distinctions between different forest certification schemes, and a general failure to resolve high game pressure on forests²¹⁴.

Summarizing the overview of the foregoing policy processes and programs in relation to forest protection and sustainable forest management, a number of **conclusions** seems pertinent:

- Despite their high-level character, **none of the referenced programs and strategies is directly binding on forest sector stakeholders**. Strategic provisions and commitments prescribed therein must be regarded as aspirational goals, rather than directly enforceable rules. This marks an important distinction between Germany and the P.R. China.
- The foregoing programs and strategies, while originating at the national level, **cannot be implemented single-handedly by the Federal government**. Owing to Germany’s federalist set-up, their practical achievement depends on coordination between the Federal and States level.
- Forest related policies, programs and strategies emerged through **cross-sector coordination** and **stakeholder participation**.
- Forest policy development is characterized by **continuity and gradual evolution**, largely independent from politics of the day. The aforementioned examples reflect a period of more than 10 years, during which the Federal government was repeatedly changed through elections. Even though, **high levels of consistency and policy coherence over time** are obvious.
- Government strategies and programs have been developed through extensive multi-stakeholder consultations, and with participation of the scientific community. **The Federal government, rather than directing policy, acted as a catalyst and moderator** aiming for the highest possible level of societal consensus, ownership and acceptance by the various stakeholders involved. However, the persistence and intensity of **disputes between organized stakeholder groups** is suggestive of structural group conflicts arising from societal pluralism and the ever diversifying demand for forest goods and services. Dynamics of this kind will likely continue to shape the image of German forest policy development in the future.

²¹² DFWR (2011): Waldstrategie 2020 – Gute Perspektiven für den Wald! Press release, September 22nd, Berlin

²¹³ <http://www.agrarheute.com/waldstrategie2020>

²¹⁴ BUND, DNR, Forum Umwelt und Entwicklung, Greenpeace, NABU, WWF (2010): Waldstrategie 2020 - Entwurf des BMELV: Stellungnahme in 10 Punkten. Joint press release, October 2010 – see also: Forum Umwelt und Entwicklung (2009): Biodiversitätsstrategie nicht torpedieren. Press release, July 1st, 2009

4.2 China – Forest Policy Frameworks for Forest Protection and the Transition towards SFM

4.2.1 Forest-related Policies and Programs since 1949

4.2.1.1 China' Forest Transition – General Characteristics

Chinese forest policy is marked by a number of characteristics, listed below, which seem radically different from German forest policy as discussed in the foregoing sections:

- the decisive impact of trends and processes outside the forest sector *over relatively short periods of time*,
- highly dynamic, sometimes radical *changes and reversals* of established perceptions and paradigms,
- a distinct dominance of the state in forest policy formulation and decision making, coupled with
- limited stakeholder and civil-society participation in the forest sector,
- a strong preference for policy implementation by means of centrally planned (and funded, sic!) programs and campaigns.

The development of a country's forest resources provides a mirror image of economic and social development, with periods of deforestation followed by reforestation and recovery (the "forest transition process"). Despite (i) low forest cover rates, (ii) uneven spatial distribution of forest resources, (iii) high population pressure and (iv) a decade-long history of widespread rural poverty, **China reversed deforestation more rapidly and decisively than most other developing countries**. This achievement did not occur by coincidence, but is the result of policy decisions backed up by significant public investment in forest rehabilitation²¹⁵.

However great current policy challenges arising from forest sector reform and the transition towards SFM may appear, forestry development in China overall must be regarded as outstandingly successful. The actual extent of forest cover changes is difficult to gauge though, because of unreliable baseline data (1943, extrapolated after 1949). Simply put, the total forest cover in 1949 may have been higher than the frequently cited figure of 9 percent²¹⁶, deforestation in natural forest areas may have been more severe, and initial effects of reforestation less pronounced, than anticipated by official statistics until the second NFI (1977-1981, revealing the serious state of forest resources)²¹⁷. Even though, China's forest cover bounced back to upwards of 20 percent by the time of China's seventh National Forest Inventory (NFI, 2009²¹⁸). Reforestation has, however, been firmly focused on area targets. Present-day policies and programs increasingly shift from quantitative reforestation goals towards qualitative parameters of forest health and stability.

²¹⁵ The World Bank (2010): China Forest Policy – Deepening the Transition, Broadening the Relationship. Washington D.C.; p. 4

²¹⁶ Zhang, Y. and Song, C. (2006): Impacts of Afforestation, Deforestation, and Reforestation on Forest Cover in China from 1949 to 2003. *Journal of Forestry*; p. 384

²¹⁷ Zhang, Y. (2000): Deforestation and Forest Transition – Theory and Evidence in China; p. 59. In: Palo, M. and Vanhanen, H. (eds.): *World Forests from Deforestation to Transition?* Kluwer Academic Publishers, Dordrecht; pp. 41-65

²¹⁸ Petry, M. and Zhang, L. (2009): Report on China's 7th National Forest Inventory. Country report, USDA Global Agricultural Information Network (GAIN), Beijing / Washington D.C.

4.2.1.2 Timber Exploitation and Reforestation in parallel

The 20th century, even prior to the establishment of the P.R. China in 1949, was characterized by deforestation at a rate substantially higher than the expansion of agricultural land. For this reason, land use change in response to rapid population growth cannot sufficiently explain deforestation in China. Significant causes of deforestation were political instability and (civil-) war prior to 1949. Thereafter, reconstruction, economic as well as industrial development, and institutional weakness²¹⁹ created conditions non-conducive to forest protection and sustainable forest management²²⁰.

Early policies of the P.R. China regarding forests had a **dual focus** on timber production in key-natural forest areas, and afforestation of barren and denuded wastelands threatened by erosion and loss of soil fertility.

National campaigns aiming to fast-track industrial development especially by means of decentralized steel-making (the “great leap forward”, launched in 1958) significantly increased the already high and rapidly growing pressure on forests.

Forest industry development during the 1960ies was largely based on the opening up of large forest areas in northeastern and southwestern parts of China, further spurring timber exploitation. Political instability throughout the “cultural revolution” period meant that while timber exploitation continued in a mostly unregulated fashion, afforestation campaigns lost momentum and effectiveness.

Large-scale afforestation on the order of 104 million ha between 1949 and 1979 – despite mass mobilization and substantial investment – often suffered from low survival rates (around 20 percent) and canopy closure well below expectations^{221 222}. Comparisons of afforestation statistics for the period 1950-1995 with extant plantations in 1995 suggest that the cumulative plantation areas were seven times larger than the resultant actual plantation forests²²³. Such observations cast doubt on past investments with a view to boosting timber supplies and reducing pressures on natural forests.

In consequence, **China did not avail of a unified, coherent forest policy, but pursued parallel avenues of timber production** (in natural forests) **and afforestation** (of hitherto non-forested, degraded lands) – resulting in continuing decline of natural forests despite an overall positive trend of forest cover development²²⁴.

This decline of natural forests (including their gradual replacement with single-storey plantations of economically attractive, fast-growing tree species) has been the cause of habitat

²¹⁹ Zhang, Y. (2001): Institutions in Forest Management – Special Reference to China; p. 361. In: Palo, M., Usivuori, J. and Mery, G. (eds.): World Forests, Market and Policy. Kluwer Academic Publishers, Dordrecht; pp. 353-364

²²⁰ Zhang, Y. (2000): Deforestation and Forest Transition – Theory and Evidence in China; p.54. In: Palo, M. and Vanhanen, H. (eds.): World Forests from Deforestation to Transition? Kluwer Academic Publishers, Dordrecht; pp. 41-65

²²¹ Wang, S. et al. (2004): Mosaic of reform – forest policy in post-1978 China. Forest Policy and Economics 6/2004; p. 74

²²² Zhang, Y. and Song, C. (2006): Impacts of Afforestation, Deforestation, and Reforestation on Forest Cover in China from 1949 to 2003. Journal of Forestry; p. 384

²²³ Zhang, Y. (2005): Multiple-use Forestry vs. Forestland-use Specialization revisited. Forest Policy and Economics, 7/2005; pp. 143-156

²²⁴ Zhang, Y. and Song, C. (2006): Impacts of Afforestation, Deforestation, and Reforestation on Forest Cover in China from 1949 to 2003. Journal of Forestry; p. 385

fragmentation, species loss, and environmental calamities such as soil erosion, high silt loads of rivers, and an increased incidence of flooding²²⁵.

4.2.1.3 Restructuring and Recovery past 1978

The year 1978 marks the onset of an unprecedented combination of political reform, economic liberalization and societal transformation, often referred to as “**China’s opening to the outside world**”.

In the forest sector, these reforms translated into (i) reinvigorated forest governance, (ii) creation of a legal regulatory framework, (iii) tenure reform, see also section 3.4, (iv) adoption of market-economic concepts, and (v) the launch of major, centrally coordinated forestry programs (see Table 16).

Forest governance was refocused on **controlling timber harvesting**. Instrumental to this end was the enactment of the Forestry Law, providing for the establishment of state-control over timber harvesting by means of a logging-quota system.

Along with enhanced forest policy coordination by the Ministry of Forestry, **economic liberalization and decentralization** loosened centralized control over state-owned forest enterprises, and ended the long standing under-pricing of timber as a cheap raw material for industrial development²²⁶.

Tenure reforms, first originating in the agricultural sector during the early 1980ies and being applied to forestry soon thereafter, were an inherent component of China’s economic and societal restructuring. Even though tenure reform did emerge neither in a linear fashion nor through centralized coordination, it achieved a lasting impact in terms of mobilizing private investment and facilitating the emergence of forest-based small and medium enterprises²²⁷ (for details, refer to section 3.4).

China past 1978 adopted comprehensive and **multi-faceted afforestation and reforestation policies**, and assured better coordination with a view to boosting both, effectiveness and efficiency. Market-economic reforms that quickly proved highly successful generated financial surpluses and thus enabled significant public investments in that regard.

China during the post-1978 era launched the following programs:

²²⁵ Zhang, P. et al. (2000): China’s Forest Policy for the 21st Century. Science, Vol. 288; pp. 2135-2136

²²⁶ Wang, S., van Cooten, G. and Wilson, B. (2004): Mosaic of Reform – Forest Policy in post-1978 China. Forest Policy and Economics 6/2004; pp. 71-83

²²⁷ Xinjian, L. et al. (2009): Challenges and opportunities for China’s small and medium forest enterprises. Forest Connect – Diagnostic Studies on Small and Medium-sized Forest Enterprises 4, FAO, Rome; p. 13

Table 16: Nationally coordinated Reforestation Programs past 1978^{228 229 230 231 232}

Title	Timeline	Scope and Investment	Foci
Key-Shelterbelt Development Program in the Three-North Region	Launched 1978 Duration 73 years (2050)	13 provinces, 551 counties, 407 Mio. ha 58 billion RMB total	Desertification control, Water and soil protection, Protection of farmland, food security, socio-economic rural development
National Compulsory Tree Planting Campaign	Launched in 1981	n/a	Afforestation, Mass mobilization and awareness building for forestry and environmental issues
Taihang Mountain Afforestation Program	Launched 1987 Trial period until 1993 Duration 13 years (2000)	110 counties of Shanxi, Hebei, Henan provinces, Beijing City 6.9 Mio. ha of forests	Afforestation
Development of the Fast-growing and High-yielding Timber Bases	Launched 1988 Duration 30 years (2018)	Establishment of 20 Mio. ha of plantation forests	Mobilization of domestic timber supplies, Reduction of pressure on natural forests
Coastal Shelterbelt Development Program	Launched 1988 22 years (2010)	11 coastal provinces, 195 counties 3.6 Mio. ha	Erosion control, Protection of farmland and infrastructure, Ecological improvement
Plain Farmland Shelterbelt Development Program	Launched 1988	724 counties 39 Mio. ha of shelterbelts	Protection of farmland, Local timber supplies, Rural development
Afforestation along the upper and middle reaches of the Yangtze River	Launched 1989 Duration 30-40 years	Establishment of 20 Mio. ha of forests	Environmental improvement for societal benefits
National Program to Combat Desertification	Launched 1991 Duration 10 years (2000)	6.7 Mio. ha of land threatened by wind erosion and desertification	Sand fixation, Land rehabilitation, Protection of farmland
Riparian Shelterbelts (Huaihe River Basin, Taihu Basin, Zhujiang River Basin, Liaohe River Basin, middle reaches of the Yellow River)	Launched 1995	16 provinces, 609 counties 12.4 Mio. ha of forests	Public and non-public investment in the establishment of forests, Multiple types of protection and production forests

Policies and government programs of the aforementioned kind are noteworthy in several respects:

- Together, they reflect the **transition towards integrated forest policy** in its own right, elevating the forest sector from its past role as a provider of cheap raw material for industrial development,

²²⁸ Li, X. (1998): Forestry Policy in China – the past, present and future. Proceedings of the IGES International Workshop Forest Conservation Strategies for the Asia and Pacific Region (July 21st-23rd, 1998, Kanagawa, Japan); pp. 134-147

²²⁹ Xiao, W., Dai, G. and Zhang, S. (2010): China's Strategy and Financing for Forestry Sustainable Development. Country Case Study, UNFF Ad hoc Expert Group on Forest Financing, Beijing.

²³⁰ <http://chinagate.cn/english/1937.htm>

²³¹ Shi, K. et al. (1997): China's Country Report on Forestry. Asia-Pacific Forest Sector Outlook Study, Working Paper APFSOS/WP/14, FAO Policy and Planning Division/Regional Office Asia-Pacific, Rome/Bangkok; pp.26-36

²³² Li, W. (2004): Degradation and Restoration of Forest Ecosystems in China. Forest Ecology and Management 201; pp. 33-41

- They **recognize the environmental, economic and social significance of forests** with a cross-sectoral perspective on rural development, but apply **clear segregation of forest functions**,
- They combine natural forest protection with afforestation and reforestation as well as rehabilitation in support of both, domestic timber production and environmental protection – thereby replacing, for the first time, **demand-driven exploitation with production-oriented forest management**.

As an immediate consequence of policies to control timber production and ease the pressure on natural forests, a **steadily widening gap emerged in China between timber supply and demand**²³³. Owing to the factors that (i) a time-lag exists between plantation establishment and harvesting and (ii) only part of China's afforestation and reforestation efforts are focused on creating production forests, imports of timber and wood products increased (and continue to increase) sharply. Recent studies speak of the need for imports, by 2010, on the order of 125 Mio. m³ round-wood equivalents²³⁴. Principal suppliers of Chinese timber imports include the Russian Federation as well as a wide range of tropical countries – primarily, but not exclusively, in South-East Asia, with the majority of wood originating from the exploitation of natural forests²³⁵. Aside from manifest demand and tightening restrictions on domestic timber logging, China in the course of its market-economic reforms also removed tariff as well as non-tariff trade barriers, which further spurred the inflow of timber imports, non-processed round-wood, pulp and paper in particular. Moreover, economic development and restructuring of Chinese timber industries rapidly increased China's downstream-processing capacity, turning China into a major exporter of (half-) finished timber products.

