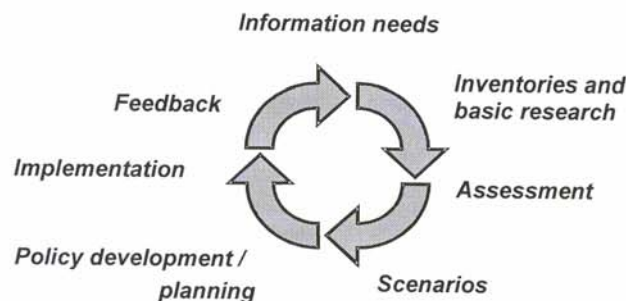


## SYMPOSIUM CONCLUSIONS

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The overall goal of the envisioned research cooperation between Chinese and German research institutions is to improve the knowledge base on the sustainable harvest and utilization of NTFPs for the benefit of the rural poor. We argue that the potential of the NTFP resources for this purpose is not yet fully realized and the respective strategies and policies not yet effectively implemented, or, that appropriate policies are lacking.

Truly trans- and interdisciplinary research is required. The large variety of NTFPs and their different characteristics and uses opens up a wide field of research covering various disciplines from natural to social sciences. Figure 1 illustrates the process of policy formulation, starting with the assessment of existing data and the formulation of information needs; the provision of information and knowledge is an important research issue. The figure also shows the various disciplines involved.



**Figure 1.** Illustration of the process of policy formulation for the sustainable management of the natural renewable resource “forest” (FAO 2000<sup>1</sup>) – which is directly applicable to the management of NTFPs. In each of the depicted steps, research questions from different disciplines arise.

The overall goal of the Sino-German research cooperation, as stated above, can only be attained by formulating regional or national policies that guide the sustainable management of NTFPs in an overall framework focusing on the sustainable use of the natural renewable

<sup>1</sup> FAO. 2000. Global forest survey concept paper. FRA Working Paper No 28. 41p.

resource “forest”. Working towards this goal requires a long-term interdisciplinary research cooperation. During the symposium it was agreed that such a collaborative and integrated research project is the mid-term goal, and that the grounds for such an undertaking must be laid step by step in a preparation phase.

Such a preparation phase would include, above all:

1. the identification of specific research topics, as well as conducting smaller collaborative research projects of two to five years duration to answer some of these, and
2. the identification of more partners from relevant research institutions in both countries.

It was agreed during the symposium that specific projects will be proposed to donors in Germany and China (for example the DFG – NSFC program of joint specific research projects) in this year. Such smaller and more focused projects will have a number of advantages, such as:

- specific results can be achieved in a relatively short period of time,
- new hypotheses can be formulated that prepare the framework of a bigger collaborative project (i.e. not only pre-formulated research questions can be addressed), and
- the responsibility for preparing project proposals is distributed among many researchers from both China and Germany, thus exercising cooperative research in an efficient manner.

About one year after the first symposium, we intend to conduct a second workshop that marks the start of the preparation of a larger collaborative Sino-German research project. Designing a proposal for such an international and interdisciplinary research project is a complex undertaking, from a technical and from an organizational point of view. While we expect the research topics and associated methodologies to be well-defined after the initial one-year preparation phase, closer cooperation and direct interaction between Chinese and German scientists is required to bring the project proposal development forward. Therefore, a number of “bi-lateral” exchange visits within the working groups (by research topic) are envisioned before and after the second workshop.

#### **TOPICS FOR SPECIFIC JOINT RESEARCH PROJECTS**

During the workshop sessions, participants suggested potential project activities, including corresponding consortia. Potential sources of funding were also discussed. It was stressed that other instruments (i.e. other than focussed joint research projects) should also be used to foster collaboration and the development of joint research ideas. Among these instruments are short or medium term exchange visits of scientists, the exchange of students for internships and theses preparation, and summer schools. Specific plans have yet to be devised for these activities. InWENT, a German organization for education and international development expressed interest in cooperation with regards to longer-term visits of Chinese scientist to Germany.

In the following, specific research topics are presented for which the Chinese and German symposium participants expressed their interest in and commitment to developing more detailed project profiles over the next few months.

Topics are listed in the order as they were proposed during the symposium workshop:

#### **TOPIC 1: DEVELOPING BIOMETRIC METHODS FOR THE INVENTORY OF MUSHROOMS**

Various mushroom species are collected in Yunnan. Some of them have a high commercial value and are even exported overseas such as the Matsutake mushroom. While traditional knowledge exists about the productivity of selected mushroom species for specific sites and under specific overall conditions, there is no technique available yet allowing the sound estimation of the existing growing stock and potential yield. This research will focus on statistical techniques on a theoretical basis, but also on the applicability of such a method and its relevance in the context of developing guidelines for the sustainable harvesting of this resource.

