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Experiences of Policy Reforms of the Forest Sector in Transition and Other Countries with Implications for the Chinese Forest Sector

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Contents

Abstract

This paper was presented as a keynote address at the “International Forum on Chinese Forestry Policy: Developing a Policy Research Agenda to Meet Existing and Future Challenges” held in Beijing, China on 13–14 June 2002.

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Experiences of Policy Reforms of the Forest Sector in Transition and Other Countries with Implications for the Chinese Forest Sector

Sten Nilsson

Effective real world policy connects local action to plans and programs through integrating institutions and top-bottom linkages. These linkages comprise information flows, debate, and partnerships (Mayers and Bass, 1999).

1 Introduction

There are lot of efforts being made today in the form of policy reforms of the world's forest sectors. Unfortunately, we cannot point at many success stories and the degradation of the forests in different forms continues in many countries. Therefore, it seems necessary to try to draw lessons from the many efforts already going on in order to be successful in designing and implementing new policy reforms for sustainable development of the forest sector in different parts of the world. This paper starts with describing some basic concepts regarding policy design and implementation, then reviews experiences and lessons from several countries, and lastly describes some of the implications of these lessons for policy reforms needed in transition countries with an outlook on the Chinese forest sector.

2 Background and Conceptual Framework

In order to achieve sustainable forest sector development there is a need to balance the economic, ecological, and social aspects of the sector. To achieve this objective, most countries have realized that there is a need for a holistic and cross-sectoral approach for forest sector policy settings and that these policy programs must be linked to rural development and environmental conservation (UN, 2001). We define policy as a course of action adopted by stakeholders, and any course of action adopted as advantageous or expedient (modified from the Oxford English Dictionary).

Solberg and Rykowski (2000) made a literature review of studies on forest policies and conclude: *"A long range of studies is found of various forest policy instruments, but nearly all of the studies describe the instruments. Very few studies exist which analyze*

the effectiveness and costs and benefits of various instruments. Even less studies exist which evaluate alternative policy instruments".

However, evaluations of policy frameworks established a long time ago show very strong impacts on the development of the forest sectors. One example is Sweden, where a policy framework for the forest sector and forestry was established 100 years ago. This framework has of course been modified and improved over time. But a recent evaluation (SNFB, 2001) shows that the policy frameworks established have, for example, protected the forests from exploitation, increased the restoration of earlier mismanaged forests, increased the production and harvest potentials substantially, increased the quality of forests, and during the last 20 years substantially protected the environmental, ecological, and social values of the forests.

Policy frameworks have a long-term impact on the development of the forest sector and especially on forestry. This is illustrated in Figure 1. As illustrated in this figure, an important component of the implementation is to evaluate the consequences or impacts of the implemented policies in order to see that the implemented frameworks will give the desired results. The policies implemented today are also strongly influenced by the historical development of the forest sector. Therefore, there is a need to analyze and understand the historical development of the sector.

Forest sector policies are often complicated and there are substantial uncertainties involved with respect to dose/response efforts of policy means, goal specification, policy adaptation, policy implementation, and future trends affecting the forest sector (Solberg and Rykowski, 2000).

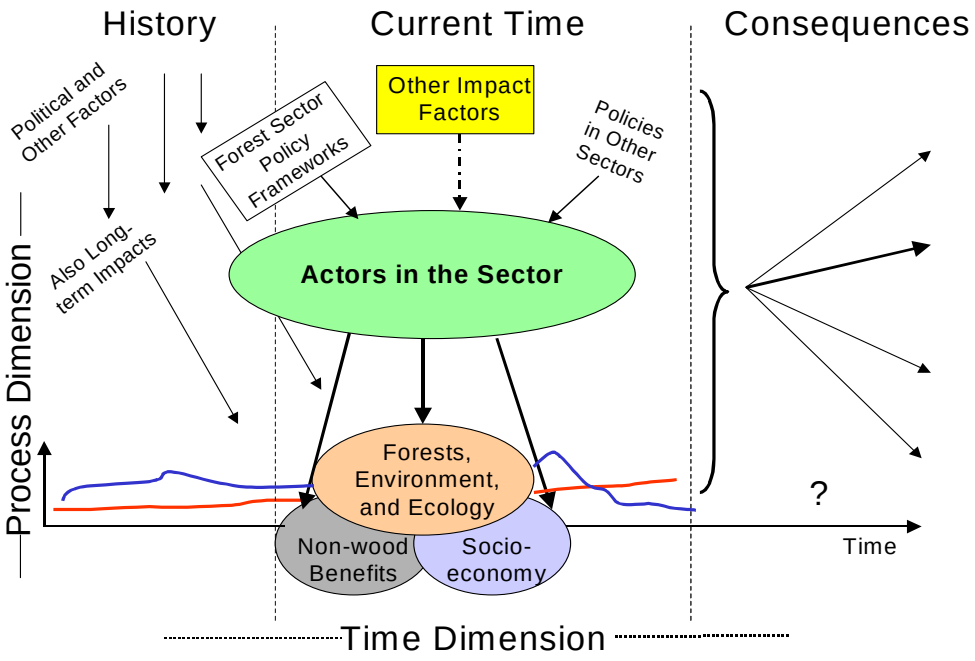

Figure 1: Policy Framework Impacts on Forestry. Modified from SNFB (2001).

This leads to the conclusion to follow an adaptive approach in the process of policy reforms.

The impact of implemented policy tools or instruments depends on other policy instruments in place in the sector or other sectors influencing the forest sector.

All governments have to make decisions about: (1) how they organize their public administration (including what level of government has what authority to do what); (2) policy instruments (like legislation, taxes, permits, etc.); (3) policies; (4) what the roles of civil and private society are going to be; (5) monitoring performance; and (6) how the forest sector relates to other sectors.

Unfortunately, in most cases, these different elements are disconnected, not coherent, and do not lead to the kind of outcomes desired. The overall goal with a framework and related policies for sustainable development of the forest sector is *to provide a coherent structure* of available means and measures for governments to reach the social, environmental, and economic goals of the forest sector. In order to reach coherency, the framework has to be simple and have political support of key constituencies in society.

We also think that the framework should aim toward objective-oriented approaches, namely the broad results we expect from the sector.

In this section we will present a proposed scope (content/outline) of a Framework for Sustainable Development of the forest sector (Figure 2). This framework is based on experiences of policy work in transition countries, (countries of the former Soviet Union), developing countries, the Nordic countries, and Canada (Nilsson, 2000a, b; 2001; 2002a, b, c; Nilsson and Gluck, 2001). The experiences show that a framework of this kind is needed in order to achieve sustainable development in a broad sense of the forest sector. But it should be underlined that there is no clear-cut outline of the framework valid for every country. There are many variations on the same theme because the different components of the framework often overlap. The framework also has to be adjusted to the specific conditions in each country. The experiences from the reforms in Transition Countries contributing to the proposed framework are discussed in Section 4 and the experiences from the reforms in Developing Countries in Section 5.

The proposed Framework for Sustainable Development presented in Figure 2 has to be implemented in the Policy Process in order to be operational. In Section 3, we present our proposal, based on our experiences in other countries, on the Policy Process and we call it the Policy Cycle.

As stated earlier, we have developed a concept based on work in many countries and is presented in Figure 2.

The concept of Figure 2 will be discussed in the following paragraphs. Due to the complexity of the issues, the indirect nature of many of the causal relations involved, and the wide diversity of situations, any attempt to generalize is inherently difficult and invites justifiable criticism (Kaimowitz and Angelsen, 2000). However, the concept presented has similarities with the comprehensive forest policy frameworks or "National Forest Programs (NFPs) for Sustainable Forest Management" proposed by the

Intergovernmental Panel on Forests (IPF, 1997). In this document it states that NFPs should follow a broad intersectoral approach, including the formulation of policies, strategies, and plans of action, as well as their implementation, monitoring, and evaluation. The programs should be implemented in the context of a country's socioeconomic, cultural, political, and environmental situation and be integrated with wider programs for sustainable land-use and with the activities of other sectors.

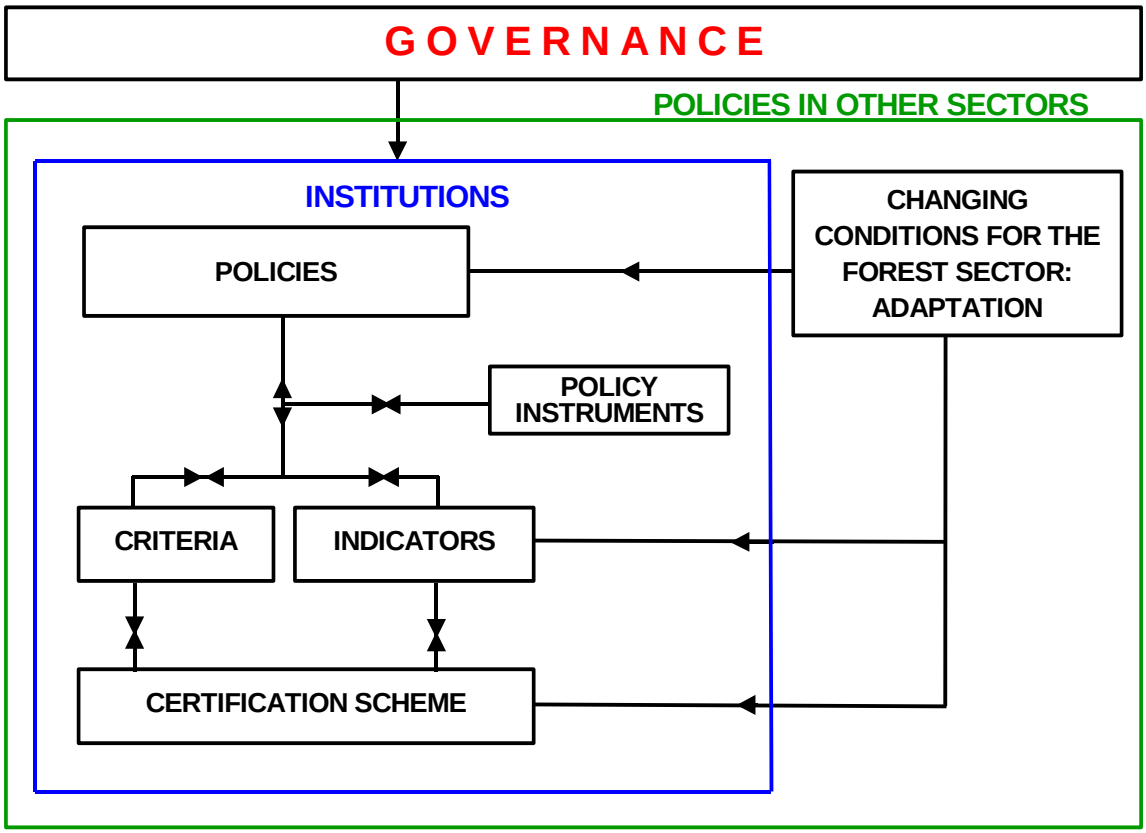

Figure 2: The Scope of a Framework for Sustainable Development.

2.1 Governance

The umbrella for policy reforms in the forest sector is the general governance conditions at hand in a country. Governance is sometimes defined as *"the exercise of authority through formal and informal traditions and institutions for the common good"* (Thomas, 2000). The general governance conditions in a country are decisive for the possibility of carrying through policy reforms in the forest sector. There seems to be a positive correlation between the existence of effective democratic institutions and successful policy reforms. A key issue for success in policy reforms is to what extent the political forces support the reforms and allow for participation and consultation in the reform process.

