

Natural Resources and Governance: Incentives for Sustainable Resource Use

Manual



Deutsche Gesellschaft für
Technische Zusammenarbeit (GTZ) GmbH

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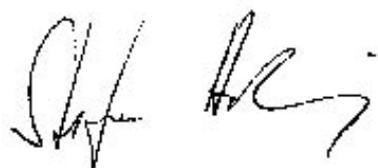
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Preface

The rules and enforcement mechanisms that guide and coordinate people's behaviour have become central issues in international development co-operation. Understanding the **governance** framework is a precondition for successful projects and programmes also when dealing with sustainable management of natural resources. At GTZ we have been working in this area long before this term came to the fore. Not incidentally, governance is GTZ's annual theme in 2004. Relative to purely technical aspects, the political and the institutional dimensions of our practical work have grown to be more and more prominent. Hence, it seems to me all the more important to share our experiences in governance analysis across sectors and thematic affiliations, and to make lessons learned more easily accessible.

This manual aims to provide a common concept and a terminology which helps to understand governance issues beyond sectoral boundaries. We analyse incentive mechanisms that foster the misuse and overexploitation of natural resources, and identify approaches how to direct these patterns towards a more sustainable development in a market economy context. It was the authors' explicit intention to base this manual on internationally well-established concepts in resource and institutional economics and to adapt them to GTZ's practical work.

Following numerous case studies and in-depth discussions with colleagues, the manual features practical applicability. I believe it deserves broad application in programme design, implementation and evaluation.



Director-General
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Introduction

1. About this Manual

The management of natural resources is a core issue of development cooperation. In a multitude of projects and programmes worldwide, the German Agency for Technical Cooperation (GTZ) fosters sustainable ways to use natural resources in fields such as watershed management, the implementation of international environmental treaties, sustainable forestry, or land management.

In contrast to the traditional development assistance conducted more than twenty years ago, recent approaches do not focus solely on the technical foundations of re-

source management. Increasingly, the **governance** of resource use comes to the fore: Overexploitation of natural resources is often – explicitly or implicitly – due to governance problems. For us, the term governance includes all the rules and mechanisms of enforcement that guide and coordinate people's behaviour with regard to a concerted outcome.

Many problems of unsustainable resource use result from a limited number of basic governance shortcomings such as the lack of clearly defined property rights, open access or insufficient enforcement of existing rules. The underlying problems are often quite similar, regardless whether water, forests, land, the atmosphere, or biodiversity are at stake.

Within GTZ, there is an abundance of ideas and approaches with regard to governance in environmental affairs. Often however, concepts and terminology remain sector-specific and empirical, making transfer of exist-

ing experiences difficult. No common language exists, and an exchange of lessons learned is severely constrained. There is an enormous pool of data and experience within GTZ, however it seems almost unmanageable. Additionally, the access to the

Comment 1



What do land management in Lesotho and social forestry in Honduras have in common?

We may have a vague impression that similarities between these two cases exist – but which ones? And what can people who work in either project learn from each other? Project documentation is often vast and includes implementation offers, project progress reviews, final reports and policy papers. Benefiting from the experience of others requires considerable effort and time.

We wrote this manual to facilitate this kind of exchange, and we would like to encourage the reader to compare the constituting elements of different cases. Which incentives determine the use of natural resources in the respective situation? Which attributes of the communities influence user behaviour? Which rules do exist, and which of these actually have an impact? And: which approaches have been applied to change incentive mechanisms so far, and which of these approaches have been successful?

international discussion is hampered by the lack of common concepts and terminology in resource governance.

Based on these considerations, we started to compile an overview of existing conceptual work and sectoral concepts in GTZ that refer to governance and natural resource management. We also took into account the international discussion on these issues. Based on the rich body of existing experience and our own considerations, we are presenting a **conceptual framework** which

- ▶ is applicable to any kind of natural resource use questions
- ▶ provides a common terminology suitable for analysing governance problems
- ▶ reduces complexity without losing its depth.

Through this framework we would like to

- ▶ help to better understand governance problems in resource management
- ▶ improve the capacity for analysis
- ▶ link GTZ's work more closely to the international discussion
- ▶ establish a basis for an *ex ante* as well as *ex post* analysis of GTZ projects
- ▶ create a framework for the planning and the design of future projects
- ▶ suggest a reference point to compare projects and underlying governance problems in order to benefit from these experiences for our future work.

2. Rationale

This manual is addressed to everybody interested in the analysis of governance problems in development cooperation. This includes both people working in the partner countries who are looking for compatible approaches to analyse specific problems, and people designing and planning new projects and programmes. We would like to motivate colleagues:

- ▶ to scrutinise and interpret their experiences based on this framework for new insights on the underlying problems of governance
- ▶ to plan new initiatives based on this framework, and to develop corresponding approaches in an advisory context – this is not to replace but to inform and enrich existing project and programme planning instruments
- ▶ to make available their experiences in an international discourse.

The latter is facilitated by the compatibility of our framework to several well-established concepts in institutional economics. We did not develop our framework from scratch – quite the contrary: the first part draws heavily on the *Institutional Analy-*

sis and Development (IAD) framework, elaborated e. g., at the Workshop for Political Theory and Policy Analysis in Indiana (see e. g., Ostrom 1990, Oakerson 1992, Thomson 1992). The IAD is now applied in organisations such as the FAO (see e. g., Thomson & Schoonmaker Freudenberger 1997) and also in international research programmes e. g., the International Forestry Resources and Institutions (IFRI)¹ program. It thus combines the merits of a theoretically elaborated, well-trying approach with practical applicability in development cooperation.

In this manual, we extend the IAD concepts and add several elements that - in numerous discussions with colleagues working both in GTZ headquarters and abroad - proved to be important for the suggested fields of application. The process of analysis described in this manual hence refers directly to development cooperation projects.

We focus on issues of governance with regard to natural resources. This involves e. g., forestry, irrigation, management of wetlands and freshwater ecosystems and land policy, but also waste and waste water management and air quality, to name but a few. The manual may also be relevant for any other area where scarce resources such as education or health care are managed.

3. How to use this manual

In this manual, we describe a process that allows us to identify governance problems and incentive mechanisms that lead to overexploitation of natural resources. We can then deduce governance interventions that might be apt to change this situation, or interpret and assess already conducted measures, respectively. According to this structure, the analytical process presented in this manual consists of two parts (see Fig. 1);

- ▶ the first part, consisting of Steps 1 to 4, introduces the analysis of the initial situation, the *status quo*
- ▶ the second part (see Steps 5-8) describes GTZ activities and interventions that aim to change resource use patterns
- ▶ additional literature and further reading, e. g., by related GTZ projects are suggested (see p. 60)
- ▶ GTZ case studies (see also p. 52) and examples illustrate the procedure.

We have based these case studies on numerous written documents such as debriefings, implementation offers and reports, but also on personal communication with colleagues. Wherever possible we quote the sources.

¹ <http://www.indiana.edu/~ifri/>

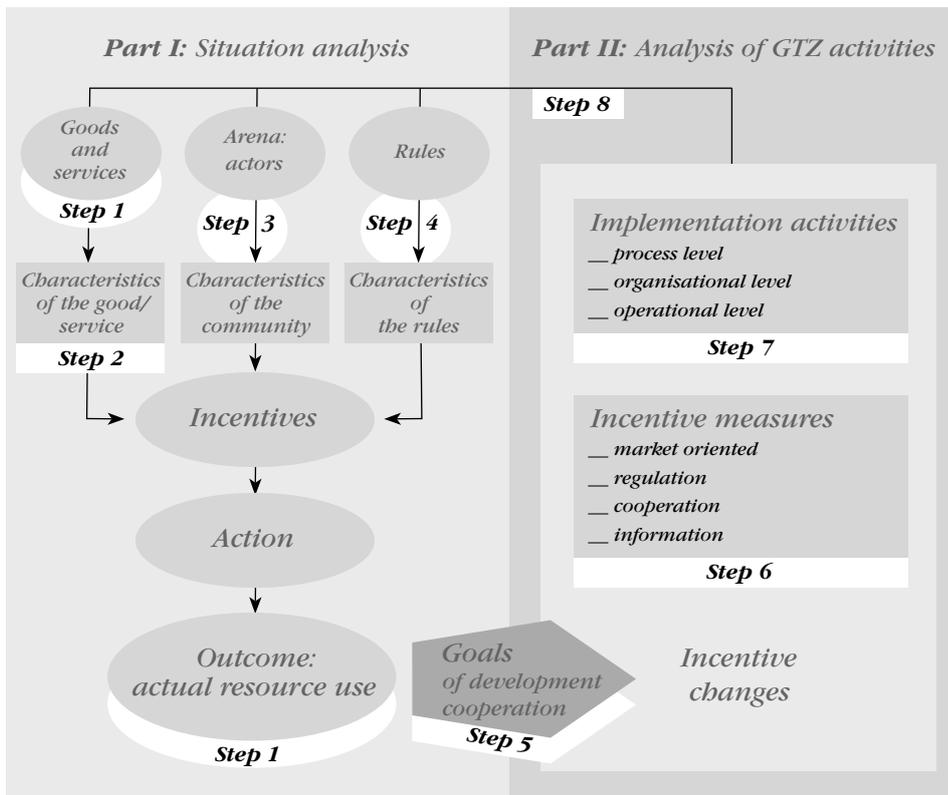


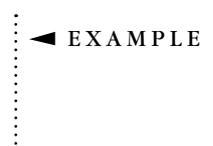
Fig. 1:
The conceptual framework
- an overview

In order to make this manual as accessible and as usable as possible, we explain our framework step by step. One section is dedicated to each analytical step. By this means, the reader can - while reading - apply the suggested ideas to his or her own experience. Examples and additional comments are given in boxes.



Comment boxes are used to discuss particular aspects in more depth, often from a critical perspective.

These boxes contain examples, generally from GTZ projects. In particular, we refer to (a) a land management project in Lesotho and (b) a social forestry project in Honduras.



SUMMARY

Short summaries are given at the end of each section.



As the manual is also available in German language, we use bilingual section headings.

4. *Basic concepts and assumptions*

For maximum clarity, we are explaining key terms and concepts in the following section. Most readers will have been running across them already – it is our aim here to ensure that we all mean the same when using them.

Natural resources are those parts of nature that have an economic or cultural value to people. In an economic sense, man-made capital and labour are also resources. However, they are not of a ‘natural’ origin. Some natural resources require the use of man-made capital and/or labour in order to make them accessible and ready to use. In this manual however, we focus on the *streams of benefits and costs*, i. e., the *goods* and *services* that derive from resources, rather than on the resources themselves. Thus, in this context it is not necessary to differentiate between pure natural resources and other kinds of resources.

Sustainability does not only imply long-term considerations, but – in the sense of the Brundtland-Commission – also the economic, social and ecological dimensions of sustainable development. In line with the 1992 UN Conference on Environment and Development (UNCED), for the Federal Ministry of Economic Cooperation and Development (BMZ) the ultimate objective of all German Development work is sustainable development.

We define **institutions** as formal and informal rules (North 1990) including the corresponding measures to enforce them. Institutions can guide human behaviour and reduce uncertainty (Richter & Furubotn 1999). They can take various shapes and forms – meeting your colleagues for lunch every day at a particular time, established procedures of conflict resolution in a school class, the right of way in traffic, but also agreements on the use of a particular grazing area – all these guidelines for human behaviour can be considered institutions.

Governance is the body of rules, enforcement mechanisms and corresponding interactive processes that coordinate and bring into line the activities of the involved persons with regard to a common outcome (Huppert, Svendsen & Vermillion 2003). We do not consider governance a single actor’s activity. Governance is not only what a central government or a dictator may do. It is the result of the interaction of a multitude of actors and mechanisms. Consequently, governance occurs whenever more than one single person makes use of a natural resource. We call governance whatever happens with regard to resource management in any given situation. Consequently, GTZ projects and interventions that aim to change these situations are also a kind of governance.

In a strict sense, *management* and *use* of natural resources are quite different from each other. However, we use these terms in a wider sense and consider them equivalent. They include (i) the extraction of goods and the use of services, but also (ii) pro-active management activities such as maintenance of irrigation tubes or pruning fruit trees. In addition, they refer to (iii) the sporadic extraction of goods and (iv) conservation and protective measures. In short, when we say *management* or *use* we subsume all those activities where people deal with natural resources in a direct or in an indirect way.

Transaction costs are the resources expended for the creation, maintenance and use of institutions (Richter & Furubotn 1999).

Incentives are factors that motivate human behaviour. They can be positive and foster certain behaviour, but they can also act as *disincentives* and deter people from doing something. Incentives can be material, but also non-material. Reputation and appreciation are examples of non-material incentives.

We assume that people act under *bounded rationality*, i. e., that they always try to increase their individual utility, restricted by their actual opportunities and capabilities. In many cases, people cannot maximise their utility since they have access to a limited amount of information only, or because their willingness to make an effort and spend time on a particular decision is low. But at large, people strive for an increased overall individual utility. In this manual we do not discuss issues such as the occurrence of bounded rationality, if irrational behaviour exists at all, or *how* people make decisions.



Comment 2

In this manual, we do not try to explain human behaviour beyond our assumption of bounded rationality. Instead, we focus on social processes. We consider the behaviour of individuals as guided by the quest for utility. Utility, as a matter of course, is not necessarily of a material nature. It also involves aspects such as reputation, power, convenience and appreciation by others. The individual striving for utility is constrained - and becomes socially acceptable - by the individual's social environment.

As an outcome of individual aspirations, the influence of the group and other incentives, a person behaves in a certain way. Institutions are a particular kind of incentives characterised by a high reliability ('institutional incentives').

5. Overview

This overview gives a first impression of the analytical process we present in the following sections.

Part I: Situation Analysis

Step ① *The problem*

- I. What is the problem we are talking about?
- II. Which goods and services are affected?

Step ② *Incentives - characteristics of the goods and services*

- I. Is it feasible to exclude others from the use of this good?
- II. Is it possible to consume the good jointly without reducing the utility of each individual user?
- III. Which type of good are we talking about? Is it a private, a club, common pool, or a public good?
- IV. Which are the incentives prevailing due to the characteristics of the good?

Step ③ *Incentives - characteristics of the actors and the arena*

- I. The 'Arena'
 - Is there a community of resource users?
 - Which stakeholders exist among resource users?
 - Are there any other actors involved such as public authorities, NGOs, private companies?
 - If applicable: How do exchange relationships between actors work?
- II. Incentives
 - Historical, social, economic and cultural factors in the community
 - Social cohesion, trust, and homogeneity of goals with regard to resource management
 - Conclusions: Which stimulating effects do these features imply?
 - If applicable: Which incentives are constituted by the relationships between actors?

Step ④ *Incentives - characteristics of the rules*

- I. Which rules exist with regard to resource use?
- II. Are these rules formal or non-formal? Are they contradictory?
- III. Are the rules working or non-working?
- IV. Do they address operational, collective decision-making or constitutional issues?
- V. Particularly relevant for operational rules: Do people consider these rules as technically appropriate and reasonable? Who disregards these rules for inappropriateness?
- VI. Which transaction costs are to be expected in order to modify rules?

Conclusions | Step ② to Step ④ : *Incentive overview*

- Which incentives stimulate a sustainable use of natural resources?
- Which incentives thwart sustainable management practices?
- Which incentives are dominant?
- What is the overall picture that we get?

Part II: Analysis of GTZ-Activities

Step 5 Objectives

- I. Which are the overall goals of the project/programme?
- II. Are these goals consistent with the relevant principles identified by BMZ, OECD etc., e. g., the Millennium Development Goals?

Step 6 Incentive mechanisms

Based on the incentive analysis (Steps 2-4):

Which incentives can help to

- I. restrict unsustainable resource use
- II. enhance sustainable resource management?