China's dependency on wood imports gives cause for global concern in regard to the adverse consequences for supplier countries. These include, inter alia, non-sustainable exploitation of forests (including high-conservation value forests – HCVF), a substantial – though hard to quantify – share of wood from illegal sources, and rampant corruption worsening the already precarious state of forest governance in many supplier countries²³⁶. Impacts materialize locally as well as globally, including destabilized community livelihoods and set-backs for rural development, foregone timber revenue as well as customs and taxes, market distortions creating a disincentive for legal and sustainable forest management, loss of biodiversity and loss of carbon sinks. Non-regulated and unsustainable forest use ultimately challenges the achievement of shared global policy goals as expressed in the relevant multilateral environmental agreements (UNCCD, UNCBD, UNFCCC)²³⁷. Such issues gave rise to various global as well as regional initiatives and processes with a view to enhancing

²³³ Li, X. (1998): Forestry Policy in China – the past, present and future. Proceedings of the IGES International Workshop Forest Conservation Strategies for the Asia and Pacific Region (July 21st-23rd, 1998, Kanagawa, Japan); pp. 134-147

²³⁴ Xinjian, L. et al. (2009): Challenges and opportunities for China's small and medium forest enterprises. Forest Connect – Diagnostic Studies on Small and Medium-sized Forest Enterprises 4, FAO, Rome; p. 11

²³⁵ Katsigris, E. et al. (2004): The China Forest Product Trade – Overview of the Asia-Pacific supplying Countries, Impacts and Implications. International Forestry Review, Vol. 6 (3-4); pp. 237-253

²³⁶ Toyne, P., O'Brian, C. and Nelson, R. (2002): The Timber Footprint of the G8 and China. WWF International, Gland (Switzerland); p. 12

²³⁷ http://www.illegal-logging.info/approach.php?a_id=265

forest law enforcement and governance (FLEG) past the year 2000²³⁸. These processes exerted considerable influence on forest policy development in China (see section 4.2.1.4).

Nature conservation by means of the **establishment of a protected area network** likewise gained considerable momentum in post-1978 China, with a corresponding sharp increase of both, numbers of nature reserves established and the total area under protection from 1980 onwards. Not surprisingly, a large proportion of nature reserves locate in forest areas; in 2004, nature reserves in forests accounted for close to 18 Mio. km², equivalent to roughly 13 percent of China's forest area²³⁹. By 1990, the total number of nature reserves was approaching 600 with a total area coverage upwards of 30 Mio. ha²⁴⁰. Within the period 1978-1999, the total number of nature reserves skyrocketed from 34 to 1,146, creating a huge challenge for environmental and forest governance as well as for the concerned rural population.

Establishment of nature reserves typically involved various government levels and professional expertise, but rarely local stakeholder participation. In its wake, restrictive conservation regimes often denied local stakeholders access to, and benefits from much needed natural resources – irrespective of legitimate use rights or livelihood needs. Not surprisingly, this development engendered widespread local disenchantment along with manifest conflicts²⁴¹. On the other hand, local governments and relevant sector administrations were hardly prepared for the rapid expansion of the protected area network – neither in terms of management capacity, nor in terms of funds or staff resources. A 2003 publication observes that one-third of nature reserves in China even lacked clear boundaries²⁴².

4.2.1.4 Shifting Paradigms – Forest Protection, Ecological Improvement, and the Transition towards SFM

In spite of undeniable achievements during the restructuring and recovery period past 1978, China, approaching the year 2000 faced significant challenges²⁴³:

- **Environmental degradation:** increasing severity and frequency of drought and floods, significant soil erosion and desertification and loss of biodiversity on a scale that threatened to set back social and economic development;
- **Weak incentives for engaging in forest protection and SFM:** lacking compensation of environmental services, insufficient tenure security, high fiscal burdens arising from taxation and the levying of fees and charges;
- **Problems affecting forest production and down-stream processing:** a generally poor state of forest resources (health and stability, growing stock per area-unit) – the so-called “resource crisis”, low efficiency and financial as well as social encumbrances affecting state-owned forest enterprises (particularly SoFEs within key-state owned

²³⁸ World Bank (2006): Strengthening Forest Law Enforcement and Governance – Addressing a Systemic Constraint to Sustainable Development. Report No. 36638-GLB, Environment and Agriculture and Rural Development Departments, Washington D.C.; pp. 15-29

²³⁹ Li, W. (2004): Degradation and Restoration of Forest Ecosystems in China. *Forest Ecology and Management* 201; pp. 33-41

²⁴⁰ Liu, J. et al. (2003): Protecting China's Biodiversity. *Science*, Vol. 300; pp. 1240-1241

²⁴¹ Jim, C., Steve, S. and Xu, W. (2002): Stifled Stakeholders and Subdued Participation – Interpreting Local Responses toward Shimentai Nature Reserve in South China. *Environmental Management*, No. 3, Vol. 30; pp. 327-341

²⁴² Liu, J. et al. (2003): Protecting China's Biodiversity. *Science*, Vol. 300; pp. 1240-1241

²⁴³ SFA (2001): China Forestry Development Report 2000. State Forestry Administration of the P.R. China, Beijing; pp. 24-25

forest areas, see also section 3.2.2) – the so-called “economic crisis”; and weak, inefficient and structurally disadvantaged timber industries;

- **Challenges arising from the adoption of a market economic system:** remnants of planned economy in terms of management and benefit-sharing, lasting dominance of the state, slow development of non-public investment and transactions in the forest sector.

Responding to such challenges, the Chinese government in 1997 re-focused its development outlook on the “**improvement of the eco-environment**” with a view to ensuring social and economic development in the face of ever more frequent natural disasters. Massive and disastrous flooding affecting the basins of the Yangtze, Songhua and Nenjiang Rivers in 1998 provided the backdrop for the launch of **six high-level national forest sector programs**²⁴⁴ that have since formed the centre-piece of Chinese forest policy, forest sector reform, and forest governance²⁴⁵. They include²⁴⁶:

- **Natural Forest Protection Program (NFPP):** with a trial period of two years until full-fledged implementation and a lifespan of initially 10 years, the NFPP encompasses a total of 734 counties and 167 forest enterprises spread across 17 provinces, with regional foci on the upper reaches of the Yangtze and Yellow rivers as well as key-state owned forest areas in China’s north-east and Inner Mongolia. The NFPP essentially aims to sharply reduce logging in natural forests and to recover significant areas by means of natural regeneration and afforestation. A key-component to these ends was the so-called logging ban to enforce the intended decrease of harvesting in natural forests. As its immediate consequence, regular operation of a significant share of SoFEs was restricted, resulting in massive lay-offs of their staff – upwards of 600,000. For this reason, the NFPP – backed up by major investment on the order of 121 billion RMB²⁴⁷ (19 billion U.S. \$), 103 billion RMB (16 billion U.S. \$) of which provided by the central government – foresaw a significant re-settlement and re-employment component, and redirected SoFEs from timber production towards reforestation, forest rehabilitation and tending.
- **Conversion of Cropland to Forests Program (CCFP):** the program aims for the reforestation of croplands on slopes steeper than 25° as well as in fragile areas prone to desertification. Covering 25 provinces with a total of 2,291 counties (120 Mio. farmers), the CCFP was designed to achieve a huge impact on rural areas, aiming for the establishment of ecological forests on as much as 80 percent of the conversion areas (32 Mio. ha in total). To these ends, the Chinese government foresaw investment upwards of 431 billion RMB (68 billion U.S. \$), with a view to (i) providing farmers with seedling material for reforestation, (ii) compensating their losses both in cash and kind (grain deliveries), (iii) subsidizing rehabilitation and tending operations by the local population, and (iv) compensating local governments for foregone fiscal revenues.
- **Key-Shelterbelt Development Program:** This program was launched for the coordinated continuation of shelterbelt-programs initiated at earlier stages (see Table 16), in-

²⁴⁴ Ibid.; p. 30

²⁴⁵ SFA (2002): China Forestry Development Report 2001. State Forestry Administration of the P.R. China, Beijing; p. 5

²⁴⁶ Xiao, W., Dai, G. and Zhang, S. (2010): China’s Strategy and Financing for Forestry Sustainable Development. Country Case Study, UNFF Ad hoc Expert Group on Forest Financing, Beijing; pp. 4-12

²⁴⁷ Exchange Rate 1 U.S. Dollar = 0.157 RMB; <http://www.bankenverband.de/service/waehrungsrechner> (November 18th, 2011)

cluding the Three-Norths Shelterbelt Program, the Shelterbelt Program for the Yangtze and Pearl rivers, the Coastal Shelterbelt Program, the Taihang Mountain Afforestation Program, and the Plain Farmland Shelterbelt Development Program. Within the period 2001-2010, government funding on a scale of 70 billion RMB (11 billion U.S. \$) was foreseen.

- **Sandification Control Program in the vicinity of Beijing and Tianjin:** In a bid to stop the growing incidence of sandstorms affecting major population centers, the Chinese government devised an integrated approach consisting of reforestation and land rehabilitation measures, reducing grazing pressure and resettlement of rural communities in fragile locations, provision of advance technology and energy services, and research activities with a view to better monitoring and forecasting sandstorms. With a total budget of initially 58 billion RMB (9 billion U.S. \$), the program was implemented with a strong component of subsidies and compensation for the affected rural population.
- **Wildlife Conservation and Nature Reserve Development Program (WCNRDP):** The WCNRDP was conceived for a lifespan of 50 years, with its first phase running from 2001 to 2010. The first phase was designed with a three-pronged approach, consisting of ex-situ conservation by means of breeding of endangered species, in-situ conservation through enlargement of the protected area network to 155 Mio. ha, and overall improvement of administrative capacities. Complementary measures included research, promotion of private sector involvement, and eco-tourism. The program's total investment volume was forecast as 136 billion RMB (21 billion U.S. \$). The program exerts a significant impact on forest management by means of an **inbuilt logging ban**, owing to the fact that nature reserves – by virtue of Article 31 [3] of the Forestry Law of the P.R. China (1998, as amended) – constitute logging exclusion zones where even logging for the purpose of rehabilitation and regeneration is prohibited.
- **Forest Industrial Base Development Program (FIBDP):** the FIBDP aims for the establishment of fast-growing high-yield timber plantations across 18 provinces within the timeframe 2001-2015. This program was designed to offset, at least in part, the economic effects of reductions in logging caused by the shift of focus to forest protection and ecological conservation. The overall goal is to establish, by 2015, a total of upwards of 13 Mio. ha of timber plantations. Unlike the other programs, the FIBDP does not rely primarily on government funding, but provides broad room for private investment, including by foreign parties, with preferential policies supporting its implementation.

Together, the foregoing programs are noteworthy in several respects. First, they provide a comprehensive, **interlocking forest policy framework** reflecting **multiple forest functions**. Second, they are propped up by **massive public investment** on a scale unrivalled elsewhere. This bears witness to the Chinese government's commitment to forest protection, ecological conservation and sustainable forest sector development. Third, the programs inadvertently **aggravate the widening gap between domestic demand and wood supplies**.

Complementing the scope of strategic national forest sector programs, two further programs with a similar focus were launched in 2005 and 2006, respectively.

- **Wetlands Conservation and Rehabilitation Program (WCRP):** The WCRP, designed for a period of five years (2005-2010) aims to promote the protection, rehabilitation and sustainable management of wetland resources. With a total investment vol-

ume of 9 billion RMB (1.4 billion U.S. \$), the program has a noticeably smaller outreach, also reflected by its focus on capacity building.

- **Program on Integrating Desertification Control in Karst Regions (PICLD):** The PICLD, launched in 2006 with an implementation period until 2015, as of 2010 remained at a pilot stage. Its total investment volume of 461 Mio. RMB (72 Mio. U.S. \$) sets it apart from the other programs described above.

While the aforementioned programs reflect the centerpiece of present-day forest policy development, the Chinese government adopted **numerous complementary policies**²⁴⁸ in line with the **Joint Resolution of the State Council and CPC Central Committee “On Accelerating Forest Sector Development”** (2003).

These policies intend to support forest sector reforms, and to account for **structural deficits** of China’s forest resources.

Box 8: Structural deficiencies of China’s forest resources

Owing to the past history of overexploitation and subsequent reforestation and afforestation, the age-class structure of Chinese forests is clearly tilted in favor of young and middle-aged forests.

These forests have been artificially established and display several **critical deficiencies**: (i) insufficient site-adaptation, (ii) high risks associated with even-aged, monocultures (forest health and stability, vulnerability to climate change), (iii) insufficient tending, aggravating the foregoing risks, (iv) low growing stock per area unit²⁴⁹, and (v) low structural as well as biological diversity.

While these deficiencies have been known for a long time, **massive and unprecedented damage** to 18.6 million ha of forests caused by a freak snow/ice storm across southern China in 2008 caused a rude awakening for the forest sector and motivated urgent policy responses²⁵⁰.

- **Financial policies:** They aim to introduce public support to forest sector development. Since 2009, the Chinese government allocated 2 billion RMB for the **maintenance and tending of key-national Ecological Public Benefit Forests** with a spatial coverage of 27 provinces (> 1.3 Mio. ha). **EPBF compensation** in 2010 was raised to a rate of 150 RMB/ha. Following widespread forest damage in 2008, the Ministry of Finance in 2009 launched a **recovery program** based on preferential lending conditions (soft-loans at an interest rate of 3 percent, as opposed to the average commercial interest rate upwards of 5 percent). With a view to **supporting tenure reform**, China since 2009 enabled forest-smallholders to raise investment capital by mortgaging their growing stock under a micro-credit policy with extended pay-back periods and preferential lending conditions. Likewise in 2009, China launched a pilot-scheme to promote **forest insurance** through subsidized insurance policies. Aiming to relieve socio-economic problems arising from the ongoing **reform of SoFE** in China’s key-national forest areas, the government in 2009 allocated upwards of 70 billion RMB (11 billion

²⁴⁸ Ibid.; pp. 13-16

²⁴⁹ Petry, M. and Zhang, L. (2009): Report on China’s 7th National Forest Inventory. Country report, USDA Global Agricultural Information Network (GAIN), Beijing / Washington D.C.; accordingly, the average growing stock stands at 85 m³/ha, with a clear distinction between natural forests (99 m³/ha) and forest plantations (49 m³/ha)

²⁵⁰ http://news.xinhuanet.com/english/2008-02/13/content_7598342.htm

U.S. \$) for re-settlement and re-employment programs and improvement of public infrastructure. Fiscal reforms served to ease the burden of forest-related taxes, fees and charges levied on forest production revenues.

