Managing Complexity Across Scales–From Common Resources to Common Security

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1. Introduction

> "...environmental problems simultaneously illustrate and are brought about by the compression of the world" (Yearley 1996, p.28)

[Ostrom, 1994 #305]Institutions and actors that manage classical local Common Pool Resources (CPRs) as well as global commons can seldom be confined to one specific level be it local, national, regional or global. Many of the resources stretch out across all levels in a variety of ways; space, time, ownership, interest, sense of responsibility, influence, responding institutions etc. Pressure increases on natural resources and ecosystems because of the increasing interconnectedness, what some would call globalisation, in social, economic, and physical terms. With the growing consciousness of a common world, also many resources that do not belong to either the local CPRs or the classical global commons, can be studied in the same theoretical mindset.[1]

A resource may be 'common' for humanity across levels in several ways. Its state may be determined by driving forces that involve a range of actors at many levels and across geographical space. This implies common culpability to some degree. Environmentally negative effects of human activities would be manifested on resources extending different geographical scales local, national, regional and global level and thus many will share the exposure and suffer effects.[2] Resources can be common for consecutive generations of humankind, i.e. stretch out in time, for example by the consumption of non-renewable resources today or negative side effects of their degradation which will affect the options for all coming human generations. The policies—or responses—from society that results from the knowledge of the negative effects may be formulated and implemented by governmental and other institutions at local, national, regional or global level and thus be an issue of 'common' concern and action in many parts of the world.[3]

Neither of these situations consider the classical way of defining a CPR. Yet, it fulfils for other reasons the basic requirements of being common resources over which no single entity, be it an individual, a state or a company, can exercise unchallenged sovereignty over, and make autonomous decisions for. The resources are further often subject to under-provision due to open access (Keohane and Ostrom 1995) and consumption or degradation by one makes it less available to others. Drawing on the

[1] A resource in the sense we discuss in this paper not only includes a physical, consumable reource (forest, fish etc. water) and those omnipresent yet to pollution and vulnerable media such as air, but also the more diffuse sum of ecosystem services, the productive capacity of soil etc.

[2] Local, national, regional and global level is here used to describe increasingly larger geographical areas which may or may not coincide with governance structures.

[3] This driving forces-(pressure)-state(effects)-response framework for structuring environmental problems is taken from the international work of developing indicators for sustainable development. Driving forces is here seen as human activities, processes and patterns that exert an impact and in many cases pressure on the environment (DPCSD 1996).

two examples of desertification and pesticide use in the South, the paper will address these resources that for either reason is 'common' for people and institutions across scales.

2. Activated complexity

We call the situation of growing inter-linkages between factors influencing the state of a resource and responses from individuals and institutions 'activated complexity'. That today's resource management systems are characterised by complexity is rather obvious from the discussion above. By adding the prefix 'activated' we wish to signal that the current complexity may contain the possibility to identify new co-operative mechanisms in human interaction. We argue that such a system has the potential to either tip over and degenerate, or lead to a higher level of effectiveness in resource management. Forming new combinations of management would contrast unsuccessful management through a limited frame of reference. The state of activated complexity can magnify both negative and positive processes, that is processes leading towards degeneration or sustainability. Negative processes such as exhaustion and/or degradation of natural resources can spread more rapidly with potential for much more prevalent and long-lasting effects. But the resulting scarcity reveals the need for effective management of a resource. It is the scarcity of the common pool resources at local and global level which has lead to inventive management structures.

The activated complexity occurs at all levels; it is not associated with scale as such but varies depending on perspective. The example we will discuss further below comes from the desertification convention within the UN system. It demonstrates how global views may identify completely different first-priority causes to the problem. Varying national views on the problem (its relevance, magnitude and implications) can lead to simplistic policy measures. Local experience is accordingly that only constrained technical partial solutions filter through for political or cultural reasons. A general conflict pattern of political differences between local and national interests connects with resource control. On top of that looms a global conflict over perspectives North/South; while the North sees desertification as an outcome of poor management the South sees it as caused by climate change.