Are these

- ▮ market-oriented
- ▮ regulation
- ▮ cooperation or
- ▮ information-related incentives?

Which combinations appear helpful?

Step 7 Appropriate implementation activities

By means of which activities incentives are meant to change?

Appropriate activities might include;

- I. on an **operational** level
 - ▮ technical or financial assistance
 - ▮ technical advisory services to resource users
 - ▮ technical advisory services to organisations
- II. on an **organisational** level
 - ▮ advisory services on regulatory policy
 - ▮ advisory services on management and organisation
 - ▮ public relations, networking, mainstreaming
- III. on the **process** level
 - ▮ advisory services on policy processes.

How do these types of implementation correspond to the *status quo* and to the planned incentive changes?

Step 8 Impacts

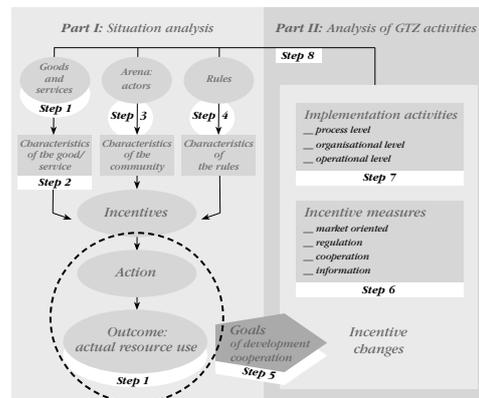
- I. How do incentive changes affect the situation? Do they lead to a modification of the characteristics
 - ▮ of the good?
 - ▮ of the actors and their relationships?
 - ▮ of the rules with regard to resource use?
- II. Are the goals being achieved?
- III. Are there any measures necessary to complement the incentives prevailing? Which incentives should be modified?

Part I: Situation analysis

Step 1 Identifying resource use problems

The very first step of analysis is always to identify the problem to be discussed and addressed. Normally, a project on natural resources management is initiated due to the notion that resources are not used in a sustainable way and that livelihoods of a

particular community are insecure at best. In some cases, this involves an obvious and massive degradation of ecosystems. In other, less spectacular cases we anticipate that in the near future given stocks of natural resources cannot support the population at these rates of growth and consumption.



EXAMPLE ►

1

Resource management problems can take numerous forms:

► In the “Ciénaga Grande de Santa Marta”, a mangrove in Colombia, the ecosystem is being severely degraded by a number of activities. Fish stocks are collapsing, both soil and water are affected by salinisation. At the same time, though, the demand for freshwater for irrigation is still increasing.²

► In Kafr El Sheikh, Egypt, the improved provision of water for domestic purposes has led to several problems of wastewater management. Capacities of traditional wastewater disposal systems are not sufficient any more, and the water table – already very high – continues to rise.³

► In the Peruvian Colca valley, livelihoods of subsistence farmers are at stake: water for irrigation is not efficiently used, and the traditional strategies of food production are no longer sufficient to feed the population.⁴

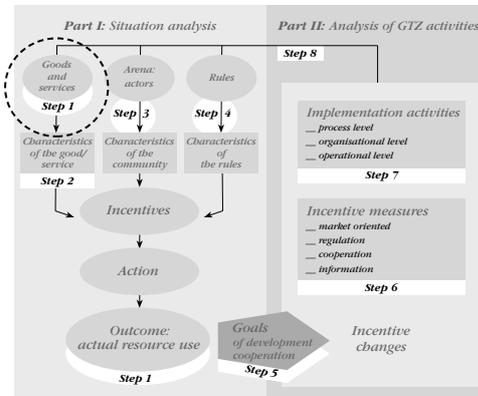
► In Lesotho, conflicts on land use are increasing. Due to migration and population growth, land that is suitable for agricultural use and grazing has become a scarce resource. Urban sprawl, lack of land use planning, inadequate techniques and overexploitation lead to decreasing yields, loss of soil and degradation.⁵

► The tropical pine and broadleaf forests of Gualaco, Honduras, are degraded by illegal timber extraction, inappropriate land use and fires, and cleared by settlers.⁶

We start with a seemingly trivial question. What are the goods and services affected by this problem? Which goods and services are being overexploited or used excessively?

In our view it may be worthwhile to examine the goods and services involved in the problem. A closer look might help to understand the incentives prevailing. However, what do we mean by saying 'goods' and 'services'?

Usually, *goods* are tangible and visible, they can be stored and transported, i. e., they do not have to be both produced and consumed at the same place. Typical *services*, in contrast, tend to be abstract and invisible as such. They cannot be stored or transported. Obviously, a continuum exists: there are services that, to some degree, have features of goods, and vice versa.



Goods from natural resources include, e. g.,

▶ products such as food, fodder, material for construction. In this case, natural resources have a *productive function*.

Services from natural resources include, e. g.,

▶ the *regulation function* of resources and media, e. g., pollution sinks and watersheds

▶ the aesthetic, recreational and cultural value of nature, i. e., the *information function*

▶ the importance of natural resources as a habitat for animals and plants: the *habitat function* (see de Groot et al. 2002).

² Römppczyk 2002: Final report

³ Kalkert 2001: Project implementation offer; RODECO 2003 Mission report

⁴ Welz 2002: Final report; Welz 2002: Debriefing

⁵ Leupolt 2000: Project implementation offer; Leupolt 2003: Debriefing; Report of Land Policy Review Commission 2003

⁶ Kosmus, Birner & Uebelbör 2002; Simon 2000: Project implementation offer; Lazo, Uebelbör & Vásquez 2003

EXAMPLE ►
2

Which environmental goods and services are affected when resources are being overexploited?

▲ In Colombia's mangrove "Ciénaga Grande" the most important goods and services include

- ▲ fish - as foodstuff for the local population
- ▲ the mangrove as a habitat for birds, mammals, molluscs and crustaceans which are also used by the local population
- ▲ freshwater for irrigation
- ▲ the regulatory function of the mangrove, i. e., as a sink for pollutants and wastewater.

▲ In Kafr El Sheikh, Egypt, soil and groundwater have been acting as a sink. These services have not been used in a sustainable way: The capacities of soil and groundwater to purify wastewater are no longer sufficient, and therefore the microbiological contamination is increasing.

▲ In the Colca valley, Peru, it is particularly water for irrigation which is not sustainably used. The productive function of land is not efficiently made use of either. Thus we also address the goods deriving from these functions, namely food and fodder.

▲ In the Lesotho case, conflicts arise mainly over the use of land suitable for grazing and as arable land.

▲ The degradation of the Honduran forests affects several goods and services such as

- ▲ timber suitable for construction etc.
- ▲ fuelwood
- ▲ genetic resources: biodiversity
- ▲ recreational functions of forests, e. g., for tourists
- ▲ buffer functions in case of torrential rains
- ▲ arable land and pastures
- ▲ fruits and other non timber forest products such as pine resin.

However, especially timber and land for agricultural use are affected by the ongoing conflicts.

Comment ?



*Table 1 displays some examples of goods and services provided by natural resources. Functions of these resources are closely interrelated: the **regulating** impacts of forests, for example, contribute to the **production** of drinking water. There is no necessity for categories to be exclusive, though. If an object of analysis is considered a good or rather a service depends on the context.*

So, why do we believe it helpful to consider goods and services provided by natural resources rather than natural resources as a whole?

▲ *Focusing on goods and services absolves us from looking for helpful classifications of natural resources - which are quite hard to establish with a consistent lo-*

gic. For example, if we consider forest a natural resource, how come that soil, air and water are both natural resources on their own and, at the same time, part of the resource “forest”? How can these resources be categorised in a coherent way?

► Property rights on resources often come as a bundle. Typically, there is not a single person or group holding the whole bundle of rights. Most bundles are split up, and actors hold the rights to use specific goods and services deriving from the resource. Focusing on the goods and services takes into account their actual role in real life.

Re-source	Function	Goods	Function	Services
Forest	Production	building poles, fuelwood, food (game, fruits, mushrooms etc.) fodder; drinking water; genetic resources	Regulation	maintenance of air quality, watershed, filtering water; climate regulation, CO ₂ sink, windbreak
			Habitat	habitat for animals and plants
			Information	recreation, spiritual meaning
Land/soil	Production	surface, topsoil	Regulation	pollution sink, decomposition of organic material
			Habitat	habitat for animals, plants and microorganisms
Atmosphere	Production	oxygen	Regulation	UVb protection, temperature regulation, maintenance of air quality
Water	Production	drinking water; irrigation water	Regulation	climate and temperature regulation, waste water sink
			Habitat	habitat for animals, plants and microorganisms

Table 1:

Natural resources and the provision of goods and services
Source: own presentation based on de Groot, Wilson & Boumans 2002; World Resources Institute 2000

An integrated view of natural resource use is hampered by the focus on goods and services, though. Recently developed approaches such as the integrated ecosystem approach (e.g., World Resources Institute 2000) emphasise the importance of a more comprehensive view on resource use. However, disadvantages of the approach suggested in this manual could be overcome by considering **all** goods and services related to the good in the limelight of analysis, both during and after the analysis procedure.

SUMMARY

Step 1 *The problem*

- I. What is the problem we are talking about?
- II. Which goods and services are affected?

Why are goods and services being overexploited and overused? What are the reasons? There are three types of *incentives* that motivate people's behaviour towards natural resources:

- ▲ characteristics of the goods and services
- ▲ characteristics of the users, the community, and other actors
- ▲ characteristics of the rules in place.

These attributes tend to influence individuals' and groups' behaviour. They determine if and how people use, overuse, or strive to manage natural resources in a sustainable fashion. An analysis and an in-depth understanding of incentive mechanisms are essential to be able to modify these mechanisms and thus change resource use patterns. An intended change of incentive mechanisms by a local community, a local or national government is a type of active *governance*.

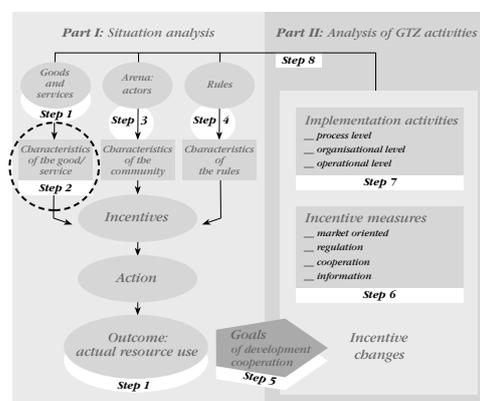
Step 2 *Incentives - Characteristics of the goods and services*

The characteristics of a good or service (for simplicity, in the remainder of the manual we subsume both goods and services under the term 'good') have repercussions

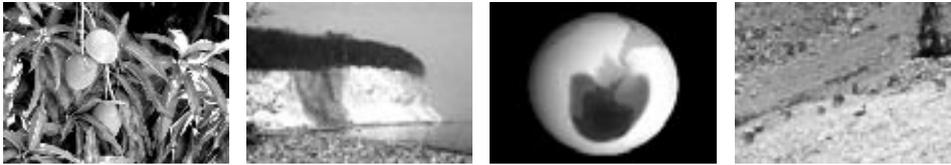
on the incentives for its use. The appropriateness of institutions to govern people's behaviour also depends strongly on these attributes. There are basically two relevant characteristics we would like to address:

▲ **excludability**, i. e., the feasibility to control access to a good or service

▲ **rivalry in consumption**, i. e., subtractability.



The following examples may illustrate the importance of these characteristics.



A typical example of a good I can easily keep others away from are the **fruits of a tree** that grows in my compound. It is relatively easy for me to control access of other potential users, and I can exclude them from collecting the fruit.

Another, less typical example is a good **view** from a particular viewpoint, e. g., at the chalk cliffs in Jasmund national park on the island of Rügen. Again, we can exclude others from having that view if we build a fence around the lookout point. Anybody not willing to pay the entrance fee will be precluded from entering that viewpoint. We cannot, however, exclude anybody from making use of the **UVb-protective services** provided by the ozone layer. It is also hardly feasible to exclude pastoralists and their herds from **grazing on alpine pastures** as access is difficult to control due to the remoteness and the geographic characteristics of these meadows.

◀ EXAMPLE

3

The feasibility of exclusion depends not only on the physical attributes of a good, but also on situational factors such as the location of a fruit tree. It is much easier to control access to a mango tree on my compound - I could e. g. fence the garden and let only those people enter whom I trust - than to a mango tree that grows far away from my house. Hence, excludability is not a definite attribute of a particular category of goods. However, in the case of many services exclusion is not feasible due to their abstract character.

What is more, exclusion of others might be technically viable in many cases, e. g., by constructing fences or installing checkpoints or guards. From an economic point of view however, preventing others from the use of such a good might not pay off. "Excludability" thus is not an absolute criterion, but depends on the concomitants and the expected costs.



Rivalry in consumption implies that consumption of a good can be subtractive or joint. If the consumption of a good is subtractive, the utility people can get from the good decreases with every additional unit of the good used by others. Joint consumption means that several individuals can use the good without reducing everyone's individual utility.

Fruits are definitely affected by rivalry in consumption. Each piece can be eaten only once, and the number of fruits available diminishes with every additional individual taking some of the mangoes.

◀ EXAMPLE

4

Contemplating the Jasmund chalk cliffs, however, does not reduce the utility of others deriving from the *good view*, although congestion might occur at some point.

The *protection from harmful UVb* is also a service which can be used by many individuals at the same time without reducing the effects for any single user.

With *grazing*, in contrast, there is rivalry in consumption. The more animals feed on the pastures, the less fodder is available for each animal.

Rivalry in consumption is also an attribute which is not static or absolute, but relative. Rivalry depends on physical characteristics of the good and the type of use: is the good expended while using it? Or is it a durable? In addition, it is the relative scarcity which might change over time, the potential for congestion, and other effects that determine the degree of rivalry in consumption.

Each good features these characteristics. The combination makes for strong incentives to manage the good in a particular way.

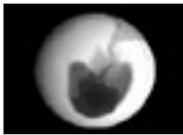
		<i>feasibility of exclusion</i>	
		<i>yes</i>	<i>no</i>
<i>rivalry in consumption</i>	<i>yes</i>	 <i>private good</i>	 <i>common pool good</i>
	<i>no</i>	 <i>club good</i>	 <i>public good</i>

Fig. 2:
Characteristics of goods
Source: Ostrom (1990),
modified

When goods are exclusive and their consumption is subtractive, they are called *private goods*. Most people are particularly motivated to use those goods and services in a sustainable way that belong to them and have a private good character. They feel motivated to invest in maintenance and preservation measures. We can consider fruits of a tree as private goods (see Fig. 2).

An exclusive good that can be consumed jointly without reducing the benefit of each single user is called *club good* or *toll good*. Normally, users pay a kind of entrance fee which gives them the right to use the good or service. Prototypes of this category include museums and fitness studios, or public swimming pools. With regard to environmental goods, the view of the Jasmund chalk cliffs is a typical club good, similar to any other nature reserve where visitors have to pay an entrance fee. The term *common pool good* stands for a good where consumption is subtractive, but where it is not feasible to exclude users from consuming the good. Common

pastures, used by a community of livestock keepers, are typical common pool goods. Access cannot be entirely controlled. It is difficult to check whether one of the herders makes his animals consume more than the allowed amount. External users from outside the community can also have their livestock grazing on these pastures, often without facing any sanctions. Non-excludability thus is an incentive to overuse a resource to improve individual welfare without bearing the costs.

Public goods, in contrast, are those goods we cannot exclude anybody from and which we can use jointly. Protection from UVb radiation by the ozone layer may be considered a public good. In these cases too, non-excludability often is an incentive to neglect maintenance of the resource and to avoid investments in preservation measures. For all those who do invest in maintenance or who manage the resource in a sustainable way, uncertainty on the behaviour of others implies a tremendous risk. They often fear that less considerate users take advantage of the investments.