- **Policies in support of forest sector re-structuring:** In 2008, the CPC Central Committee and the State Council jointly resolved to **step-up forest tenure reform nationwide**, with a particular emphasis on enhancing the exercise of rights by holders of ownership-certificates. The policy aims to facilitate use-right transfers and mortgaging, coupled with budgetary allocations for boundary demarcation and title registration. Renewed efforts at **reforming state-owned forest enterprises** and state forest farms explore organizational models, financing and investment schemes, and options to lease out state-owned forests to private investors.
- **Policies with a view to promoting SFM in line with internationally recognized principles and protocols:** Following the adoption of the NLBI in 2007, China embarked on a course of benchmarking its national frameworks for forest management against internationally recognized principles and protocols of SFM. With a view to promoting **regional cooperation on SFM** including biodiversity conservation and climate change, China in 2008 initiated the Asia-Pacific Forest Rehabilitation and Sustainable Forest Management Network (APFNet²⁵¹). Since 2009, 11 provinces were selected for **SFM pilot-activities** with a view to (i) tending and maintenance of young and middle-aged forests, (ii) improvement of deficient forest plantations, (iii) promoting forest certification, and (iv) enhancing forest protection against fires and other hazards. As part of this initiative, the SFA since 2006 is in the process of drafting a **National Guideline on SFM** which, as of 2011, has reached an advanced stage. Part and parcel of the transition towards SFM is the **reform of the logging-quota system**, aiming to gradually replace centrally allocated logging quota with the Annually Allowable Cut (AAC), determined on the basis of forest management planning at the level of individual forest management units (FMUs). With growing exports of half finished and finished wood products, Chinese timber industries increasingly perceived **certification** as a means of securing market access in Europe and North America. Since 2000, China pursued the development of national criteria and indicators for SFM, initially within the framework of the Montreal Process²⁵². In 2001, national high-level working groups on forest certification were established, and practical certification commenced on the basis of the FSC generic standard. As major certification schemes (FSC and PEFC) began to engage in China, SFA with support by the Chinese Academy of Forestry (CAF) within the period 2004-2007 developed a national standard for SFM certification as well as China's National Certification Scheme (China Forest Certification Council – CFCC). With all three systems (FSC, PEFC, CFCC) operating in parallel, China seeks mutual recognition between CFCC and the other two²⁵³.

Being a signatory party to all forest-related multilateral environmental agreements (MEA) and active participant in international as well as regional forest policy dialogues and initiatives, and seeking international recognition as a “responsible global citizen”, China increasingly adopts policies with a global perspective.

²⁵¹ <http://en.apfnet.cn/index.php>

²⁵² http://www.rinya.maff.go.jp/mpci/criteria_e.html

²⁵³ Hinrichs, A. (2009): Forest Certification in China – Status quo and Support Opportunities for the Sino-German SFM Project. Report No. 9, Sino-German Sustainable Forest Management Project, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing; pp. 4-5, 9-13

- **Policies in response to international initiatives to combat illegal logging and trade in illegally sourced forest products:** While large-scale illegal logging does not occur in China, the country exerts a considerable influence on the suppliers of its timber imports. In recognition of this fact, and responding to global concerns and criticism, China joined the regional processes on **forest law enforcement and governance** (FLEG) for East-Asia and the Pacific (2001) and Europe and North Asia (2005). Being a signatory party to the St. Petersburg Declaration²⁵⁴, China confirmed her commitment to expanding sustainable sourced domestic timber supplies by means of SFM²⁵⁵. Against this backdrop, China since 2000 concluded a number of **bilateral memoranda of understanding** or joint communiqués with Russia, Indonesia, the U.K. and the U.S. Starting in 2006, China expanded its FLEG collaboration with the EU, leading to the signing of a bilateral coordination mechanism (BCM) in reference to the EU-FLEG(T) Action Plan²⁵⁶. **Sino-European cooperation** is backed up by an EU-China Policy Dialogues Facility, operative since 2007. With a similar perspective, China – following the enactment of the Public Procurement Law in 2003 – initiated a process for the development of a **Green Government Procurement Policy for Forest Products**²⁵⁷. This process has been supported by intensive research exploring policy options and the associated costs and benefits²⁵⁸. It is expected that the development of a green procurement policy specific to forest products will require a period of between 5 and 10 years. In March 2009, the Ministry of Commerce (MOFCOM) and SFA jointly issued a **Guideline on Sustainable Overseas Forest Management and Utilization by Chinese Enterprises**, framed around the principles of (i) recognition of national sovereignty and legal compliance, (ii) mutually beneficial operation and corporate social responsibility, (iii) parallel pursuit of ecological, economic, and social benefits, (iv) due diligence, (v) SFM and forest protection, and (vi) resource efficiency²⁵⁹. With a similar focus, SFA in 2008 had already issued a Guide on Sustainable Overseas Silviculture by Chinese Enterprises, addressing issues such as reforestation, nature conservation, including HCVF, and community development²⁶⁰.
- **Policies aiming to promote the forest sector's contribution to climate change mitigation and adaptation:** In 2004, China partook in the international dialogue on renewable energy sources (Renewables 2004), and developed a Renewable Energy Law as well as a national strategy in response thereto (2005). Biomass – wood-based fuels in particular – nonetheless continues to play a marginal role, as compared to other bio-fuels such as biogas, ethanol and the like. In 2007, China adopted a **Nation-**

²⁵⁴ <http://www.fao.org/forestry/69435/en/>

²⁵⁵ http://www.illegal-logging.info/uploads/MDILA_final_25_Nov_05_eng.pdf

²⁵⁶ Hinrichs, A. (2009): Forest Certification in China – Status quo and Support Opportunities for the Sino-German SFM Project. Report No. 9, Sino-German Sustainable Forest Management Project, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing; pp. 14-15

²⁵⁷ Chen, X. and Sizer, N. (2005): Legal and Institutional Arrangements in China to Prevent the Import of Illegal Wood. The Nature Conservancy (TNC) China and Asia-Pacific Programs; p. 16

²⁵⁸ Wen, Y., Li, X. and Hou, F. (2008): Cost-benefit Analysis of China's Adoption of Green Procurement Policy for Forest Products. School of Economics and Management, Beijing Forest University, Beijing.

²⁵⁹ MOFCOM and SFA (2009): Guideline on Sustainable Overseas Forest Management and Utilization by Chinese Enterprises. Ministry of Commerce Dept. of outward Investment and Economic Cooperation, SFA Dept. of Development Planning and Finance Management, Beijing; pp. 15-17

²⁶⁰ SFA (2008): Guide on Sustainable Overseas Silviculture by Chinese Enterprises. State Forestry Administration of the P.R. China, Beijing.

al Climate Change Program²⁶¹, closely followed by the Chinese **State Council White Paper “China’s Policies and Actions for Addressing Climate Change”** (2008). The White Paper emphasizes legal-regulatory action with the goals of (i) enhancing forest cover quantitatively, (ii) protecting fragile and endangered ecosystems and rare species, e.g. by means of reinforcing protected area networks and management routines. Chinese policies highlight, and promote the specific contribution of forests to climate change adaptation and risk prevention in other sectors, e.g. in terms of expanding shelterbelts for coastal protection. The National Climate Change Program likewise stipulates action in three principal regards²⁶²: (i) improvement of legal-regulatory frameworks and respective governance, (ii) acceleration of governmental and industrial afforestation efforts, (iii) continuation and reinforcement of national forest sector programs. In 2008, the **China Beijing Environmental Exchange (CBEE)**X was founded as a state-owned company for the purpose of promoting a national market for pollution rights and Verified Emission Reduction certificates (VER). Responding to a manifest national demand for voluntary carbon-offsets, the PANDA Standard was developed as one of two national standards for voluntary carbon marketing. Designed after the Gold Standard Program of Activities (PoA), PANDA aims to integrate rural poverty alleviation into carbon management. Hitherto focused on rural energy, the development of forest-specific standards under PANDA is at a pilot stage²⁶³. SFA in 2007 established the Green Carbon Fund for the purpose of developing technical standards for carbon-accounting and Measuring, Reporting and Verification (MRV). The Green Carbon Fund in 2010 emerged into the **China Green Carbon Foundation (CGCF)** under the auspices of SFA, involving two major Chinese corporations as well as seven ministries. CGCF is focused on afforestation, forest protection and forest management, with a wide range of activities including the calculation, verification and issuance of carbon-offset certificates pursuant to the CGCF standard, developed in reference to CDM A/R and Climate Community and Biodiversity Alliance (CCBA) and approved by SFA. CGCF mobilizes capital for afforestation and forest management projects in six focal provinces²⁶⁴. Following up on commitments announced by the Chinese President Hu Jintao at the UNFCCC CoP 15 in 2009, China in January 2010 informed the UNFCCC Secretariat of her **voluntary mitigation measures**, including to increase, between 2005 and 2020, forest cover and stock volume by 40 million hectares and 1.3 billion cubic metres, respectively²⁶⁵.

The foregoing discussion of forest policy development invites several **conclusions**:

- Even though forest policy development since around the year 2000 progressed in a far more **integrated manner**, the significant number of individual policy decisions, programs and strategies reflects **rapid and highly dynamic policy development** at the national level.
- While adhering to a limited set of strategic priorities, national forest governance structures **respond quickly to emerging challenges or opportunities** – to the point of substantially modifying, or even reversing past policy decisions. This observation con-

²⁶¹ NDRC (2007): China’s National Climate Change Program. National Development and Reform Commission of the P.R. China; Beijing.

²⁶² Ibid., pp. 46-47

²⁶³ CBEE – oral notice, May 24th, 2011

²⁶⁴ CGCF – oral notice, June 1st, 2011

²⁶⁵ NDRC (2010): China’s voluntary mitigation actions. Letter of information for UNFCCC Secretariat by the National Focal Point.

trasts with the continuity and gradual evolution of forest policy in Germany (see section 4.1.5).

- China increasingly adopts **international forest policy frameworks** as a reference for national forest sector development, and actively pursues **international cooperation** to this end.
- China increasingly recognizes the **forest sector's significance for social equity and political stability in the course of rural development**. Key-forest sector reforms such as tenure reform and the re-structuring of state-owned forest enterprises are motivated by a cross-cutting socio-economic and socio-political rationale. Summing up his observations gained during inspection tours to the provinces of Jiangxi and Liaoning, the Chinese premier Wen Jiabao in 2009 highlighted forest sector reform as a means to "*put the minds of the people at ease*"²⁶⁶. The **future course of forest sector development** may be characterized by the following salient aspects: (i) continuation and even extension of the national key forest sector programs, (ii) promotion of tenure security and observance of local decision-making, management and use-rights, and wider participation by non-state stakeholders (iii) provision of public support, particularly budgetary allocations with a view to promoting the transition towards SFM, valuation and compensation of environmental services, and forest insurance, (iv) increased service orientation of forest administrations at various levels, (v) strengthening the forest sector's contribution to biodiversity conservation and climate change management, and (vi) diversification of forest production with a view to enhancing rural commerce and socio-economic development.

4.2.2 The Mechanics of Forest Policy – from Formulation to Implementation

Forest policy development in China is, and remains to be, essentially **state driven**. This applies to sector-policies in the narrower sense which are drafted by SFA subject to approval by the State Council, or overarching policy directions of the national government, requiring the development of sectoral strategies or plans of action in response thereto. China, with its current 12th Five-Year Plan, aims for a **strategic shift from purely quantitative goals** of forest sector development **towards qualitative parameters** – forest health, stability and resilience in particular.

Decentralization of forest governance means that the political leverage and leeway of provincial governments in forest sector development have been markedly increased. Consequently, top-down implementation of national policy decisions increasingly gives way to vertical as well as horizontal consultation and negotiation. SFA does not control the conduct of PFDs directly, and divergent views of SFA and PFDs require arbitration and decision making by the State Council. Governance structures at the local level, CFBs in particular, in spite of training and capacity building efforts from the national level downwards, display **significant capacity deficits** and hence constitute a serious bottleneck for the implementation of progressive forest policy programs²⁶⁷. In consequence, the dynamics of forest policy formulation outpace implementation capacity – meaning that many **innovative concepts and approaches take long in maturing from the state of concept development and trials to wider replication and mainstreaming**.

²⁶⁶ Speech delivered by Wen Jiabao, Premier of the State Council on June 22nd, 2009 at a meeting with representatives of the Central Conference on Forestry Work

²⁶⁷ SFA Dept. of Policy and Legislation – oral notice, May 31st, 2011

Stakeholder participation and the role of civil society, whilst expanding gradually, display specific characteristics limiting their impact on forest policy formulation and implementation. The founding of China's Friends of Nature (FoN) in 1994 marked the emergence of numerous non-governmental organizations with a focus on environmental protection and nature conservation (ENGOs), occupying a niche between the state and market forces. Their emergence has, to some degree, been facilitated by the presence of several international environmental NGOs (INGOs) in China, e.g. IUCN, WWF, Greenpeace, TNC etc.. Civil society organizations in China may be broadly clustered into three categories: (i) officially recognized and registered NGOs and "non-profit enterprises", (ii) student environmental associations affiliated with Universities, subject to lesser registration requirements, and (iii) NGOs affiliated with and organized by government agencies, also known as GONGOs, regarding themselves as transmission belts for government policies. Rules of registration require NGOs to be sponsored by public institutions, and limit the number of NGOs that may address a specific area of work such as, for instance, environmental protection or nature conservation. Unlike in Germany (see section 4.1.4), Chinese NGOs do not claim a pronounced "watchdog" role opposing government policies or exposing practices of which they are critical, but resort to non-confrontational means of participation, for instance public awareness building and education, media-interaction with emerging "green media", capacity building, implementing various types of projects and pilot activities, often in collaboration with INGOs or development cooperation agencies, etc.. In recent years, some ENGOs initiated advocacy services, litigating on behalf of, e.g. pollution victims in high-profile cases²⁶⁸.

Scientific institutions at both, the national and provincial levels (universities, academies, and research & development institutes) by comparison play a more pronounced and active role than civil-society. They conduct a wide range of **basic as well as applied research** in forest related fields, including field trials and demonstration of novel concepts and approaches, often with international cooperation and support. Research and development are also driven by the respective science and technology departments and research centers of both, SFA and PFDs. While delivering high quality research and receiving widespread acclaim by the international scientific community, several factors limit the role of science as a facilitator in the transition towards SFM: (i) weak inter-agency coordination and information and knowledge management (IKM), (ii) a noticeable time-lag between forest policy dynamics and the advancement of forest related science, and (iii) a certain imbalance between technical research foci and issues relating to policy, legal-regulatory, administrative and socio-economic framework conditions of forest sector development (see also section 4.2.3.2).

4.2.3 Reality Check: Key-Challenges for Promoting SFM in China

4.2.3.1 Forest Protection and Management

Despite China's commitments to mainstream SFM, exercise multi-purpose forest management, safeguard multiple environmental and socio-economic co-benefits – biodiversity in particular, as well as to mitigate the risks outlined in Box 8, actual forest management practices are slow in changing.

