4.1 Scenario I: The CHM as Information Platform

CHM as information platform fulfils the requirements of programme element 2.

In Scenario I the CHM acts mainly as information platform and as basically passive provider of information. The implementation of this field of action is the fulfilment of the requirements from programme element 2 (information systems) of the respective work programme of the CBD and has to be achieved by a properly working CHM.

Nevertheless, the present study shows, that a passive information platform is not sufficient for really mediating TT. Therefore, if the CHM wants to be used for support to further fields of action as described in the other programme elements (needs assessment, enabling environment, capacity building), a step to a higher level of quality has to be performed, going beyond just an information platform (see Scenarios II and III, page 45 and 46).

A passive information platform is not sufficient for really mediating TT.

Scenario I: Tasks and instruments

Tasks:

- to promote of the CHM as such
- to collect, process and provide information about actors and institutions of TT and about technologies on a regional, national and European level
- to keep the information up-to-date
- to provide best-practice examples of successful TT
- to index data banks of relevant industrial associations, expert groups, scientific communities, bilateral associations for economic development, systems of economic incentives as sources of information

Instruments:

- Well maintained web-site
- Electronic newsletters informing about new contents of the CHM, new developments of the CBD and with special issues covering thematic areas or selected technologies
- Web-Board as possibility of information exchange
- Calendar of events or event-compass for CBD-relevant TT
- Linkage to data banks and information systems
- Posters about CHM and TT via CHM
- Development of portable media like brochures and CDs

4.2 Scenario II: The CHM as Partner (Moderator) of a national Network of biodiversity related Technology Transfer Competence

Scenario II in comparison to Scenario I describes the CHM as an improved and more active information platform and assigns an additional counselling function. As a step to a higher quality level, Scenario II develops the CHM as partner and possible moderator of a network of competence.

Scenario II integrates Scenario I, but is enhanced in important parts. The implementation of Scenario II is ambitious, but would enable the CHM to fulfil its tasks as assigned by the CBD work programme much more profoundly.

The CHM, as envisioned in Scenario II, would refer to these requirements in its counselling function and guarantee permanent feedback from the members of the network of competence. This feedback would secure that toolkits and other guiding recommendations are realistic enough for implementation and are related to practice.

Scenario II: Tasks and instruments (including Scenario I)

Tasks:

- to fulfil a moderation function of a national network of biodiversty related technology transfer competence
- to bring together existing national competence
- to create and moderate a national network of biodiversity related technology transfer competence

Instruments:

- Provision of information platform at least in one UN language and newsletters also in printed version
- Support on effective search for relevant information in the internet
- Organisation of regular meetings among national partners biod TT network in order to create a network of competence, including participants from TT-institutions, industry, nature conservation associations, fair trade organisations etc.
- Facilitation of workshops for knowledge transfer and development of concepts for further development of TT approaches, political conditions etc
- Documentation and dissemination (via newsletter) of information and recommendations from exchange of experience and workshops in order to improve the information platform

4.3 Scenario III: The CHM as Transfer-Manager

On a higher level of quality the CHM takes over a mediation and promotion function as an active transfer manager. This would be a new dimension for the CHM.

Scenario III is a further widening of the tasks of the CHM in order to provide support to all four programme elements. The CHM takes over a mediation and promotion function as an active transfer manager, in order to bring providers and users of technologies into contact. This function can be fulfilled on request or on own initiative. This would be an enhancement of existing activities of the CHM. Acting on an even more enhanced quality level than in Scenario II.

This new function as an **active transfer manager** would open a new dimension for the CHM, which, nevertheless, is requested by the work programme of the CBD (compare UNEP/CBD/COP/7/L.20, 2.1.2[1]: *'To enhance the clearing-house mechanism, including its national nodes …. as a key mechanism for exchange of information on technologies and as a core element in its role to promote and facilitate scientific and technical cooperation, for facilitating and promoting technology transfer…'*).