Indeed, non-excludability often is a strong incentive for **free-riding** behaviour. Single individuals profit from the community bearing the costs of a good's provision, but do not contribute themselves. There

are two rationales that may motivate free-riding behaviour. We might think that our own contribution is too small and insignificant to make a difference, e. g., when we ponder the pros and cons of taking the car for a weekend trip versus going by train. We might feel that it really doesn't make a difference, as everybody else takes the car anyway. A second rationale might be based on the belief that I can enjoy the good anyway, even without paying for it, since the community provides it to everyone and does not restrict the use only to those who did contribute.

For each single individual and on the short term, decisions based on these considerations might be rational. On the long run however, and seen from the perspective of the whole community, utility decreases considerably. This phenomenon is called the **tragedy of the commons** (see e. g., Hardin 1968; Ostrom 1990; Thomson & Schoonmaker Freudenberger 1997).

A factor contributing to this tragedy is the fact that the management of common pool and public goods often lacks rules. Access is not restricted. This feature cannot be blamed on the nature of the goods. It is rather due to the existence or non-existence of institutions that govern resource use, and to their actual enforcement (see Step 4). In cases where no access rules exist, or where these rules do not work properly, we can speak of **open access** situations (see Ostrom 1990). In open access situations, users often lack the motivation to maintain and sustainably use the resources. They feel uncertain about the future possibilities to use the good (tenure insecurity), and

Natural resources often provide a combination of goods and services of different kinds. Goods such as fuelwood, mushrooms, bushmeat and building poles are often subtractive in consumption. Services, in contrast, can often be jointly used. Examples include the regulation function of forest in the water cycle. A forest thus can provide a whole array of goods and services with different characteristics. These characteristics, in turn, act as incentives on human behaviour in a multiple way.



Comment 5

they assume others to free-ride. Open access thus often leads to an uncontrollable exploitation of natural resources. Whenever demand for these goods is higher than the actual supply, we call for an active governance of resource use.

EXAMPLE ►
5

What does that mean with regard to our examples?

▲ Fish stocks and other fauna in the “Ciénaga Grande” are typical *common pool goods*: users cannot be excluded, and there is rivalry in consumption. The same holds for freshwater resources used for irrigation. The regulation and habitat functions of the mangrove ecosystem can be considered *public goods*. The unregulated (“open”) access to these services acts as an incentive to overuse the mangrove.

▲ So far, the sink function of groundwater and soil in Kafr El Sheikh, Egypt, has been a *public good*. Regulating the use of these services was not necessary in the past. However, the increasing quantities of wastewater now exceed capacity. Services of groundwater and soil acting as a sink are now a rather scarce *common pool good*.

▲ In the Peruvian Colca valley, water used for irrigation is also a *common pool good*. Quantities extracted by individual farmers are not controllable, farmers apply as much water as they like. In addition, we focus on agricultural produce, namely food and fodder, that can be classified as *private goods*.

▲ Formally, the king is the owner of all land in Lesotho. Due to the lack of enforcement however, land has become an open-access-resource, i. e., a *common pool good*. As a consequence of illegal squatting, parts of the land can now be considered a *private good* - with very low tenure security, though. The lack of governmental enforcement thus acts as an incentive to appropriate land and exclude others from the use. However, as there are no reliable property rights which could secure long term use, little incentives exist to manage land in a sustainable way.

▲ Goods and services provided by Honduran state property forests are *common pool* and *public goods*. These include timber, fuelwood, genetic resources, recreational and buffer functions of the forests, and the land which is also used for agriculture and grazing. Feasibility of exclusion is low, and the official access rights are poorly defined and enforced. These goods and services thus can be considered open access resources which strongly motivate overexploitation.

SUMMARY

Step 2 *Incentives - characteristics of the goods and services*

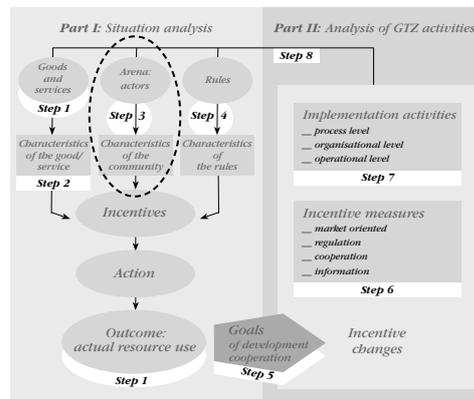
- I. Is it feasible to exclude others from the use of this good?
- II. Is it possible to consume the good jointly without reducing the utility of each individual user?
- III. Which type of good are we talking about? Is it a private, a club, common pool, or a public good?
- IV. Which are the incentives prevailing due to the characteristics of the good?

Step 3 Incentives – Characteristics of the actors: the arena

It is not only the characteristics of the goods and services that have an impact on resource management. The attributes of the resource users themselves, their communities and other actors involved have a strong impact on how a resource use regime functions – or does not function.

If all members of a community of water users agree, e. g., that water should be used as carefully as possible, sustainable use is much more likely than if users have no such common principles. If for all inhabitants of a village a particular grove has a spiritual meaning, people will not destroy that grove or take the wood poles out. Social, historical, economic and cultural characteristics of a group of people act as incentives that guide resource management.

In actuality, though, there is often more than one group or community involved in the use of a particular good or service. We thus have to identify all relevant actors in the ‘arena’. A typical arena consists of various groups of stakeholders, i. e., people that have an immediate interest in using the good. Actors such as public authorities who do not use the good in a direct way, but are involved in the management processes, also form part of the arena.



In the Lesotho project on land management, land users include farmers, livestock keepers, but also parts of the low income urban population in need of housing. Interests of these stakeholders are conflictive and compete with each other. In addition, members of the respective authorities and commissions, consultants and moderators are part of the arena of actors.

In Gualaco, Honduras, the user group consists of several sub-groups, including

- ▲ smallholders who use the goods provided by the forest (e. g., wood, fruit, wildlife) for subsistence. In higher altitudes, they would also cultivate shadow-grown coffee as a cash crop
- ▲ members of a local forestry co-operative
- ▲ livestock owners
- ▲ owners of sawmills and timber companies.

Both staff of the forest administration and the GTZ project PROFOR are also part of the arena of actors (see Kosmus, Birner & Uebelhör 2002).

◀ EXAMPLE
6

Comment 6



By saying “users”, “stakeholders” and “actors” we use a terminology which is different from the one applied in official GTZ documents. In GTZ language, relevant actors are called “target groups” and “intermediaries”.

***Target groups** are meant to be the final beneficiaries of an undertaking. In most cases, they are the immediate users of a good or service. As indicated in the examples (s. a.), a target group may consist of several different stakeholders.*

***Intermediaries** are organisations such as public authorities or NGOs, and their staff. For example, water user associations may be intermediaries, or a local forest administration. Often, GTZ projects include advisory services or training for these organisations’ staff. Impacts on the target group’s behaviour and livelihoods thus are indirect, i. e., mediated. Both intermediaries and business representatives may act as **project partners** (see Handreichung Angebote GTZ 09/03). In many cases, it may be instructive to compare the addressees of a cooperation project, where impacts actually manifest and where they were planned to occur; and the incentives that result from these facts. In some projects, where exclusively the designated intermediaries and target groups are considered, other relevant actors are possibly being neglected. At the same time one should have in mind that at the end of the day, it is the actual behaviour of the immediate resource users that constitutes sustainable use. So it may be important to check whether GTZ activities addressed to an intermediary have in fact an impact on the behaviour of the target group and other users.*

Which are the characteristics of groups within an arena of actors that are relevant for the management of natural resources? Which characteristics might influence user behaviour?

It may be both the attributes of specific groups of users and the attributes of the entire arena that act as incentives. When we use the term “community” in this context, we include any section of the arena of actors and also the entire arena as such.

Particularly the following factors tend to be highly relevant:

▲ the **history** of the community – what is the origin of the group members? Was the place populated by members of different groups, lineages, or clans? When was that? Did conflicts arise? And how have they been resolved?

- ▶ **social factors** such as ethnicity, language, family structures, gender relations, and caste and other social divisions
- ▶ **economic factors**, particularly with regard to livelihood strategies and the distribution of wealth
- ▶ **cultural factors** such as religious and moral beliefs. The opportunity to gain reputation might be a strong incentive as well. Behaviour patterns that lead to reputation also differ between communities, depending on the cultural context. In a community where individuals gain reputation by knowing the most productive cultivation techniques, farmers are likely to be highly motivated to develop and learn about new, more efficient strategies – possibly with positive side-effects with regard to resource use rates. In another community, where financial power is a precondition for high reputation, incentives that foster resource exploitation for one's own financial benefit without considering ecological and social costs are probably very strong.

The distribution of endowments and negotiation capacities among actors has strong motivating effects on people's resource use behaviour as well. Let us consider the economic resources of actors in a wider sense, including power and information (compare e. g., to Schlüter 2001 p. 114). Particularly relevant features are;

- ▶ **positional power**, i. e. power deriving from the status, from the position of an actor in a community
 - ▶ **path dependency** – are there any anterior, precedent decisions that now hamper the adoption of new resource use strategies?
 - ▶ **exit options** – does the actor have an option at all to change her former behaviour? Both path dependencies and the availability of exit options affect the costs an actor has to bear when adopting a new strategy. The following aspect is closely linked to these factors:
 - ▶ **transaction costs** – what are the expected costs of a strategy change?
 - ▶ **subjective discount rate** – what is the actors' time horizon? Do they tend to consider long-term implications or do they strive for immediate benefits, e. g., because of extreme poverty? Some resource users simply cannot afford making long-term considerations as they have to struggle for their immediate survival.
 - ▶ **risk aversion** – actors differ with regard to risk aversion due to their personal character; but also due to their material endowments
 - ▶ **information** – information is closely related to risk aversion: The less a person knows, the higher the risk she has to take when adopting a new behaviour pattern.
- Information asymmetry between actors is a strong incentive as well. Individuals*



Comment 7

*who hold more information than others might feel motivated to overexploit natural resources since they cannot be held responsible for the negative effects – the others just do not possess sufficient data to prove the exploiters' misbehaviour. Information asymmetry gives the information holder an advantage over other actors particularly when managing a **public good** or a **common pool resource** collectively. Information asymmetry can also affect the management of **private goods**, e. g., when a contractor (an agent) takes advantage over the principal's ignorance, blaming the poor quality of his performance on some unfavourable external impacts.*

How are these resources distributed among actors? Both these features and the differences with regard to the different actors' endowments operate as incentives and govern people's behaviour. An individual might feel that her behaviour is invariably determined by path dependencies, prohibitive transaction costs or the lack of viable exit options. In these cases, incentives to adopt a new behaviour pattern have to address these aspects, and they have to be particularly powerful. In addition, strong differences between actors with regard to power, information, and other assets might reduce people's willingness to cooperate with each other (see below).

Historical, social, economic and cultural factors have an impact on

I. a **community's homogeneity** with regard to common goals and strategies of resource management

II. **social cohesion** and **trust** among community members.

These factors are likely to have considerable influence on the motivation of each single member of the community to cooperate, to respect rules and to consider the needs of future generations when managing natural resources.

EXAMPLE ►

7

More than 70 % of the Lesotho population are subsistence farmers, and about 40 % keep livestock with low stocking rates. However, suitable land is very scarce, only 9 % of the area is suited for agriculture while about 66 % is suitable for grazing. The population of Lesotho grows fast due a relatively high birth rate and former miners coming back from South Africa. Pressure on land is therefore high, landlessness is widespread, and the number of violent conflicts increases. The central democratic government seems to lack flexibility; the administration is considered incompetent to deal with land management. Overall, trust in public authorities appears to be low, and a high competition and extreme poverty are strong disincentives to co-operate in sustainable land management.

The main part of the population migrated to Gualaco, Honduras, from adjacent areas more than a century ago. The history of these groups is characterised by violent conflicts between families, clans and members of different political parties. Participatory and democratic principles and processes are poorly developed.

Most inhabitants are smallholders with diverse livelihood strategies. Many farmers combine shifting cultivation of corn and beans with other sources of income such as the cultivation of coffee, the extraction of pine resin, livestock keeping or timber trading. Timber for construction and fuelwood, game and other forest products are also used for subsistence.

Political impact and power are distributed unequally among actors. Particularly the livestock keepers are very influential, whilst the timber companies have also strong impacts on local policy makers and the forest administration.

Due to the prevailing violence and the disparate economic interests and political resources, the arena of actors is characterised by a rather weak social cohesion, an obvious heterogeneity, fear, and the lack of trust. Incentives to collaborate with regard to forest management are thus weak. For smallholders it is very likely that the more powerful actors will not respect agreements and that the latter will violently enforce their demands.

An analysis of exchange relationships between actors can help shed light on additional incentive mechanisms that govern resource management (see also Huppert & Urban 1998; Huppert, Svendsen & Vermillion 2001). Actors exchange both services and goods. An authority e. g., the local forest administration, provides a service such as awarding forest concessions. An enterprise e. g., pays cash for a concession. An NGO may offer advisory services, etc.

Especially those relationships with open feedback loops and where one of the actors lacks accountability tend to be incentives that stimulate rent-seeking and opportunistic behaviour. The relationship between resource users and public authorities or administrative staff - in GTZ documents called "target groups" and "intermediaries" - has a particularly strong impact on resource use patterns. This is the case in Gualaco where the forest administration awards licenses from state forests to commercial timber companies without being accountable to the local population. Without giving them an opportunity to intervene, the basis of their livelihoods is degraded.

For the forest administration staff, no incentives exist that stimulate cooperation with the local population, or respect for their claims. In contrast, incentives to gain some personal rent from selling the licenses are considerably stronger. For an attempt to display these relationships see Fig. 3.



Comment 8

EXAMPLE ►
8

Applied to the Gualaco case, relationships can be visualised – albeit simplified – as follows (see Fig. 3):

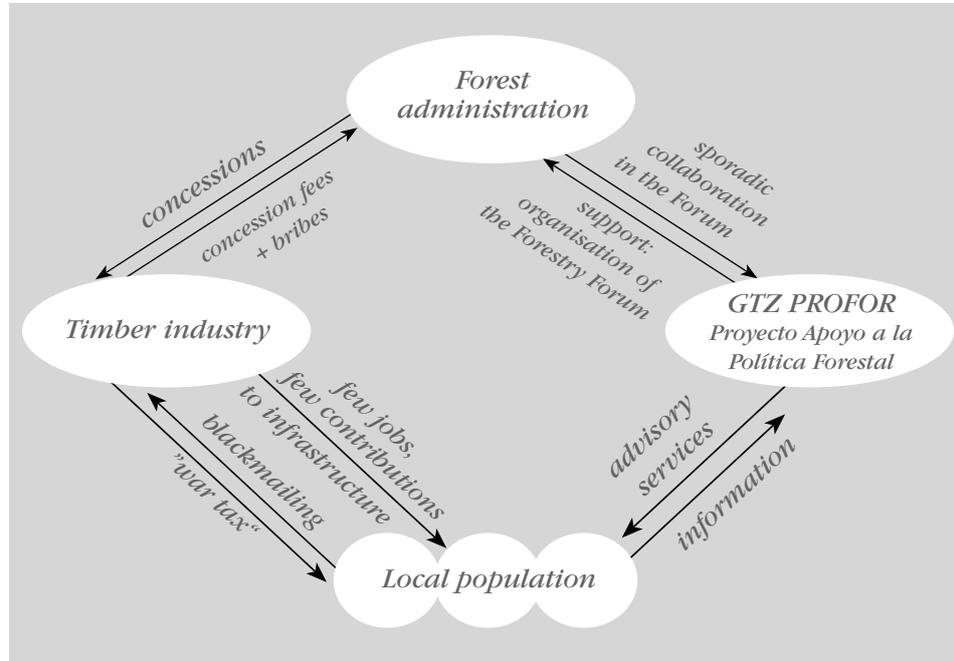


Fig. 3:
Arena of actors
in Gualaco,
Honduras
Source: own
presentation based
on Kosmus,
Birner & Uebelhör
2002 and
Lazo, Uebelhör &
Vásquez 2003

Figure 3 depicts relationships between the actors. As mentioned above, the local population is a rather heterogeneous group, consisting of several subgroups engaging in violent conflicts. The members of these groups, but also the timber industry are direct users of the forest resources, hence conflicts arise both among the population sub-groups and between timber companies and these sub-groups.