Plantation forests are commonly subjected to age-class management with short rotation periods (ranging from 10 to 30 years), followed by clear-felling, removal and burning of logging debris, and replanting with a **limited number of economically significant tree species** (e.g. *Cunninghamia lanceolata*, *Pinus massoniana*, *Eucalyptus spec.*, *Casuarina equi-*

²⁶⁸ Yang, G. (2005): Environmental NGOs and Institutional Dynamics in China. The China Quarterly; pp. 46-66

setifolia, *Acacia mangium* etc.). Reforestation after logging requires the application of fertilizers, and forest protection against pests and diseases frequently involves the application of pesticides and other agro-chemicals. Such management routines are hard to reconcile with the concept of SFM.

Natural forests often are non-managed, not only because of management restrictions arising from the NFPP or classification as EPBF, but likewise because local forest authorities tend to allocate logging quota primarily for the management of plantation forests. Combined, these factors obstruct also silvicultural interventions aiming to promote forest health and stability, e.g. thinning of densely stocked young or middle-aged stands. **Close-to-nature, selective forest management** remains practically restricted due to insufficient infrastructure (forest roads as well as machinery and equipment required for reduced impact logging) and the dynamics of local and regional timber markets which tend to favor small-dimensional bulk products over large-dimensional, high-value timber. Moreover, the economic potential of numerous indigenous – especially broad-leaved tree species – is not realized to a sufficient degree, even though their ecological characteristics and potential uses are well known and documented in scientific circles²⁶⁹.

In practice, forest functions are – and remain to be – spatially segregated to a large degree.

In a wider perspective, the **implementation of high-level national forest sector programs** (see section 4.2.1.4, especially NFPP, CCFP and WCNRDP) adds to the challenges facing SFM. The NFPP, designed with the aim of either banning, or significantly reducing logging within 17 provinces across China with 61 million ha of natural, predominantly collective forests has received wide acclaim due to the significant reduction of deforestation and forest degradation. However, the NFPP, **emphasizing narrowly focused protection over management**, does not necessarily promote SFM. Moreover, it also triggered far-reaching **socio-economic side effects**: (i) loss of employment, re-settlement of forest workers and the need for massive state subsidies and redundancy schemes in state-owned forest areas²⁷⁰, (ii) loss of income and livelihood opportunities for affected collectives, and (iii) de-facto restriction of management and use rights for title-holding members of the concerned collectives. Effects of the logging ban have been likened to a regulatory taking of property as would, in principle, entitle the aggrieved parties to compensation. However: ecological-benefit compensation is based on politically determined, administratively fixed rates – but not on forest resource valuation considering foregone revenues or replacement values²⁷¹. Current international processes and studies on the economics of ecosystems and biodiversity (TEEB), including by BfN in cooperation with CRAES, address this issue and aim to provide methodological guidance on more evidence-based valuation. The sheer magnitude – in spatial as well as financial terms – of the NFPP also translated into top-down implementation with little room for tailored responses to site-specific ecological, socio-economic and socio-cultural conditions

²⁶⁹ Hinrichs, A., Lei, X. and Zhang, W. (2007): Forest Management Models in China – an annotated bibliography. Consultants Report on behalf of the Sino-German Program on Forests for Sustainable Development, Beijing.

²⁷⁰ Rozelle, S. et al. (2000): China – From Afforestation to Poverty Alleviation and Natural Forest Management – Evaluation Country Case Studies. The World Bank, Washington D.C.; p. 6 – as opposed to official figures of laid off personnel (ca. 740,000), the World Bank estimated the number of jobs lost **directly as well as indirectly** due to the NFPP significantly higher, and spoke of a total loss of up to 2.4 million jobs. The three provinces of Hunan, Sichuan and Heilongjiang are expected incur about 80 percent of the losses.

²⁷¹ Li, P. and Zhu, K. (2007): A legal Review and Analysis of China's Forest Tenure System with an Emphasis on Collective Forest Land. Rural Development Institute, Beijing/Rights and Resources Initiative, Washington D.C.; p. 30

(including local knowledge and skills)²⁷². Such observations hold critical implications for forest protection and biodiversity conservation, neither of which can be achieved without the consent of, and active participation by the local population.

It must not be overlooked that the national forest sector programs overlap spatially, and hence create **cumulative effects**. Studies investigating the parallel implementation of the NFPP and CCFP suggest that negative socio-economic side effects were most severe for the poorest and most forest-dependent segment of collective farmers²⁷³. By comparison, the WCNRDP not only creates transient management restrictions, but a **permanent barrier to forest management**. This is because all logging operations, including silviculturally motivated interventions, are summarily prohibited within nature reserves, pursuant to Article 31 [3] of the Forestry Law of the P.R. China (1998, as amended). In summary, high-level socio-economic development policies and forest-sector programs with a focus on forest protection and nature conservation clearly face **the challenge of conceptual streamlining through horizontal as well as vertical inter-agency coordination**, as would result in more coherent practical implementation.

Recent observations regarding the effectiveness and impacts of national forest sector programs, specifically the NFPP and CCFP, point in a similar direction²⁷⁴. Among the concerns raised, the shifting relative proportions of natural and plantation forests stands out as a critical factor. Plantations made up of non-native species (including fruit trees, rubber and even tea) accordingly account for the rapid expansion of forest cover. China's emphasis on reforestation as a means of combating desertification also means that plantation forests are established even on sites where forests do not grow naturally (e.g. areas on the Tibetan Plateau) – sometimes exacerbating degradation of the topsoil. Developments of this kind may be ascribed to a variety of factors. For one, centrally coordinated and controlled afforestation policies face the problem of China's huge expanse with its associate diversity of sites and ecosystem conditions. Secondly, local governments are under pressure to deliver results in line with centrally made decisions, enjoying comparatively little leeway to alter or revise prescribed measures. Third, afforestation policies are frequently tied to a socioeconomic rationale, suggesting selection of fast-growing tree species for maximum benefits, regardless of the ecological implications involved.

Such challenges are candidly admitted in national evaluation reports on the implementation of the national forest sector programs²⁷⁵, yet remain difficult to address and resolve.

Further insights can be gleaned from the experience and lessons learnt of Sino-German forestry cooperation. The Sino-German Sustainable Forest Management Project (SG-SFMP, implemented jointly by the SFA Forest Economics and Development Research Center – SFA-FEDRC and the German Agency for International Cooperation - GIZ) between 2008 and 2011 promoted the practical application of SFM. Designed for the purpose of feeding back practice-oriented lessons learnt from field trials to national forest policy decision makers, the project demonstrated SFM routines (forest management planning in particular) at selected forest management units (FMUs) in the provinces of Fujian, Hainan and Hu-

²⁷² Xu, M. et al. (2000): China's new Forest Policy. *Science, New Series*, Vol. 289, No. 5487; pp. 2049-2050

²⁷³ Xu, J., Katsigris, E. and White, A. (2002): *Implementing the Natural Forest Protection Program and the Sloping Land Conversion Program – Lessons and Policy Recommendations*. China Forestry Publishing House, Beijing.

²⁷⁴ Xu, J. (2011): China's new forests aren't as green as they seem. *Nature* Vol. 477; p. 371

²⁷⁵ SFA (2006): *A Report on Monitoring and Assessment of Socio-Economic Impacts of China's key Forestry Programs*. China Forestry Publishing House, Beijing; p. 13

nan²⁷⁶. The project provides the following snap-shot image of **structural challenges to the practical implementation of SFM**:

- continuing demand-driven forest use with a **focus on maximized financial returns**, which motivates a preference for short-rotation, high-yield plantations,
- looming **fragmentation** of hitherto consolidated collective forest areas, due to the effects of collective tenure reform;
- emergence of a vibrant, though **non-regulated real estate market** that spurs the concentration of tenure rights in the hands of private investors, with a risk of widespread rural disenchantment and adverse socio-economic as well as ecological consequences²⁷⁷;
- **non-equitable access and benefit sharing** (ABS) which – along with the non-regulated concentration of forest areas post tenure reform – creates a risk of disputes over forest resources, and detracts from the socio-economic rationale of tenure reform;
- **non-permanent boundaries of forest enterprises**, rendering them unfit as spatially consolidated forest management units (FMUs) for planning, implementation and monitoring of forest management;
- **lack of management capacity**, and **financial encumbrances** on the part of many forest enterprises, including state forest farms;
- **lack of evidence-based micro-level planning and resource monitoring**, as are pivotal not only for SFM, but likewise for the application of innovative instruments such as forest certification and valorization of environmental services, particularly forest-carbon-management relying on MRV;
- **weak transparency and arbitrary application of legal-regulatory provisions** by local forest administrations at the county or township levels – chiefly, but not exclusively, in regard to logging quota allocation and the exercise of tenure rights.

4.2.3.2 Forest related Research as a Decision-making Aid for Policy Formulation

The extent, depth as well as the speed of Chinese forest sector reforms result in high levels of complexity and urgency and necessitate policy decisions with considerable uncertainty. This observation underscores the significance of **basic as well as applied forestry research as a decision-making aid for policy makers** at the national level. Several factors suggest a prominent, supportive role for science as research in support of Chinese forest sector reforms:

- First, the scientific community, aside from state agencies and market forces, is a far more active, vociferous and influential stakeholder in forest sector development, than civil society (see also section 4.2.2).
- Second, the scientific community avails of strong international ties, and hence is well positioned to support both, the transfer of knowledge and lessons learnt from third

²⁷⁶ Mann, S. and von der Heyde, B. (2011): Sino-German Technical Cooperation in the Chinese Forest Sector – The Project Sustainable Forest Management. SG-SFMP Occasional Paper No. 6, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing; p. 11

²⁷⁷ Similar observations have been recorded in regard to land acquisition by foreign investors – e.g. establishment of a 40,000 ha plantation for pulp & paper production by the Stora Enso corporation; see: Li, P. and Nielsen, R. (2010): A Case-Study on large-scale Forest Land Acquisition in China – the Stora Enso Plantation Project in Hepu County, Guangxi Province. Rights and Resources Initiative (RRI), Washington D.C.; pp. 22-23

countries, and the politically desired benchmarking of Chinese framework conditions against internationally recognized principles and protocols of SFM.

- Third, scientific institutions at both, national and provincial levels are actively involved in a wide range of field trials, tests and demonstration measures with a view to promoting SFM in practice.
- Fourth, pursuant to its terms of reference, the report at hand shall serve as a reference for BfN with a view to identifying potential future areas of cooperation and support. Thus far, BfN cooperated closely with the Chinese Research Academy of Environmental Sciences (CRAES). However, in forestry research and development in China a close coordination with local and national forest authorities is also desirable.

A two weeks' fact-finding mission to China, conducted in preparation of the report at hand, provided the opportunity to assess, by way of stakeholder interviews, the role currently played by forest related research institutions. The workshop on "SFM in Smallholder Forestry in South China – Financial Aspects and Benefits" (May 25th-26th, 2011) in Changsha (Hunan province) enabled further discussions with SFA and PFD representatives, researchers and forest practitioners from the provincial level. Together, stakeholder interviews and informal discussions yielded the following results²⁷⁸:

- Research agendas essentially **respond to priorities defined by ministries** (e.g. Ministry of Environmental Protection, Ministry of Science and Technology, Ministry of Education) or state-agencies with a similar rank (e.g. National Development and Reform Commission, State Forestry Administration). Different ministries and ministry-level state-agencies rarely streamline their respective agendas (notwithstanding inter-ministerial coordination under the auspices of the National Development and Reform Commission), resulting in **weak horizontal coordination of research activities** between subordinate universities and academies. Research in the forest sector suffers from an obvious **lack of institutionalized working relations and networking**.
- Research funds are allocated by ministries or ministry-level state-agencies on the basis of multi-annual plans, synchronized with the national Five Year Plans. Research institutions access such funds primarily through **applications for defined research projects** (a competitive procedure). Case-based research activities may likewise be commissioned directly by sector administrations. For instance, different departments of SFA formulate specific requests, subject to the overall coordination by the SFA Dept. of Science and Technology. In so doing, **SFA relies primarily on the Chinese Academy of Forestry, to which it is directly affiliated**. Interview results suggest that directly commissioned research activities with a practice-oriented focus occur less frequently, though, and tend to emphasize technical issues over matters related to policy, legislation, and socio-economic aspects of forest management.
- Combined, **the foregoing factors constrain integrated and multi-disciplinary research** with a balanced approach to ecological, economic and social aspects of forest sector development.
- When initiating research projects at the field level (based on the approval of applications and allocation of funds), **research institutions tend to interact directly and independently with local forest governance structures** (at the county and township level). They do not communicate and streamline research designs, the selection of trial sites, and practical implementation through either SFA or PFDs (who likewise con-

²⁷⁸ Detailed consultation protocol (including verbatim statements) provided to BfN

duct a wide variety of applied research, field trials and pilot activities in pilot areas spread across China). Representatives of SFA openly criticized this practice and challenged the practical value of field research of which they are neither notified in advance, nor involved in design and implementation. This raises concerns about a likely **duplication of efforts**, and efficiency overall. Not only does it limit the practical usefulness of scientific results as a decision-making aid, but also **restricts the role of research institutions in the monitoring of policy processes**.

- Multi-annual research programs pursuant to the abovementioned competitive procedure enable **less flexible and timely responses to the dynamics of forest policy formulation and forest sector reform**. Research results materialize primarily in the form of ex-post publications and comprehensive reports, submitted to the respective commissioning and funding bodies after conclusion of the research activities. This creates a **time lag** reducing the value of research results as contributions to forest sector reforms (including critical issues such as green accounting and the valuation of environmental services, including climate change mitigation and adaptation).
- While expressing **distinctly critical opinions and attitudes in regard to the current direction of forest sector reforms** (in particular, a perceived bias in favor of (socio-) economic issues, and little regard for ecological implications), respondents from the scientific community do not perceive themselves as stakeholders in forest related policy processes. Specifically, they do not pursue proactive agenda-setting and research-based advocacy, but mostly react to policies that have already been decided. Respondents from the scientific community displayed a distinctly more cautious and conservative attitude towards forest sector development, than representatives of both, the SFA departments of Policy and Legislation and Forest Resources Management.
- SFA does not (yet) avail of a consolidated data base of past and ongoing forest related research activities. As a direct consequence, even the approximate numbers of research projects, field trials or pilot activities are hard to gauge.

In summary, there exists a significant and persistent **institutional as well as procedural divide between forest governance and forest related research**, as captured by the following statement by one of the respondents:

Box 9: The Gap between Theory and Practice

“There is a huge gap between theory and practice. Science and research are out of touch with policy reforms. The government must move on - SFA cannot stop at publishing papers about problems and conflicts, but needs to solve them.