Scenario III: Tasks and instruments (including Scenario II)

Tasks:

- to further promote the CHM
- to enhance the information platform into a discussion platform for TT
- to enhance counselling function from passive provision to active counselling
- to mediate TT as an active broker

Instruments:

- Dissemination of information about the CHM
- Facilitation of chat rooms for relevant topics
- Calling for on-line-discussion-forums
- Facilitation of a service office
- Initiation of training measures
- Using of CBD-related meetings for facilitating contact between TT-actors and the CBD
- Presentation of the CHM as information platform, counsellor and facilitator of a national network of biodiversity competence for example thematic conferences
- Enabling of access to thematic conferences for selected representatives of developing countries i.e. organisation of funding as an active broker
- Initiation of technology fairs of CBD-relevant technology sectors
- Initiation of a certification system or quality certificate for CBD-relevant technologies

[1] *www.iisd.ca/download/pdf/enb09284e.pdf*

4.4 Future potential Activities of the German CHM

The CBD work programme in its four programme elements assigns different functions to the CHM. The present study develops proposals for the implementation of the resulting tasks. The work programme sees as main contribution of the CHM to TT that '*National, regional and international information systems for technology transfer and cooperation provide comprehensive information of relevance to foster technology transfer and technology cooperation*' (objective of programme element 2).

Scenario I describes this role of the CHM as information system and lists tasks and instruments for the implementation.

Scenario II enhances the tasks of the CHM as an information platform. In this scenario the CHM also fulfils a counselling function by providing guidance. The CHM could act as partner and moderator of a national Network of biodiversity related Technology Transfer Competence. Such a **network of competence** should then organise regular exchange of experiences between participants from TT institutions, the industry, nature conservation organisations, fair trade organisations, development cooperation institutions etc. The realisation of this scenario would be an important step towards the implementation of the tasks of the CHM defined as early as in Decision II/3 4.c (COP 2): '*The CHM should be developed by gradually building up its functions in response to clear and identified demand*'[1]. In a network of competence the demand could be identified from the perspective of different actors. Additionally, in many cases demands coming from outside could be directly answered by members of the network.

A further step in the development of the CHM is represented by Scenario III. The CHM would act as an **active TT broker**. This scenario integrated Scenario I and II and would actively try to foster TT by facilitating personal contact between providers and customers of biodiversity-relevant technologies. This would be a significant enhancement of the role of the CHM with respect to TT.

Potential Target Group of TT via the CHM

The CBD formulated the goal to significantly reduce the loss of biodiversity until 2010 and knowledge and technology transferred via the CHM should in the first instance help to reach this goal. One potential target group could be local communities or rural population who are relevant users of biodiversity.

Considering this the CHM should try to develop its role as mediator of TT to this potential target group, under the reflexion that:

1. local communities directly influence biodiversity;
2. many technical solutions already exist and could potentially be adapted;
3. local communities have limited access to relevant appropriate technologies;

[1] www.biodiv.org/decisions/default.aspx?m=COP-02&id=7076&lg=0: "*The Conference of the Parties decides [...] that the clearing-house mechanism […] should be developed: c) by gradually building up its functions in response to clear and identified demand based on experience gained and resources available*."

The German CHM can act as an interface on bilateral national and international CHM of the CBD and thus facilitate connections between potential users / recipients of need technologies and the providing or developing these technologies. To channel questions, provide answers and to facilitate partner matching. The CHM leads to synergies between different actors and instruments, making TT more effective.

Proposals of the CHM on a wide variety of activities with respect to developing countries

With respect to the target group of the developing countries, as proposed in the previous chapter, different options for further activities of the CHM could be envisaged.

One further activity could be to facilitate access to those technologies that are highly demanded from developing countries and are not freely accessible. The CHM could facilitate a matchmaking function certain technologies out of the wide range of biodiversity-relevant technologies, following the identified demand of developing countries.

Furthermore, the CHM in its service function could facilitate seminars for handling protected technologies, patents or license agreements for participants from developing countries. The CHM would than act as service centre for easier access to selected technologies.