Since the fundamental structural reform in 1992, concessions in the state forest are to be awarded by means of auctions. The revenues provide financing for administration and forest management. In theory, the local population can also take part in the auctions and bid for concessions. In practice though, companies are awarded these concessions on a regular basis due to their financial power.

According to the 2004 forestry legislation, the administration implements management plans by means of long term contracts with local users and timber companies. The authorities are also meant to supervise these activities, but not to engage in actual operation. Yet in actuality, none of these rules is put into action. As a consequence, there is a considerable legal vacuum which is an effective incentive to exploit resources.

This example also emphasises the different nature of the goods and services exchanged. The forest administration awards concessions and receives, especially from timber companies, money in return – including both fees and bribes. So far, the local population has had little influence on the authorities' practices. Some of the exchange relationships feature illegality, e. g., the relation between timber companies and local livestock breeders who managed to appropriate parts of the state forest.

These livestock breeders blackmail companies, forcing them to pay the so-called war taxes (see Kosmus, Birner & Uebelhör 2002).

These evident power imbalances lead to strong incentives for rent-seeking behaviour. To put it negatively: the absence of incentives to manage forests in a sustainable way enhances overexploitation. Staff of the forest administration e. g., can increase their personal utility by awarding licenses to the financially powerful companies – who, besides paying the fees, are also likely to pay additional unofficial charges. The majority of smallholders have no means – neither politically nor financially – to influence the actual practices. As a consequence, there are few incentives for administrative staff to administer national forest resources in a way that meets the interests of all stakeholders.

In contrast, several powerful sub-groups who can credibly threaten other actors benefit from the lack of enforcement of the existing rules. This lack is a strong incentive to try to get the biggest share – at the expense of weaker parts of the local population who are deprived of any opportunity to express their needs and opinions. The timber companies charge the public for the blackmailed payments ('war tax'), paid to the violent parts of the livestock breeders, by reducing the concession fees payable to the authorities. In addition, companies are not stimulated at all – neither by regulations nor by market-based incentives – to invest a portion of their revenues in rural development.

Overall, in this arena the majority of incentives stimulate actors to reap benefits. Only few incentives exist that enhance sustainable approaches.

In addition, Figure 3 shows that in a previous phase, the PROFOR project managed to involve only parts of the local population in a Local Forestry Forum. Public authorities and companies in contrast, are participating only irregularly, avoiding to be exposed to the public critique. Especially the timber industry seems to have no motivation at all to change the existing situation.

SUMMARY

Step 3 Incentives – characteristics of the actors and the arena

I. The 'Arena'

- ▲ Is there a community of resource users?
- ▲ Which stakeholders exist among resource users?
- ▲ Are there any other actors involved such as public authorities, NGOs, private companies?
- ▲ If applicable: How do exchange relationships between actors work?

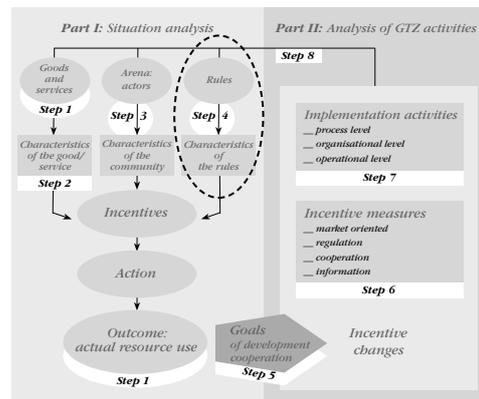
II. Incentives

- ▲ Historical, social, economic and cultural factors in the community
- ▲ Social cohesion, trust, and homogeneity of goals with regard to resource management
- ▲ Conclusions: Which stimulating effects do these features imply?
- ▲ If applicable: Which incentives are constituted by the relationships between actors?

Step 4 Incentives - Characteristics of the rules

The precedent steps addressed a variety of incentives which result from the characteristics of the goods and services, and from those of the arena of actors. There is another category of incentives very closely linked to these factors: the characteristics of the rules with regard to resource management in the respective society.

Typically, management rules specify the way goods and services are to (or may) be used, as well as maintenance and preservation measures that are to be conducted.



Often, management rules contradict an individual's strive for short-term personal benefits. Thus, these rules need an explicit enforcement. This means, they have to be complemented by matching implementation and enforcement mechanisms such as sanctions imposed in the case of non-compliance.

The effectiveness of enforcement mechanisms, in turn, depends on the characteristics of the community (see Step 3). In social contexts where people do not trust in others' compli-

ance with the rules in place, incentives to respect these rules are weak. By contrast, communities with a strong social cohesion might have a strong ability to enforce norms and rules, as every group member knows and respects the sanctions imposed by the community.

Both examples - the Lesotho land management issue and also the Honduras forestry case - illustrate that the common pool character of the goods and services, the lack of cohesion and homogeneity are not the only factors that guide the actual overexploitation of resources. The legal situation is closely interlinked with these aspects, and in many cases there are no rules that coordinate the management of public or common pool goods. For a sustainable collective management of resources, however, it is mandatory that all users collaborate e. g., by means of agreements, bargaining, regulations and sanctions. Consequently, rules - any kind of working rules - are particularly important in the case of common pool and public goods.

In some cases however, e. g., in the Lesotho example, rule systems are contradictory, and/or existing rules are not put into action. Legal uncertainty often leads to rent-seeking and resource overexploitation due to tenure insecurity - for an individual user, investments will probably not pay anyway. At the same time, people who disrespect the rules do not face any punishment due to the lack of actual enforcement. Again, these are very strong disincentives for a sustainable use of resources. Quite the contrary, these incentives support short term utility maximisation.

The following properties have a particularly strong impact as incentives:

- I. the formality of rules – are the rules *formal* or *non-formal*?
- II. their actual impact on people's behaviour – are these *working* or *non-working* rules?
- III. the type of rules, i. e., the level of human interactions that these rules address – are we talking about (i) *operational*, (ii) *collective decision-making*, or (iii) *constitutional* rules?
- IV. the actual *content* – do these rules *make sense* from the applicants' point of view?

It might not make a difference for people's actual behaviour if rules are formal, i. e., codified, issued by a legislative process or formal decree, or if they are non-formal, i. e. unwritten and customary. However, in some cases codified and customary rules on the same issue might exist simultaneously, but are conflicting or contradictory. Some of them might be enforced while others are not. To understand the incentive mechanisms that result from this situation, a differentiation between these categories of rules seems helpful.

Rules with regard to a particular issue can be displayed in a table to get an overview of the actual legal situation. Table 2 shows the example – again simplified – of the Lesotho land management⁷ case.

	enforcement	working	non-working
<i>formality</i>			
<i>formal</i> (Land Act 1979)		–	Land is held by the king as the representative of the Basotho nation. He delegates rights to village development councils.
<i>non-formal</i>		–	Land is held by the king who delegates rights to the chiefs and elders.

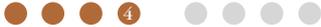
Table 2 indicates that there are no rules which are reliably put into action. Even though traditional and constitutional rules coincide – both give all property rights on land to the king who may delegate them –, rules are not enforced or are applied in an arbitrary way, due to the lack of capacities and coordination of the public authorities.

◀ EXAMPLE

9

Table 2:
Codification
and actual
enforcement
of land rights
in Lesotho

⁷ Leupolt 2003: *Debriefing; Report of the Land Policy Review Commission 2000*



In addition, conflicts arise between chiefs and village development councils. According to the traditional law, chiefs were quite influential and played a strong part. The new formal Land Act, though, removes this power from the chiefs and gives it to the development councils. Consequently, chiefs are not motivated at all to collaborate in the enforcement of the new land legislation.

Moreover, the existing rules are poorly elaborated and leave ample scope for personal interpretation. This scope is utilised arbitrarily at best. Due to this insecurity, land has become an open access resource. Users do not expect any sanctions or interventions from the authorities and thus try to exploit the land, disregarding the rules.

Rules refer to people's behaviour at different levels:

- ▲ on an **operational** level – these rules describe technical aspects of resource management; they specify e. g., open and closed seasons, limitations to water extraction from a river, or techniques used for harvesting;

- ▲ on the **collective decision-making** level – who has the right to determine operational rules? Is this a group or a single person? And what is the procedure to make, modify or revoke operational rules? On a local level, collective decision-making rules address e. g., the way a village assembly or a user association works. On a national level, the rules may e. g., prescribe legislative procedures in a parliament. Are decisions made by a single person, by unanimity or by a majority?

Rules on collective decision-making are closely linked to the exchange relationships between actors and the corresponding governance mechanisms (see Step 3).

- ▲ on a **constitutional** level. These rules prescribe how the rules on collective decision-making can be made or changed. Who determines whether a problem is to be addressed by an autocratic, majority or unanimous decision? How are individuals identified who become members of a parliament, of an assembly, or an autocratic leader? Who can change this procedure, and at what point of time? And e. g., who elaborates the essential characteristics of multilateral conventions and treaties, in order to be binding under international law?

Obviously, the **contents** particularly of operational rules have impacts as well. Rules that people do not consider reasonable, or technically inappropriate rules, tend to be disregarded. By contrast, working rules based on outdated beliefs about resource management often contradict the more recent notions of sustainable development. In addition, it is understood that rules should take into account both the characteristics of the good and the community.

In many cases the nature and the properties of existing rules contribute to an actual overuse of natural resources. Generally, it is easier to change operational rules than to modify collective decision-making or even constitutional rules. Any modification, however, requires expenses of different kinds – time, effort, and money – i. e., transaction costs;



- ▶ to develop and bargain rules that are accepted by all stakeholders
- ▶ to formalise, i. e., codify the modified rules, if necessary
- ▶ to implement the rules
- ▶ to enforce and monitor compliance
- ▶ to resolve arising conflicts.

The expected transaction costs in turn are an incentive that influences whether people consider the modification of rules feasible or not.

SUMMARY

Step 4 *Incentives - characteristics of the rules*

- I. Which rules exist with regard to resource use?
- II. Are these rules formal or non-formal? Are they contradictory?
- III. Are the rules working or non-working?
- IV. Do they address operational, collective decision-making or constitutional issues?
- V. Particularly relevant for operational rules: Do people consider these rules as technically appropriate and reasonable? Who disregards these rules for inappropriateness?
- VI. Which transaction costs are to be expected in order to modify rules?

Conclusions: Incentive analysis

Figure 4 summarises the types of incentives that affect people's behaviour with regard to resource use. Which incentives stimulate cooperative behaviour and compliance with rules? Which conditions foster an overexploitation of resources or rent-seeking behaviour?

A synopsis of these factors shows us the bigger picture, and may help to appraise the overall impact of single incentives. In actuality, incentives are often competing and conflicting. Which incentives are dominant? Which overall picture do we get?

We can then draw conclusions with regard to potential measures to modify incentives and to stimulate particular behaviour patterns. Is it the contents of the rules or rather the lack of enforcement that leads to unsustainable practices? Are there information and power asymmetries or one-way relationships that give people an easy opportunity to maximise personal rents?

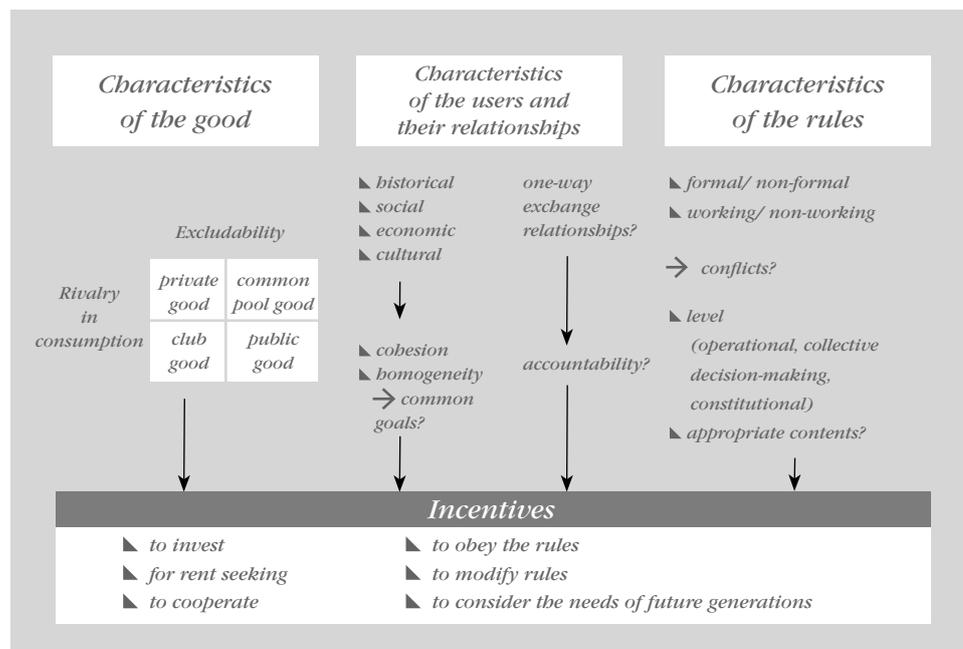


Fig. 4:
Incentives overview

SUMMARY

Conclusions | Step 2 - | Step 4 : Incentives overview

- ▲ Which incentives stimulate a sustainable use of natural resources?
- ▲ Which incentives thwart sustainable management practices?
- ▲ Which incentives are dominant?
- ▲ What is the overall picture that we get?

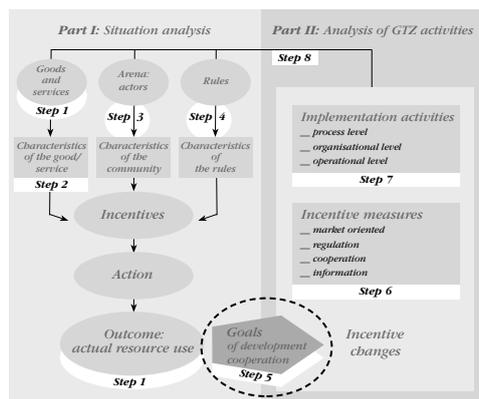
Part II: Analysis of GTZ-activities

How can management practices be influenced in a way that ensures sustainable livelihoods? Which incentives have to be modified to change the behaviour of resource users?

This chapter addresses the second part of our analytical framework (see Fig. 1). It deals with GTZ interventions, advisory services and other development cooperation activities. In the following sections, we take an *ex ante* perspective to describe the analytical procedure. As mentioned before, all these steps can be applied at any time during the project and also for an *ex post* evaluation of an undertaking (see also case study p. 52 ff.).

Step 5 Identifying goals and objectives

So far, our framework and the analytical steps we introduced did not imply normative goals. Obviously though, if we call something 'a problem' this does include an



act of normative evaluation. But apart from that, in the first part of the framework we wanted to describe, explain and understand, but not to evaluate incentive mechanisms.

However, actual GTZ work has to know where it heads for. It does ask for targets and objectives. Active governance of natural resource management needs a reference value. Projects and programmes in development cooperation thus have normative goals.

For GTZ, the Federal Ministry of Economic Cooperation and Development (BMZ) together with the partner countries define these reference values.

For BMZ, development cooperation is global structural policy.⁸ Its overarching goal is sustainable development, characterised by its four dimensions⁹:

- ▲ social justice
- ▲ economic efficiency
- ▲ ecological sustainability
- ▲ political stability.