Besides, the forest policy dialogue in China has become far more pluralistic – there is a wider range of stakeholders of which scientists are but one group.

Some scientific opinions are highly specific to local circumstances and cannot be generalized easily; many research projects are too narrowly focused and lack a broad overview.

In China, government has always been very strong and hence avails of more information and data.”



Figure 13: Monitoring of site ecology: View of a long-term ecological monitoring plot of CERN (Chinese Ecosystem Research Network) established in 1989 in Heshan, Guangdong Province. **Reference:** Zhao



Figure 14: Women working in the tree nursery: Seedlings of *Pinus eliottii* (slash pine) are cultivated in Qianyanzhou, Jiangxi Province. **Reference:** Grossheim

5 Synopsis

5.1 SFM Concepts in Germany and China

The NLBI defines SFM as “*a dynamic and evolving concept, aiming to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations*”²⁷⁹. This understanding of SFM implies three basic determinants: (i) recognition of multiple forest functions, (ii) an anthropocentric perspective and (iii) a long-term concept of inter-generational equity.

As UNFF members, China and Germany alike are committed to SFM in line with the foregoing definition which, by virtue of the NLBI, is operationalized in reference to the Seven Thematic Elements of SFM: a) extent of forest resources, b) biological diversity, c) forest health and vitality, d) productive forest functions, e) protective forest functions, f) socio-economic forest functions, and g) policy and legal framework conditions designed to promote the achievement of the foregoing items. Germany and China also are signatory parties to forest related conventions with resultant obligations to, inter alia, preserve biological diversity, combat desertification, and check the detrimental impacts of climate change.

The foregoing discussion of policy and legal frameworks, administrative structures, ownership patterns and development trends in Germany and China reveals several noteworthy similarities as well as differences. Perhaps the most obvious similarity lies in the fact that present day forests in both countries result from a historical sequence of exploitation and recovery which, in spite of undeniable successes particularly in quantitative terms, fundamentally altered the composition and structure of the natural forest vegetation. In both countries, forests form part of cultural landscapes, notwithstanding their significance as key-resources for biodiversity conservation. In both countries, manifest scarcity of forest goods and services as well as the adverse consequences of deforestation and forest degradation motivated the emergence of, and eventual transition towards SFM.

Another similarity is that the societal perception of, and preferences for forest goods and services in both countries are subject to directional change, closely aligned with economic development, changing values and socio-cultural patterns. Such changes, in turn, drive the continuous re-interpretation of SFM, and the diversification of human demand for, and interest in forest resources in both countries - justifying the commitment to multi-purpose forest management.

Nonetheless, framework conditions as well as practical approaches to forest protection and SFM in Germany and China are fundamentally different in many respects. These include, inter alia, the role of civil society and organized interest groups in forest policy formulation and agenda setting, forest governance styles, mechanisms for reconciling public and private interests, professional expertise and management capacity at different levels, and the availability of information and data on forest resources. Differences of this kind determine the ways and means whereby Germany and China address their respective structural challenges to forest protection and SFM.

In **Germany**, multi-purpose forest management has traditionally been interpreted as the achievement of the highest possible diversity of forest functions **simultaneously in time and space**. Medium-term micro-level forest management planning on the scale of FMUs is a key-

²⁷⁹ United Nations (2008): Non-legally binding instrument on all types of forests. Resolution adopted by the General Assembly at its 62nd session (A/RES/62/98), New York; p. 4

instrument to achieve this goal in practice, translating forest policy goals and legal requirements into operational guidance. However, the traditional understanding of multi-purpose forest management has increasingly come under stress in the recent past, due to the growing diversification of stakeholder views and interests to a point, where a clear prioritization of some functions over others is required. International obligations add to this challenge, especially in regard to biodiversity conservation and climate change.

One option to better promote biodiversity conservation – especially when it comes to the conservation of mature or old-growth forest ecosystems and the setting aside of reference areas free from human intervention – is to conserve, and exempt forests from logging primarily in State forests, as required by Germany's National Biodiversity Strategy. The designation of large, non-utilized forest areas does not contradict the notion of multi-purpose forest management per se, but implies a spatial reference wider than that of individual FMUs. Implementing this particular aspect of the National Biodiversity Strategy requires for consensual decision making, coordination and concerted action on different levels of forest policy formulation and forest governance: Horizontal coordination of policies on the national level, vertical coordination between the Federation and the States, and a negotiated consensus involving forest owners and civil society.

Another option – also in line with the National Biodiversity Strategy – is to further enhance close-to-nature management of all types of forests and the protection of ecological values through transformation of commercially managed forests into more structurally diverse, healthy and resilient stands. This – already ongoing – process will take time, given the lasting dominance of age-class forests over uneven-aged forests, the age-class structure tilted in favor of young and middle-aged forests, and the still high proportion of conifer-dominated forest-types. Public support, including expert advice, technical assistance, and financial incentives in favor of environmental services and ecological values are the most important forest policy instrument available to this end – provided that the latter are more closely tied to biodiversity conservation goals. Even though the need for transformation of even-aged monocultures is widely recognized – not the least because of economic risks and concerns over the effects of climate change – the process is slow, gradual and not always free from contradictions: climate change policies call for intensified wood production (also with a view to promoting woody biomass as a renewable source of energy), and coniferous species remain highly attractive in commercial terms, providing a significant source of revenue. This holds true not only for private forest owners but also for State-owned forest enterprises which, following the restructuring of State-forest management, are bound to optimize their economic efficiency.

The evolution of forest policy and the legal framework in Germany is slow and gradual. Public forest governance is characterized by state institutions acting primarily as catalysts and moderators, while private forest owners enjoy considerable freedom of decision within the limits defined by law. Unlike in China, there is little room for swift and decisive government interventions. However, the management of state forests, corporate forests and large private forests is characterized by high levels of professional expertise, management capacity and awareness. Even though individual smallholders may lack professional expertise and management capacity, FMA are pivotal to ensuring observance of legal requirements and high management standards even in small private forests – backed up by a strong, traditional sense of ownership and a self-perception that in principle promotes the responsible consideration of societal requirements on forests and forestry.

In **China**, after decades of demand-driven forest exploitation, multi-purpose forest management and SFM are still relatively novel concepts. Despite high levels of awareness and commitment displayed by decision makers at the national level, practical implementation of SFM faces serious challenges. For one, rapid reforestation resulted in vast stretches of young and middle-aged, single storey monocultures which not only are in urgent need of maintenance to mitigate their demonstrated instability, but likewise are deficient in growth – with growing stock volumes per hectare well below that of natural forests. This marks an important difference between Germany and China – German forests, while in need of further improvement of their stability and ecological value, achieved an unprecedented accumulation of growing stock, creating the opportunity to use them as climate assets.

Statements of this kind should not be mistaken for one-sided criticism. China's success in reversing past trends of deforestation is indisputable, and from the perspective of soil and water protection as well as multiple socio-economic benefits, any forest must seem advantageous over barren and degraded wastelands prone to erosion that resulted from China's past history of forest exploitation. However, Chinese plantation forests do not lend themselves to biodiversity conservation as easily as German forests undergoing transition to a more structurally diverse state. Nor do they – given low growing stock volumes and high risks of damage – facilitate climate change mitigation and adaptation.

Natural forests, on the other hand, are currently not managed and utilized to their full potential, including biodiversity conservation and climate protection. The primary cause for this does not necessarily lie in China's legal framework which, similar to that of Germany, is interlocking and broadly expanded – even though the legally prescribed concept of classified forest management is difficult to reconcile with the German interpretation of multi-purpose forest management.

Several factors seem more important, applying to forest plantations and natural forests alike: First, the widespread lack of knowledge, skills and management capacity for close-to-nature management especially at the local implementation level. Second, centrally coordinated and planned forest sector programs which result in top-down decision making, creating barriers even for selective and not commercially focused forest management in support of forest health and stability. While the rapid expansion of protected area networks in China may be welcomed chiefly by proponents of biodiversity conservation, it seems debatable whether new and additional forest reserves can be effectively administrated, managed and safeguarded against human pressure and conflicting interests with the available governance capacities. Third, concerns arising from both, the status of state-owned forestry units and collective forests subject to tenure reform. State-owned forestry units face a wide range of structural deficits, ranging from oversized staffing levels and low efficiency of forest management and use to financial encumbrances and debt. Clear delimitation and demarcation of boundaries remains a critical issue, engendering land-use and tenure disputes. Tenure reform in collective forests implies the risk of massive fragmentation, resulting in inefficient management. Among the options tested to overcome this risk, private investment in the forest sector likewise faces challenges, because it places forest smallholders at a significant disadvantage (given their lack of organization and weak bargaining power), breeds disenchantment as a result of insufficiently regulated land circulation, and runs the risk of promoting management practices that are narrowly focused on financial returns (due to short terms of tenure). In consequence, forestry units – state-owned as well as privately run – may lack one critical characteristic of FMUs: stable boundaries and clear as well as undisputed management authority.

China has gone at great lengths to mobilize domestic funding for forest sector development. The Chinese government – rightfully – highlights the huge sums allocated to national forest sector programs and forest reforms as a testament to China’s commitment to SFM. With a similar focus, China has implemented far-reaching fiscal reforms alleviating the burden of taxes, fees and charges. It has also established a system of forestry funds with the aims of (i) channeling back timber revenues to reforestation and forest management and (ii) compensating owners of EPBF for the loss of revenue sustained in the pursuit of protective and ecological functions. Ecological public benefit compensation, however, consists of area-based flat rate subsidies which – in spite of the total funding volumes involved – are too low to offset financial losses sustained especially by rural smallholders dependent on the use of forest resources. They are also insufficiently tied to forest policy and conservation goals, rewarding inaction rather than management performance according to transparent criteria.

In summary, China’s principal challenges in the pursuit of SFM with due regard for biodiversity conservation seem to lie neither in a lack of policy commitment nor significant legal gaps, but rather in the needs (i) to develop local management capacities and awareness, (ii) promote coherent and evidence-based decision making on all levels, and (iii) improve forest governance enabling more flexible and site-adapted solutions (e.g. micro-level planning for the identification of forest functions and determination of sustainable harvesting volumes and practices, as opposed to classified forest management and rigidly applied logging quota). As has been shown in sections 4.2.2 and 4.2.3.2, neither civil-society participation nor forest science as yet have reached their full potential to support forest sector reforms.

5.2 Options for mutual learning and cooperation

Sino-German cooperation in the forest sector has been ongoing for close to thirty years, emerging right after China’s open-door policies in 1979. Progressing from localized cooperation with a focus on technical and silvicultural matters to a national-level policy dialogue on SFM past the year 2000, it has reached a stage where China and Germany as partners pursue common goals for the stewardship of global public goods – including biodiversity conservation and climate protection. Eager to benefit from the experience of third countries, Chinese decision-makers and forestry practitioners alike appreciate German forestry as a useful reference for China’s forest sector reform and development.

While it is obvious that German approaches to SFM and biodiversity conservation cannot serve as a blueprint, simply to be transferred to the Chinese context, SFA – building on the experience and lessons learnt from Sino-German cooperation – has launched several processes which seek to adapt German concepts to the Chinese context.

SFA is in the process of **developing a new framework for forest classification and the protection and management of EPBF**, aiming to promote more flexible and site-specific management responses. Accordingly, three classes of EPBF will be distinguished: The first class is to remain under strict protection, while non-consumptive forest uses (e.g. ecotourism) and selective, close-to-nature forest management are to be promoted in the other two. SFA, in consultation with the Ministry of Finance, considers the introduction of new and additional incentives for tending and maintenance of young and middle-aged forests within NFPP areas, and intends to re-orientate funding support away from area-based flat-rate subsidies towards performance-based support. German expertise and lessons learnt regarding functional forest classification, public support in regard to environmental benefits, and more

flexible approaches to biodiversity conservation (e.g. through nature conservation by agreement) could prove helpful to these ends.

SFA likewise has initiated reforms in respect of **forest management planning and the resultant determination of sustainable harvesting levels**. Key to such reforms is the concept that FMUs, availing of a publicly approved medium-term forest management plan, will in the future receive logging-quota allocations up to the amount specified as the Annually Allowable Cut (AAC). According to recent statements by SFA representatives, this is not to replace the logging-quota system altogether, but to ensure its more flexible and more transparent application. Even though, some challenges remain. First, the requirement for individual logging permits in addition to an already approved forest management plan seems overstretched, creates unnecessary cost, and absorbs forest governance capacities that might be more effectively employed elsewhere. Second, Chinese procedures for forest management planning are also in need of improvement: (i) Class-B inventory data used for forest management planning are often inaccurate due to their being extrapolated from older data-sets, (ii) micro-level forest function mapping in regard to e.g. terrain, water resources, conservation values, socio-economic forest features remains a novel concept, (iii) management zoning with the aims of determining the net-production area and implementing management restrictions likewise is novel to the Chinese context, (iv) site-data, enabling species-site matching are widely unavailable to FMUs, and (v) advanced management-information systems, enabling forest resource monitoring as well as operational and financial controlling are widely lacking. Advanced forest management planning on the FMU level is a critical precondition not only for practical application of SFM, but likewise for the better integration of biodiversity conservation into management decisions taken at the local level. It is also instrumental in **readying FMUs for forest certification** and in creating a basis for MRV (a precondition for **forest carbon management**). Such issues have already been addressed in the context of Sino-German forest cooperation through knowledge transfer, demonstration measures and capacity development. Replication and mainstreaming of best practices nevertheless remains a crucial requirement.

Tenure reform within China's Southern Collective Forest Region has resulted in opportunities as well as risks. Its further advancement according to SFA representatives is a top-priority with national decision makers. On the one hand, apprehensions about reckless forest destruction by smallholders seeking quick windfall benefits – often voiced in scientific circles – have not materialized. On the other hand, fragmentation of forest smallholdings obstructs both, the achievement of the socio-economic rationale underlying tenure reform, and more advanced and environmentally friendly forest management by farmers who lack even basic knowledge, skills and material preconditions of SFM. Weakly regulated land circulation and concentration of forest tenure in the hands of private investors runs the risk of triggering intense conflicts, unless adequate social responsibility rules and safeguards are put in place. For these reasons, SFA prioritizes the creation of FMA and capacity development as means to mitigate the effects of fragmentation. Chinese decision-makers and forestry practitioners alike are keenly interested in Germany's broadly developed system of FMA, as shown many times in the course of e.g. international study tours organized in the context of Sino-German forest cooperation. However, suitable organizational models prove difficult to identify in China, in terms of both, smallholders' expectations and acceptance, and corresponding support arrangements and responses on the part of local forest authorities. German experience and lessons learnt may prove particularly valuable as regards the interaction between forest authorities and FMA as well as private forest owners – especially in view of training and extension services, joint marketing support, and similar support service options. Building forest

governance capacities to support – and guide – private smallholders towards more efficient as well as ecologically sound management requires not only silvicultural and managerial expertise, but likewise didactical and communication skills along with a service-oriented mindset. Qualification profiles of this kind have yet to be developed, and the biggest impact might be achieved by mainstreaming such aspects into academic curricula and professional training and extension programs (e.g. at Beijing's Forestry Staff College). Sino-German expert exchange such as that facilitated by BfN, involving decision-makers, forestry practitioners and scientists, clearly seems highly useful in supporting China's search for FMA models and governance frameworks adapted to the Chinese context.