Another activity in which the CHM could act as service centre in the above mentioned sense is the field of genetic pollution. The rising use of genetically modified varieties in food production leads to increasing needs for control and monitoring measures. In many cases this requests sampling and measuring technologies that are not per se available in developing countries. Nevertheless, such technologies would be needed especially in developing countries where great parts of the population are directly using genetically modified organisms. The CHM in cooperation with the Biosafety Clearing House could provide information about relevant technologies for sampling, control and monitoring and access to such technologies. Similar needs can arise where invasive or imported species pollute the original gene pool of a region. This can also lead to a demand for the respective technologies.

A further activity in which the CHM could foster easier access to selected technologies is the field of 'caps'. Caps are definite upper limits of pollution that are allowed for a certain volume of air, water or soil. Regional and international agreements regulate trade with certificates originating from the definition of such cap values. This international trade with certificates can be a source of income for developing countries if they are able to measure their own pollutant emissions and measure, control and monitor the resulting pollution. The CHM could inform about the relevant technologies and about the respective cap values and trade options.

The real value of any TT lies in the local adaptation and integration of the technology on community or national level. The whole process integrates transfer of knowledge and hardware as well as capacity building, training and financial support. TT should enable the recipient to control and further develop the technology according to his needs so that it contributes in a sustainable way to strengthen local economies, to generate additional income and to reduce poverty.

5 List of Abbreviations

ARC	Agricultural Research Council South Africa
AHK	Aussenhandelskammer; Chamber of Foreign Trade
AiF	Arbeitsgemeinschaft industrieller Forschungsvereinigungen "Otto von Guericke"; German Federation of Industrial Cooperative Research Associations
AvH	Alexander von Humboldt Stiftung
BASIN	Building Advisory Service and Information Network
BCH	Biosafety Clearing-House
BfN	Bundesamt für Naturschutz; Federal Agency for Nature Conservation
BIG	Bundesinformationssystem Genetische Ressourcen; Federal Information System on Genetic Resources
BMBF	Bundesministerium für Bildung und Forschung; Federal Ministry for Science, Technology and Education
BMU	Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit; Federal Ministry for the Environment, Nature Conservation and Nuclear Safety
BMWA	Bundesministerium für Wirtschaft und Arbeit; Federal Ministry for Economics and Labour
BMVEL	Bundesministerium für Verbraucherschutz, Ernährung und Landwirtschaft; Federal Ministry of Consumer Protection, Food and Agriculture
BMZ	Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung; Federal Ministry for Economic Cooperation and Development
CBD	Convention on Biological Diversity; Übereinkommen über die biologische Vielfalt
CGIAR	Consultative Group on International Agricultural Research
CHM	Clearing House Mechanism
CIM	Centrum für International Migration; Centre for International Migration
COP	Conference of the Parties; Vertragsstaatenkonferenz
CPG	Cleaner Production Germany
DBU	Deutsche Bundesstiftung Umwelt
DED	Deutscher Entwicklungsdienst; German Development Service
DFG	Deutsche Forschungsgemeinschaft; German Research Foundation
DLR	Deutsches Zentrum für Luft- und Raumfahrt; German Aerospace Centre
DNR	Deutscher Naturschutzring
EARTO	European Association of Research and Technology Organisations
ECP/GR	European Cooperative Programme for Crop Genetic Resources Network
EFB	European Federation of Biotechnology
EST	Environmentally Sound Technologies
FE	Forschung und Entwicklung
FHG	Fraunhofer Gesellschaft
GATE	German Appropriate Technology and Ecoefficiency Programme
GBIF	Global Biodiversity Information Facility
GMO	Genetically Modified Organisms, Genveränderte Organismen
GTZ	Gesellschaft für Technische Zusammenarbeit; German Society for Technical Cooperation
GURTs	Gene Usage Restriction Technologies
HGF	Helmholtz-Gesellschaft
ICRISAT	International Crop Research Institute for the Semi-arid Tropics