The main targets of development policy include poverty reduction, safeguarding peace and a fair globalisation. In addition, the German Development Cooperation is guided by international agreements, conventions and treaties such as the Millennium

⁸ www.bmz.de/themen/Motive/Ansaeetze

⁹ www.bmz.de/de/service/infotbek/bildung/unterricht/GR_13.PDF

Development Goals.¹⁰ These Goals explicitly mention environmental sustainability. Their main focus rests on the eradication of hunger and extreme poverty, and on a global development partnership. But they also define minimum standards for health and primary education.

All these guiding lines are rather unspecific and do not really help to design and to specify governance measures for resource management. However, BMZ's criteria for 'good governance'¹¹ explain the normative goals of German development cooperation in more detail. These criteria include:

- I. respecting human rights
- II. the participation of the population in political processes and decision making
- III. rule of law and legal certainty
- IV. market organisation according to the concept of social market economy
- V. development as a guiding principle of governmental activities.

In addition, according to OECD (1999 p. 68) incentives measures should meet the following formal criteria:

- ▶ impacts should be predictable
- ▶ measures should conform to the precautionary principle
- ▶ be politically acceptable
- ▶ easily adaptable
- ▶ and feasible with regard to administration.

The overall objectives of a project and the objectives of the phase or programme component under review are normally formulated according to these general guiding principles.

At this point of analysis, it is important to reflect the actual – although still somewhat unspecific – objectives of a project, and to be able to compare these goals to the principles set by BMZ, the partner countries, or international organisations. An operationalisation of project goals is not essential for an analysis according to our framework, though.

We thus ask for both the contents and formal features of the incentive measures we would like to implement in order to govern resource use behaviour: Which is the direction we want to head for – how should the ideal resource use be like? And: how do incentive measures have to be designed in order to be appropriate and feasible?

EXAMPLE ▶
10

The overall goal of the Honduran social forestry programme is formulated as follows: "Actors in the agricultural and forestry sector manage the Honduran forests and nature reserves in a sustainable way according to the guidelines of a concerted forest policy."¹² This goal implies the principle of sustainability. It also suggests an elaborati-

¹⁰ <http://www.bmz.de/themen/motive/entwicklungspolZiele/International/grundsuetze202.html>
<http://www.un.org/millenniumgoals/>

¹¹ <http://www.bmz.de/de/service/infothek/fach/spezial/spezial044/a2.html>

¹² see Simon 2000, project implementation offer: Social Forestry Programme

¹³ see Leupolt 2000, project implementation offer: capacity development and land management in Lesotho

on of comprehensive rules for forest management acceptable for all stakeholders.

In the Lesotho project, sustainability is also the overall concept, alongside with the formal goal to reach a sound legal basis of land policy: "Management-, planning- and discursive capacities of institutions and the local population are developed and the necessary preconditions for a sustainable and legally sound land management are established."¹³

In this case, capacity development is emphasised, as management and planning capacities are considered crucial for long-term sustainable land use. In contrast, in Honduras the elaboration of specific guidelines for forestry is part of the project core, and capacity development is considered only to a lesser degree.

SUMMARY

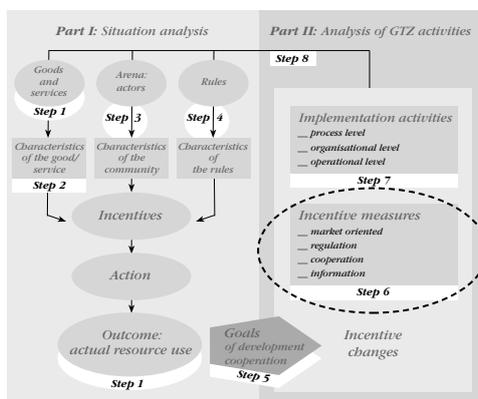
Step 5 Objectives

- I. Which are the overall goals of the project/programme?
- II. Are these goals consistent with the relevant principles identified by BMZ, OECD etc., e. g., the Millennium Development Goals?

Step 6 Identifying alternative incentives

The next step requires the concrete design of institutional changes: Which incentives could motivate resource users and other actors to change their behaviour according to the above mentioned goals?

Ideally, this step draws on the insights we gained from the first steps of our analysis: Which incentives have been lacking so far that could motivate people to act according to the goals? Are there any adverse incentives that need to be removed? Both



in literature (e. g., OECD 1996; OECD 1999) and in practice we find a multitude of suggested incentive measures. Participatory methods can help to keep a sense of reality, and are likely to improve social acceptance of these measures.

Generally, we have to be aware that;

► Incentive measures should be adapted to the character of the good. The sustainable management of a private good – as opposed to, say, a common pool good – requires different kinds of incentives. In some cases, sustainable practices with regard to private goods can be stimulated by *information* and *training*: Owners of these goods are likely to use alternative management techniques

– requires different kinds of incentives. In some cases, sustainable practices with regard to private goods can be stimulated by *information* and *training*: Owners of these goods are likely to use alternative management techniques

whenever they know that these techniques enhance efficiency, and that they will profit from these efficiency gains. In the case of common pool goods, in contrast, information on more efficient techniques often has to be complemented by additional incentives.

▲ There are three basic approaches to face problems of open access with common pool or public goods. In practice, these approaches may be combined or complemented by additional measures:

I. ▲ Goods may be privatised. Use and management patterns then result from market-based and other incentives in place – including social stimuli such as reputation;

II. ▲ Management rules can be developed and set into action by hierarchical structures such as governments or bureaucracy. Incentives most likely result from the avoidance of sanctions and penalties;

III. ▲ Management rules may be negotiated and implemented by user communities. Incentives then depend largely on the characteristics of the community (see Step 3).

▲ Institutional modifications should always refer to existing institutions, and take them as a starting point. This holds true for both the creation of rules and the development of organisations. Small changes of existing institutions are often much easier to accept. They tend to last longer than institutions which are established from scratch.

In the context of GTZ projects, there is another important aspect we have to take into account: Which are the actors we want to address? Whose behaviour is to be stimulated by the incentives?

As outlined above, there are often quite a few actors involved in a resource management problem. In GTZ language they are called target groups and intermediaries (see Comment # 6). In Step 3 of our analytical framework, we identified the relevant actors and their role with regard to resource management. We now have to decide whose behaviour is to be influenced by additional, new or modified incentives. Is it the whole arena, including all stakeholders and also the actors that are not directly involved such as the public authorities, that is going to be addressed? Or does the project rather focus on the behaviour of single actors?

Table 3 gives an overview of incentive measures that potentially stimulate people's behaviour. There are four different categories of measures:

I. ▲ **market-based incentives**, i. e., measures that have an impact on people's activities on markets, normally via the price mechanism

II. ▲ **regulation**, i. e., governmental interventions or command and control measures that define the legal framework

III. ▲ **cooperation**, i. e., measures that motivate people to change their resource use patterns by giving them the opportunity to participate in the decision making and governance processes

IV. ▲ **information-based incentives**, i. e., measures that make externalities visible and thus help people understand the actual benefits and costs of particular management techniques.

Category	Market oriented incentives	Regulations	Cooperation	Information
Impacts	<ul style="list-style-type: none"> ▶ might change character of the goods and services ▶ may have an impact on the attributes of the community (distribution of income) ▶ might alter characteristics of the rules 	<ul style="list-style-type: none"> ▶ might change character of the goods and services ▶ might alter characteristics of the rules 	<ul style="list-style-type: none"> ▶ framework building ▶ reduction of uncertainty ▶ reduction of transaction costs ▶ may have an impact on the characteristics of the community 	
	<ul style="list-style-type: none"> ▶ assignment of property rights ▶ creation of markets ▶ market protection through tariffs 	<ul style="list-style-type: none"> ▶ fines ▶ liability for damages 	<ul style="list-style-type: none"> ▶ capacity building ▶ audits 	
Examples	<ul style="list-style-type: none"> ▶ fees ▶ charges ▶ user taxes ▶ tax exemptions 	<ul style="list-style-type: none"> ▶ standards ▶ best practices 	<ul style="list-style-type: none"> ▶ cooperation management ▶ roundtables etc. 	<ul style="list-style-type: none"> ▶ information on externalities, legal situation, property rights etc.
	<ul style="list-style-type: none"> ▶ performance bonds ▶ refund systems 	<ul style="list-style-type: none"> ▶ common burden taxes 	<ul style="list-style-type: none"> ▶ conflict management 	<ul style="list-style-type: none"> ▶ economic valuation ▶ cost benefit analysis
	<ul style="list-style-type: none"> ▶ individual tradable quotas (ITQs) ▶ tradable permits 	<ul style="list-style-type: none"> ▶ exclusion of particular groups of users ▶ non-tariff market protection 	<ul style="list-style-type: none"> ▶ stakeholder alliances 	<ul style="list-style-type: none"> ▶ labelling ▶ signalling ▶ certification
	<ul style="list-style-type: none"> ▶ facilitate market access 	<ul style="list-style-type: none"> ▶ access restrictions ▶ moratoria 		<ul style="list-style-type: none"> ▶ accounting for non monetary values
	<ul style="list-style-type: none"> ▶ subsidies to inputs ▶ market support 	<ul style="list-style-type: none"> ▶ publicly financed maintenance measures incl. maintenance contracts for conservation 	<ul style="list-style-type: none"> ▶ stakeholder participation ▶ preference elicitation 	
	<ul style="list-style-type: none"> ▶ reform and removal of adverse subsidies 	<ul style="list-style-type: none"> ▶ common property management by publicly financed agents 		<ul style="list-style-type: none"> ▶ technology transfer
	<ul style="list-style-type: none"> ▶ revenue sharing 	<ul style="list-style-type: none"> ▶ tariff design ▶ minimum and maximum prices 		<ul style="list-style-type: none"> ▶ information and measuring systems
	<ul style="list-style-type: none"> ▶ payments for environmental services 	<ul style="list-style-type: none"> ▶ direct income support 		

Table 3:
Incentive measures -
an overview

Source: own presentation based on OECD 1999; OECD 1996; Swallow & Bromley 1995; Klarer 1999; Petersen & Sandhøvel 2001; Brown 2000; Bizer et al. 1994; Paulus 1995.

Some of the market-based measures displayed in Table 3 are now explained in more detail:

- ▶ The *creation of markets* implies that for new products the sales potential on local, national or even international markets is being identified and made accessible. These new products might include smaller commodities such as candles made from herbal waxes by Guatemalan peasants, or artisanal paper products, but also services in (eco-)tourism.
- ▶ *Performance bonds* help ensure that contracts are accomplished by both parties. The agent (or concessionaire) gives some kind of security, a bond, to the principal. If the contract is fulfilled – e. g., an ecosystem has been restored by the concessionaire after a period of mining – the collateral is given back to the agent.
- ▶ *Access to markets* can be facilitated by the provision of infrastructure e. g., road construction. This means that costs to sell products on a market are considerably reduced. This measure is – similar to a few others listed in this category – a *subsidy*, i. e., financial assistance, normally provided by the government, without direct returns to the donor.
- ▶ *Factor prices*, that is, prices of the inputs necessary to produce a good, e. g., raw material, labour, machinery, can also be reduced by *subsidies*. The final products thus can be sold at a lower price and are more competitive.
- ▶ *Market support* implies that activities on markets such as export are encouraged. This is applicable e. g., when world prices are lower than domestic prices. If sellers are paid the difference between world and domestic prices, their losses can be reduced, and export is stimulated.
- ▶ *Revenue sharing* is also an incentive to fulfil contracts and to adopt the most efficient strategies.

Regulation measures include, e. g.:

- ▶ *taxes*, if they are based on the principle of common burden, i. e., if not only the users of a particular resource are charged. These taxes do not necessarily have a stimulating impact. In some cases they might even hamper sustainable use if taxpayers feel that by paying the tax, they have acquired the right to use as much of the good as they like.
- ▶ *access restrictions* such as regulations in nature reserves, open and closed seasons, or the total allowable catch (TAC) that defines the portion of a stock that can be legally extracted per unit of time
- ▶ *moratoria*, that means, rules that prohibit the use of a particular resource for a given period of time, e. g., the moratorium on commercial whaling
- ▶ *non-tariff market protection* e. g., by regulations on import, excludes participants from domestic markets whose products do not fulfil qualitative criteria, e. g., with regard to social and ecological standards
- ▶ *direct income support* which does not necessarily direct people's behaviour in a very specific way, but which can e. g., help smallholders to keep their farming systems. After an initial stage of implementation e. g., by a government, market-oriented incentives do not require permanent central coordination. Transaction costs of market-

oriented incentives thus tend to be relatively low, taking effect wherever they lead to efficiency gains. For this reason, development cooperation policy has been promoting this type of measures for a long time. The command-and-control approach, in contrast, being less flexible, rather costly, and relying on the standing of central governments, appeared less favourable. However, market-oriented incentives always need to be supported by a regulatory and legal framework (see Comment Boxes 9 and 10).

Moreover, it is evident that one single type of incentive cannot suffice to address all actors and stakeholders. Therefore, combinations of incentives should be applied to provide stimulating factors for all actors including not only users, but also public authorities, governments and companies.

*The impact of **market-oriented incentives** is mainly based on the influence of these measures on **prices**. Price changes can lead investments, management and consumption patterns towards a more sustainable resource use. The more expensive the consumption of a good is, the higher people's motivation to use the good in an economical and efficient way. This stimulates investments in new, more efficient technology.*

*Market-oriented measures often aim to reflect the 'true' prices of goods and services on the market. 'True' pricing means that **all** costs and benefits of resource use should be included into price calculations.*

As an example we can think of diesel combustion. Emissions are pollutants that lead to a decrease in air quality and, in addition, contribute to the greenhouse effect. Prices might be calculated so to reflect the actual social costs of diesel use. Higher diesel prices would then be an incentive to invest in more efficient technology and thus to reduce diesel consumption. Theoretically, surpluses resulting from higher fuel prices could be allocated e.g., to air purification measures.

*Often however, market-oriented incentives are not precisely based on actual costs, as information on the 'true' benefits and costs, i. e., on social benefits and costs, is scarce. **Indirect measures**, though, can also alter costs and benefits and thus act as incentives. Indirect measures are, e. g.,*

- ▶ *subsidies and the removal of subsidies*
- ▶ *support to market access such as publicly financed road construction*
- ▶ *the creation of markets, e. g., support for ecotourism*
- ▶ *user taxes, fees and charges.*

A precondition for these incentives to take effect is the legislative and regulative framework. People need certainty that in the future they will be in the position to profit from their investments. The assignment and enforcement of property rights are particularly relevant in this context. For example, tenure security is a strong



Comment 9

motivation to adopt sustainable management strategies. Assigning property rights thus contributes to the effectiveness of market-oriented incentives.

This does not necessarily imply privatisation. A careful definition and arrangement of property rights within a collective management system can also produce strong incentives. Revenue sharing might be an appropriate incentive to fulfil contracts in the most efficient way.

Additional explanations and case studies with regard to market-oriented incentives can be found e. g., in Paulus 1995; Bizer et al. 1994; OECD 1996; OECD 1999.

EXAMPLE ►
11

In Lesotho, land is *de facto* an open access resource. Enhanced by extreme poverty and scarcity of resources, this fact encourages an uncontrollable overexploitation of land (see above). On this background, land privatisation seems an appropriate measure. Ensuring the reliability of property rights might serve as an incentive for farmers to employ more sustainable management techniques, since tenure security leads to an increased probability that in a future, users can benefit from their investments. In this case, market-based incentives are thus used to reduce ‘investment risks’. However, these market-based measures need an adequate framing, namely regulation and cooperation activities, that ensure the collaboration of both public authorities and the population with regard to the reliable enforcement of rights.