China, as shown in section 4.2.3.2, implements a wide range of **forestry research** measures on all levels, including application oriented field trials and pilot activities as well as basic research. Past events such as the recent Fourth Sino-German Workshop on Biodiversity Conservation hosted by BfN, but likewise Sino-German symposia and dialogue fora on SFM conducted in the course of Sino-German forestry cooperation, bear witness to the contextual breadth and methodological depth of forestry research in China. However, research results as yet do not achieve their full potential as evidence-based decision making aids guiding forest sector reforms, owing primarily to insufficient horizontal and vertical coordination and the apparent lack of structures and procedures for cross-sector information and knowledge management. Such observations suggest further entry-points for Sino-German expert exchange and cooperation.

5.3 Approaches to SFM and their Significance for Biodiversity Conservation

Given the NLBI definition of SFM and the Seven Thematic Elements adopted and applied by the UNFF, it stands to reason that biodiversity conservation is an inherent component of SFM. This view is fully recognized by Germany and China alike, as shown by their respective interlocking policy and legal frameworks. Moreover, being signatory parties to the UNCBD, both countries are under the binding obligation to preserve biological diversity.

UNCBD parties at the Tenth Conference of the Parties (COP 10, October 2010, Nagoya, Japan) adopted the Strategic Plan for Biodiversity 2011-2020 as "*an overarching framework for biodiversity, not only for the biodiversity-related conventions, but for the entire United Nations system*"²⁸⁰. The Strategic Plan applies 20 detailed targets for action, clustered into five strategic goals.

²⁸⁰ <http://www.cbd.int/sp/>

Table 17: The Aichi Targets underlying the Strategic Plan for Biodiversity 2011-2020

Strategic goals of the Aichi Targets underlying the Strategic Plan for Biodiversity 2011-2012		
Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society		
Target	1	By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.
	2	By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.
	3	By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio-economic conditions.
	4	By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits.
Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use		
Target	5	By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.
	6	By 2020, all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.
	7	By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.
	8	By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.
	9	By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.
	10	By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning.
Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity		
Target	11	By 2020, at least 17 percent of terrestrial and inland water, and 10 percent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.
	12	By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.
	13	By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services		
Target	14	By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.
	15	By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 percent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.
	16	By 2020, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation.
Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building		
Target	17	By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.
	18	By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.
	19	By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.
	20	By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subjected to changes contingent to resources needs assessments to be developed and reported by Parties.

The question arises as to whether SFM concepts applied in Germany and China support or hinder achievement of the Strategic Plan and the Aichi Targets, and what changes and responses might be necessary to give full play to the shared goals expressed therein.

As regards **Strategic Goal A**, one observes that German forestry, due to the diversification and continuous re-interpretation of SFM (see Table 12) generally applies concepts supportive to the achievement of the Aichi Targets. All four targets linked to Strategic Goal A may safely be regarded as fulfilled to a large extent. Societal awareness for biodiversity conservation is high, even though individual production and consumption patterns may require further improvement. Within the German forest sector, there is widespread consensus about the need to further stabilize forest ecosystems with a view to improving their health and resilience, especially to the expected impacts of climate change. Related measures will very likely lead to an improvement of forest biodiversity, even though considerable parts of Germany's forests are in need of further improvement. Forest related support and incentive systems, as exemplified in Table 13, suggest that biodiversity conservation is observed in practical forest management. Forest sector planning – including both, spatial planning and silvicultural strategies as well as medium-term forest management planning at the level of individual FMUs – integrate biodiversity conservation to a considerable extent. Widespread application of forest certification pursuant to either PEFC or FSC suggests that private sector stakeholders as well as civil-society are, in some respects, moving towards qualitative levels of forest man-

agement that exceed legally prescribed minimum requirements. Even though, quantification and valuation of ecological forest functions – a precondition for policy decisions to better reward environmental services – remains a challenge. In China, awareness for biodiversity conservation seems highest in governance and academic circles at the national level, and needs further efforts and time to percolate downwards to the level of forest practitioners and forest stakeholders. Public support schemes, incentive systems and forestry funds aiming to reward environmental services and forest functions – as shown in the preceding sections – require further refinement and more flexible, site-adapted and performance based application. Forest sector reforms initiated at the national level suggest that China is moving in this direction. The 12th FYP which, for the first time, emphasizes forest health and stability in addition to chiefly quantitative targets, provides the basis for both, required changes of policy, legal and institutional frameworks and mobilization of substantial funds to these ends. The main challenge now seems to lie in narrowing the gap between national policy commitments and actual forest management practices at the local level – a task that, besides allocation of resources, calls for capacity development with a broad scope. Unlike in Germany, civil-society participation in support of forest sector development is less pronounced in China, and market-based instruments such as forest certification clearly are less widely used and appreciated. Therefore, further mainstreaming of biodiversity conservation in the forestry sector will hinge primarily on government action across all levels.

On **Strategic Goal B**, one observes that, in a historical perspective, both countries have come a long way in reducing pressure on forest resources and promoting their sustainable use - as reflected by the fact that forests in both countries are key-resources for nature conservation and critical to the designation and expansion of protected area networks. In Germany, most NATURA 2000 areas designated pursuant to the respective EU-directives locate in forests. Similarly, the rapid expansion of nature reserves in China and high-level national programs to improve ecological values are focused on forests. However, China in this regard faces significant challenges, resulting from the need to ensure social stability through (socio-) economic development of its predominantly rural population. This is why China aims to adopt a more integrative approach to SFM, visibly in reference to the concepts applied in German forestry. Initiatives to – gradually and cautiously – replace classified forest management and centralized logging-quota determination with more flexible and locally adapted governance and planning instruments, and to promote long-term commitment to SFM through enhanced tenure security all point in this direction. Also, outcomes of the Fourth Sino-German Workshop on Biodiversity Conservation (see section 1) are suggestive of a growing academic consensus on integrative approaches to SFM. **In both countries, key-challenges to SFM and biodiversity conservation arise from outside the forest sector** – including pollution, acidification of forest soils, excess deposition of nutrients, and climate change. Unable to counter such influences single-handedly and of its own account, the forestry sector in Germany and well as in China is bound to pursue adaptive strategies. Given the longevity of forests and the resultant long planning cycles of forest management, measures to improve forest health and stability must apply a medium to long-term perspective. In Germany, the ongoing transformation of age-class forests to a more stable and structurally diverse state has been ongoing for several decades and displays measurable success²⁸¹. In China, however, the thus far distinct spatial separation of forest functions proved a structural bottleneck for SFM and warrants critical reflection.

²⁸¹ <http://www.bundeswaldinventur.de/enid/99f8f8a1f8a788a08186624a29d5e738,0/31.html>

Strategic Goal C is focused on biodiversity conservation by means of protected areas and measures to safeguard endangered species as well as genetic diversity. Associated targets include a commitment to conserve, by 2020, “*at least 17 percent of terrestrial ecosystems*”. This requirement is difficult to interpret in several respects: First, it is non-specific to forests, even though forest areas arguably represent the biggest area reserve for the target’s achievement. Second, what remains open to discussion and sovereign decision by UNCBD signatories is the selection of appropriate protected area categories, each with their specific level of protection and resultant management restrictions. Third, the inherent complexity of the target grows with the diversity of forest tenure systems, calling for proactive reconciliation of public and private rights and interests. Problems of this kind are particularly prevalent in pluralistic societies, as exemplified by stakeholder discussions regarding Germany’s National Biodiversity Strategy (refer to sections 4.1.4 and 4.1.5). One option is to focus the expansion of protected area networks (especially of high protection status) on state-owned forest resources. Another is to expand public support and compensation with a view to cushioning off effects on non-state forest owners. Either option holds budgetary implications and requires coordinated policy decisions at the Federal and State levels. For these reasons, expansion of protected area networks in the recent past progressed far more rapidly in China than in Germany. On the other hand, the question remains whether governance capacities for protection, management, and conflict resolution of protected areas in China can keep pace with the rapid expansion of the protected area network. Both countries apply legal frameworks for the protection of forest genetic resources and the production of reproductive material. However, the Chinese forest sector’s narrow focus on a limited number of commercially significant tree species tends to obstruct the targeted valorization and sustainable use of a wide range of – potentially valuable – indigenous trees (broadleaved species in particular).

As regards **Strategic Goal D**, both countries apply policies and legal provisions aiming to safeguard, and promote protective, ecological and social forest functions and benefits. However, respective approaches to multi-purpose forest management are different. In Germany, forest laws as well as forest governance routines apply functional classification with a high degree of resolution, based on micro-level planning and operationalized through regulatory designation of forest areas as well as medium-term forest management planning. In consequence, functional categories intersect spatially, resulting in varying degrees of management restrictions and justifying differentiated public support. Chinese forest laws distinguish five classes of forests which, in practical forest governance, are categorized as either commercial forests or EPBF – a system clearly less flexible, less locally based and less performance-oriented than Germany’s integrative concept of multi-purpose forest management. Commercial forests in particular are fraught with significant risks and afford less ecological values and benefits than regularly managed German forests. These problems are being increasingly recognized, especially at the national level – explaining China’s interest in benefiting from, and adopting experience and lessons learnt from German forestry. Arguably, close-to-nature forest management is the concept of choice to simultaneously improve health and stability of commercial forests, including resilience to climate change, enhance their productivity and accumulate growing stocks, also with a view to strengthening the carbon sequestration potential, and diversify the range of forest goods and services. More environmentally sound management of commercial (plantation) forests would promise a particularly significant impact, owing to the fact that plantations continue to expand rapidly. This, however, presupposes targeted development of more enabling framework conditions, and capacity development as well as forest sector support on a grand scale.

Strategic Goal E aims at engendering the widest possible societal consensus and support for the mainstreaming of biodiversity conservation. Germany, by virtue of its National Biodiversity Strategy, has created a national policy framework to this end – even though horizontal as well as vertical policy coherence may be further strengthened. The National Biodiversity Strategy, similar to related policy processes and initiatives such as Germany's National Forest Program, its Wood-Promotion Charter and the recently adopted Forest Strategy 2020, has been developed through intense stakeholder participation, including science, forest sector interest groups and ENGOs. Depending on compromise and societal consensus, policy decisions hence prove more difficult to reach in Germany, than in China with its state-dominated governance styles. Even though, participatory forest governance helps to reduce trade-offs and transaction costs and in the long run promotes forest owners' willingness to voluntarily integrate public preferences and benefits in their management decisions. Gradual evolution of public policies, predictability and transparency of governance, and tenure security are key to the successful application of SFM with its long-term perspective of inter-generational equity.

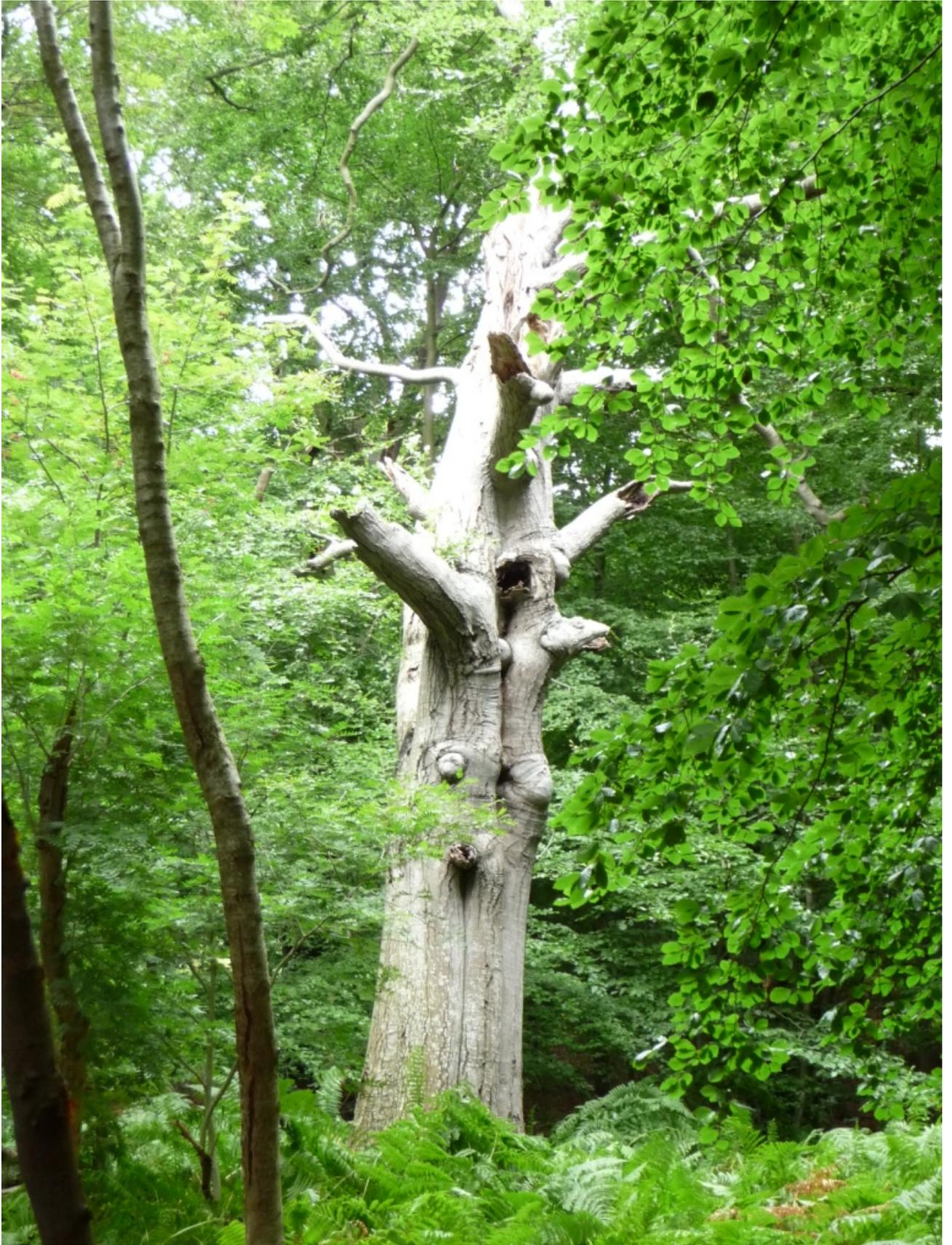


Figure 15: Forest dynamics: Combination of deadwood and natural regeneration – Island of Vilm.
Reference: Lehmann

6 Reference Literature

Alemann, U. (1996): Was sind Verbände? In: Informationen zur politischen Bildung, No. 253, Bundeszentrale für politische Bildung; Bonn

Anon. (2010): Energiegewinnung aus Holz wird weiter zunehmen – Herausforderungen für die stoffliche Holznutzung. Holzzentralblatt Nr. 6; pp. 162-163

Arbeitsgemeinschaft Forsteinrichtung und AG Landespflege (1982): Leitfaden zur Kartierung der Schutz- und Erholungsfunktionen des Waldes (Waldfunktionenkartierung). J.D. Sauerländer, Frankfurt.