IDCED	International Dialogue Centre Environment and Development; Internationales Dialogzentrum Umwelt und Entwicklung
IHK	Industrie- und Handelskammer; Chamber of Commerce
INRAB	Institut des Recherches Agricoles du Benin
INSTI	Innovationsstimulation; Innovation Stimulation
intecnet	Network of International Technology Cooperation
INWENT	Internationale Weiterbildung und Entwicklung; International Education and Development
IÖW	Institut für Ökologische Wirtschaftsforschung; Institute for Ecological Economy Research
IPEN	International Plant Exchange Network
IPGRI	International Plant Genetic Resource Institute
IRC	Innovation Relay Centre
ITUT	Internationales Transferzentrum für Umwelttechnik
IWU	Umweltinstitut
KfW	Kreditanstalt für Wiederaufbau
KMU	Kleine und mittlere Unternehmen; Small and Medium Sized Enterprises
MPG	Max-Planck-Gesellschaft
NGO	Non Governmental Organisation; Nichtregierungsorganisation
NIS	Newly Independent States; Neue unabhängige Staaten
OECD	Organisation for Economic Co-operation and Development
RD	Research and Development
RUN	Rural Universe Network
SBSTTA	Subsidiary Body on Scientific, Technical and Technological Advice
SES	Senior Expert Service
SME	Small and Medium Sized Enterprises; Kleine und mittlere Unternehmen
TT	Technologietransfer; Technology Transfer
UBA	Umweltbundesamt; Federal Agency for the Environment
UFZ	Umweltforschungzentrum Halle Leipzig; Centre for Environmental Research Halle Leipzig
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climatic Change; Klimarahmenkonvention
VENRO	Verband Entwicklungspolitischer Nichtregierungsorganisationen
VSK	Vertragsstaatenkonferenz; Conference of the Parties
WGL	Wissensgemeinschaft Gottfried Wilhelm Leibnitz
WissRech	Institute for Scientific Investigation and Advice in Environmental Technology and Life Science
ZADI	Zentralstelle für Agrardokumentation und Information; German Centre for Documentation and Information in Agriculture
ZEF	Zentrum für Entwicklungsforschung; Centre for Development Research

Some practical observations and experiences on technology cooperation and transfer in the frame of German development cooperation focussing on rural populations illustrating its complex matter.

Annex 1:

Technology Cooperation and Transfer for Poverty Alleviation

by: Carsten Hellpap, GATE/GTZ
http://www.gtz.de/en/themen/umwelt-infrastruktur/oekoeffizienz/7023.htm

Introduction

Technology Cooperation and Transfer have contributed in the last decades to significant improvments of the livelihood of the poor in developing countries. Life expectancy in developing countries has increased over the past 30 years from 46 to 64 years; rates of infant mortality have halved; the proportion of children enrolled in primary school has increased by more than 80 per cent; adult literacy rose from 55 per cent in 1980 to 70 per cent in 1995; and there has been a doubling of access to safe drinking water and basic sanitation. Despite these achievements the world-wide situation of the poor is still dramatic:

- 1.2 billion people live still with less than 1 US $ per person and day;
- more than 2 billion people have no access to modern, efficient forms of energy supply;
- 1.5 billion people still live in inadequate shelter;
- 1 billion people have no access to safe water, and 2.4 billion have no sanitation;
- 826 million people continue to face regular hunger and long-term malnutrition;

In light of this human tragedy poverty eradication continues to be one of the key challenges for international development.

Poverty alleviation through strengthening the technological capability

Poverty reduction measures can be distinguished in three categories:

a) direct measures, which benefit directly the poor
b) indirect measures, which create better frame conditions having positive effects on the livelihood of the poor on the medium and long run,
c) general measures, improving the economical and living conditions in a region or a sector including those of the poor, but which do not directly target to benefit specifically the poor.

Typical measures of direct poverty reduction are projects aiming at income generation, or the provision of shelter, food or other basic goods or social services (health care, education). The prospects of these measures depend largely on the introduction and dissemination of new technologies through technology transfer. Micro-, small and medium scale enterprises will generate additional income if they achieve higher productivity, product quality and diversity through the use of innovative and more efficient technologies. Improved technologies, such as more efficient stoves, water pumps, solar

panels, appropriate building technologies or farming methods are likewise necessary to increase food production, to give more people access to drinking water, energy supply and shelter and to extend social services and communication. Thus, the introduction of new technologies among micro, small and medium enterprises through technology transfer is a key element to strengthen the economic potential of the poor contributing to poverty alleviation. To be effective, it has to be combined with a general improvement of the technological capability of micro and small entrepreneurs and that of other relevant actors, so that they are able:

- to analyse correctly their main technological problems,
- to identify and to evaluate potential technological solutions suitable to the specific needs,
- to develop existing technologies further or to select, adapt and disseminate innovative technologies through technology transfer,
- to evaluate the short, medium and long term effects of new technologies,
- and to adapt introduced technologies further.