Comment 10



Regulatory interventions are a precondition for the existence of well-functioning markets. For example, legal regulations are often essential to carry out privatisation measures. Building a framework for markets includes (see Table 3):

- ▲ defining standards, norms, and best practices
- ▲ setting sanctions and fines, and determining liability rules
- ▲ protecting markets e. g., through social or ecological standards.

Command-and-control approaches can not only support market-oriented incentives. They can also replace these measures, e. g., when conservation measures are publicly financed. The provision of funding implies an incentive for the public to maintain its property. However, public financing does not necessarily impede free-riding behaviour of individual users.

Comment 11



Measures that facilitate cooperation between actors can also stimulate a change in resource use behaviour. **Stakeholder participation** often has a very positive impact, fosters acceptance and hence the actual enforcement of measures. In addition, the cooperation of stakeholders in public decision-making helps to identify feasible solutions in the local context.

The concept of “stakeholder participation” is often used in a very wide sense, ran-

ging from simply informing the actors to an independent decision-making and implementation by the stakeholders. Generally, incentives to cooperate and to comply with rules will be stronger, the higher the participatory involvement of the actors.

In many cases, weaker actors can grow more influential when collaborating with others. **Alliances** between stakeholders can thus change power relations and influence the relationships between actors (see Comment # 7). The reduction of power imbalances is an incentive to engage, e. g., to call for accountability and the compliance with rules. Formerly weaker actors thus can initiate and put forward changes with regard to the characteristics of the community and the rules.

Conflict management also contributes to an improved effectiveness of market-oriented and regulatory measures.

There is a wide variety of incentives related to **information** (see Table 3) that may serve various purposes. When managing private goods, **training and information on efficient technology and management techniques** directly provide incentives since the user is likely to profit from the efficiency gains herself.

The **elicitation of information as a basis for policy making** is another group of incentives in this category. Data on the valuation of goods and services, on the population's preferences and also on the non-monetary values of environmental goods may inform political decisions that are more likely to be accepted by the stakeholders.

Databases, land registers and geographical information systems (GIS) **facilitate the enforcement** of rules and regulations.

Informational incentives thus can have three different kinds of impacts:

- ▶ information can help users to manage their private property in a more efficient and sustainable way
- ▶ information can support political decision making, providing data on public preferences, costs and benefits of goods and services
- ▶ information can facilitate the enforcement of rules.

In Lesotho, privatisation of land is complemented by measures including;

- I. participatory land use planning and democratic approaches to decision making (cooperation),
- II. awareness raising and information on rights to land, especially addressing women (information),
- III. preparation of a national information system on land titles (land register: information).

◀ EXAMPLE
12

EXAMPLE ►
13

The social forestry programme in Gualaco promotes a combination of cooperation, market-based and regulation measures to support a sustainable management of forest resources.

The Local Forestry Forum is meant to institutionalise the cooperation efforts of stakeholders. This Forum, open to all actors, facilitates the discourse on and the coordination of forest-related issues. Conflict management, the opportunity to participate in decision-making, and an increase in transparency are thought of incentives for actors to respect the official management plans.

The well-defined assignment of property rights seems essential and paramount. So far, perceptions of the population, the formal legal situation, and actual practices have been differing considerably. As a consequence, forest resources have become an open access resource, appropriated by the most powerful actor at a time. However, the local population suffers from this situation and considers it most unfair (see e. g., Kosmus, Birner & Uebelhör 2002). Assigning property rights can help

- ▶ create legal certainty and thus a basis for investments in collective management systems (community forestry). In this case, incentives are not based on privatisation, but on the assignment of rights to groups;

- ▶ initiate revenue flows, resulting from the concession fees paid to the authorities, to the communities, e. g., by financing infrastructure. Local communities could thus benefit from the revenues generated by the auctions.

Unambiguous rules and their enforcement can act as disincentives for the illegal and extralegal exploitation of forests. In other words: A regulatory framework that empowers weaker actors to call for their rights is a precondition for meeting the project's objectives. Additional market-oriented incentives could take effect in the future, e. g., when implementing payment schemes for environmental services.

Comment 12



Why do we suggest to classify incentive measures this way? From the analysis of the status quo and the incentives in place (Part I of the conceptual framework) we want to deduce measures suitable for changing mechanisms in a way that fosters sustainable development. This requires a 'mental map' of potential measures and interventions.

In addition, a classification of incentives may help to get an overview of GTZ activities in this field of action. We thus can identify actual focal points and priorities, compare them to the overall goals as described in Step 5, and also to long term strategic settings in development cooperation.

Comment 13



Which type of incentive measures is suitable for which kind of good? Table 4 offers a - somewhat stereotype - overview.

<i>incentives</i>	<i>private goods</i>	<i>collective goods</i>		
		<i>club goods</i>	<i>common pool goods</i>	<i>public goods</i>
<i>market oriented</i>	<i>creation of markets</i>	<i>assignment of property rights, privatisation</i>		
	<i>market protection (tariffs), facilitate market access, market support, subsidies</i>	<i>ITQs, tradable permits</i>		
		<i>user fees and charges, tax exemptions</i>		
	<i>performance bonds</i>	<i>payments for environmental services, creation of markets for environmental services, compensations</i>		
<i>regulation</i>	<i>market regulation, non-tariff market protection</i>	<i>access restrictions, moratoria</i>		
		<i>publicly financed conservation measures, management by publicly financed agents</i>		
<i>cooperation</i>		<i>stakeholder participation, community-based management</i>		
		<i>cooperation management (roundtables, boards, ..)</i>		
		<i>stakeholder alliances</i>		
<i>information</i>	<i>labelling, signalling, certification</i>	<i>elicitation of preferences for non-market goods evaluate non-monetary values</i>		
	<i>technology transfer</i>			

Table 4:
Incentive measures and their suitability for different types of goods

Table 4 covers the incentives listed in Table 3. For simplicity, we did not include incentives from Table 3 which are suitable for all types of goods such as

▀ revenue sharing ▀ fines, liability for damages ▀ tariff design, setting minimum and maximum prices ▀ information on externalities, the legal situation etc. ▀ economic valuation and cost-benefit-analysis ▀ conflict management ▀ capacity building ▀ development of information and measuring systems ▀ audits.

In Lesotho (see above, Example # 11), land originally was a common pool resource. Due to squatting, land has become a private good. However, tenure security does not exist, and land users feel extremely uncertain about their future opportunities to benefit from their investments. Under these circumstances, **privatisation** may be an appropriate approach. During the transition phase of privatisation,

supporting **cooperation** and **information** measures are particularly important. Participatory planning, information about the legal situation and property rights, but also the establishment of well-working land registers might help considerably to successfully privatise the land resources.

The Gualaco social forestry project mainly involves **cooperation** measures. Roundtables, conflict management and stakeholder alliances are planned to stop the overexploitation of common pool resources, which is currently undertaken by the more powerful stakeholders (see Example # 13).

The classification shown in Table 4 is quite stereotyped however, and by no means exhaustive:

▲ Measures which are described as suitable for private goods often do not aim at a governance of this particular good. These measures are meant to change use patterns with regard to other goods and services which are affected by the production or the transport and distribution of the private good. For example, certificates often warrant an ecologically acceptable, resource-friendly production of commodities such as timber, flowers, or agricultural produce. A government may subsidise market access to foster competitiveness of products whose externalities are socially desirable. Alternative livelihoods may thus be encouraged, and ecologically harmful practices, e. g., slash and burn agriculture, are reduced. In these cases, market support with regard to a **private** good has an impact as an incentive for the sustainable management of e. g., forest-related goods, which often are **public** or **common pool goods**.

▲ Some of the measures classified in Table 4 can easily be applied to other types of goods as well. For example, certification is not only an important tool in marketing **private**, but also **common pool goods**. Often though, measures are particularly relevant for a specific type of good. That is why we put them into a category where they seem to fit best.

SUMMARY

Step 6 Incentive mechanisms

Based on the incentive analysis (Steps 2-4):

Which incentives can help to

- I. restrict unsustainable resource use
- II. enhance sustainable resource management?

Are these market-oriented, regulation, cooperation or information-related incentives?

Which combinations appear helpful?



Again, a classification of activities can help to identify actual focal points of GTZ project work, and to compare them to the overall goals. Relevant questions include:

- ▲ What is the subject of advisory services? Are these technical issues, e. g. addressing the efficient use of energy or irrigation water in the field? Does cooperation thus mainly focus on operational issues? Or does it rather focus on processes, management and organisation, or regulatory issues?
- ▲ Do these activities match the *status quo*? Are they adapted to the situation as analysed in Steps 2 to 4?
- ▲ Are the suggested incentives actually going to be implemented? Does the project provide for measures to empower organisations to set incentives into action and to enforce rules? In other words: Does the project take into account the preconditions on an organisational level?
- ▲ Who is the addressee of the advisory services – the local population, public authorities, or a government? Do the impacts of consultancy “trickle down” to the target group?

In this context, it might be interesting to distinguish between technical advice to *resource users* and to *organisations*. The former normally takes place on a local level. Typical cases include community forestry projects, e. g., the social forestry programme in Honduras.

Advisory services to organisations often take place on a district or even national level. Here, it could be instructive to check whether these organisations – in GTZ language called ‘intermediaries’ – manage to translate their lessons learned into actual incentive changes, and thus pass the impacts of GTZ cooperation on to the resource users.

In some cases, GTZ activities focus on connecting stakeholders, information of the general public, or facilitating networks. These measures create incentives e. g., to employ certain techniques in natural resource management. They could also encourage citizens to call for their rights.

Generally, a variety of other potential activities exists such as basket funding. If necessary, the conceptual framework can easily be expanded to integrate additional cooperation types.

EXAMPLE ►

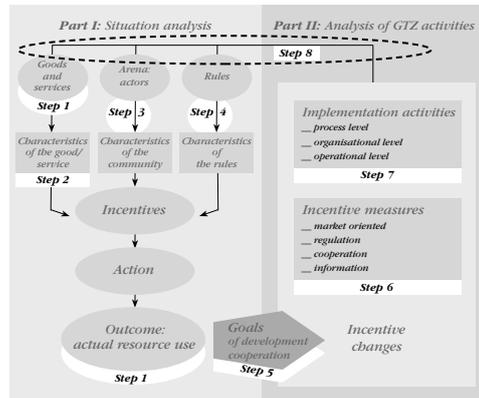
14

In Gualaco, Honduras, a smaller part of activities resulted in *financial assistance*, namely financial support to the municipal environmental administration and to small-scale timber industries for the introduction of more sustainable technologies. The main part of the activities consisted in *advisory services* on an *organisational level*:

- ▲ *regulatory policy advice* to the forest administration; this includes the development of land use and management plans, creating a legal basis for access rights of the local population to state forest;
- ▲ *advisory services on management and organisation* to the municipal environmental administration;
- ▲ *advisory services on management and organisation* to the Local Forestry Forum, particularly to empower weaker actors;

Step 8 Feedback: Project impacts

What are the actual impacts of the planned and implemented measures? Do they move resource management towards the overall goals (see Step 5)? Are essential incentives still lacking? Are there adverse incentives that hamper sustainable development?



An assessment of project impacts that can claim to be comprehensive is a very complex exercise. Only in a few cases a complete impact evaluation will be feasible. However, in many cases a simple comparison between (i) the starting position, (ii) the goals, (iii) the implemented incentive changes and (iv) the situation after completion of

the project is instructive. Figure 1 and Table 3 depict how measures can impact the *status quo*. These feedbacks then lead to a modification of the *status quo*, which in turn is to be examined for the incentives now prevailing. Central questions include;

▲ In which respect do cooperation activities influence the characteristics of (i) the good, (ii) the community and (iii) the rules?

In the majority of projects, activities aim at strengthening the rules that guide sustainable resource management (see also Table 3). They help organisations to enforce rules, or to eliminate conflicts and contradictions between rules. However, measures that have an impact on the characteristics of the community also exist, e. g., where the political power of women or minorities increases due to cooperation interventions. The characteristics of goods and services can also be altered, e. g., by privatisation.

▲ Which incentive mechanisms do operate in the new situation?

▲ Do the modifications help to govern user behaviour in an effective way and into the desired direction?

▲ Which additional measures are needed to complement the now prevailing incentives?

▲ Which incentive mechanisms have still to be changed?

EXAMPLE ►

16

One main goal of the Gualaco project was to establish stakeholder cooperation in the Local Forestry Forum. The Forum was meant to be a roundtable for all stakeholders, including timber companies and the local forest administration. However, only some of the actors are represented in the Forum on a regular basis. Particularly stronger actors who usurp state resources by violent means do not participate in the Forum.

Obviously, there is a lack of incentives that could motivate timber companies to col-

laborate. As a matter of course, they expect their present access to timber and their benefits to be constrained by the roundtable of stakeholders, and do not perceive any advantages in collaborating with the representatives of the smallholders. Forest administration staff in turn, who potentially may tend to accept bribes, benefit from the present situation, too. They are not interested in increased transparency and participation of the local population, either. In addition, opportunities of the Forum members to express their demands and to negotiate on conflicts are very limited due to threats of violence by the more powerful actors.

The project aims to modify the *characteristics of the goods* and the *rules* in place: forest-related goods, i. e., open access resources, are planned to be transformed to well-specified private and common pool goods. Legal conditions and management plans are to be elaborated jointly by the stakeholders and enforced in a reliable way. The project also attempts to change the social structure of the arena of actors. However, altering the *characteristics of a community* tends to be a long-term process. In Gualaco, power imbalances between actors are most significant. Thus incentive changes, e. g., the assignment of property rights to groups are not likely to take immediate effect.

As a conclusion, we can state that decreasing power imbalances – which act as incentives to overexploit the forest – is an essential precondition for the effectiveness of further interventions. If and how GTZ activities can contribute to mitigate these differences in Gualaco is still an open question. Maybe it could have been more helpful to use a yet existing institution that has already involved the stronger actors as a starting point for the roundtable, rather than trying to create a new institution from scratch. The Forestry Forum, established some years ago, has not proved attractive so far to motivate representatives of the authorities, timber companies and livestock keepers to engage in regular cooperation.

In Lesotho, the local population was apparently willing to participate in the policy review process on both the local and the national level. Due to their personal disastrous situation, people were motivated to invest time, money and personal effort to improve land management. The Land Policy Review Commission consisted of representatives of the stakeholders from all strata. For the members, personal incentives to cooperate were strong, presumably because a new land policy stood for a win-win-situation most stakeholders would benefit from. Probably for the same reasons, public hearings and other participative approaches proved successful too. These operational and organisational activities thus seemed to be appropriate in this context.

Actual policy changes were slow, though. According to the GTZ report this was due to the lack of commitment of the respective ministry. Apparently, the institutional and political capacities of governmental organisations were the weakest link in the land policy reform chain. As a consequence, attempts to modify operational and decision-making rules were successful only to a limited extent. A reformed land policy has been neither formalised nor implemented so far.

◀ EXAMPLE

17

The goal to develop capacities of commission members and local population was reached, however. In contrast, it proved much more difficult to foster these competences of the public authorities staff. This was presumably because personal and institutional incentives to stick to the former legal situation were rather strong. Adverse incentives that prevent land reform should be scrutinised thoroughly in order to develop measures that motivate members of governmental bodies to engage in a more sustainable land management.

In addition, the lack of actual outcomes of the population's participation in the planning process might lead to a decreasing motivation and thus put at risk the previous success in capacity development.

EXAMPLE ►
18

Do the Lesotho and the Honduras cases have anything in common, as suggested in the beginning (see Comment # 1)?

In both projects, problems of open access to natural resources are a key issue. In Lesotho, it is the property of the king while in Honduras it is state property which becomes a common pool resource due to the lack of enforcement of existing regulations and contradictory formal and informal rules. De facto, restrictions to access and management plans that aim at sustainable development are non-existent in both cases.