Bauer, J. (2007): Holzpotentiale und Holzstoffströme in Bayern. Cluster-Initiative Forst und Holz Bayern. Presentation March 26th, 2007; Straubing

Bauhus, J. (2010): Was kann moderner Waldbau? Präsentation, 3. Symposium Waldstrategie 2020 (12. April 2010), BMELV

BayStMELF (2010): Überprüfung der Forstreform – Erfolge der Forstreform festigen! Ergebnisbericht – ARF Gesellschaft für Organisationsentwicklung mbH, München/Nürnberg

BfN (2010): Dialogforum Öffentlicher Wald und Nationale Biodiversitätsstrategie. Tagungsband – Vilm, 19.-21. Mai 2010, Bundesamt für Naturschutz, Bonn

BMBF (2008): Delphireport – Die Zukunft der Waldnutzung in Deutschland. Forschungsprojekt Zukünfte und Visionen Wald 2100. Berlin

BMELV (2002): Bundeswaldinventur II. (www.bundeswaldinventur.de)

BMELV (2004): Verstärkte Holznutzung zugunsten von Klima, Lebensqualität, Innovation und Arbeitsplätzen (Charta für Holz). Bundesministerium für Ernährung, Landwirtschaft und Verbraucherschutz, Berlin;

BMELV (2006): Protokoll der Sitzung des 18. Runden Tisches des Nationalen Waldprogramms Deutschland. (www.nwp-online.de/fileadmin/redaktion/dokumente/Tisch-18/tisch-183a.pdf)

BMELV (2006): Protokoll der Sitzung des 19. Runden Tisches des Nationalen Waldprogramms Deutschland. (www.nwp-online.de/fileadmin/redaktion/dokumente/Tisch-19/tisch-193a.pdf)

BMELV (2007): Zielsetzung und Konzeption der zweiten Bodenzustandserhebung im Wald. Berlin

BMELV (2009): Waldbericht der Bundesregierung. Berlin

BMELV (2011): Waldstrategie 2020: Nachhaltige Waldbewirtschaftung – eine gesellschaftliche Chance und Herausforderung. Berlin

BMU (2007): National Strategy on Biological Diversity. Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Berlin

BUND (2007): Entwurf der nationalen Strategie zur biologischen Vielfalt – Stellungnahme des Bund für Umwelt und Naturschutz Deutschland (BUND)

BUND, DNR, Forum Umwelt und Entwicklung, Greenpeace, NABU, WWF (2010): Waldstrategie 2020 - Entwurf des BMELV: Stellungnahme in 10 Punkten. Joint press release, October 2010

Burschel, P. and Huss, J. (1987): Grundriss des Waldbaus. Paul Parey, Hamburg und Berlin

Chen, X. and Sizer, N. (2005): Legal and Institutional Arrangements in China to Prevent the Import of Illegal Wood. The Nature Conservancy (TNC) China and Asia-Pacific Programs

DFWR (2007): Forstwirtschaft kritisiert massiv die Nationale Strategie der biologischen Vielfalt. Press Release November 7, 2007

DFWR (2011): Waldstrategie 2020 – Gute Perspektiven für den Wald! Press Release, September 22, Berlin

Endruweit, G. and Daheim, H.-J. (eds.): Moderne Theorien der Soziologie. Enke, Stuttgart

Enssle, J. (2010): Ist ungenutzter Wald schlecht für das Klima? Die unterschätzte Senkenleistung dynamischer Naturwälder. Naturschutzbund Deutschland (NABU), Berlin. NABU Hintergrundpapier.

Essmann, H. (1993): Forstwirtschaft und Naturschutz – Unterschiede und Übereinstimmungen in Theorie und Praxis. Allgemeine Forstzeitung 48; 522-525

Fairbank, J.K. and Goldman, M. (2006) China: A New History. Harvard University Press, Cambridge (Massachusetts)

Forum Umwelt und Entwicklung (2009): Biodiversitätsstrategie nicht torpedieren. Press Release, July 1, 2009

Häusler, A. und Scherer-Lorenzen, M. (2002): Nachhaltige Forstwirtschaft in Deutschland im Spiegel des ganzheitlichen Ansatzes der Biodiversitätskonvention. BfN-Skripten 62, Bundesamt für Naturschutz, Bonn

Hardin, G. (1968): The Tragedy of the Commons. Science, Vol. 162, No. 3859

Hartig, G.-L. (1804): Anweisung zur Taxation und zur Beschreibung der Forste. Bd. 1 – Theoretischer Teil (2., ganz umgearbeitete und vermehrte Auflage), Heyer, Gießen

Hasel, K. (1985): Forstgeschichte. Paul Parey, Hamburg und Berlin

Hinrichs, A., Lei, X. and Zhang, W. (2007): Forest Management Models in China – an annotated bibliography. Consultants Report on behalf of the Sino-German Program on Forests for Sustainable Development, Beijing

Hinrichs, A. (2009): Forest Certification in China – Status quo and Support Opportunities for the Sino-German SFM Project. Report No. 9, Sino-German Sustainable Forest Management Project, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing;

IFCC (2011): China National Progress Report to the UNFF Secretariat on the implementation of the NLBI and other relevant resolutions. UNFF National Focal Point, Beijing

Inglehart, R. (1977) The silent Revolution – Changing Values and Political Styles among Western Publics. Princeton, New Jersey

- Jim, C., Steve, S. and Xu, W. (2002): Stifled Stakeholders and Subdued Participation – Interpreting Local Responses toward Shimentai Nature Reserve in South China. *Environmental Management*, No. 3, Vol. 30; pp. 327-341
- Kaiser, B. (2008): Zu Tode reformiert? Anmerkungen zur Forstpolitik in Deutschland. Adress to the convention of delegates of the Association of Forest Professionals, Northrhine-Westfalia (BDF-NRW), April 3, 2008
- Katsigris, E. et al. (2004): The China Forest Product Trade – Overview of the Asia-Pacific supplying Countries, Impacts and Implications. *International Forestry Review*, Vol. 6 (3-4); pp. 237-253
- Kong, F. et al. (1999): Evaluation of China's Forest Resources Management Policies. China National Forestry Economic and Development Research Centre (SFA-FEDRC), GCP/RAS/158/JPN, CSA Paper No. 2 (1997-1998); Beijing
- Krause, E. (2010): Urbane Waldbesitzer – Analyse der Perspektiven Bayerischer Beratungsförster und nicht-bäuerlicher Waldbesitzer zum Thema urbane Waldbesitzer anhand motivationspsychologischer Theorien. Dissertation, Wissenschaftszentrum Weihenstephan für Ernährung, Landnutzung und Umwelt, Technische Universität München
- Krott, M. (ed.): Strategien der staatlichen Forstverwaltung – Praxiserfahrungen im europäischen Vergleich 1991-2000. *EFI Proceedings No. 40*, 2001, Joensuu
- Krott, M. (2001): Politikfeldanalyse Forstwirtschaft – eine Einführung für Studium und Praxis. Parey, Berlin; p.20
- Küster, K. (2004): Entwicklung der land- und forstwirtschaftlichen Arbeitsverfassung in Ostdeutschland – Konsequenzen für die heutige Arbeitswelt. In: Lewark, S. & Kastenholz, E. (eds.): *Wald Arbeitspapier No. 5*, Institut für Forstbenutzung und forstliche Arbeitswissenschaft, Freiburg i. Br.
- Li, P. and Zhu, K. (2007): A legal Review and Analysis of China's Forest Tenure System with an Emphasis on Collective Forest Land. Rural Development Institute, Beijing / Rights and Resources Initiative, Washington D.C.
- Li, P. and Nielsen, R. (2010): A Case-Study on large-scale Forest Land Acquisition in China – the Stora Enso Plantation Project in Hepu County, Guangxi Province. Rights and Resources Initiative, Washington D.C.
- Li, S. (2006): The reform of Property Rights in China. State Forestry Administration of the P.R. China; Beijing
- Li, W. (2004): Degradation and Restoration of Forest Ecosystems in China. *Forest Ecology and Management* 201; pp. 33-41
- Li, X. (1998): Forestry Policy in China – the past, present and future. Proceedings of the IGES International Workshop Forest Conservation Strategies for the Asia and Pacific Region (July 21st-23rd, 1998, Kanagawa, Japan); pp. 134-147
- Liss, B.-M. (1999): Nationale Waldprogramme – Konzept für einen Politik- und Planungsrahmen zur nachhaltigen Bewirtschaftung der Wälder. *GTZ/TWRP*, Eschborn

- Liu, J. et al. (2003): Protecting China's Biodiversity. *Science*, Vol. 300; pp. 1240-1241
- Liu, J. (2009): Reconstructing the History of Forestry in Northwestern China, 1949-1998. *Global Environment – A Journal of History and Natural and Social Sciences*; No. 3, 2009; Naples; pp. 191-221
- Liu, J. and Zhao, L. (2009): Have decollectivization and privatization contributed to sustainable forest management and poverty alleviation in China? *Forest Policy and Institutions Working Paper*, Food and Agriculture Organization of the United Nations (FAO), Rome
- Liu, S. and Cannon, C. (2011): Impact of socio-economic status on the implementation of China's collective forest tenure reform in Zhang Guying Township, Hunan: potential for increasing disparity. *Forestry, An International Journal of Forest Research*; Institute of Chartered Foresters; pp. 1-9
- Mann, S. (1998): Konflikte in der deutschen Forstwirtschaft – Konflikttheoretische Analyse der forstpolitischen Diskussion über die Krise der Forstwirtschaft. Shaker, Aachen
- Mann, S. (2008): Promoting Sustainable Forest Management against the Backdrop of Forest Tenure Reform – Challenges and Determinants of Success. Report No. 8, Sino-German Technical Cooperation Project Sustainable Forest Management (Deutsche Gesellschaft für Internationale Zusammenarbeit – GIZ). Paper presented to the International Conference on SFM, Huangshan, Anhui Province (September 18th-20, 2008)
- Mann, S. (2009): Sino-German Technical Cooperation in China's Forestry Sector – Stewardship for global Public Goods. Deutsche Gesellschaft für technische Zusammenarbeit (GTZ) GmbH; Beijing
- Mann, S. (2010): Climate Change Adaptation in the Chinese Forest Sector. Occasional Paper Sino-German Technical Cooperation Project "Sustainable Forest Management"; Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing
- Mann, S. and von der Heyde, B. (2011): Sino-German Technical Cooperation in the Chinese Forest Sector – The Project Sustainable Forest Management. SG-SFMP Occasional Paper No. 6, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), Beijing
- Mantau, U. (1996): Öffentliche Güter und staatliches Handeln. *Forst & Holz* 51; pp. 102-107
- Meskauskas, E. (2004): Reformprozesse in staatlichen Forstverwaltungen. Dissertation, Universitätsverlag Göttingen
- MOFCOM and SFA (2009): Guideline on Sustainable Overseas Forest Management and Utilization by Chinese Enterprises. Ministry of Commerce Dept. of outward Investment and Economic Cooperation, SFA Dept. of Development Planning and Finance Management, Beijing
- Mrosek, T., Kies, U. und Schulte, A. (2005): Clusterstudie Forst und Holz Deutschland 2005. *Holzzentralblatt* Nr. 84
- NDRC (2007): China's National Climate Change Program. National Development and Reform Commission of the P.R. China; Beijing

- NDRC (2010): China's voluntary mitigation actions. Letter of information for UNFCCC Secretariat by the National Focal Point; Beijing
- Niedenzu, H.-J. (1993): Konflikttheorie: Ralf Dahrendorf. In: Morel, J. et al. (1993): Soziologische Theorie, 3. überarbeitete Auflage, Oldenbourg, München und Wien
- Nießlein, E. (1985): Forstpolitik – ein Grundriß sektoraler Politik. Paul Parey, Hamburg und Berlin
- Nolte, C. (2008): Property Rights and Payments for Watershed Services from Forests in China: An exploratory Case Study of Beijing's Miyun Reservoir. Magisterarbeit, Humboldt Universität, Berlin
- Nüßlein, S. (2005): Alles im Fluß – Forstreformen in der Bundesrepublik Deutschland. Deutscher Forstwirtschaftsrat (DFWR). Präsentation anlässlich der Konferenz „Forstreform – Chance der Zukunftsgestaltung?“. Evangelische Akademie Tutzing, Februar 18-20, 2005
- Pauli, B., Suda, M. and Mages, V. (1998): Das Schlachthausparadox oder das Dilemma der forstlichen Öffentlichkeitsarbeit. LWF Aktuell, No. 13/1998; pp. 10-14
- Petry, M. and Zhang, L. (2009): Report on China's 7th National Forest Inventory. Country report, USDA Global Agricultural Information Network (GAIN), Beijing and Washington D.C.
- Reger, M., Panknin, B. and Untheim, H. (2010): Ziele und Organisation des Landesbetriebs ForstBW. AFZ-Der Wald, 15/2010; pp. 4-5
- Röhrig, E. and Bartsch, N. (1992): Waldbau auf ökologischer Grundlage – Vol. 1: Der Wald als Vegetationsform und seine Bedeutung für den Menschen. Paul Parey, Hamburg und Berlin
- Rozelle, S. et al. (2000): China – From Afforestation to Poverty Alleviation and Natural Forest Management – Evaluation Country Case Studies. The World Bank, Washington D.C.
- Ruddiman, W. F. (2005): Plows, Plagues and Petroleum – how Humans took Control of Climate. Princeton University Press, Princeton NJ
- Saito, O. (2008): Forest History and the Great Divergence: China, Japan and the West. Global COE Hi-Stat Discussion Paper Series 009; Research Unit for Statistical and Empirical Analysis in Social Sciences, Hitotsubashi University (Japan)
- Schmidhüsen, F. et al. (2003): Unternehmerisches Handeln in der Wald- und Holzwirtschaft. Deutscher Betriebswirte Verlag, Gernsbach
- Schraml, U. et al. (2008): Waldzukünfte – Herausforderungen für eine zukunftsfähige Waldpolitik in Deutschland. Ergebnisband des BMBF Forschungsvorhabens Waldzukünfte 2100, Berlin
- Seitsch, B. (2010): Holzbilanzen 2006 bis 2009 für die Bundesrepublik Deutschland. Arbeitsbericht 03/2010, Johann Heinrich von Thünen Institut/Institut für Ökonomie der Forst- und Holzwirtschaft Universität Hamburg, Hamburg
- SFA (2001): Forestry in China. Beijing