In this sense, technology cooperation and transfer, intended to strengthen the technological capability of the poor, have not only to consider the financial resources for and the access to new technologies but also the necessary requirements of know-how and skills to use them.

Problems of the technological approach

The relevance of technological capability for the economic and social development of the poor has been demonstrated by many projects. Most of them had positive effects on the living conditions of their target groups. Nevertheless, the overall impact on poverty has been quite limited. Beside scarce resources and unfavourable frame conditions, the unsatisfactory impact of fostering the technological capability of the poor is also caused by the very limited possibilities for poor families to generate additional income. The experiences of many technology projects which tried to strengthen the economical potential of the poor showed that a significant increase of the productivity of small enterprises are extremely difficult to achieve due to low profit margins, marketing problems, competition with industrial and semi-industrial products and the lacking capability to compensate unforeseeable problems, such as increase of prices of raw material or yield losses. Most national economies leave only few niches for resource poor producers, offering favourable conditions for income generating activities. The most skilled and competent small farmers and entrepreneurs may be able to use these niches. This part of the target group benefits in general from technological support. The broad majority of poor families, however, has only a small chance to increase their income through new technologies. They will be able to improve their living conditions at best only in very small steps and as a long process. The degree to which they can use existing chances depends largely from their knowledge about the demand and requirements of the market and how to organise more efficiently their production or service.

Most small farmers and entrepreneurs are not competent enough in this respect. They will fail with improving their productivity on the medium and long run even if the production could be increased temporary or a new product line could be established with new technologies.

Another problem of the technology approach has been the local focus of most projects. Measures to develop technologies further or to introduce new technologies were quite often carried out on village, or community or in rare cases on district level. The new

technologies, even if they were successfully applied, did in general not spread automatically and rapidly to other villages, communities or districts. One reason is that poor families living outside the project area can not easily bear the risk of investing in new technologies, even if they are interested in these technologies. Due to their economic vulnerability they avoid cost effective changes of unknown risk and prefer to continue in the traditional way. They know, that the neighbour village started with the new technology only because they got support from outside. On the other hand many local groups are not interested to disseminate their technological innovations which gives them a privileged competitiveness in comparison to others.

Consequences for the technological cooperation within poverty alleviation strategies

There is no doubt that strengthening the technological capability of the poor can significantly contribute to poverty alleviation. Higher incomes of small farmers and entrepreneurs can be achieved to a large degree through increased productivity depending from technological changes. However, improvements of the technological capability have to be accompanied by a good business management competence, such as the competence

- to analyse and assess markets and market opportunities
- to analyse and assess strength and weaknesses of their own products/services
- to identify and evaluate potential solutions for overcoming weaknesses of products/services,
- to identify and solve problems causing unnecessary costs and affecting the efficiency of the production or service.

Strengthening the technological capability and improving the business management competence of the poor are two complementary elements necessary for a successful enhancing of the economic activity of micro, small and medium entrepreneurs. Both capabilities are preconditions, that poor families can increase their productivity, improve the quality of their products and use consequently existing commercialisation possibilities. If only one of both elements is supported there is a high probability that the project or programme will not be sustainable and have only a very limited dissemination impact.

Furthermore, technological oriented projects which want to achieve a broad impact will have to work more on national level and to tackle more structural aspects of technological development. Projects should deal with the improvement of the management methods and technological capability of small producers of a whole agricultural or industrial branch. Such a concept would have to start with a detailed need assessment on national level. For example, what are the most important management and technological problems of small cotton producers, or shoemakers or of small food industries. Based on this analysis a strategy has to be worked out how management and technological innovations can be introduced, disseminated and implemented in the branch.