But there is also a "Governance" issue within the forest sector. There must be a good climate for reforms within the sector, which requires strong leadership that can only

come from within the forest sector — from the people who know and understand the sector. These people have to communicate their understanding and visions to the society and governments in order to bring about reforms (Apsey *et al*., 2000).

2.2 Integration With Policies in Other Sectors

The forest sector is just one part of the total economic activities of a country. The impact by the forest sector on regional/rural development and the environment may be high in some countries but in many countries the policies implemented in other sectors of the economy are more important for the forest sector than implemented forest sector policies are in other sectors of the economy (Peck and Descarques, 1995). Examples on broad policy issues interacting with forest sector policies and influencing the functioning of the forest sector are policies dealing with:

- agriculture/land-use,
- energy,
- environment,
- employment,
- trade,
- transportation,
- macroeconomic and social policies and investments,
- technological development,
- rural/regional development, and
- climate change.

In many cases, policies may be well conceived in a narrow (sectoral) context but are unsustainable in a broader context.

Special emphasis must be paid to integrate social, rural, environmental, and forest policies (World Bank, 2000).

However, there is hardly any country so far that has properly managed this integration of policies between different sectors.

2.3 Policies for the Forest Sector

Bluntly expressed, the establishment of Policies is the process where *we formulate what the society wants from the forest sector and forestry in the future* (Apsey *et al*., 2000; Nilsson and Gluck, 2001) or how to get where we want to be. *"The starting point [for policy formulation] must be the social objectives. It must provide for specified goods and services to go to specified groups by specified dates. That means finding out what people want… Thus the creation of a forest policy is a process which should involve all groups and institutions with a direct or indirect say in the forest or with responsibility for implementing policy"* (Westoby, 1989). Within the sustainability concept, we think Policies is one of the most important components. It is in this component that society should have an intense debate on setting conflicting and balancing goals. Balancing of goals is required both within the forest sector and between the forest sector and other

sectors of the economy to fulfill overall development objectives of the society. This balancing is missing in most countries today.

Policies should consist, in one way or the other, of the following components: Overall Societal Goals for the Forest Sector, Overall Forest Policy Goals, Detailed Goals for Sustainable Forestry, and Detailed Regional Goals for Sustainable Forestry (see Figure 3). There is a broad variation between countries in the formulation of these goals. In Appendix 1 we have tried to illustrate the features of the goals of these different policies.

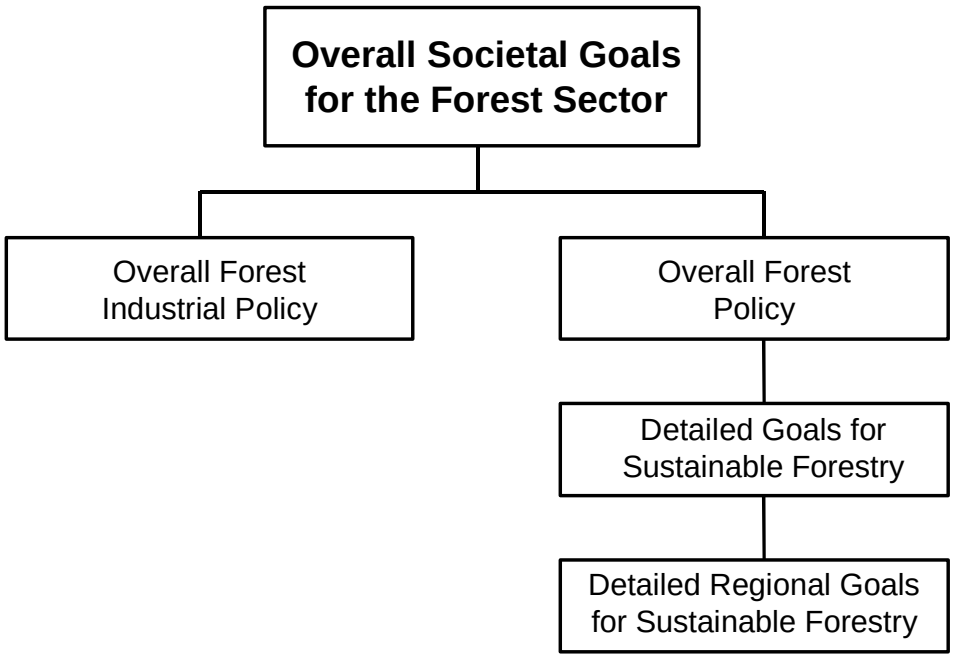

Figure 3: Illustration of the Policy Components (see Appendix 1).

With respect to Forest Sector Policies a certain problem exists, which is caused by administrative measures. We define the "Forest Sector" as containing the components "Forestry", "Forest Industry", and "Markets". In many countries, the policies for "Forestry" are set by a Ministry for Agriculture and/or Forestry and the policies for the "Forest Industry" and "Markets" by Ministries for Industry and/or Trade. This means that there is not an overall harmonized policy for the forest sector but there are individually set policies for the different sub-components "Forestry" and "Forest Industry". The most developed part, so far, of the Policies is with respect to "Forestry" and this is mainly used as an illustration in Appendix 1.

The social values to take into account by the forest policies vary greatly, depending on culture and social group, and the roles that forests play in their livelihoods and quality of life. Examples of these social values are presented in Table 1.

Table 1: A Spectrum of Social Values Associated with Forests. Modified from Mayers and Bass (1999).

Social Values	Forests Provide
Livelihood Basics:	
Staple food	Carbohydrates and protein for forest-dwelling communities Fuelwood for cooking
Supplementary food	Variety/palatability to diet through meat, fish, fruit Seasonal buffers/famine foods
Health	Water supplies Climate moderation Medicine Vitamins and minerals
Shelter	Poles, thatch
Economic Security:	
Main income	Forest products for sale Forest services, e.g., tourism for sale
Supplementary income	Forest products for sale
Savings/social security	Timber stocks Land value
Risk reduction	Biodiversity Multiple products Soil conservation Water conservation
Cultural and Social Identity:	
Cultural, historical, spiritual and symbolic associations	Forest Landscapes Forests as sacred groves Individual species and their products
Social identity and status	Forest as source of power from ownership/cultivation/ clearance Ability to pass forest on to future generations
Quality of Life:	
Education/science	Biodiversity conservation Means of access to forest
Recreation	Biodiversity conservation/control Forest-based facilities
Aesthetic values	Landscape design and management Biodiversity/conservation

2.4 Policy Instruments

Policy Instruments are the tools that try to move development towards the goals set in Policies. Thus, there should be a strong link between Policies and Policy Instruments. There are many Policy Instruments in the policy process available for implementing the adopted forest policies. One way of classifying the instruments is presented in Table 2.

Table 2: Policy Instruments.

Regulatory/Juridical: Constitutional guarantees, laws, by-laws and other regulations, rights, tenure, trade, legally-binding international connections
Economic/Market: Taxes and revenue systems, subsidies, stumpage, permits, auctions, certification
Information: Extending science, education and training, research, monitoring and information systems, policies in other sectors
Institutional: Property regimes, concession systems, mechanisms for dialogue and partnership, mitigation of corruption and capital flight
Agreements: Management agreements, non-legally-binding international agreements
Adaptation and Evaluation: Manuals and plans
Sustainable Development Frameworks (overall coordination)
Forest Sector Programs (strategies), ***National Forest Programs***, etc.
Choice of Implementation Strategy
Plans on How to Implement Policy Frameworks

The legislation is probably the strongest policy instrument. The legislation can be divided into *nominal* and *functional* laws (Schmithüsen, 1992). The nominal laws are constituted by the legislation directly dealing with forestry, and the functional laws are regulations outside forestry but affecting forestry. Law and legislation content should be reflecting the result of the policy formulation but is, at the same time, a prerequisite for the implementation of the policies adopted.

In many countries, the forest legislation is not sufficient in order to reach the goals of the Policies discussed in Section 2.3. To reach these goals, other political measures and voluntary actions by the forest owners beyond forest legislation are required.

2.5 Criteria and Indicators

Over 150 countries are currently in one or more international processes that aim at the development and implementation of criteria and indicators for sustainable forest management (Palmberg-Lerche *et al*., 2001). The ultimate goal with this system is to promote improved forest management practices over time, taking into consideration the social, economic, environmental, cultural, and spiritual needs of the full range of stakeholders in forestry.

The transparency concerning the actual state and trends of forestry that follows from open dissemination of the indicators is, in itself, a vital tool and has resulted in improved forest reporting (Duinker, 2000).

As an entity, the focus on "criteria and indicators" may be quite misleading. Criteria are *a set of core values*, while indicators are *a set of core data*. These are two very different concepts, and we think it is important to see them as such. There are positive experiences with the criteria and indicators concept but there are also a number of limitations to be considered. We are not going to burden this paper with a discussion on the limitations but reference Nilsson and Gluck (2001). It is clear that the "criteria and indicator" concept has an important role to play in a sustainable development framework for forestry. But in order to be this important tool, the sets of criteria and indicators have to be harmonized with the goals of the Policies discussed in Section 2.3. This harmonization is, to a large extent, missing in most countries today. In order to move in that direction we think it is, in the future, important to operate with three levels of indicators: (a) the international level, where the internationally agreed indicators are reported in common format; (b) the national level, where the indicators are closely linked with the content of the national policy framework; and (c) the regional level, where the indicators are closely linked with the regional goals of forestry (see Appendix 1) (Nilsson, 2000b).

2.6 Certification

The original purposes of market-oriented certification are: (1) to improve the quality of forest management, and (2) to provide market advantage or improved access for products from sustainably managed sources (Bass and Simula, 1999). Certification of forest management is defined as an established and recognized verification procedure that results in a certificate on the quality of forest management in relation to a set of predetermined criteria based on an independent (third party) assessment. Verification takes place through an audit. In assessing forest management quality, it is established whether the performance requirements, expressed as criteria and indicators (standards), are complied with in a defined forest area. The criteria are generally associated with sustainable forest management and may often consider various sets of internationally agreed "Criteria and Indicators" discussed in Section 2.5 (Bass and Simula, 1999).

Schopfhauser (2001) estimates that there are some 70 systems being developed worldwide but only a small number are operational; most of them are market-oriented schemes and only some 90 million ha was certified in 2000 (Bourke, 2001).

Thus, there are reasons to see Certification and "Criteria and Indicators" systems as complementary efforts with largely the same final aim — to promote the sustainability of forest management. However, their functions are markedly different. "Criteria" stands for core values, while up-to-date dissemination of results on "Indicators" supply the status on core data. The "Criteria and Indicators" originate from international agreements.

A certification standard constitutes an agreement between consumers and producers of forest products and/or services on a voluntary basis. We see certification as a pure market instrument. There are still many issues to be resolved with respect to certification (Bourke, 2001; Nilsson and Gluck, 2001) but we omit these issues from the discussion in this paper.

In the same way as "Criteria and Indicators", the "Certification" can play an important role in a sustainability framework. But our major concern is that the certification systems should be harmonized with the goals of the Policies discussed in Section 2.3, and without this harmonization there is a risk that the certification systems can become counterproductive to the overall policies.

2.7 Institutions

In order to get the Policies, Policy Instruments, Criteria and Indicators, Certification Schemes, and balancing with policies in other sectors harmonized and efficiently operational, efficient Institutions have to be established. There is a consensus that Institutions constitute a major bottleneck for the sustainable development of the forest sectors in many countries (Ljungman, 1998; Nilsson and Gluck, 2001; Nilsson 2002a; Carlsson *et al*., 2001). Ljungman (1998) claims that the main obstacle for establishing efficient Institutions or reforms is the presence of powerful stakeholders with an interest in the status quo.