These examples indicate that especially for state property or similar property types unambiguous, explicit rules have to be defined and implemented. Formal rules that leave ample scope for interpretation stimulate the development of informal rules. In Gualaco e. g., the local population claims customary rights to forest use though there is no codified foundation of these rights. For weaker actors, these informal rules are difficult to enforce. Hence, in a heterogeneous arena scope for interpretation often is an incentive to reap personal benefits at the expense of weaker stakeholders.

In both cases incentives for actors to participate in local panels and boards are decisive for the success of cooperation measures. In Lesotho, stakeholders were obviously willing to collaborate in the Land Policy Review Commission. Motivation to invest time and effort was high since the commission had the mandate to elaborate a draft of the future land policy. In other words: the rules with regard to decision-making (see Step 4) acted as incentives to engage in drafting operational rules.

In Gualaco, in contrast, only those users who suffered from the present practice felt sufficiently stimulated to participate in the Forestry Forum. Stakeholders who benefited from the present situation had no incentives to collaborate.

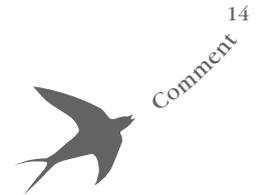
How can these actors be motivated to cooperate? As mentioned above, it might be possible to integrate the tasks of the Forum into a yet existing institution where stronger stakeholders have been traditionally involved. The Lesotho example indicates that the actual political influence of an institution can be a powerful incentive to cooperate. If the Forestry Forum was given more political impact, livestock owners and also the timber industry might be more interested in joining the Forum.¹⁵ However, rules with regard to decision-making have to be designed in a way that empowers the weaker parts of the arena.

In addition, the Lesotho example shows that political influence of an institution should not only exist formally. The outcomes of the Commission's work have to take effect in order to sustain the members' willingness to engage. If incentives for the government to suppress influences of democratic bodies are too strong, the government might impede reforms, and motivation for the members of democratic bodies to cooperate will decrease.

*GTZ projects aim at **institutional change**. Natural resources are being overexploited, people's livelihoods are at stake. This situation is considered problematic. To put it in this manual's terminology: Institutions are being modified to create stronger incentives for sustainable resource use, and to decrease the impact of adverse incentives on the actors' behaviour. This type of institutional change is intentional, and is deliberately being instigated.*

Often, however, actual effects are different from the impacts initially desired. The intended process of institutional change might possibly interfere with other unintended, unanticipated processes. Despite the numerous efforts of social scientists to describe and to understand these phenomena, institutional changes still appear far too complex to be steered and managed. Hanisch (2003) and Schlüter (2001) provide an overview of these issues from an academic point of view.

*Institutional change always entails **costs** for the **national economy**. A new tax, e. g., incurs considerable losses to the economy through the so-called excess burden of taxation. In addition, changing the rules always leads to transaction costs, and if market equilibria are affected, this also results in changing producer surplus. At the same time, considerable benefits are created. For the sake of sustainability in the sense of economic efficiency, institutional change should always aim at a positive ratio between benefits and costs.*



14
Comment

SUMMARY

Step 8 Impacts

- I. How do incentive changes affect the situation? Do they lead to a modification of the characteristics
 - of the good?
 - of the actors and their relationships?
 - of the rules with regard to resource use?
- II. Are the goals being reached?
- III. Are there any measures necessary to complement the incentives prevailing? Which incentives should be modified?

¹⁵ see also Kosmus & Uebelhör 2001: *Diagnóstico sociocultural*

Case study: Irrigation water management in the Jordan valley¹⁶

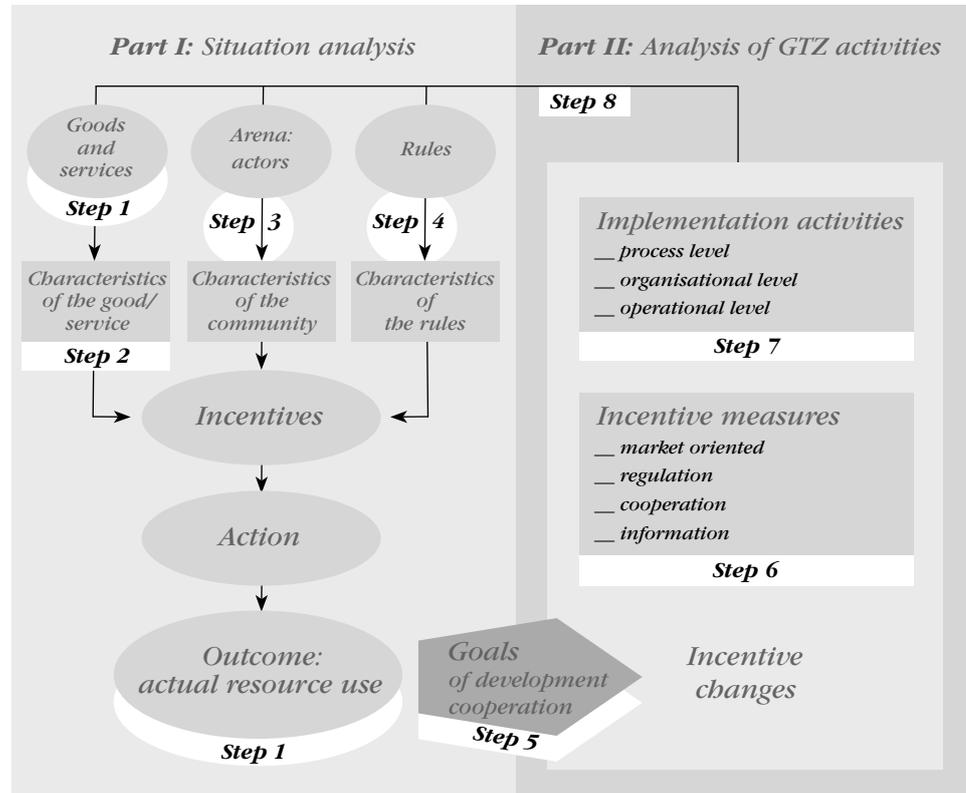


Fig. 6:
Overview

Step 1 The problem

Jordan is one of the countries worldwide where water is scarcest. Seventy percent of available water resources are used for irrigation – often in a very inefficient way. Not only surface water, but also groundwater resources are being grossly overexploited, and fossil water that could be used for domestic purposes is utilised in irrigation. Sectors are competing more and more for the scarce water available, especially as the demand of the city of Amman is constantly rising. Thus pressure on irrigated agriculture to use water in a more efficient way increases. In this case study, we focus on the management of irrigation water in the Jordan valley.

¹⁶ The study is mainly based on data from early 2000, see Huppert & Urban (1999); Regner & Huppert (2003): project implementation offer; Regner & Kanzler (2000): project implementation offer.

Step ② *Incentives - characteristics of the good*

Water is a *common pool good* in Jordanian irrigated agriculture: (i) it is very scarce and consumption is subtractive; and (ii) due to the lack of reliable mechanisms it is almost impossible to exclude users from water consumption. Farm turnout assemblies (FTAs), i. e., valves that are meant to control and measure water delivery at the field level, are often not working. Farmers try to manipulate FTAs in order to have access to water even when it is not their turn. Water prices have been introduced. In theory, the combination of prices per unit of water and FTAs makes irrigation water a *private good*. These structures are intended to motivate farmers to use water in an efficient way.

Yet in actuality, these features are not effective:

- ▶ On the one hand, farmers cannot rely on their right to get a certain amount of water delivered. Water provision is almost unpredictable for both farmers and the Operation and Maintenance (O & M) Directorates who in turn get quantities of water assigned by the Central Directorate. This is due to considerable fluctuations in water supply across seasons and years, but also to an intransparent centralised policy of water allocation carried out by the Central Directorate. These uncertainties with regard to water availability strongly stimulate users to withdraw as much water from the system as possible whenever possible.
- ▶ On the other hand, it is hardly feasible to exclude farmers from the system. FTAs often are manipulated and do not work properly. As a consequence, actual consumption cannot be measured, and financial incentives such as water prices are practically without effect. Farmers often apply drip irrigation in an inefficient and inappropriate way due to the lack of financial incentives, but also because of insufficient knowledge, training, and trust in new technologies. Consequently, farmers use a lot more water for irrigation than necessary.

Step ③ *Incentives - characteristics of the users and the arena of actors*

Relevant actors include, e. g.,

- ▶ the immediate users of water, the *farmers*. In the Jordan valley, they belong to different Operation and Maintenance Directorates. Land is distributed very unequally, and several of the wealthier landowners are politically very influential. Farmers compete with each other for water resources, and so do the O & M Directorates. In addition, interests of landowners and tenants tend to differ considerably. So far, attempts to develop well-working water user associations (WUAs) have had very limited success.
- ▶ the *Ministry of Finance* that receives the water charges from the area
- ▶ the *Jordan Valley Authority (JVA)*, a governmental agency with the following relevant sub-organisations:

- ▶ *Operation and Maintenance Directorates*
- ▶ *the Central Directorate*
- ▶ *Stage Offices*
- ▶ *Ditch Riders*, i. e., workers who carry out the Stage Offices' orders.

Figure 7 sketches the exchanges relationships between these actors, and indicates some of the incentives prevailing in this arena.

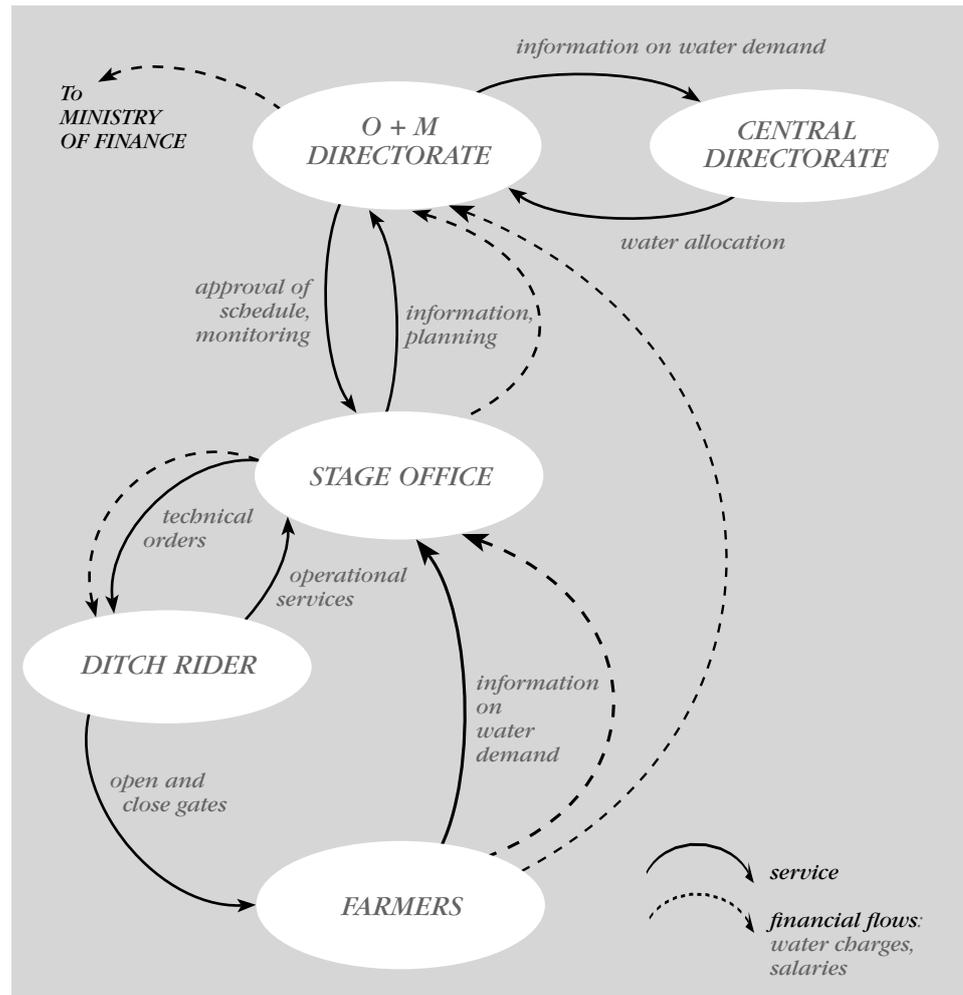


Fig. 7:
Relationships
between
relevant actors,
Source: Huppert &
Urban 1999
modified

Which relations are particularly interesting in this context?

▶ The Central Directorate allocates water to the O & M Directorates. Ideally, this allocation schedule is simulated by means of a computerised information system. Data on water requirements is collected well in advance. However, the actual allocation plan has to be updated daily according to water availability and the farmers' water demand. This procedure causes information gaps and asymmetries: simulation results are not very realistic, farmers overstate their actual demand to be on the safe side, and only the Central Directorate knows the exact figure of water available on a given day. This lack of information implicates strong incentives for rent-seeking and

strategic behaviour. For example, due to seasonal fluctuations and changing demand from the city of Amman, water availability in the Jordan valley is almost unpredictable. Theoretically, the Central Directorate could take advantage of this situation and allocate water to influential farmers. They could thus receive additional rents in return ('moral hazard') without taking the responsibility for the lack of water, as water scarcity can always be blamed on unfavourable circumstances.

▲ Only O & M Directorates have information on the water demand of farmers in their region. This might also be an incentive to overstate water requirements vis-à-vis the Central Directorate, and to sell additional water to influential farmers.

▲ Farmers report their water demand to the stage offices who prepare the irrigation schedules and send them to the O & M Directorates. The Directorates approve schedules and monitor their implementation. Ditch riders receive orders from the stage offices. Correspondingly, they open and close FTA valves etc. at the farm level. For influential farmers it can be advantageous to shortcut the official procedure and address directly the O & M Directorate to get an extra share of the water available. As a consequence, they undermine the mechanisms meant to govern the use of water. Ditch riders, in turn, tend to have a very low income and often depend on wealthy farmers in multiple ways. Both these facts constitute strong incentives to deliver additional quantities of water to certain farmers and hence to secure the own income and the income of family members who often work on these farms.

▲ The O & M Directorates have to pay revenues from water charges to the Ministry of Finance. Consequently, JVA does not benefit from these revenues. Budget allocations from the Ministry of Finance are not related to the amount of water fees collected. Thus for O & M Directorates, there is no incentive to provide good quality services or to efficiently generate money.

Additional incentives derive from the characteristics of the actors and their relations to each other;

▲ Due to the competition for water, few incentives exist among water users, namely the farmers, to cooperate. So far, no well-working WUA has been established. One factor complicating the formation of WUA is the heterogeneity of water users. In a WUA, owners of great estates would have to collaborate with smallholders, tenants with landowners, managers in industrial agriculture with subsistence farmers, members of different Jordanian lineages with each other and with foreigners e. g., from Pakistan. Social incentives to make a joint effort, to develop new rules and to respect these rules, are thus virtually non-existent. Quite the contrary: single, more powerful farmers can expect preferential treatments. They do not have to fear any sanctions by the rest of the users as these lack the adequate organisation to enforce rules.

▲ Farmers' investments in e. g., seeds or on-farm technologies such as drip irrigation are so-called sunk costs. These are strong economic incentives that call for sufficient water supply at the appropriate point of time. Yet in actuality, water availability is unpredictable, and farmers might try to manipulate FTAs to get sufficient water even

if it is not their official turn. Due to the increased and unscheduled consumption, water pressure in the tubes changes, and water delivery becomes even more irregular and unpredictable.

- ▶ Smallholders have almost no legal options to call for their needs and to stand up to the wealthier farmers. With no alternative options, few incentives exist to denounce the present practices.

- ▶ JVA engineers working e. g., in the Stage Offices are underpaid. Their wages are not related to their performance, and thus do not provide economic incentives to deliver services more efficiently and more user-friendly. Instead, low wages might stimulate corruption.