The policy debate has circled around they issue to what extent even a rigid policy for bottom-up actually expresses a top/down mode of thought. Community based natural resource management groups has been a favoured concept among those dealing with CPR policy. The Zimbabwe based CAMPFIRE (Communal Areas Management Programme for Indigenous Resources) initiative is an example. It has been referred to because of its bottom-up ideals. The aim with this and other project-level bottom-up initiatives has been to mobilise rural people for conservation by feeding economic benefits back to local communities.

If driving forces exist at different levels then every serious attempt to develop a policy for taking remedial action for a threatened resource has to be taken at each of these levels. Otherwise policy makers are confined to take action that will at best reduce the

symptoms of the problem if the driving forces occur at levels beyond their jurisdiction. But if policy-makers at each level base their policies on a problem structuring that differs quite distinctively, incentives or reasons for taking action will be different. In this situation of common resources and activated complexity, there is a need to switch from independent to more co-ordinated action across levels. In this paper we look at the theoretical elements developed for local CPR management for indications of what may be needed to facilitate this switch.

3. Applying CPR theory across scales

The theory formulations of the management of a local common pool resource (Ostrom 1990; McKean 1992) also show potential for affording important insights in settings beyond local CPRs. Even though they were developed within local communities of limited size in mind, often in rural and less developed contexts, the issue can be extended beyond that (Ostrom 1990; Young 1994; Keohane and Ostrom 1995; Karlsson 1997). Here we take the theory application further. Focus is on the many common resources in situations of activated complexity where the management is influenced by factors from multiple levels. We intend to see how a few elements of the theories from studying local CPR management may be of value in analysing these.

Successful management of a common resource necessitates that individual strategies of action are replaced by co-ordinated action. Ostrom has outlined some key variables for the creation of an organisation of appropriators, thus opening for a switch from independent to co-ordinated action at local level (Ostrom 1992). The four situations required among appropriators in the organisation are according to her findings:

- Common understanding of the problem;
- Common understanding of alternatives for co-ordination;
- Common perceptions that decision-making costs do not exceed benefits;
- Common perception of mutual trust and reciprocity.

Viewing actors across levels we do not have any one such formal or informal organisation from the local to the global level. Yet we consider these factors in general terms for the chain of interconnected actors around a resource or another environmental issue area. We face a number of cultures, political systems and ethnic belongings in this setting. Can any degree of common understanding and perception be reached across this diversity? In what elements of problem structuring and alternatives for action is a consensus across levels beneficial?

There is an increased frequency of broad international summits in recent years, open for many different groups of civil society as well as governments for a number of issues, not only concerning the environment. This perhaps indicates an understanding that the first step of solving what is seen as global problems would be to reach a common understanding of both what the problems are and strategies for solving them. But clearly, common understanding in the four areas listed above at international level is not yet deep enough to lead to a substantial switch from independent to co-ordinated action

and how much less so for those resources and environmental issues not yet officially called 'global'.

We use two issue areas in particular, pesticide use in the South and desertification as examples to illustrate the same point in two perspectives. Sameness is the act of connecting local and global. Both issues concern common resources in the way we define the concept which was outlined in the introduction. The case of desertification policy leads to management practices of specific projects (or sectors), while that of pesticide use leads to a simplistic management approach. Even if there is no single organisation spanning the entire local/global gap, the four points above can still be used, however, at least as metaphors or sorting principles in the search for partial conditions.

There is a range of other aspects of managing local CPRs that would raise crucial questions if applying these for the common resources across levels such as the size of the group of users, cost of monitoring etc. We will leave most of these behind for now. Instead we will start by elaborating some aspects of converting decision-making into action and the complexities added with policy making at both local and global level. From this exposé it should be clear that the starting point needs to be the problem formulation, what knowledge it is based upon and the alternatives for action it gives. This discussion opens up for two special cases of demand for deeper awareness, the local being aware of the global perspective, and the global of the local specificity. Finally we will draw together the conclusions for knowledge systems and value frameworks that would facilitate the switch to co-ordinated action, where institutional diversity, environmental awareness and social capital play their respective role.

4. From decision making to implementation—compounding factors

The road from problem identification via decision making to implementation is often assumed rational and straightforward. The issue areas considered here reveal the compounding factors that may divert the policy process from this rational road.