The Institutions should be understood as "the rules of the game" in a sector, not as organizational entities (North, 1990; Crawford and Ostrom, 1995). Thus, Institutions consist of those formal and informal rules that are *de facto* used by a set of actors. Pejovich (1998) defines institutions as *"…the legal, administrative, and customary arrangements for repeated human interactions… the prevailing institutional framework in a society consists of formal and informal rules"*. This implies that Institutions of a society or a sector are composed of a large number of institutions. The features of Institutions are coordination between organizations, legislation, property rights, tenures, revenue and taxes, land-use, corruption, transparency, knowledge, etc. Stiglitz (1999) states *"…economic development and transition to something new is more a matter of institutional transformation than economic management"*. IIASA has carried out a lot of efforts in analyzing the Institutions of the Russian forest sector.[1] The lesson learned is that there are limited possibilities to achieve sustainability without substantial changes and reforms in the existing Institutions, and the reforms needed must be in harmony with the establishment of the sustainability concept illustrated in Figure 2. Apsey *et al*. (2000) and Nilsson and Gluck (2001) make similar conclusions for Canada.

[1] The reports are available on the Internet: http://www.iiasa.ac.at/Research/FOR.

2.8 Changing Conditions for the Sector: Adaptation

The political, social, and economic conditions are changing rapidly and with that the conditions for the operations of the forest sector. In order to cope with these changes, the framework of the sustainability concept has to be adaptive and regularly revised to deal with these changes. Without an adaptive concept with revisions, the existing Policies, Policy Instruments, Criteria and Indicator Systems, Certification Schemes, and Institutions will be counterproductive from a sustainability point of view. To do this adaptation, the availability of a tool-kit for the changes is required. Thus, it is important to establish an efficient adaptive mechanism for updating the content of the framework for sustainability.

3 The Policy Process — The Policy Cycle

In Section 2, we discussed the *Scope* (or content) of a Framework for Sustainable Development of the Forest Sector, and in this section we will discuss how to go about the *Process* of establishing the framework and *Policies* for Sustainable Development of the sector — we call the process the *Policy Cycle*.

There are many ways to try to describe the policy process. One way is to look at the process as a series of stages — e.g., information–decision–implementation–evaluation — as a cycle. A simplified "Policy Cycle" is presented in Figure 4. However, there are risks with these rational approaches because policy processes are usually products of long history, the stages may not be sequential and are not insulated from each other (Mayers and Bass, 1999). Nevertheless, in the following paragraphs we will comment on the components of the Policy Cycle.

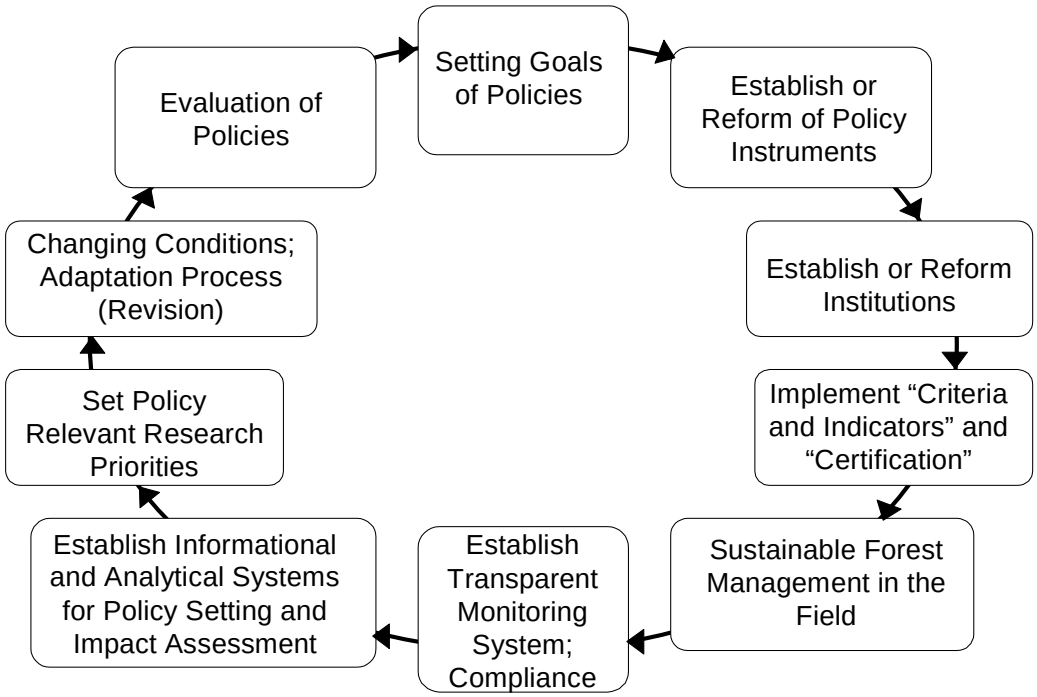

Figure 4: The Policy Cycle.

3.1 Setting Goals of Policies

Participation of the main interest groups in developing and implementing new goals and policies is compulsory in order for these to be well designed and for good stakeholder cooperation in the forest sector. Thus, it is important to develop *Policy Communities* of the major stakeholders in order to efficiently set goals and policies. The policy community can foster new ideas, which are important for the policy process. Thus, setting goals of the Policies requires *Participatory Approaches*. Calls for engaging stakeholders in the development of efficient policies have been raised, among others, by Warburton (1997), Carter (1999), Buchy and Hoverman (2000), Burley *et al*. (2001), and Kennedy *et al*. (2001). IIASA has a long experience in developing and using participatory approaches in policy making. Brewer (1986) developed the concept of "Policy Exercises" to engage the stakeholders in the policy process. This concept was applied in a number of exercises with respect to the European forest sector (Duinker *et al*., 1993). Later, the Policy Exercise concept has been used in trying to set new Policies and Institutions in forest sectors in transition, more specifically the Russian forest sector (Olsson, 2001). We will not describe the Policy Exercise concept in detail in this paper, but will only conclude that the concept works even in countries like Russia. Of course, there are also other concepts to follow for the formulation of Policies.

The process of setting the goals of Policies is an interactive process with respect to context, actors, process, content, and impact. Mayers and Bass (1999) have tried to illustrate this interaction in Figure 5.

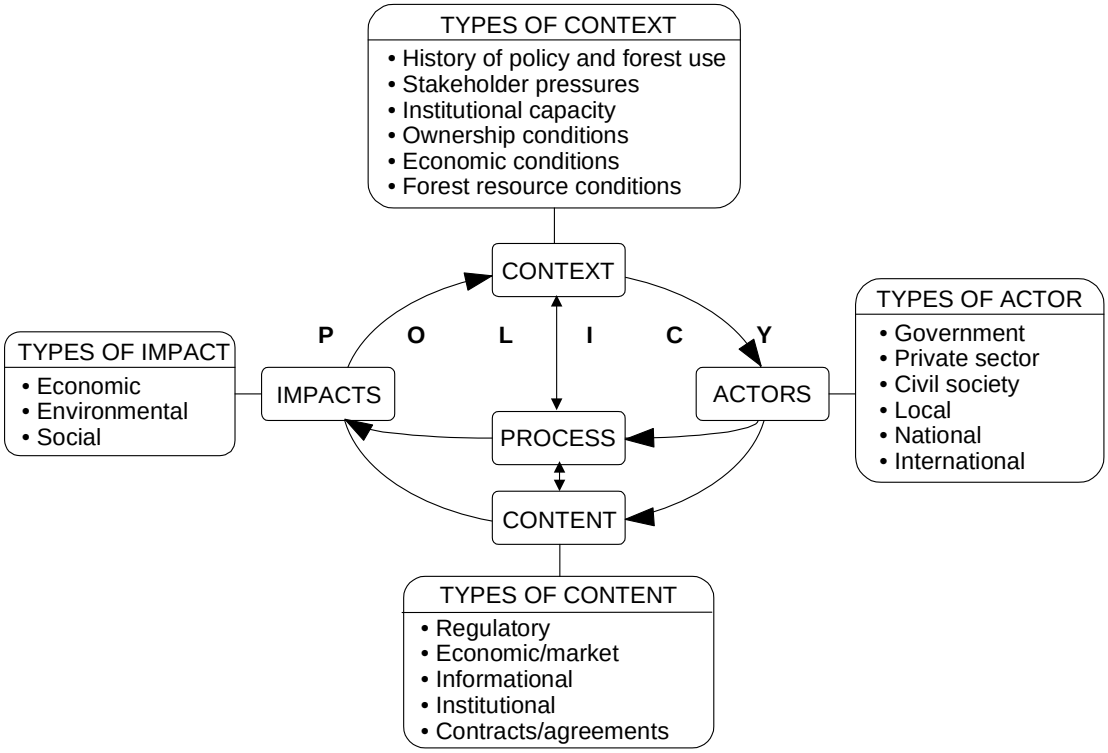

Figure 5: Interaction of Context, Actors, Process, Content, and Impact. After Mayers and Bass (1999).

Establishment or Reform of Policy Instruments

After setting the goals and policies, the policy instruments to be used to reach the goals have to be established. Some of the different policy instruments available are discussed in Section 2.4.

In many countries, the forest legislation is the basic component of the forest policy and should reflect the intentions set in the Policies. The legislation defines the binding norms to be respected by the community in operation of the forest sector toward set goals.

Establishment or Reform of Institutions

The Institutions have to be adjusted to be able to handle the goals set in the Policies and to execute the Policy Instruments. The Institutions are defined as discussed in Section 2.7.

Implement "Criteria and Indicators" and Certification

The Policy Community, discussed in Section 3.1, has to implement international agreements on "Criteria and Indicators" and also modify these in the policy process to national and regional conditions and levels. The certification should be established on a voluntary basis but the Policy Community could play an active role in stimulating the establishment of a certification scheme and make sure that both the certification scheme and the implementation of "Criteria and Indicators" harmonize with the overall concept or framework for sustainable development of the sector (see Figure 2).

Sustainable Forest Management in the Field

After the stages described above, there is a platform for operational sustainable forest management. But this is not the end of the Policy Cycle stages.

Establishment of Transparent Monitoring System; Compliance

In order to follow the policy actions, there is a strong need to establish consistent and transparent monitoring (inventory) and reporting systems. These systems have to be designed so that they can measure compliance with the goals of Policies, with the Policy Instruments, and with the implemented "Criteria and Indicators" systems.

Establishment of Informational and Analytical Systems for Policy Setting and Impact Assessments

The data from the monitoring system has to be implemented into informational and analytical systems assessing the impact of the policies adopted. The informational system also helps to set relevant policy research priorities.

Set Policy Relevant Research Priorities

The Policy Cycle is a continuous process and during the journey the need for policy relevant research agendas will be identified. The Policy Community has to communicate to the scientific community and make sure that these research agendas are implemented.

Changing Conditions; Adaptation Process

As discussed in Section 2, the Policy Cycle is an adaptive process and the environment of the forest sector is changing rapidly due to new knowledge, changed values over time, changed economic and political conditions, etc.

These changes have to be followed and scrutinized in the Policy Cycle. Some of these changes have to be analyzed in the earlier discussed Informational System and some require new research. In some cases, adjustment of the existing policies is required and in others it is not.