This list illustrates that for every single actor there are many incentives, mainly of an economic nature, that foster rent-seeking behaviour. Particularly information asymmetries between actors seem to be very prominent factors. In contrast, there are few social or economic mechanisms that motivate actors to cooperate with regard to a more sufficient water management. Farmers seem to have no common interest, social cohesion is low. The lack of institutions that might facilitate cooperation also hampers the collective management of the common pool good 'water'.

Step 4 *Incentives - characteristics of the rules*

Water provision is formally regulated:

- ▶ there is a detailed JVA programme which describes the procedure of water allocation

- ▶ JVA is responsible for maintenance of infrastructure up to the farm unit level

- ▶ farmers have to pay water charges for every unit of water consumed (see above). However, the biggest part of these rules is not enforced. The resulting vacuum leaves scope for the more influential actors to push their personal interests through;

- ▶ with broken FTAs, farmers cannot be obliged to pay water fees

- ▶ stage offices and ditch riders have no options to sanction the manipulation of FTAs - e. g., they cannot shut farmers' tubes off

- ▶ it is not politically viable to sanction the illegal delivery of water to the more influential farmers.

Overall, a reform of the rules, enabling actors to call for their compliance, will result in high political costs.

Conclusions Step 2 - Step 4: *Overview incentives*

Indeed, there are elaborated formal rules with regard to water provision in Jordan. Several impacts however, hamper the effectivity of these rules:

▶ measures to monitor and enforce the implementation of rules are poorly designed. Whenever services are not delivered or fees are not paid, the would-be recipients have no means to call for compliance with these rules. Incentives to secure personal water supply in times of water scarcity are thus much stronger than the few weak incentives that stimulate the compliance with rules;

▶ the existent rules do not provide enough economic incentives for actors to work efficiently;

▶ cooperation between actors has not been successfully institutionalised so far. This cooperation could help improve reliability and transparency of water delivery. Transaction costs to establish WUAs, but also the political costs to create alliances between actors and to change the potentially corrupt system are high. Consequently, JVA may have reasons to accept investments from external donors, namely technical assistance. Presumably, they are less interested in interventions that address inefficient structures.

Step 5 Goals and objectives

The GTZ project aims at an increased sustainability of water use in irrigated agriculture. This corresponds to BMZ's guiding principle of sustainable development and also to Millennium Goal No. 7. The project is closely related to a number of other GTZ projects related to water sector planning and operations management. These projects address ministries and administration. Projects of other donors focus on irrigation efficiency on the field level.

Step 6 Incentive measures

The project is not intended to be exhaustive. It complements other undertakings (see above). It features measures that foster **cooperation** and **information** flows among water users and also between users and the actors providing the water. In this regard, the main instrument is the creation of water user associations (WUAs). Their function is

▶ to strengthen social cohesion and to facilitate the definition of a common goal which will be beneficial to all users – a more efficient use of water resources. A WUA could provide the essential social incentives that stimulate compliance with rules. WUAs, however, have to take the different interests of the diverse water users into account;

▶ to monitor the function of FTAs. Consequently, the existent but poorly implemented and virtually non-effective market-based incentives could operate, and the price mechanism could take effect;

▶ to reduce the potential for corruption: Mutual monitoring and more transparent procedures could also help to increase the impact of the price mechanism;

- ▶ to manage conflicts by providing adequate institutions;
- ▶ to organise a more demand-oriented provision and allocation of water in accordance with JVA. This would probably lead to a higher reliability and quality of water provision, and users' willingness to pay for these services might increase. This effect might also enhance the impact of water prices;
- ▶ to reduce incentives to extract as much water as possible from the system. A higher reliability of water provision, but also information and training, e. g., on technical requirements of drip irrigation, could contribute to that;
- ▶ to reduce information asymmetries, e. g., by participatory techniques and audits that increase information flows and transparency within the WUAs.

Modifications of the **regulatory framework** could complement these measures and motivate farmers to take more responsibility for their water consumption. For example, farmers could get permission to open and close their FTAs. The overall vision is deregulation. This means e. g., to assign responsibilities formerly held by JVA to WUAs and private companies.

In addition to the yet existing **market-based incentives** such as water prices, the privatisation of water provision could also enhance the impact of market-oriented incentives. This is in line with the JVA long-term strategy and is supported by an additional GTZ project.

Step 7 Implementation

Cooperation activities focus on the *operational* and the *organisational* level. The core component is located on the organisational level: the development of WUAs. This requires *advisory services on management and organisation* (i) to farmers as the future members of WUAs and (ii) to JVA staff who are meant to support the development of WUAs. For example, farmers receive training in administration of WUAs. Another important feature is to educate farmers to articulate their needs, and to encourage them to stand for their interests vis-à-vis the JVA. As mentioned above, heterogeneity among water users complicates a successful establishment of WUAs. However, certain favourable distributions and combinations of water users could foster identification of farmers with their respective WUA. It may also help to explicitly address conflictive issues. A central objective of advisory services on management and organisation is definitely to work on information asymmetries.

As mentioned above, *advisory services on technical issues* could also contribute to the effectiveness of incentives.

Step 8 Feedbacks - project impacts

In the first place, the outlined measures are likely to impact the characteristics of the user community. WUAs are meant to improve the farmers' abilities and oppor-

tunities to cooperate. Consequently, incentives to respect the existing formal rules grow stronger. The private good character of irrigation water is emphasised, and incentives to use water efficiently become operative. In this case, it is a collective – the WUA – who regulates water markets in collaboration with JVA.

In a pilot site, these measures have proved appropriate so far. In this particular site, WUAs have been successfully established and users have become much more content with water allocation. Water losses decreased. The impact of formal rules however, always depends on the general rule of law in Jordan.

Moreover, revenues from water provision are still to be paid to the Ministry of Finance (see Fig. 7). If these revenues were part of the WUAs' and JVA's own budget, incentives to effectively collect water fees and to provide good quality services would definitely increase.

The system of JVA, their low wages and the resulting incentives have not been modified so far. Consequently, it is not likely that reforms of JVA are initiated from within. However, in a future, self-confident and socially competent WUA could exert pressure on JVA to work on information asymmetries, improve services and to modify structures. The WUAs' options, though, strongly depend on the overall political situation and the general dynamics for change in the Jordanian public administration.

Further reading

Additional literature, documents and case studies will be provided in the **GTZ intranet**, see *Intranet/Fachbemen/Umwelt und Infrastruktur/Informationen/ 4411-Handreichungen*.

Regarding the conceptual framework

This FAO manual provides a comprehensive and vivid description of the first part of our conceptual framework. It presents participatory methods that help to collect the information necessary for an analysis:

▲ **Thomson, J. & Schoonmaker Freudenberger, K. (1997):** *Crafting institutional arrangements for community forestry. FAO community forestry field manual.* - Rome: FAO.
www.fao.org/docrep/W7483E/W7483E00.btm

Elinor Ostrom explains basic concepts such as 'institutions' and 'rules' in a simple and demonstrative way. Based on her own experience, she argues in favour of a transdisciplinary conceptual framework such as the IAD (Institutional Analysis and Development). She also summarises the purposes and contexts the IAD has been applied to so far.

▲ **Ostrom, E. (1999):** *Institutional rational choice - an assessment of the Institutional Analysis and Development framework.* - In Sabatier, P.A. (ed.): *Theories of the policy process.* - Boulder: Westview Press.

Introduction: Basic concepts, definitions

What is governance? The following two publications illustrate the different facets and the implications of the governance concept.

▲ **Huppert, W.; Svendsen, M. & Vermillion, D. (2001):** *Governing Maintenance Provision in Irrigation - A Guide to Institutionally Viable Maintenance Strategies.* - Wiesbaden: Universum.

▲ **Huppert, W.; Svendsen, M. & Vermillion, D. (2003):** *Maintenance in Irrigation: Multiple actors, multiple contexts, multiple strategies.* - *Irrigation and Drainage Systems* 17: 5-22.

Definitions of concepts such as property rights, governance and institutions can be found in:

▲ **Swallow, B. & Bromley, D. (1995):** *Institutions, governance, and incentives in common property regimes for African rangelands.* - *Environmental and Resource Economics*. 6:99-118, available <http://www.sarjpn.org.za/documents/d0000187/index.php>

Step 1 *Problems of natural resource use*

Examples of goods and services provided by ecosystems:

▲ **World Resources Institute (2000):** *World Resources 2000-2001 - People and ecosystems: The fraying web of life.* - Washington, D. C. http://pubs.wri.org/pubs_description.cfm?PubID=3027

Elaborating on the concepts of goods and services, and hybrids:

▲ **Huppert, W. & Urban, K. (1998):** *Analysing Service Provision.* - Wiesbaden: Universum.

This report refers to goods and services related to biological diversity and focuses on the design of markets for biodiversity goods.

▲ **OECD (2003):** *Harnessing markets for biodiversity - towards conservation and sustainable use.* - Paris. www.oecd.org

Step 2 *Characteristics of goods and services*

Ines Dombrowsky elaborates on the criteria 'feasibility of exclusion' and 'rivalry in consumption' as seen from an economic perspective. She also discusses the merits and disadvantages of the private as opposed to a public provision of goods.

▲ **Dombrowsky, I. (2004):** *Is Water a Public Good? In: UFZ Bericht 7/2004: 54-71.* - Leipzig-Halle.

Seminal work on common pool goods:

- ▶ **Ostrom, E. (1990):** *Governing the Commons. The Evolution of Institutions for Collective Action.* - New York: Cambridge University Press.
- ▶ **Hardin, G. (1968):** *The Tragedy of the Commons.* - *Science* 162: 1243-1248.

And a brief overview:

- ▶ **Dietz, T.; Ostrom, E. & Stern, P. (2003):** *The Struggle to Govern the Commons.* - *Science* 302: 1907-1912.

Step 3 Characteristics of the actors and the arena

Huppert et al. describe in detail how an analysis of exchange relations can help to understand incentive mechanisms. They focus on irrigation issues.

- ▶ **Huppert, W.; Svendsen, M. & Vermillion, D. (2001):** *Governing Maintenance Provision in Irrigation - A Guide to Institutionally Viable Maintenance Strategies.* - Wiesbaden: Universum.
- ▶ **Huppert, W. & Urban, K. (1998):** *Analysing Service Provision.* - Wiesbaden: Universum.

Step 4 Characteristics of the actors and the arena

- ▶ **Thomson, J. & Schoonmaker Freudenberger, K. (1997):** *Crafting institutional arrangements for community forestry. FAO community forestry field manual.* - Rome: FAO.
www.fao.org/docrep/W7483E/W7483E00.htm

Step 5 Goals and objectives

Goals and guiding principles set by BMZ are presented on the BMZ website. The English version is currently under construction. It is scheduled to operate again by the end of 2004.

- <http://www.bmz.de/de/english.html>
- <http://www.bmz.de/tbemen/Motive/Ansaeetze/>
- <http://www.bmz.de/tbemen/motive/entwicklungspolZiele/International/grundsaeetze202.html>

Goals and evaluative criteria are also discussed in;

- ▶ **Dietz, T.; Ostrom, E. & Stern, P. (2003):** *The Struggle to Govern the Commons.* - *Science* 302: 1907-1912.
- ▶ **OECD (1999):** *Handbook of incentive measures for biodiversity - design and implementation.* - Paris: OECD publications.

- ▶ **Ostrom, E.; Gibson, C.; Shivakumar, S. & Andersson, K. (2002):** *Aid, incentives, and sustainability.* - Gothenburg: Elanders Novum. http://www.grc-exchange.org/info_data/record.cfm?id=678

The latter is a very interesting report on incentives that guide people who work in development cooperation - and that may interfere with the genuine goals of cooperation.

This publication addresses social needs that determine patterns in natural resource management such as the need for reputation. The authors also discuss criteria to be met by institutional incentives according to the principle of sustainable development.

- ▶ **Ostrom, E.; Schroeder, H. & Wynne, S. (1993):** *Institutional incentives and sustainable development - infrastructure policies in perspective.* - Boulder: Westview Press.

Step 6 Incentive measures

The GTZ pilot project on institutional development in environment focused particularly on market based incentives. Publications include, e. g.:

- ▶ **Bizer, K. et al. (1994):** *Pollution prevention through market based incentives: two case studies on Thailand.* GTZ 402-94-e PVI. - Wiesbaden: Universum.

Addressing incentive measures on the supranational, national and local level in the forestry sector:

▲ **Tomforde, M. (1995):** *Compensation and incentive mechanisms for the sustainable development of natural resources in the tropics: their socio-cultural dimension and economic acceptance.* GTZ - Wissensspeicher.

A review of more than 280 case studies on market creation:

▲ **Landell-Mills, N. & Porras, I. (2002):** *Silver bullet or fools' gold? A global review of markets for forest environmental services and their impact on the poor.* - London: *iiED*.

Basic facts and information on the creation of markets for ecosystem services:

▲ **Powell, I.; White, A. & Landell-Mills, N. (2002):** *Developing markets for the ecosystem services of forests.* - Washington D. C.: *Forest trends*.

<http://www.katoombagroup.com/Katoomba/publications.htm>

Focusing on incentives with regard to the conservation and sustainable use of biodiversity, giving definitions and descriptions of a multitude of measures and their applicability:

▲ **OECD (1996):** *Saving biological diversity: economic incentives.* - Paris: *OECD publications*.

▲ **OECD (1999):** *Handbook of incentive measures for biodiversity - design and implementation.* - Paris: *OECD publications*.

▲ **Tbies, E. (2000):** *Incentive measures appropriate to enhance the conservation and sustainable use of biodiversity.* - Eschborn.

http://intranet.gtz.de/umwelt/cd-rom44-2003/documents/agrobiodiv_cd/07_incentive_measures.pdf

▲ **Almekinders, C. J. M. (2002) (ed.):** *Incentive measures for sustainable use and conservation of agrobiodiversity. Experiences and lessons from Southern Africa. Processings of a workshop.* - Lusaka.

<http://www.gtz.de/dokumente/bib/02-0178.pdf>,

<http://www.gtz.de/dokumente/bib/02-0178a.pdf>

Step 7 GTZ activities

▲ **Hamacher, W.; Heidbrink, K. & Paulus, S. (2001):** *Umwelt - Politik - Beratung.* - Wiesbaden: *Universum*.

▲ **Gómez, R.; Gutiérrez, M. & Lisy, K. (2004):** *Instrumente und Ansätze der Politikberatung in der Technischen Zusammenarbeit.* - GTZ: Eschborn.

Step 8 Evaluation

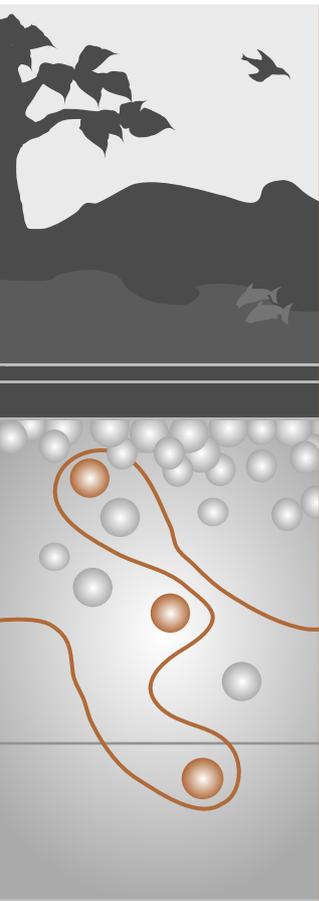
▲ **Gottret, M. V. & White, D. (2003):** *Assessing the impact of integrated natural resource management: challenges and experiences.* In: *Campbell, B. & Sayer, J. (eds.): Integrated natural resource management.* - Wallingford: *CAB International*.

Literature

- ▲ **Bizer, K. et al. (1994):** *Pollution prevention through market based incentives: two case studies on Thailand.* GTZ 402-94-e PVI. - Wiesbaden: Universum.
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