> "When a wider set of cultural viewpoints is introduced, the problem becomes much more extreme. There is simply no one logic which follows from the identification of an environmental problem, let alone any one solution" (Smith 1994, p.31)

Smith's statement concerns those situations where more perspectives on a problem are introduced, leading up to a more aggregate identification of the problem. In the case of a policy based activated complexity the situation would be even more aggravated; active initiatives are taken in order to short-cut a gradual socio-political process towards widening views, adding perspectives. For the sake of urgency different views are instead rushed on the political arena. The effect is certainly that the process of change is speeded up but also that a vulnerable polarisation process emerge.

Local level

Local knowledge has been one of the priority issues in preparations for the United Nation Convention to Combat Desertification (UNCCD). A key topic has been to what extent such knowledge is actually derived from community level. This example builds on experience from drylands in developing countries (with livestock regimes), and the issue why a collective full-fledged set-up of know-how at community level in some instances is mobilised as a common resource, in other cases not exploited. A key political issue for municipality government is to implement such a policy that reinforces the sustainability of the local "enterprise". Again, more or less contradictory authority systems must meet; the sectoral enterprise-focused interest group of the specialised livestock producers, for instance, and the politico-administrative local government representing a community of subsistence oriented pastoralists or agro-pastoralists. Mandates differ, views on what should be common differ, opinions on degrees of communality differ. Yet, where goals can be harmonised, or rather not be contra-productive, an add-on effect is achieved. It takes the form of increased security, first in political terms and then in food access. The great degree of complexity has to be managed across scales, also when seen from the community perspective.

Conflicting expectations are to be considered when an activated complexity induces one policy on collective resources. The point is structural and concerns scale; the set of goal-oriented logic positioning leads to inferences that are hard to foresee. The move from decision to implementation can either take the shape of centralised decentralisation (rhetorical bottom-up) or decentralised centralisation (when vested interests operate in global organisations disguise). At local level inhabitants might experience the implementation as formed by outside initiative. The implication is a need for diversity also in the field of institutions,[4] since capacity demands look different depending e. g. on environmental awareness and empowerment.

Global level

For an example from the global level we take the case of pesticide use in the South, an activity which can create transnational environmental and health problems as well as very localised negative effects. The multitude of actors that address some angle of this issue creates a picture of institutional diversity but not always one leading to successful governance. The actors include Intergovernmental Organisations (IGOs) whose mandate and agenda are determined by their member governments, international NGOs and international industry associations (representing transnational corporations manufacturing and selling pesticides). Various multilateral agreements (both hard and soft law) have been or are being formulated, negotiated and agreed upon. Concentrating for now on the work of the IGOs, the number of UN agencies whose work in some way relate the issue of pesticides and their potential negative effects on health, environment and trade is substantial. They include UNEP, WHO, FAO, UNIDO, ILO, WTO and

[4](Ostrom, Burger et al. 1999), raise the point of institutional diversity in connection with global commons.

UNITAR and often several offices within each agency. There are several joint programmes or activities that involve two or more of these organisations, such as the International Programme on Chemical Safety, the Joint Meeting on Pesticide Residues and the Codex Alimentarius (IPCS 1995; IPCS 1998; FAO/WHO in press).

Lack of co-ordination is a much repeated criticism against the UN. Many agencies work on the same issues, whereas other issues are not dealt with anywhere. Attempts have been made to increase co-ordination in the area of chemical management in general, which includes pesticides. In Chapter 19 of Agenda 21, which dealt with chemical management, the need for more co-ordination was explicitly raised and recommendations made for creating a special organisational mechanism to achieve this (UNCED 1992). The result was the formation in 1994 of the Intergovernmental Forum on Chemical Safety (IFCS 1994). This is not an organisation but rather a mechanism for governments, UN agencies and NGOs to set priorities for the work on chemical safety. All member governments meet only once every three years and a smaller selection of governments the years in between. Implementation is then carried out in the various UN agencies. There is also a collaboration group of IGOs where tasks are divided, the Inter-organisational Meeting on Chemicals (IOMC) which consists of a number of IGOs. Co-ordination in this way requires a lot of resources and extra time for the UN officials working in the agencies. But co-ordination could also be facilitated one level preceding this, at government level. Governments send representatives from different ministries to the different bodies, and they seldom co-ordinate their positions (Childers and Urquhart 1994). The frequent call upon the UN to increase co-ordination to a large extent falls back upon the governments. It becomes a call to governments to start co-ordinating themselves. Lack of co-ordination and common goals in such a complex governance system as exists for chemicals and countless other issues leads to the need for values and leadership also in the case of a global level view. Knowledge formation, new as well as experience based, reaches beyond rationality into identity and ethical principles.