Evaluation of Policies

As stated in Section 2, policies in the forest sector and especially in forestry have long-term impacts. Therefore, there is a need to carry out major Evaluations of Policies. The evaluations should be made against the goals set in Policies. It is also of importance to identify cause/effect relations in the evaluations. The direct impact of the Policies is often difficult to identify from the impacts of other factors outside the sector. Therefore, there is a need to study the different actors in the sector with respect to attitudes and behavior together with direct impacts, e.g., in forestry. In many cases, the evaluations result in redirections of the Policies, Policy Instruments, and Institutions.

Major evaluations are complicated and costly and can, therefore, only be carried out at longer time intervals. These evaluations are often initiated by major changes in the environment/surroundings of the forest sector.

4 Policy Reforms in the Forest Sector in Former Centrally Planned Economies

In the following paragraphs, a brief summary is made of the experiences of the policy reforms during the 1990s (or how successful the policy reforms have been so far) in the former Soviet bloc.

4.1 Eastern Europe Central Asia Region (ECA Region)

Solberg and Rykowski (2000) have studied the policy reforms during the 1990s in forestry of the ECA region (25 countries). They conclude that:

- The goals for forestry are not clearly defined and are not derived from the overall development goals of the respective country;
- The property rights regimes are not clearly defined and are not followed in practice;
- There are overlapping and unclear legal and institutional arrangements between governmental institutions with respect to forest policies;
- There are insufficient and insecure investments in forestry;
- Public participation and conflict resolution in forestry is not sufficient;
- The dialogue between forest authorities and other interest groups have to improve;
- Corruption is a serious problem and make reforms of forest policies meaningless;
- The knowledge of the impact of different policy instruments is not sufficient;

- There is no coordination of forest policies with policies in other sectors;
- The overall coordination of a sustainability framework is missing;
- The reforms of the state forest service is insufficient; and
- There is a lack of interface between research and policy making.

4.2 Former Eastern Europe

Nilsson (2002c) has analyzed the reports by individual countries to the European Forestry Commission (EFC, 2000) on the development of policy frameworks for sustainable development. It can be concluded that only one-third of the countries have delivered reports to the European Forestry Commission, which means that many countries have a long way to go in order to come up with solid frameworks for policies and sustainability. It is difficult to get a concrete picture from the existing reports on if and how the developed frameworks are operating in the real world. Most of the efforts have been made on forest legislation and not on a complete framework in line with Figure 2. With respect to "Institutions", the reports mainly discuss the reorganization of the institutions. As illustrated earlier in the text, the domain of institutions is much more than just the organization and responsibility of the institutions of the forest sector. There does not seem to be any balancing of policies between forestry and other sectors, and there is no overall forest sector policy. There is not much implementation of the Criteria and Indicators system.

There are also conflicts between central and local governments with respect to the forest sector. Many institutions and legislations are outdated. Corruption and illegal harvest and trade are substantial. Governmental budgets for forest management are disappearing. The privatization of industry is suffering from insufficient reinvestments.

4.3 Belarus, Russia, and Ukraine

Krott *et al*. (2000) have studied the existing policies and policy frameworks in Belarus, Russia, and Ukraine, and make, among other things, the following conclusions:

- The status of the existing policy framework for the forest sector is weak;
- Legal rules have been reformulated but are too general or contradictory to give clear guidance to institutions;
- The implementation of laws is moving slowly;
- There is a need to strengthen independent forestry institutions for law implementation;
- Due to separation by time, space, and institutions of the central budget, there are large difficulties to coordinate the earnings with the necessary long-term investments in forestry production as well as technology and infrastructure;
- With respect to the impacts of other sectors on the forest sector, new policies and programs are established but the implementation is limited;
- There is a need to bring in managers with new skills to the forest sector; and
- The state budgets for the forest sector are not task-oriented.

4.4 Conclusions from Former Eastern Europe

The above presentation may give the impression that nothing has happened with respect to policy reforms. There have been impressive changes in the frameworks in comparison with the Soviet era (UN, 2001). But the UN (2001) is also pointing out that there are problems in the region because forestry has a marginal role in the national economic planning, the transition process in the forest sector is determined by more general transition-related factors than the needs of transition in the forest sector.

Kallas (2000) confirms that there have been substantial changes in the policy formulations, reforms of the public forestry organizations, and improvement of different stakeholders of the forest sector, but policy implementations have brought only limited results in other components of the policy and sustainability frameworks and there are no avenues for policy revisions established.

Based on the review presented above, it can be concluded that the former Eastern European countries still have substantial work to do in each component of the scope of the sustainability framework presented in Figure 2 and of the Policy Cycle in Figure 4. The review also shows the need to have a systematic and analytical approach, in line with Figures 2 and 4, in order to be successful and keep momentum in the policy reform work. The overall impression is also that the former Eastern European countries have concentrated on reformulation of Legislation of the Policy Instruments. This may be a good strategy to get moving on the reforms. The World Bank (1997) argues that the establishment of the juridicial prerequisites of the forest sector is an effective strategy for reforms and transition. The experiences of former Eastern Europe also show that the policy reforms take a long time.

Kallas (2000) also concludes that the experience shows:

- That the initiative for reforms must come from inside the forest sector;
- The "right" leaders for the reform work have to be found;
- The policy reforms can only be done in a meaningful way by the people in the transition countries not by outside experts; and
- The policy reforms of the forest sector do not require huge financial resources but a substantial political will.

4.5 Russia

As stated earlier, IIASA has undertaken a major effort in studying the sustainability frameworks of Russia. For details we reference IIASA's Forestry web page (http://www.iiasa.ac.at/Research/FOR) and we will not repeat the details here.

We can conclude that during the transition and the policy reforms, there has been a lack of general governance but especially a lack of governance in the forest sector. There is no coordination with policies in other sectors influencing the forest sector. Russia lacks a sufficient Policy component with respect to the forest sector. A number of efforts have been made but failed due to lack of leadership in the sector. There is a forest legislation, which has been reformulated and stipulates the organization of forest

management, forest management principles, rules for forest utilization, rules for and organization of protected areas, rules for and organization of forest reproduction, and regulation of trade. But there are no links to any Policies and the law is general and, in many cases, conflicting. In addition to the Forest Code, there are about 15 other laws affecting the forest sector and they are often in contradiction with each other.

The Forest Code stipulates the establishment of "Criteria and Indicators for Sustainable Forest Management in the Russian Federation". The fulfillment of implementing the adopted criteria and indicator system rests with the Ministry of Natural Resources. Through our sampling we have not been able to detect any reporting by forest enterprises or regions on the criteria and indicators to the responsible authority.

Also, a mandatory Certification System is stipulated in the Forest Code, which should be based on normative legal documents, but this has nothing to do with the certification discussed in the international debate.

Detailed analysis of the Institutions of the forest sector illustrates that none of the required cornerstones of Institutions is in place to make sustainable development possible. The situation can be illustrated as: *"…the legal and administrative systems have not yet evolved that would support market economies, and they remain much as they were prior to the transition. The result is inadequate and chaotic legal, administrative, and commercial systems juxtaposed with increased democratization of political life. In such an environment, corruption flourishes, conflicts go unmediated, the climate for investment is poor, ecological qualities decline, and social coherence diminishes"*. In addition, the quality of forest education is declining, there is no policy relevant research, the quality of monitoring declines, etc.

Levintanous (2002) has recently supplemented the IIASA picture of the ongoing policy reforms in the Russian forest sector. He points out the lack of linking the forest sector with other sectors of the economy and lack of governance in the forest sector. The author continues: *"…at present a comprehensive forest policy and strategy including economic, legal, and institutional mechanisms for realization of sustainable forest management has not yet been elaborated in Russia"*.

4.6 Conclusions on Eastern Europe, Russia, and Central Asia

The World Bank (2002) has recently done an evaluation of the transition after the first ten years of transition in this region. The objective with the evaluation is to study the development of the overall economic policies but some of the findings also have relevance for the forest sectors.

The Bank concludes that newly created private businesses are the strongest engine for reforms and policy changes. For successful policy reforms, governments must be credible and able to constrain insiders, and increased transparency and accountability in governments is required. In a similar way, political contestability is an issue for success in policy reforms. The World Bank also concludes that there is a lack of confidence in Legal and Judicial institutions, a high insecurity of property rights, and stakeholders are

not involved in the policy reforms. Finally, it is concluded that corruption, tunneling, and anti-competitive practices mar all policy reform efforts.

Some readers may regard the review of the policy reforms in the captioned regions as depressive reading. But we think the review clearly illustrates:

- That there are limited possibilities to achieve sustainable development in a broad sense in the forest sector without implementing a holistic and analytical oriented framework for sustainable development;
- That any of the problems identified in the review could be handled if the countries had followed concepts similar to those presented in Figures 2–4; and this tells us
- That the presented concepts seem to be able to handle the policy reforms required in the real world.

5 Policy Reforms in Developing Countries

Mayers and Bass (1999) have made a major effort in analyzing policy reforms and how to get policy to work in the forest sectors of developing countries (Costa Rica, Ghana, Zimbabwe, Pakistan, India, and Papua New Guinea). The common findings are that a *policy process, institutions* bringing stakeholders together, and applications of *policy instruments* in line with the concepts discussed in Sections 2 and 3 are needed in order to get new policies or policy reforms implemented. But they underline that these are only frameworks and should not be regarded as detailed specifications due to the fact that there are "no magic bullets".

Mayers and Bass (1999) stress that the *context* of the policy process is the most important issue. The formation of the context involves national and regional actors and analysts. They also make a similar conclusion to what we have made based on the experiences of the policy reform in the former Eastern Block: that no outsider is qualified to intervene in the policy process until an understanding of the context is in place. Based on the six case studies in the developing countries, they conclude that there are a number of factors influencing the feature of the policy process:

- History and power structure;
- The forest asset base;
- The vulnerability of forests to external ecological influences;
- Economic and financial conditions;
- Social-cultural conditions;
- Strength of institutions; and
- Room for changes (governance).

Thus, the experiences from the developing world are similar to what we have discussed with respect to the Eastern Block. We read this, that the frameworks presented and discussed in Sections 2 and 3 would also function in China if they were mastered in the right way.

6 Pan-Europe

The purpose of the Ministerial Conference on the Protection of Forests in Europe (MCPFE) was to establish a forum for the protection of forests at a Pan-European level. One of the concerns of MCPFE is the development of relevant frameworks for sustainability and policies. The reason for this concern is that these frameworks are not sufficiently efficient in many European countries (including Western Europe). A number of workshops, under the umbrella of MCPFE, have taken place in order to gain experiences and consensus for future transition work on these issues. The 2001 workshop on this issue gave the following recommendations to the Fourth Ministerial Conference on the Protection of Forests in Europe to be held in 2003 (MCPFE, 2002a):

- Provide a forum to exchange experiences and to monitor progress made on sustainable development;
- Highlight issues and priorities in the forest sector, including the balance of private and public interests;
- Provide links between global, national, and regional levels;
- Recognize the cross-sectoral nature of sustainable forest management and contribute to the integration of sectoral policies;
- Reinforce political commitment to promote transparency, multi-stakeholder cooperation, and public participation;
- Promote national forest programs;
- Promote review of existing Institutions and Policy Instruments; and
- Enhance capacity building.