The success of the whole process from need assessment to strategic planning and implementation will largely depend on the degree of participation of all relevant actors and the intensity of co-operation between them. For, the entrepreneurial capability (management and technological capability) of a sector is determined by the political frame conditions, the quality and focus of the education system, the efficiency of management and technological services and the competence of the enterprises. All factors are interlinked to each other forming a system, where a single component and the intensity of co-operation can either stimulate or hinder innovations (see table 1).

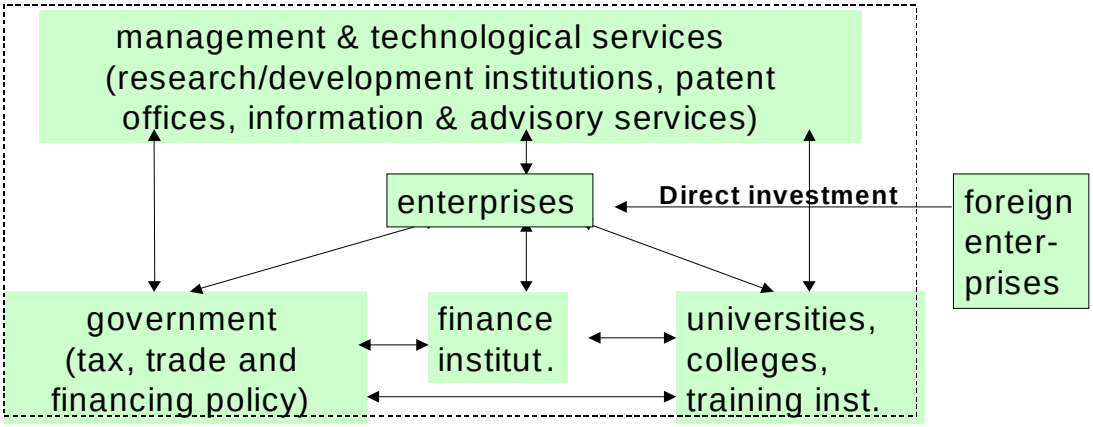

Table 1: Entrepreneural system

Based on this understanding two concepts have to be followed for promoting successfully and sustainably development and transfer of innovative management methods and technologies in the micro, small and medium enterprise sector of a country. On one side the interaction between enterprises, government, educational institutions and service organisations on communal, regional, national and international level has to be enhanced, including strengthening the participation of all involved groups to create optimal conditions for mobilising entrepreneurial self-initiative. The main activities comprise strengthening participatory processes in policy formulation and implementation (f.e. through institutionalising processes of participation and decentralisation), development of new forms of information exchange among actors, the organisation of information events, contact meetings, etc. and providing advise on financial investment strategies for environmental technology.

On the other hand single actors or groups of actors have to be supported to overcome institutional weaknesses which are bottlenecks for the innovation system: Such a capacity building will enable these actors to play a more active, professional and stimulating role within the entrepreneurial system.

Annex 2**:**

Checklist for selecting a technology within the scope of Technology Transfer

by: Carsten Hellpap, GATE/GTZ

Basic questions

What problem shall be solved with the technology? What is the purpose of the technology?

Which technologies may provide a solution to our problems?

How can we get sufficient theoretical and practical information about the different technological options?

Which technologies should be considered more in detail?

Questions to assess specific technologies

What are the investment and running costs of the technology?

What is the expected benefit of the technology?

What are (possible) side effects (economic, social, environmental effects)?

How robust is the technology (ie. in respect to climate factors, instable energy supply etc.)?

What is the expected life span?

What kind of spares does the technology need during the expected life span?

Which infrastructure and materials does the technology require (electricity?, special chemicals, raw materials, lubricants?)

What kind of knowledge und skills does the technology require?

Which organisational structure is necessary to use the technology?

Questions to the supplier of a technology (product)

What is the prize of the product? Are there any hidden costs?

Will the supplier provide me with a written detailed specification of the product and all its components?

Will the supplier provide a user manual in the local language?

Does the product come with a warranty? For which period? What kind of warranty?

What kind of after-sales support is provided?

Where are spares available, at which price?