Among the tentative research topics are: identification of relevant species and relevant research areas in general, the establishment of a link between plant communities and mushroom abundance as a starting point for modelling, and the identification of the general spatial distribution pattern of mushrooms as a function of different site factors.

Potential partners in this research topic are: Prof. Yang Yongping (KIB, CAS), Dr. Yang Xuefei (KIB, CAS) and Prof. Kleinn (Goettingen). More scientists at the Forestry Faculty of Georg-August-Universität Göttingen are potential partners, as there is a rich expertise on fungi research.

#### **TOPIC 2: MULTI-PURPOSE TREES / MULTI-FUNCTIONAL TREES**

Many tree species are a resource for more products and functions than just timber. Bark, leaves, fruits, root parts, etc. are tree products for which specific uses are known for a great variety of species. In addition, relating to topic 1, mushrooms are linked to tree species (mycorrhiza).

Therefore, further developing forest management towards fostering and integrating multi-purpose tree species is an important research field. Specific topics include the identification of promising species and corresponding production types, the development of diversified production mechanisms in multi-species ecosystems and of optimal production types for simultaneous production of several products (e.g. fruit and timber), the development of inventory techniques for multi-purpose trees in the remaining natural stands (distribution, species composition, characteristics), the adaptation of silvi-cultural treatments in the context of close-to-nature forest management in those stands, and of harvesting techniques.

Potential partners are: Prof. Lu Yuanchang (CAF), Prof. Yang Yongping (KIB, CAS), Dr. Marco Stark (CMES, KIB/ICRAF), Prof. Dohrenbusch (Göttingen), Prof. Mussong (Eberswalde) and Prof. Phoris (Dresden).

#### **TOPIC 3: SETTING UP A NTFP INFORMATION SYSTEM**

NTFPs are a large and diverse group of products. An extremely valuable basis for all research and development work in this context would be a comprehensive information



system in which the available relevant information is stored, amended and made available to interested researchers.

Each one of the project topics presented here will produce data inputs for this information system. Even though it is not a generic research project, it is nonetheless of utmost importance and requires a systematic approach to creating a comprehensive and useful knowledge base. Funding for this activity probably needs to be sourced from other agencies than those supporting research projects.

The Kunming Institute of Botany (CAS) might be the best host of such an information system.

#### **TOPIC 4: PRODUCT LINE DEVELOPMENT**

For most of the NTFPs not much is known about the product line (commodity/supply chain), i.e. from the harvest in the forest up to the end user. Detailed knowledge about transport channels, value adding, distribution of benefits, final uses etc. will enable the resource planners to improve NTFP management and harvest and identify improved and/or alternative market channels (including organic and fair-trade certification).

Research topics include the analysis and optimisation of the product lines for selected NTFPs, the analysis of the resource management (above all the evaluation of sustainable harvesting techniques) and the analysis of the “social resources” (market and income studies, cost-benefit-analysis). Particular interest in that context has been expressed for the products bamboo, pine-resin, nuts, mushroom and medicinal plants. This topic links to Topic 5.

We still need to identify more partners in the field of socio-economic research and market studies. Potential partners from among the symposium participants include: Dr. Lou Yiping (INBAR), Prof. Phoris (Dresden), Prof. Höfle (Göttingen) and Dr. Marco Stark (CMES, KIB/ICRAF).

#### **TOPIC 5: SOCIAL SCIENCE ASPECTS OF NTFP HARVESTING**

While much research on NTFP focuses on natural science research questions of growing stock and production potential, there are also very relevant social science implications which refer mainly to market issues, but also to policy issues when it comes, for example, to the regulation of user rights.

Research topics include conflict management (for example when collection habits conflict with regulations in protected areas), legal frameworks for endangered species (how are they implemented and enforced, and what are the driving forces in policy making), market analysis (commodity chain, who benefits most, the role of local collectors and middlemen, what institutions are concerned with benefit sharing? CB-analysis – this links to Topic 4), policy impacts on forest resource management and livelihoods of local communities, property rights concerned with NTFPs (in nature reserves for example). In this context, though not a research topic, also capacity building for local communities and government is an important issue (how does policy implementation differ from policy intention?)

Among the potential partners are all researchers among the participants who work in economics and policy, including Dr. Zheng Baohua (CDS, YASS), Mr. He Jun (CMES, KIB/ICRAF), Dr. Sikor (Berlin), Dr. Grossmann (Freiburg) and Dr. Krott (Göttingen). More partners among the Chinese scientists need to be identified and should possibly come from governmental and national level research institutions in China.