Later on, there was a meeting on National Forest Programs (MCPFE, 2002b), which has strong similarities with the Framework for Sustainable Development discussed in this paper. MCPFE (2002b) concludes that a national forest program *"…constitutes a participatory, holistic, intersectoral and interative process of policy planning, implementation, monitoring, and evaluation at the national and sub-national level"*. It is also concluded that a successful national forest program requires long-term high-level political commitment. MCPFE (2002b) highlight the following elements and principles of the required programs: participation, holistic and intersectoral approach, iterative process with long-term commitment, capacity building, consistency with other national policies and strategies, consistency with international initiatives, institutional and policy reforms, partnership for implementation, and criteria and indicators is a component of the program.

The above experiences, highlighted by MCPFE, for Europe on the transformation of the forest sector towards sustainable development are covered in the Framework for Sustainable Development and the Policy Cycle presented in Sections 2 and 3 of this paper.

7 Summary of Experiences of Policy Reforms

The overall experiences from analyses of different countries shows that without concepts of the type presented for a Framework for Sustainability and the Policy Cycle there are limited possibilities to achieve sustainable development of the forest sector. Countries having these concepts in place are doing well from a sustainability point of view, and countries lacking these concepts are doing badly. It can also be concluded that the problems identified in different countries could be taken care of if they would implement proposed concepts.

So what does make it work with the implementation of the needed concepts? A number of factors seem to crystallize:

- A long history of forest sector management;
- A systematic and holistic view on problem solving in the sector;
- Strong institutions;
- Strong leadership of the sector used to take initiative to changes;
- A well functioning Policy Community in the sector;
- A multi-stakeholder participatory process;
- A multi-sectoral approach; and
- The right national governance in place.

We also think that an important feature can be learned from the Russian macroeconomic policy setting. During most of the 1990s, Russia tried to follow the different policy recommendations coming from outside Russia with the result of no development at all. In the late 1990s, Russia realized that this was their problem and had to solve it themselves in their "Russian way". After that, major progress has been made in the Russian macroeconomic policy setting.

8 A Framework for Sustainable Development and the Policy Cycle of the Forest Sector in a Chinese Perspective

In the following paragraphs we will try to put the discussed frameworks into a Chinese perspective.

8.1 Some Major Policy Issues Facing the Chinese Forest Sector

In this section we will discuss some of the major policy issues that have to be handled by the Chinese Policy Community. The list of policy issues presented does not claim to be complete; it is more an illustration of the magnitude and diversity of policy issues that have to be handled by the frameworks to be implemented.

How to Secure Needed Wood Supply?

The rapid economic growth, strong population increase, environmental concerns, and insufficient timber resources is driving China into a serious wood deficit. In 2010,

although with large uncertainties, the sustainable harvest in Timber Forests is assessed to be 100–110 million m^3/year (Jaakko Pöyry, 2001; Hagler, 2000) and the demand on the same forests to be 130 million m^3. The total import of forest products, expressed in roundwood equivalents, is estimated to be 107 million m^3 (Jaakko Pöyry, 2001) to 120–160 million m^3 (Zhang *et al*., 1997). The total depletion from Forested Land (263 million ha) is currently assessed to be 360–400 million m^3/year (FAO, 1998; Shi *et al*., 2000; Jaakko Pöyry, 2001), but the sustainable supply from Forested Land is assessed to be only 310 million m^3/year.

Thus, China is facing a serious overall sustainability problem and a severe future supply problem for the industry.

How Much Forest Resources Exist in Reality?

Jaakko Pöyry (2001) reports the following on forest resources based on the latest census report in China: *"China has around 263 million ha classified as forest land of which 159 million ha is forest while the remaining 104 million ha are woodland, scrubland, newly planted or empty lands. Timber Forests, for industrial wood production, cover 99 million ha of which 24 million ha are planted and 75 million ha are natural. Of the 24 million planted Timber Forests, at least 5 million ha are planted on good sites and are likely to provide economic yields. In addition to Timber Forests, there are Fuelwood Forests, Special Forests, Protection Forests, Orchard Forests, and Bamboo Forests accounting for another 55 million ha. There are innumerable scattered and so-called four-sides trees, which could cover the equivalent of 10–20 million ha, although such figures do not exist"*. Shi *et al*. (2000) assess the standing growing stock to be 10.1 billion m^3 on forested land and 11.3 billion m^3 when scattered trees on forest land are included. FAO (2001) reports forested land of 163.5 million ha with a corresponding standing growing stock of 8.4 billion m^3. Total plantations are reported to be 45 million ha. Sayer and Sun (2001) report that the 1998 UNEP/SEPA Study assessed the forest land to be 133.7 million ha. They also point out that official forestry statistics provide very little information on the quality, condition or environmental values of the forests. The numbers illustrate the difficulties of using official statistics to assess the status of China's forest resources.

In order to set relevant policies, it is a prerequisite to have relevant statistics on the extent, quality, and environmental values of the existing forest resources.

How to Secure Needed Import?

China is the world's largest importer of tropical logs and tropical sawnwood. The import of tropical logs has increased from 1 million m^3 in 1996 to 7.3 million in 2001, and sawnwood from 0.5 million m^3 to 2.1 million m^3 during the same time period (ITTO, 2002). As an example, the Japanese import was halved during the same period. With the increased import of tropical hardwoods, China's supply problems are exported to regions with high biodiversity and areas with high rates of forest loss (Harkness, 1998), which may raise international concerns. Another major import source for China is Siberia and Far East Russia. The official import figures for 2000 are some 6 million m^3 and are expected to grow substantially in the future (Nilsson, 2002a). But there is an increased concern in Russia that more and more of this import is constituted of illegally harvested and traded wood, which will reduce future trading possibilities between Russia and China (Friends of the Earth–Japan, 2000).

Restructuring of the Industry

There are some 10,000 mechanical (lumber and panels) wood processing units with a total production capacity of 50 million m^3/year. This industry is very fragmented and dominated by medium- and small-scale operations. The average sawmill capacity is 4,000 m^3/year and the average plywood capacity is 5,000 m^3/year. The mechanical wood industry has supply problems with raw material and has a low utilization rate. The sawmilling industry will have to change operations from large log diameter to small log diameters and will be heavily dependent on log imports (currently 14 million m^3/year). The plywood industry will see a decline in the number of mills and capacities.

The paper production in 2000 was 30 million tons. There are more than 6,000 paper mills with an average capacity of 6,000 tons/year compared with a world average of 40,000 tons/year. Chinese paper production has traditionally been based on non-wood pulp (straw and bamboo). Non-wood fiber-based papermaking is highly polluting and the raw material used leads to low product quality. Some 60% of the paper production is of low and medium grade products. There is not enough pulp production in China. In 2000, China imported 32 million tons of wood pulp, 2.5 million tons of recycled paper, and 7 million tons of paper and board — and the import is expected to grow substantially in the future (Jaakko Pöyry, 2001). Yin (1998) claims that the wood manufacturing industry is badly developed with low recovery rates, poor product quality and services, and causing serious pollution problems.

Thus, a consolidation of the forest industry is needed with forward integration and a higher value-added production is required. But the Chinese forest industry is severely constrained in the restructuring by the lack of investment capital.

Without an economically sound forest industry there are strong limitations in achieving a sustainable development of the forest sector.

High Wood Costs

For the wood-based pulp industry, the pulp wood costs must be internationally competitive if the domestic pulp and paper industry is to compete with imports. To be competitive the delivered pulp wood costs to industry should be in the range of 30 US$/$m^3$, but currently the corresponding costs in many regions of China are in the range of 50 US$/$m^3$ (Jaakko Pöyry, 2001). Tang and Mao (2001) illustrate that in many cases there are negative economic returns on investments in plantations in China.

Future Land-use

China has made major efforts in different tree planting and afforestation campaigns, like the National Compulsory Tree Planting Campaign, Three Norths Shelter Wood Development Program, Soil and Water Conservation along the Yangtze River, Coastal Shelterbelt Development Program, National Program to Combat Desertification, Taihang Mountain Afforestation, Plain Farmland Development Program, State Program on Timber Plantations (supported by the World), etc. (Jinrong and Xuhe, 2001). Many of these plantation activities have probably been important from an ecological point of view, but from an industrial point of view questions can be raised. Plantation forestry will need to be very productive to be competitive and will require growth rates well in excess of present growth rates in China in order to be competitive on the international

market and to be more profitable than agriculture. To a large extent, timber plantations have so far been established on less productive land that is unsuitable for agriculture. This has resulted in low growth rates, which are unsuitable for commercial forestry supplying the industry with raw material, and the wood costs do not reflect the real costs for the growth (e.g., Jaakko Pöyry, 2001).

To be industrially competitive, the plantations must be located on good sites and must return 1,000–2,000 US$/ha/year to be competitive with agriculture. Therefore, to achieve economically sound forest plantations a land-use conflict with agricultural production is foreseen.

Another dimension of the plantations is the issue of decreased biodiversity, which will be discussed later.

The World Bank (2001) points out that China has widespread and increasing land degradation, the worst water erosion problems in the world, the highest ratio of actual to potential desertified land in the world, rapidly degrading grasslands, and the best cultivated land being lost to urban, industrial, and infrastructure areas. It is estimated that the loss of cultivated land during 1987–1995 was 4.8 million ha (World Bank, 2001).

Socioeconomic Role of the Forest Sector

The output value of forestry in China is claimed to currently account for 2–8% of GDP (Shi *et al*., 2000; Jinrong and Xuhe, 2001). The export value of forest products is in the range of 1.2 billion US$ (Jinrong and Xuhe, 2001). About 2.5 million people are employed in state-owned forestry institutions (Shi *et al*., 2000), 2.5 million in the forest industry (Jinrong and Xuhe, 2001), and some 60 million people are involved in village forestry activities (Jinrong and Xuhe, 2001).

Forestry is very important for economic development and poverty reduction in rural areas. Jinrong and Xuhe (2001) claim: *"Mountainous areas occupy about 69% of the total land area and has half of the population and most of them are poor people. Among the total of 592 poor countries, 496 are located in mountainous areas. The development of the forest industry, through production of timber and forest products can increase farmer's income and finance revenue, support the mountainous economy and poverty alleviation. In many important forestry regions, the forestry revenue coming from forest fruits, mushrooms, flowers, medicine, forestry food and forestry tourism has greatly increased the gross economic revenue"*. This sounds as a challenge but to happen in reality, as illustrated earlier, a substantial restructuring of the forest industry is needed and improved productivity in forestry is required with substantial capital investments in regions desperately looking for needed investment capital.

These conditions will require considerable policy efforts.

Future Energy Supply

In recent years, the consumption of oil has grown by 5.77% per year in China and the domestic oil supply has only increased by 1.67% annually. In addition, the dependence on foreign imported oil has increased dramatically and domestic oil reserves are often geographically and politically difficult to exploit. The predicted demand for 2010 is 2.25 billion barrels of oil per year to meet the demands of expanding industry and

markets and half of this has to be imported. China has to look into alternative fuel sources in the future in order to minimize overseas dependence (STRATFOR, 2002).

The official estimate on fuelwood consumption is about 85 million m^3/year (Shi *et al*., 2000), which is probably an underestimate of the real consumption. An increased biomass production may play a role in the Chinese energy balance and reduce the dependence of imported oil to some extent.

Future Water Supply

In western and northern China, the mountains and the plateaus are the major source of rivers flowing into the world's most populated regions. Sayer and Sun (2001) claim: *"…the water supply for almost half of the world's population living in China itself, Indochina and SE Asia, and the Indian subcontinent originates in China"*. In parallel the economic growth, industrialization, irrigation, urbanization, and more chemicals in agriculture have caused increased stress on the quantity and quality of the water in China, and droughts, floods, befouled flows, and water shortage in different regions is a common picture. The forest ecosystems have a major role to play in regulating the hydrological complex and especially the runoff. The World Bank (2001) points out that the water availability and quality is a critical problem in China and it is assumed to worsen in the future.