- SFA (2001): China Forestry Development Report 2000. State Forestry Administration of the P.R. China, Beijing
- SFA (2002): China Forestry Development Report 2001. State Forestry Administration of the P.R. China, Beijing
- SFA (2005): Code of Forest Harvesting LY/T 1646-2005; Beijing
- SFA (2006): A Report on Monitoring and Assessment of Socio-Economic Impacts of China's key Forestry Programs. China Forestry Publishing House, Beijing
- SFA (2008): Guide on Sustainable Overseas Silviculture by Chinese Enterprises. State Forestry Administration of the P.R. China, Beijing
- SFA (2009): The National Code for the Ecological and Environmental Management of Industrial Plantations in China – draft for approval as a national standard for the forestry sector, applicable for trial since October 1st, 2009. Beijing
- Shi, K. et al. (1997): China's Country Report on Forestry. Asia-Pacific Forest Sector Outlook Study, Working Paper APFSOS/WP/14, FAO Policy and Planning Division/Regional Office Asia-Pacific, Rome and Bangkok
- Sonderregger, R. (1997): Werte, Identität und Neue Soziale Bewegungen. Online Publications Social Movements, Pressure Groups and Political Parties; Soziologisches Institut der Universität Zürich (Switzerland)
- Songster, E. (2003): Cultivating the Nation in Fujian's Forests: Forest Policies and Afforestation Efforts in China, 1911-1937. *Environmental History* Vol. 8, No. 3 July 2003; pp. 452-473
- Speidel, G. (1972): Planung im Forstbetrieb – Grundlagen und Methoden der Forsteinrichtung. Paul Parey, Hamburg und Berlin
- Staatsbetrieb Sachsenforst (2010): Waldfunktionenkartierung – Grundsätze und Verfahren zur Erfassung der besonderen Schutz- und Erholungsfunktionen des Waldes im Freistaat Sachsen. Pirna
- Sunderlin, W.D., Hatcher, J. and Liddle, M. (2008): From Exclusion to Ownership? Challenges and Opportunities in Advancing Forest Tenure Reform. Rights and Resources Initiative, Washington D.C.
- Toyne, P., O'Brian, C. and Nelson, R. (2002): The Timber Footprint of the G8 and China. WWF International, Gland (Switzerland)
- United Nations General Assembly (March 20, 1987). "Report of the World Commission on Environment and Development: Our Common Future; Transmitted to the General Assembly as an Annex to document A/42/427; New York
- United Nations (2008): Non-legally binding instrument on all types of forests. Resolution adopted by the General Assembly at its 62nd session (A/RES/62/98), New York
- Volz, K.-R. (1992): Über die Zumutbarkeit von Artenschutzprogrammen im Wald. *Forstwissenschaftliches Centralblatt* 111, pp. 243-254

- Volz, K.R. (1995): Zur ordnungspolitischen Diskussion über die nachhaltige Nutzung der Zentralressource Wald. *Forst & Holz*; p. 163
- Wagner, S. und Jönsson, A. (2001): Einschränkungen der Waldbewirtschaftung durch Naturschutzauflagen am Beispiel des europäischen Schutzgebietssystems NATURA 2000. Gutachten im Auftrag der Arbeitsgemeinschaft deutscher Waldbesitzerverbände (AGDW); Augsburg und Göttingen
- Wang, C. and Chokkalingam, U., in: Chokkalingam, U. et al. (eds., 2006): Learning lessons from China's forest rehabilitation efforts. Center for International Forestry Research / Chinese Academy of Forestry / State Forestry Administration of the P.R. China; Jakarta and Beijing
- Wang, S., van Cooten, G. and Wilson, B. (2004): Mosaic of Reform – Forest Policy in post-1978 China. *Forest Policy and Economics* 6/2004; pp. 71-83
- Wang, X. (2006): China's Forest and Forest Land Tenure. World Forest Institute, slide presentation available at www.cof.orst.edu/cof/international/XiaoliWang.pdf
- Wen, Y., Li, X. and Hou, F. (2008): Cost-benefit Analysis of China's Adoption of Green Procurement Policy for Forest Products. School of Economics and Management, Beijing Forest University, Beijing
- Weber, N. und Mann, S. (1997): Der postmaterialistische Wertwandel und seine Bedeutung für die Forstwirtschaft. *Forstarchiv* 68; pp. 19-24
- Werland, S. und Morisse-Schilbach, M. (2008): Die Bäume, aber den Wald nicht sehen – was bedeutet die Internationalisierung der Waldpolitik für Sektor und Wissenschaft? *Forst und Holz* 63, No. 9; pp. 12-16
- Wippel, B., Becker, G. & Borchers, J. (2008): Holzmobilisierung im Kleinprivatwald – Ergebnisse der Pilotprojekte in Eifel und Lausitz. Abschlußbericht, Holzabsatzfonds, Bonn
- The World Bank (2006): Strengthening Forest Law Enforcement and Governance – Addressing a Systemic Constraint to Sustainable Development. Report No. 36638-GLB, Environment and Agriculture and Rural Development Departments, Washington D.C.
- The World Bank (2010): China Forest Policy – Deepening the Transition, Broadening the Relationship. Washington D.C.
- Xiao, W., Dai, G. and Zhang, S. (2010): China's Strategy and Financing for Forestry Sustainable Development. Country case study for the UNFF Ad Hoc Expert Group on Forest Financing. Beijing
- Xiaokui, X. et al. (2011): Application of China's National Forest Continuous Inventory Data Base. Online Publication Environmental Management DOI 10.1007/s00267-011-9716-2, Springer Science and Business Media
- Xinjian, L. et al. (2009): Challenges and opportunities for China's small and medium forest enterprises. *Forest Connect – Diagnostic Studies on Small and Medium-sized Forest Enterprises* 4, FAO, Rome

Xu, J., Katsigris, E. and White, A. (2002): Implementing the Natural Forest Protection Program and the Sloping Land Conversion Program – Lessons and Policy Recommendations. China Forestry Publishing House, Beijing

Xu, J. and Ribot, J. (2004): Decentralization and accountability in Forest Management – case from Yunnan, Southwest China. *European Journal of Development Research*, Vol. 16, No. 1; pp. 146-164

Xu, J. (2011): China's new forests aren't as green as they seem. *Nature* Vol. 477; p. 371

Xu, M. et al. (2000): China's new Forest Policy. *Science, New Series*, Vol. 289, No. 5487; pp. 2049-2050

Yang, G. (2005): Environmental NGOs and Institutional Dynamics in China. *The China Quarterly*; pp. 46-66

Zhang, P. et al. (2000): China's Forest Policy for the 21st Century. *Science*, Vol. 288; pp. 2135-2136

Zhang, Y. (undated): Relative Scarcity, Institutions and China's Environment – Special Reference to the Forest Sector. Faculty of Forestry, University of Toronto (undated Web-Publication: <http://www.cerdi.org/uploads/sfCmsContent/html/192/Zhang.pdf>);

Zhang, Y. (2000): Deforestation and Forest Transition – Theory and Evidence in China; p. 59. In: Palo, M. and Vanhanen, H. (eds.): *World Forests from Deforestation to Transition?* Kluwer Academic Publishers, Dordrecht; pp. 41-65

Zhang, Y. (2001): Institutions in Forest Management – Special Reference to China; p. 361. In: Palo, M., Usivuori, J. and Mery, G. (eds.): *World Forests, Market and Policy*. Kluwer Academic Publishers, Dordrecht; pp. 353-364

Zhang, Y. (2005): Multiple-use Forestry vs. Forestland-use Specialization revisited. *Forest Policy and Economics*, 7/2005; pp. 143-156

Zhang, Y. and Song, C. (2006): Impacts of Afforestation, Deforestation, and Reforestation on Forest Cover in China from 1949 to 2003. *Journal of Forestry*; p. 384



中国环境科学研究院
Chinese Research Academy Of Environmental Sciences

Fourth Sino-German Workshop on Biodiversity Conservation

Nature-oriented and Multifunctional Forest Management

Concepts, Approaches and Instruments for Conserving Biodiversity
and Ecosystem Services

June 29th – July 2nd 2011,

International Academy for Nature Conservation on the Isle of Vilm, Germany

Introduction

Forests are one of the most important ecosystems for biodiversity and climate protection and provide livelihoods for many people around the world. The general discussion about forest use or protection, in the context of climate change adaptation and mitigation, biodiversity loss and conservation, ecosystem services and the debate around bio-energy, reflects the diverging interests of its stakeholders. Natural or near natural forests with multiple functions play an important role not only in the conservation of ecosystems and species, but also in the protection of the abiotic environment (water, soils, air) and are therefore key elements in national and international conservation efforts.

China and Germany share an interest in sustainable forestry, which balances ecological, economic and social needs. This offers potential for the exchange of experience and knowledge as well as for cooperation, in order to improve nature-oriented and multifunctional forest management concepts and practices.

Programme

Wednesday, 29 June 2011

- 14:00 – 14:30 Prof. Beate Jessel (Federal Agency for Nature Conservation, BfN):
Welcome & Opening Speech
- 14:30 – 15:00 Prof. Jianmin Shu (Chinese Research Academy of Environmental
Sciences, CRAES): Welcome & Opening Speech
- 15:00 – 15:15 Round of introduction
- 15:15 – 15:30 **Coffee break**
- Module I: Overview of the Ecological Status Quo of Forests and Forest
Ecosystem Services in China and Germany**
- 15:30 – 16:00 Prof. Qijing Liu (College of Forest Sciences, Beijing Forestry Univer-
sity): Vegetation pattern and process in Changbai mountain, North
East China
- 16:00 – 16:30 Dr. Peter Elsasser (von Thünen Institut, vTI): Forestry, Forest
Policy, and the Value of Forest Ecosystem Services in Germany
- 16:30 – 17:15 Dr. Stefan Mann (ECO Consult): Preliminary results of a compara-
tive study "Forest protection and forest use in China and Germany"
- 17:15 – 18:00 Discussion
- 18:30 **Dinner**
- 19:30 Walk around the Isle of Vilm (ca. 3 km) with Prof. Hans Dieter
Knapp

Thursday, 30 June 2011

- As of 7:30 **Breakfast**
- Module II: Scientific Concepts and Approaches for Maintaining Biodiver-
sity and Ecosystem Services in Forests**
- 9:00 – 9:30 Andreas Krug (BfN): Integrative forest management in Germany -
combining biodiversity conservation, ecosystem services and timber
production
- 9:30 – 10:00 Dr. Peter Pechacek (CIM at CRAES): Ecosystem approach and its
application to forest
- 10:00 – 10:30 Dr. Goddert von Oheimb (Institute of Ecology, University of Lüne-
burg): The role of tree and shrub diversity for ecosystem functioning
in Chinese subtropical forest ecosystems
- 10:30 – 11:00 **Coffee break**
- 11:00 – 11:30 Prof. Shidong Zhao (Chinese Academy of Science, CAS): Forests
and forestry of China - Current status, challenges and perspectives

- 11:30 – 12:00 Prof. Hans Dieter Knapp (BfN): Biogeographical position of forests in Central Europe
- 12:00 – 12:30 Summary and discussion of the morning session
- 12:30 Lunch**
- Module III: Applied Management Concepts for Strengthening Biodiversity and Ecosystem Services in Forestry**
- 14:00 – 14:30 Prof. Jingwen Li (Forestry College, Beijing Forestry University): Degradation and restoration of "Populus euphratica" forest at Ejina Oasis, China
- 14:30 – 15:00 Bernhard von der Heyde (Gesellschaft für internationale Zusammenarbeit, GIZ): Sustainable Forest Management in China – Meeting International Commitments
- 15:00 – 15:30 Coffee break**
- 15:30 – 16:00 Dr. Hu Lile (CRAES): Response to Climate Changes of Alpine treeline *Larix chinensis* in Qinling Mts., China
- 16:00 – 16:30 Dr. Xiushan Li (CRAES): Forest management and its impact on present and potential future Chinese insect and plant biodiversity - A case study from Gansu Province
- 16:30 – 18:15 Working Groups to discuss module II and III
- Working Group I: Identification of research gaps for nature-oriented and multifunctional forestry
- Working Group II: Recommendations for implementation of biodiversity and ecosystem aspects in policy and practice
- 18:30 Dinner**
- 20:00 Slide show and field report from a visit to China, Andreas Krug and Christian Großheim, BfN

Friday, 1 July 2011

- As of 7:30 Breakfast**
- Module IV: Voluntary Instruments for Strengthening Ecosystem Services in Forest Management**
- 9:00 – 9:20 Christian Großheim (BfN): REDDplus: Carbon storage as the overarching ecosystem service of forests in developing countries?
- 9:20 – 9:45 Dr. Zhanli "Jerry" Sun (Institut für Agrarentwicklung in Mittel- und Osteuropa. IAMO): Exploring the land use responses to Payment for Ecosystem Services in Yunnan, China
- 9:45 – 10:00 Dr. Zhanli "Jerry" Sun (IAMO): Overview of an REDDplus project
- 10:00 – 10:30 Coffee break**

10:30 – 11:00	<i>Prof. Ying Zhang (School of Economics and Management, Beijing Forestry University): Study on the calculation of forest water conservation compensation price by optimal control method in China</i>
11:00 – 11:15	<i>Dr. Lei Jingpin (Sustainable Forestry Development and Research Center (SFDRC) of the Chinese Academy of Forestry (CAF)): "Introduction and progress of Sino-German Project on SFM Training and support measures for South China"</i>
11:15 – 12:30	<i>Discussion</i>
12:30	Lunch
14:00 – 16:00	<i>Working Groups</i> <i>Strengthening aspects of biodiversity and ecosystem services in forest management and forest policy:</i> <i>Working Group I: Identification of research gaps</i> <i>Working Group II: Developing recommendation for policy makers</i> <i>Working Group III: Developing recommendations and needs for a better implementation</i>
16:00 – 16:30	Coffee break
16:30 – 18:00	<i>Presentation and discussion of the Working Group results and developing follow up activities</i>
18:00 – 18:30	<i>Final discussion</i>
18:30	Dinner

Saturday, 2 July 2011

As of 7:30	Breakfast
9:00	<i>Departure from Lauterbach Mole by bus to Biosphere Reserve Schorfheide-Chorin</i>
12:00	Lunch
13:30	<i>Excursion Biosphere Reserve Schorfheide-Chorin, (Formstamt Hesseenhagen)</i> <i>Mr. Donath (Woodman of Landesbetrieb Forst Brandenburg) demonstration of two field sites</i>
Ca. 18:00	<i>Driving to Berlin</i>
20:00	Dinner in Berlin