#### **TOPIC 6: BAMBOO**

Although bamboo is probably the most extensively researched NTFP (it is commonly considered a NTFP – although this may be challenged since commercial bamboo comes predominantly from pure bamboo stands), there are still many research questions, in particular with respect to determining the growing stock, sustainable yield regulations and optimizing silvicultural management practices.

Research issues include: the refinement of specific inventory techniques, in particular for tropical bamboo (Note: a link to ongoing INBAR activities is envisaged), monitoring and assessment of bamboo management strategies (including human impacts on biodiversity, and plantation vs. indigenous management), and management and sustainable harvesting schemes for bamboo from natural forests. The last issue refers to an integrated management approach (major challenge: replacement of forest for bamboo plantation) which includes the definition of criteria and indicators for sustainable bamboo management for natural stands and plantations and the development of monitoring mechanisms.

Interested research partners from the symposium include: Dr. Luo Yiping (INBAR), NN (KIB and Southwest Forestry College, China), Dr. Horst Weyerhaesuer (ICRAF), Prof. Kleinn (Göttingen) and Prof. Phoris (Dresden).

#### **TOPIC 7: RELATIONSHIP BETWEEN MUSHROOMS AND MULTIPURPOSE TREES (*FAGACEAE* ETC.)**

Given the high economic value of some mushroom species, one of the goals is domestication. While this has been successful for some species, it continues being a problem for others. Basic information for any domestication attempts are the site requirements. This research aims at the identification of these site requirements with a particular focus on the interaction between tree species and mushroom species.

This is a research topic which is combining aspects of Topics 1 and 2 and requires the matching of expertise in mycology, ecology and forestry. Mycology experts are to be identified, possibly from the corresponding research group in Göttingen.

#### **TOPIC 8: HONEY BEES**

Honey is an NTFP with large local importance. Compared to plant resources it has different attributes in terms of seasonality, spatial distribution and productivity. Information procurement will depend largely on interviews with honey seekers. Very little systematic research has been done so far on honey as a NTFP. Therefore, research needs to address basic issues, such as an inventory of the abundance of honey bee hives (habitat, abundance, status), the relationship between honey bees and plant communities (maize, barley, *Castanopsis* and other forest species) and the production of bee products (honey, propolis etc.), including their medical and nutritional properties.

Interested research partners from the symposium include: Ms. Jie Dong (IAR, CAS) and researchers from the Chinese Academy of Agricultural Sciences (CAAS); further partners need to be identified.

#### **TOPIC 9: TREE LINE AND ELEVATION RANGE OF NTFPS**

The spatial distribution of NTFPs with respect to eco-regions and elevation gradients is another open research question. Basic research would include the establishment of transects along an eco-region gradient and the identification of changes in biodiversity and diversity of NTFPs. This research would also include rural appraisals and interviews with the

communities that harvest NTFPs. It will contribute in a very relevant manner to topic 3, the information system. Another important question that can be addressed by this research is how global change possibly affects the productivity and availability of NTFPs, i.e. this research topic does not only have a natural science, but also a strong socio-economic dimension.

Interested research partners from the symposium include: Prof. Yang Yongping (KIB, CAS), Dr. Horst Weyerhaeuser (ICRAF), and Prof. Dohrenbusch (Göttingen); additional scientists with expertise in vegetation sciences, ecology and socio-economy will need to be identified.

#### **TOPIC 10: TRANSITION ZONES BETWEEN FOREST AND OTHER LAND USE TYPES**

Although it seems contradictory to the definition of the term “NTFP” – these non-timber forest products are also found outside the forest. For example, tree bark and wild fruits harvested from non-forest trees are also considered NTFP. It is a general trend in forestry research to also recognize the tree resource outside the forest (‘forest landscapes’ or ‘land use mosaics’ at a landscape level) as a resource that is relevant from a forest and ecosystem utilization and management point of view.

The research questions include how the species composition changes along a transect that starts from the forest and extends into the open land, and whether a specific niche can be identified (with respect to various site factors) where the latter is an important issue also for domestication attempts.

Interested research partners from the symposium include: Prof. Lu Yuanchang (CAF), Dr. Horst Weyerhaeuser (ICRAF) and Prof. Kleinn (Göttingen).

#### **CONCLUSION**

The symposium achieved its goal of forming research partnerships and identifying specific research topics in the field of sustainable management of non-timber forest products. While a relatively great number of different institutions actively involved in research and development initiatives on the management of natural renewable resources, including NTFPs, were present at the symposium, more partners need to be identified in the process of developing the envisaged larger Sino-German research project. The symposium has been a gratifying opportunity to start the process of establishing and further developing the Sino-German cooperation in a field of research that has not only local and national importance, but is also of great regional and global value. We envision this partnership to develop into a long-term joint research initiative with the next two to three years.