A major water quality problem in China is the sedimentation. Liu Changming and Cheng Tianwen (1996) identify that the problems with Chinese water are threefold: shortage, wastage, and quality, and by solving the two latter problems can substantially help to solve the first problem.

Kong Fanwen *et al*. (1996) assess that the annual value of water and soil conservation, and air purification of China's forested uplands is two to ten times the gross output value of wood and wood processing. They also claim that the value of the water storage role of China's forests is 7.5 trillion yuan, which is about three times more than the wood value of all forests. Sayer and Sun (2001) stress the importance of the seriousness of the water problem.

Nickum (1998) argues that the water crisis in China is economic and institutional rather than a vanishing resource. The World Bank (2001) states that administrative and legal reforms have to be made in order to solve the water problem in China.

How to Secure Biodiversity?

Harkness (1998) argues that China is one of the world's major centers of biodiversity and states that the variety of wild plants and animals is greater than that of North America and Europe and equal to one-eighth of all species on earth (Raun, 1995).

Harkness (1998) claims that forests are the most important ecosystem in China with a remarkable variety of different forest types hosting over 2,800 tree species.

Degradation of the forests and threat to the biodiversity has been common since early imperial times (Menzies, 1994), and the threat has increased seriously in modern times by increased logging, hunting, and conversion of forests to agricultural land and grasslands.

China has established 1,118 nature reserves (1999) of a total area of 86.4 million ha (Sayer and Sun, 2001). Additional steps have been taken for promoting forest

conservation through the Natural Forest Protection Program, which has the goal to protect an additional 61 million ha of forests in the upper sections of the Yangtze and Yellow rivers and 33 million ha of forest in northern China and inner Mongolia (CCICED, 2000). Another step is the governmental program to convert farmland on steep slopes to forest or grass. The goal is to have 5 million ha afforested of this land category by 2010.

Sayer and Sun (2001) point out that *"…the area of forest in China is increasing annually but it is clear that as far as biodiversity is concerned, the replacement of native forests with artificial forests fail to offer the complex habitats required to conserve many important species. New forests are almost always monocultures, often of exotic species and generally of conifers. Fires and pest attacks of these plantations has been a constant problem"*.

Mackinnon *et al*. (1996) identify serious gaps in the protected area system. Sayer and Sun (2001) claim that no adequate funding is provided for the maintenance of existing reserves and illegal activities can be found in almost all protected areas.

The same authors claim that forest harvests, forest fires, and conversion to agricultural lands have fragmented the native forests and made it impossible to maintain important species.

Sayer and Sun (2001) raise the question whether protection in the future should be concentrated on quality rather than on quantity.

How to Mitigate Soil Erosion?

Forest degradation has contributed to serious soil erosion problems in China. Heilig (1999) assesses that the soil erosion (light-extreme) by water and wind affects some 340 million ha in China causing flooding and sandstorms with associated health problems for a large extent of the population. The World Bank (2001) reports that the areas affected by water erosion in 1996 were some 175 million ha. According to statements by the government, 356 million ha of China's land area have erosion damages caused by water, wind, freezing and melting, and the annual soil losses are 5 billion tons (China Daily, 2002). The same source claims that 100 million ha of grasslands are degraded. The economic impacts of the flooding, the storms, and the connected health problems are huge (Zhang Shouyong, 2000).

The program discussed above with the goal of converting 5 million ha of farmland on steep slopes to forests by 2010 is hoped to help mitigate the floods and sandstorms. But this will reduce the existing agricultural land to the same extent, which will require increased yield on the remaining agricultural land. Without this or other new income possibilities for the people affected by the conversion, the planned program will cause decreased income in already poor regions and may cause social unrest (Linther, 2002).

The above examples are illustrations of some of the major policy problems the Chinese forest sector is facing. The list could be made longer but with this illustration we would like to underline that the major Chinese forest sector policy issues are *multi-sector issues* and cannot be handled in a *narrow sectoral context* but in a much broader context in order to reach sustainable development.

8.2 Some Observations on the Establishment of Frameworks for Sustainable Development of the Chinese Forest Sector

In the following paragraphs we will make some comments on the establishment of a Sustainable Development Framework and the Policy Cycle for the forest sector of China. In the discussion we will follow the structure presented in Figures 2 to 4. The discussion will not be complete but will highlight some of the issues.

Governance

The illustration of some of the major policy issues of the Chinese forest sector in Section 7.1 makes it clear that these are not only forest sector issues but also multi-sector issues. This requires governance by the government, which allows dealing with the issues as multi-sector problems and using a multi-stakeholder approach. The governance by the forest sector must release itself from narrow-oriented sectoral approaches and strive for multi-stakeholder and multi-sectoral approaches. It is far from clear whether the governance needed is in place in China in these respects.

Integration With Policies in Other Sectors

From the discussion above, it is obvious that developed policies for the forest sector must be integrated with relevant policies in the areas of macroeconomic and social development, investments, industrial development, agriculture/land-use, rural/regional development, employment, trade, energy, environment, transportation, etc. Ma and Ortolano (2000) conclude that the current administrative framework is able to facilitate nationwide coordination within one sector but is not well equipped at all to handle coordination between sectors.

Policies for the Forest Sector

As stated earlier, the Policies for the Forest Sector, should include *Overall Societal Goals for the Sector, Overall Forest Industrial Policy*, *Detailed Goals for Sustainable Forestry*, and *Detailed Regional Goals for Sustainable Forestry*. We have not been able to detect in the literature any Overall Societal Goals for the Sector or any consistent Overall Forest Industrial Policy.

With respect to the Overall Forest Policy, it can be concluded that the forestry administration adopted a new forestry strategy in 1999 with the objective *"…to establish complete forest ecosystems and an advanced industrial forestry system"* (Jinrong and Xuhe, 2001; Zhou Shengxian, 2001).

Zhang *et al*. (2000) define the purposes of the new forest policy: (1) to restore natural forests in ecologically sensitive areas, (2) to plant forests for soil and water protection, (3) to increase timber production in forest plantations, (4) to protect existing natural forests from excessive logging, and (5) to maintain the multiple-use policy in natural forests.

Sen Wang and van Kooten (2001) claim that the new forestry paradigm of China is to safeguard ecological systems rather than to use the resource base for industrial timber supply. They illustrate their view of the new forestry paradigm according to Figure 6.

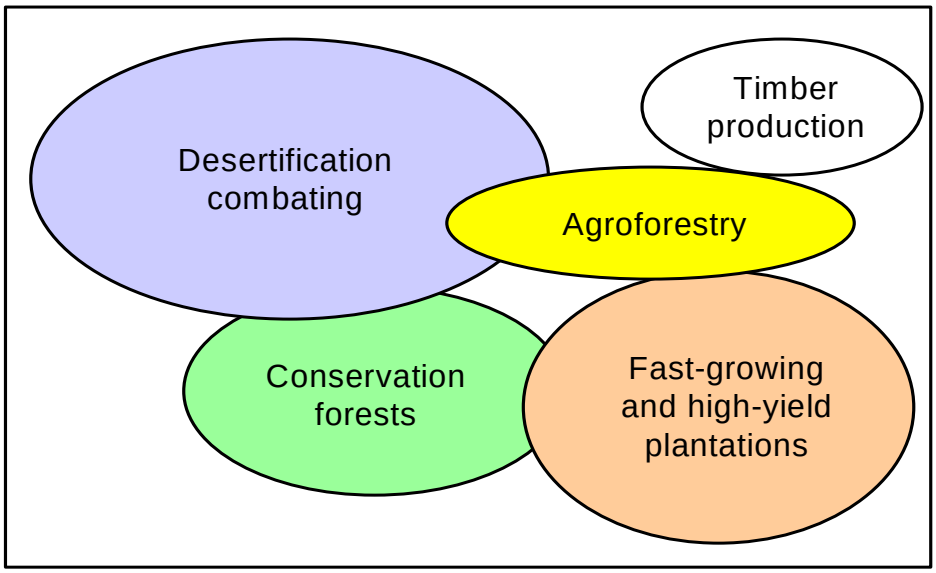

Figure 6: China's New Forestry Paradigm. After Sen Wang and van Kooten (2001).

Sen Wang and Wilson (2001) stress that the new overall forest policy centers on the overriding objective of raising the country's forest cover to 26% by 2050.

We assess that the Overall Forest Policy, in its format, is in line with what is required. But whether the policy is satisfactory from the point of view of dealing with the major policy issues discussed in Section 7.1 is more questionable.

With respect to *Detailed National and Regional Goals for Sustainable Forestry*, we have not been able to detect similar goals for China as illustrated in Appendix 1.

Policy Instruments

In order to implement the Overall Forest Policy the administration is applying a number of public policy instruments. Zhang *et al*. (2000) list the following:

- *Technical training and education*. Training is carried out with provincial leaders, provincial and forest bureau officials, and local forestry cadres.
- *Land management planning*. Forest lands are divided into nature resources and commercial forests based on location and characteristics.
- *Mandatory conversion of marginal farm lands to forest lands*. Farmers losing their farmlands are offered free food and financial support for the conversion of the land.
- *Resettlement and retraining of forest dwellers*. Over a million forest workers have been laid-off in areas with logging bans. These people are offered re-education for other employment.
- *Share in private ownership*. Local people have the right to manage forest land.

- *Expanded research*. Research has been expanded on three demonstration sites for conversion of marginal farmland, retraining of forest dwellers, and selective cutting and small clear cuts in natural forests.

In addition or as part of the above, it can be pointed out that ten major ecological forestry programs were established in the 1990s covering China's most fragile areas with respect to soil erosion and salinization. A new forestry protection program has been introduced to stop the logging of natural forests along the Yangtze and Yellow Rivers and to substantially reduce the harvest in state-owned natural forests in NE and SW of China and in inner Mongolia (Jinrong and Xuhe, 2001). "The China Agenda in the 21st Century: Plans of Forestry Action" and the connected Tenth Five-Year Plan covering the period 2001–2005 emphasize an industrial forestry plantation program in the 13 southern provinces with a planted area of 4.3 million ha. Another program encompasses the government initiative to promote economic development in the interior provinces and forestry is assumed to be an instrument in this process.

Restructuring of the Forestry Economic System has been done in order to establish a more efficient forest administration and market-oriented management system. This includes a market-oriented distribution of timber to the industry instead of the old state planned distribution.

It should be pointed out that the above is far from a complete description of the Policy Instruments or Programs that the Chinese administration has implemented in the form of programs for the forest sector.

However, there are concerns about the above policy instruments. The restructuring of the forestry economic system with a market-oriented distribution of timber to the industry does not function satisfactorily.

Dachang and Edmunds (2001) claim that monopolized purchase of timber by state industry companies from farmers is a barrier to forest development. Yin and Xu (2001) conclude that the private owners do not have the right to access the market freely. The forest plantations have a slow growth rate and productivity could be strongly improved by intensified silviculture and forest management. The production increase by intensified management is substantially less costly than the production costs from new plantations (Jaakko Pöyry, 2001), and consequently it can be questioned whether the planned large scale plantations is the right policy instrument.

One of the most important policy instruments is law and legislation. The Forest Law and the Law of Wild Life Conservation form the basic framework for the forestry legislation in China, which emphasizes the ecological functions, clarifies the state economic policy for forestry development, and intensifies the legal measures to protect forest resources and property rights (Jinrong and Xuhe, 2001).

Ma and Ortolano (2000) point out that the vagueness of the legislation contributes to "legal flexibility" and that local counter measures to national legislation opens up for negotiations. Cheng and Rosett (1991) claim that the actual text of laws is just one of several factors considered in the enforcement of legislation. In reality, *people's feelings and affections*, *propriety or reason*, and the *law* are taken into account in the enforcement. Ma and Ortolano (2000) conclude that there is a wide gap between what agencies are authorized to do and what they actually do in enforcing the legislation. Tanner (1994) demonstrates that the law-making process is a multi-arena process (the

major players are the CCP central apparatus, the State Council, the State Planning Commission, and the National People's Congress) and that the law-making process and power relationships among these players are not clearly defined and the resulting laws are too ambiguous. He also claims that too many governmental agencies influence the implementation of the legislation.

Taxes, licensing, and quotas are usual policy instruments in the forest sector worldwide and also in China. Jinrong and Xuhe (2001) underline that high taxes and unfavorable policies in China restrict forestry development. Dachang and Edmunds (2001) conclude that the taxes are too high in forestry to attract private forest development. The same authors claim that wood harvesting is regulated by the government by using harvest quotas and harvest, transport, and processing permits with negative impacts on development possibilities. Jaakko Pöyry (2001) concludes that the tax system in the pulp and paper industry is complex and the taxes are too high, as well as the high import and anti-dumping duties on paper products, which limit the restructuring possibilities of the industry.

The above examples on implemented policy instruments illustrate that there is a lack of analyses on the impacts of the chosen instruments and it is not clear whether they support or are counterproductive to the overall forest policies discussed in Section 7.1. There is also a serious problem with the implementation of the chosen instruments in operation.

Institutions

Ma and Ortolano (2000) illustrate the Institutions for natural resources and the environment in China: Institutions — setting policies and programs; Formal rules — laws and regulations; Informal rules — customs and unwritten codes of behavior; and Enforcement — monitoring, compliance, and penalizing when failing to comply.

1. *Organizations*

   The central government agency for forestry is the State Forest Administration (SFA), which is responsible for laws and regulations, resource issues, environment, non-wood products, bamboo, logs, and the solid wood and panel industries. Each province has its own Forestry Department with the same responsibilities at the provincial level as the SFA has at the federal level. The SFA has not much interest in the pulp and paper industry, which is under the auspice of the Ministry of Light Industry. The split in responsibilities is a hindrance for a holistic forest sector development (Jaakko Pöyry, 2001).

   Four agencies (with many departments) are involved in the development of the pulp and paper industry: the State Department of Light Industry (SALI), the State Development Planning Commission (SDPC), the State Economic and Trade Commission (SETC), and the China Paper Association (CPA). SALI is responsible for developing strategies and proposing policies as well as industry regulations. SDPC is responsible for proposing strategies for national economic and social developments and preparing development plans. SETC is responsible for monitoring the national economy, making recommendations to the State Council and initiating industrial restructuring. CPA acts as a bridge between the government and companies. With these many stakeholders involved there are difficulties in creating efficient policies for the pulp and paper industry.

Jinrong and Xuhe (2001) point out that the overwhelming bureaucracy and the low efficiency in the administration has caused excessive exploitation and inefficient utilization of forest resources. Zhang (2000) and Zhang (2001) conclude that the main problems with governmental investments in forestry are: *"(1) high administrative costs in multi-layer governments and misuse of forestry funding, leaving less money to the on-the-ground forestry activities, and (2) high monitoring costs and shirking behavior"*. The State logging industry, dominated by 135 state forest bureaus, have aging fixed capital and 85 bureaus are highly debt ridden (Harkness, 1998; Yucai, 1996). Perotti *et al*. (1999) conclude that managers of State-Owned Enterprises (SOE) have conflicting roles by simultaneously being a government bureaucrat, chief of a SOE community, and an entrepreneur. Jinrong and Xuhe (2001) underline that the state-owned economy has a dominant position in the forest sector and that there are limited incentives here for developing the sector due to lack of investment funds. Yin and Xu (2001) stress that the efficiency in governmental forest investments has been far from satisfactory. China has moved slowly on trade reform and the government is heavily involved in trade through its state trading and licensing system. It looks like the State trader, COFCO, will still have a heavy hand over international trade even after China joins WTO. The impact on the Chinese forest sector by becoming a member of WTO is uncertain but is assumed to contribute to the restructuring of the sector (Sun, 2000).

2. *Property Rights*

The forest tenure is organized into: State Forest Farms, Collective Forests or Village Forest Farms, Shareholding Cooperative Forest Farms, Individual or Group Household Forests, Community Joint Venture Forests, Private Lease Forests, and Corporate Forests.

The government has empowered individual households to make more forest management decisions in non-state forests (Dachang, 2001). Dachang and Edmunds (2001) have analyzed the impact of this devolution. They conclude that there is serious tenure insecurity making farmers reluctant to plantation development and frequent policy changes make farmers hesitant to forestry development. Yin and Xu (2001) conclude that there is a lack of change in the tenure system that would be required for productivity growth in rural forestry. Albers *et al*. (1998) make it clear that a tenure reform must be supplemented by substantial government investment capital in order to obtain rural forest development, which has not been the case so far.

Grinspoon (2001) claims that neither the private nor the common property systems cause the conflict in the forest sector, but rather the unclear property rights that lie between the two systems. Yin and Xu (2001) stress that farmers have to sell their wood to government agencies at lower prices than on the open market and, in addition, there are heavy taxes and fees involved in the transactions. Jinlong and Wenfa (2001) support these latter conclusions.

3. *Informal Rules*

In the policy process there are a number of Chinese features or cultural aspects to take into account. Confucian tradition in the administration is still important in China. People behave consistent with their roles ("father and son behavior") and

there is a deep respect for authorities (Ma and Ortolano, 2000). *Guanxi* is another Chinese feature, which is defined as a crude form of favoritism — *"…create feelings of responsibilities and obligations on the one hand and indebtedness on the other"* (Ju, 1996; Pye, 1981). "Face" is another feature and is complex but plays an important role in defining an individual's standing in a group or society. Ma and Ortolano (2000) define "face" as a social currency. "Loss of face" and "enhancing face" can be productive or counterproductive in the policy process (Redding, 1996). There are also links between "Face" and "Guanxi".

As stated before, these features can enhance the policy process but they can also have the opposite effect and we think these features are very important to take into account in the policy process. This is also clearly illustrating the fact that the establishment of a framework for sustainable development of the forest sector in China must be done by insiders in the sector and not by outside experts.

4. *Participatory Process*

There is a tradition in China of giving people the possibility to make complaints about decisions to government authorities. This tradition goes back more than 2000 years ("offices of letters and visits", Shi, 1997). In addition, many agencies have "complaint divisions" and the Local People's Congress is another avenue for complaints. But the complaints can only be made after the negative effects of policies or decisions have become visible (Ma and Ortolano, 2000). NGOs and the media have to register with the government and do not have the same freedom as in western countries; they also have difficulties in accessing data. Thus, there is a platform established but has to be further developed for a fully-fletched participatory policy process.

It can be concluded that Institutions are a central problem in the Chinese forest sector. Wang (2002) concludes that institutional arrangements between central and regional governments are far from optimal, there are no constitutional constraints binding the center to follow the rules they make, and the extra budgetary funds are big loopholes draining the State revenue. Horowitz and Marsh (2002) conclude that both top-down and bottom-up institutional environments play important roles for the regional economic development opportunities. Yin and Xu (2001) find that there is a lack of institutional innovation in the sector. Dachang and Edmunds (2001) state that institutional reforms are important for private forest development. Zhang *et al*. (2001) claim that the biggest challenge for China's forestry is the weak demand side and inefficient institutions making forest management costly, and state that the priority in the future policy development should be on institutions. Shi and Xu (2000) state that without reforms in current institutions and increased government investments the old system will be reproduced in the reforms, and this old system has proved to be the reason for China's forest degradation.

We conclude that Institutions is a central area for development in the Chinese forest sector in order to be able to establish an efficient framework for sustainable development.

Criteria and Indicators

China participates in three major international processes on Criteria and Indicators for Sustainable Forest Management. These processes are: "Regional Initiative for the Development and Implementation of National Level Criteria and Indicators for the Sustainable Management of Dry Forests in Asia" (8 national level criteria and 49 indicators for dry forests in Asia); "The Montreal Process dealing with Criteria and Indicators for Sustainable Forest Management in Temporate and Boreal Forests in Countries Outside Europe" (7 non-legally binding criteria and 67 indicators); and "The ITTO Process dealing with Criteria and Indicators at National and Forest Management Units in Tropical Humid Forests (7 criteria and 66 indicators) (FAO, 2000).

We have not been able to find that much of these international negotiations have been implemented in practice in China. Therefore, there is a need for practical implementation of these international agreements. These implementations should be based on the principle of China-specific criteria and indicators contributing to the achievement of the overall policies for the forest sector in China.

Certification

Certification is in its infancy in China and is facing administrative and practical problems. Wenming (2001) suggests that China should develop its own national forest certification scheme based on the local conditions but following FSC guidelines. This is in line with our view on certification in a holistic sustainability framework.

Bourke (2001) concludes that important markets in Asia — such as China — show limited interest in certification. If China has the ambition of being a sustainable player on the international markets for forest products (which seems to be the case based on expressed policies), there is a need to rapidly move into operational certification.

Monitoring Systems and Compliance

Ma and Ortolano (2000) identify a significant gap between the goals included in the laws and regulations dealing with China's national resources and environmental and the actual quality. The missing component is *compliance*. Rozelle *et al*. (2001) identify ineffectiveness in the current forest monitoring system and harvesting statistics. Jaakko Pöyry (2001) states that China has not yet developed a comprehensive statistical system with respect to the production and consumption of forest products, which makes analysis difficult.

Mooney (2002) identifies a serious problem with Chinese monitoring and statistics and claims that statistics are distorted by political diktat, conflicting definitions, murky indexes, and non-consistent methodologies. He argues that the National Statistics Bureau does not have the means to produce the right statistics and the difficulties stem from the problem with data collection through a reporting system instead of using sample surveys. Mooney (2002), Studwell (2002), and Chang (2001) illustrate serious statistical overestimates of economic growth, industrial output, underestimates of unemployment, debts, non-performing loans, etc.

There will be serious problems in implementing relevant policies for the forest sector if the real serious problems in the sector are masked by non-adequate monitoring and reporting, and statistical Pandora boxes.

To verify compliance of operations with the set policies, there is a need to have consistent and transparent monitoring and statistical systems for the forest sector in China. It is a major challenge for the country to get these systems in place. These systems also serve as input to the succeeding activity of the policy cycle, *Informational and Analytical Systems for Policy Analysis and Impact Assessments.*

Informational and Analytical Systems for Policy Analysis and Impact Assessments

The Chinese forest sector is suffering from the void of an analytical framework to assess government policies and their impact, and with this the Chinese government suffers from the void of a knowledge basis to devise its policies and setting priorities. This lack has led to misunderstandings about the forest sector and makes it difficult for policy makers and development agencies to reach sound judgments on reform strategies (Anonymous, 2001).

It seems to be important to establish a Policy Community in the form of a multi-stakeholder Task Force for holistic policy analysis supplemented with solid analytical and informational systems for policy analysis of and impacts on the Chinese forest sector.

Policy Relevant Research Priorities

The government has adopted the principle that the economic development must rely on science and technology and has presented a guiding ideology to promote forestry development by research and development (Jinrong and Xuhe, 2001). Perez *et al*. (2001) stress the need for strong links between research and extension services and point out that there are currently major informational and analytical gaps with respect to policy implementations. Jiang Zemin (Science, 2000) states that future interdisciplinary research may strongly influence China's future well being. Interdisciplinary and policy-oriented research is a must in order to support a relevant framework for sustainable development of the forest sector in China.

Currently, it does not look like the important policy issues have a major influence on the setting of the science agenda of the Chinese forest sector. In order to create a solid sustainability framework for the sector it is a must that the science agendas can support this work with consistent and transparent knowledge.

Adaptation of Policies and Sustainability Framework

As stated earlier, the development of proposed Policies and the Sustainability Framework are adaptive processes taking into account different changing conditions for the operation of the forest sector. This requires informational and analytical systems for quantitative and qualitative analysis. As pointed out above, these systems are missing in the Chinese forest sector. Therefore, there are no possibilities for a systematic adaptation of policies. Of course, in reality adaptation takes place in the Chinese forest sector policy process due to changed conditions today, but this adaptation has an ad hoc feature.

Evaluation of Policy and Sustainability Frameworks

We have not been able to detect any systematic qualitative and quantitative evaluations of the existing policies of the Chinese forest sector in line with, for example, the

Swedish evaluation presented earlier (SNFB, 2001). Evaluation statements have been made but they are based more on political judgments than hard facts.

The government assess that the reforms so far have been a great success with the establishment of ecological forests, increased plantations, increased output from the forest industry, establishment of an improved forest legal system, and improved forest science and education. But they conclude that the forestry reform has advanced slowly compared with the agricultural reform (Jinrong and Xuhe, 2001).

There are a number of scientific studies trying to assess the efficiency of current policies. Dachang and Edmunds (2001) conclude that there are not yet reliable policy environments for changing the incentive rights for rural forestry and state that *"…the government should invest in establishing the preconditions for a successful policy change before implementing reforms"*. Yin and Xu (2001) stress that the Chinese forest sector policy makers have not managed to handle the issues of market access and taxes. Sen Wang and Wilson (2001) conclude that during the past two decades no coherent national forest policy model has emerged, and the existing model is more a result of the dynamics of program competition and a compromise of clashing interests.

Rozelle *et al*. (2001) have probably made the most extensive evaluation effort and state that there is a great disagreement on the achievements of China's reform measures in the forestry sector, but claim that science can find little evidence on neither success nor complete failure of implemented reforms. They conclude that analysis of the existing policies raise more questions than answers. The authors stress that there are significant positive changes in forestry taking place in China, but they cannot conclude that this is a result of implementing new national forest policies or is just an effect of economic growth, falling fertility, immigration, etc. Rozelle *et al*. (2001) recommends that the Chinese policy makers continue to do what they are doing on the policy reforms but should do more.

Zhang *et al*. (2001) question whether the policy on massive plantation programs is the right one and that instead the investments should go to institution building that would promote definition, transfer, and protection of property rights.

Thus, based on existing evaluation efforts of policies and reforms of the Chinese forest sector there are difficulties to judge whether the taken measures have improved or worsened the conditions, or whether or not the measures have contributed to the set overall objectives for the Chinese forest sector. It seems reasonable to conclude that there is a need for the establishment of independent and transparent evaluations of the current policies and reforms in the Chinese forest sector.

9 Conclusions and Options for Further Development

We have in this paper, based on our experiences from policy work in transition and other countries, tried to present a conceptual approach for the development of a sustainable development framework and a Policy Cycle for the forest sector. It should, from the beginning, be pointed out that there is no magic bullet with respect to the development of these concepts. The conditions vary a lot from country to country but we are convinced that some variant of the concepts presented is necessary in order to achieve sustainable development in a broad sense of the forest sector in China.

We have taken the concepts developed and tried to put these into a Chinese forest sector perspective by using a substantial amount of governmental, international, and scientific reports on the Chinese forest sector. In the following paragraphs we will make a brief summary of the Chinese perspective of the different components of the concepts proposed.

Governance

It is not clear from the review whether governance at the national and sector levels are in place in China for a holistic approach on the development of a sustainability framework and a Policy Cycle for the Chinese forest sector.

Multi-sector Approach

Based on our identification of some of the major policy issues of the Chinese forest sector, it can be concluded that the Policy Setting requires a multi-sector approach. The review identifies that China is equipped to coordinate nationwide sector policies but not cross-sectoral policies.

Policies

The Policies should include overall societal goals for the sector, overall forest industrial policies, overall forest policies, and detailed national and regional goals for sustainable forest management.

We have not been able to identify clearly stated societal goals for the forest sector and overall forest industrial policies. From a format point of view, the overall forest policies are judged to be satisfactory but it is not clear whether the content of these policies are tackling the real major policy issues satisfactorily.

We have not been able to detect detailed national and regional goals for sustainable forest management.

Policy Instruments

The government has implemented a number of policy instruments in order to reach the goals of the overall forest policies. From the review, it is not clear whether the implemented policy instruments contribute to achieving these goals, and there is a lack of analyses on the efficiency of the chosen policy instruments. There are also difficulties with the implementation of the chosen instruments. The legislation has shown reduced enforcement and the tax and permit systems hinder development of the forest sector.

Institutions

Major difficulties are identified in different components of Institutions. Organizations have low efficiency and conflicts of interests. The current system of property rights and tenure constitute a hindrance for the development of the sector. The informal rules in the sector are complex and only make it possible for people in the sector to develop an efficient framework for sustainable development. The participatory approach for the policy development requires further development within the Chinese forest sector.

Criteria and Indicators

China participates in a number of international processes on criteria and indicators for sustainable forest management. We have not been able to detect that much of this work has been implemented in practice.

Certification

Certification is in its infancy in China and not much has been implemented in operations.

Monitoring, Statistical Systems and Compliance

There are major problems with the monitoring and statistical systems in China. In some cases, there are no possibilities to verify compliance with policies due to the lack of consistent and transparent data.

Informational and Analytical Systems for Policy Analysis

The Chinese forest sector is lacking informational and analytical frameworks for solid and holistic policy analysis and for the assessment of policy impacts.

Policy Relevant Research

There seems to be a lack of a research agenda in the forest sector in China, which would support the policy development for the sector.

Adaptation of Policies

The development of Policies is an adaptive process and the Chinese forest sector is missing a systematic adaptation process for changing conditions.

Evaluation of Policy and Sustainability Frameworks

We have not been able to detect any systematic and quantitative evaluation of the policies implemented. Therefore, there are difficulties to judge whether the implemented policies have contributed to the overall objectives of the Chinese forest sector.

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After the review, based on international comparisons, the overall impression is that the existing framework for sustainable development and the Policy Cycle of the Chinese forest sector are not harmonized and are not coherent enough to fulfill the social, environmental, and economic goals of the Chinese forest sector.

An option for further development of the existing frameworks could be that the Chinese administration establish holistic, coherent, harmonized, and transparent frameworks for policies and sustainable development of the forest sector in line with what is presented in this paper. The development may include the establishment of a Policy Community in the form of a multi-stakeholder Task Force operating with a participatory process and

a multi-sector approach. The Policy Community should be constituted of insiders with deep insights in the Chinese forest sector.

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Appendix 1: Illustrations of Policies

Overall Societal Goals for the Forest Sector (Sweden)

The sector shall contribute to:

- Economic growth,
- Full employment,
- Regional balance,
- High quality nature and environment, and
- Remain an important export sector.

Overall Forest Policy Goals (Sweden)

Environmental Goal	*Production Goal*
• The natural production capacity of forest land shall be maintained. • The biological diversity and genetic variation of the forest shall be secured. • Species naturally belonging to forests shall have habitats for survival under natural conditions in vigorous populations. • Threatened species and nature types shall be protected. • The cultural aesthetic and social values of the forests shall be safeguarded.	• The forest and forest land shall be utilized efficiently and very responsibly for a favorable yield. • The management of forest production shall create degrees of freedom with respect to utilizing the yield.

Overall Forest Policy Goals (Finland)

Forestry shall:

- Support a sustainable development of the country,
- Support the growth potential of the forest industry,
- Be profitable and have a high rate of employment,
- Secure the ecological sustainability,
- Manage the forests well,
- Offer recreation and non-wood products,
- Create improved forest knowledge, and
- Actively take part in the international forest policy formulation.

Overall Forest Policy Goals (Denmark)

Forestry shall:

- Promote biological diversity,
- Promote recreation,
- Promote the utilization of wood,
- Promote environmental concerns,
- Promote cultural concerns,
- Promote the landscape, and
- Promote more forest cover and nature.

Overall Forest Policy Goals (Canada) [consists of nine Strategic Directions]

- Multiple values of forest ecosystems should be promoted,
- Forest management should practice stewardship,
- Public participation should be promoted in forest management,
- Forestry should make it possible for the forest industry to be a global competitor,
- Integration of Forest Science and Management,
- Forestry should promote development of communities,
- The rights of aboriginal people should be secured,
- Private wood lots should promote a growing opportunity, and
- Canadian forestry should be on the global stage.

Detailed Sector Goals for Sustainable Forestry (Sweden)

- Forests are a renewable resource. The forests should be managed so that they sustainably produce multiple values.
- In the management of the forests the possibilities for multiple use should be secured.
- Forest management shall be practiced in a manner that reindeer pasture is not hindered from access to forest land.
- Forest management shall be practiced in the whole country.
- Wood production should be dominated by coniferous species, but with a higher extent (volume) of deciduous species in the future.
- Forest management should result in wood production that makes a higher sustainable harvest level possible in the future compared with the current harvest level (to be quantified).
- The area of valuable and other deciduous species, as well as volumes, should be larger compared to the current situation.
- Forest management measures should be adjusted to site conditions and the natural and cultural values of a specific forest.
- The reforestation should have a density, quality, and species distribution that sequester the potential productivity of the forest soil and generate the conditions for high quality production. Seeds and seedlings of suitable origin. Natural as well as genetically improved material to be used.
- The young forests should have a species distribution, density, and quality that they efficiently utilize the soil productivity and generate a solid economic growth.
- Pre-commercial and commercial thinnings should be carried out at the right time, in the right manner, and to a satisfactory extent.
- Forests in thinning ages should, for the soil conditions, have suitable species distribution and density.
- Damage to growing forests by insects, game, and fungi should be limited.
- Forest management measures should be carried out in such a manner that negative impacts on the hydrology of the forest soils are minimized.
- The forest road network should be designed so that forest transports can be carried out efficiently but at the same time, has limited negative impacts on the environments of nature and culture.
- The wood value should be taken care of and wood losses minimized.
- The utilization of the forests should be managed so that the natural production capacity is maintained, leakage of nutrients should be limited, and harvest of biomass should not harm environmental values.
- General nature and culture considerations should be made to a satisfactory extent.
- The forests should be managed from a forestry, historical, cultural, and ecological perspective. The ecological capacity of the forest ecosystems should be maintained or improved.
- Forest management in sensitive nature environments shall be carried out so that environmental values are maintained or improved.
- The extent of the forest land set aside as undisturbed protected areas for environmental reasons or are managed to protect and improve environmental values should be larger than today.
- Valuable cultural environments should be maintained and made visible.
- Forestry should contribute to human needs of high quality of the adjoining environment, recreation, and rich inspirations in forests and nature. The aesthetic values should be maintained.

Detailed Regional Goals for Sustainable Forestry

The detailed regional goals for sustainable forestry are similar to the sector goals for sustainable forestry but adjusted to the regional conditions.