5. What and whose problem

The first area where a common understanding is essential among managers of a CPR is according to Ostrom the problem itself. The ways in which stakeholders structure a problem may be influenced both by access to knowledge and what priorities and values they hold.

Knowledge base profiles for problem formulation

The level of information and knowledge among appropriators is generally positively correlated with facilitating successful management of a common resource (Ostrom, Gardner, et al. 1994). In a situation of policymakers across levels, they are likely to have very different access to information and knowledge and the sources of the knowledge may then originate in varying knowledge systems. What is the role and characteristic of knowledge based on science, on experience, intuition, or cultural or religions tradition, and what happens when knowledge from these different sources clash?

Scientists, or those who use their arguments, have a tendency to claim their scientific way of interpreting the issue at stake as the correct and only interpretation, legitimising 'technocratic governance'. Science often claims to present a universally valid definition of a problem (Yearley 1996) or at least that it should be able to do so after significantly more research. Compare this with contextually bound local knowledge where cultural competence identifies "windows of opportunity"; i.e. opportunities for drawing on outside knowledge in local application. There is, simply by definition, no claim by such knowledge to be universalistic.

The priorities held by stakeholders, based on their values, form another major factor in the structuring of a problem. Effects on things that are not valued in some sense will not be defined as 'problems' as Milton outlines when quoted by Adam:

> "There are underlying disagreements over how problems are defined, their degree of seriousness, who is responsible for solving them, and how amenable they are to solution. These disagreements run deep; they are based on different moral principles, different values, different assumptions about how the world operates, and they are found not only at the international level, where cultural diversity is to be expected, but at all levels, within a single society or organisation, and within the actions and policies of a single corporate group (Milton 1991, p.4)" (Adam 1994, p.92)

The resulting construction may vary extensively both for whom it is a problem, whether it is an environmental issue, what *is* an environmental issue and not the least what priorities policies and actions should strive towards. When multiple actors influence or benefit from a resource, formulating a common priority or goal for its management is difficult. There may be multiple uses for a resource with different incompatible goals (Karlsson ed., 1997). Frost argues that even for actors in world politics, they can not escape having to take decisions on normative issues "The moral problem is to choose the ends to be pursued and to decide upon what means might legitimately be used in pursuit of those ends" (Frost 1996, p.11). Activated complexity means less detailed knowledge of the system, and higher level of uncertainty in both cause and effects that may warrant decision making more based on values (Karlsson 1997).

Alternatives for action

Engaging a wide spectrum of stakeholders in any management efforts of co-ordination across levels for a common resource raises paramount challenges. These concern what kind of common understanding about alternatives for action that would be fruitful or even necessary to reach across levels. The issue is not only one of alternatives of action but also which actions should be carried out at which levels as Saurin discusses on formal institutions and Ostrom relates in more general governance terms:

> "The distancing of the site of degradation from its original cause confuses the allocation of responsibility. In the post-Rio context, this poses enormous public policy problems regarding the level of legislation–local, national, international or transnational" (Saurin 1994, p.46)

> "...if the complexity is the nature of the systems we have an interest in governing (regulating), it is essential to think seriously about the complexity in the governance systems proposed" (Ostrom 1995)

A couple of examples follow to illustrate how prescriptions for several governance levels have been addressed in some policy making processes at global level.

The Rio process has been one of fostering a unity of thought in the kind of problems humanity face, the guiding principles for the approach and the resulting Agenda 21 action plan contained a smorgasbord of suggested actions. It encouraged grass-root involvement down to problem structuring and setting priorities. The suggested strategies of action were not only for the national and local level but also for international co-ordination. It gave little on international structure, however, and recommendations in this area were expressed in vague language (UNCED 1992).

For the issue of pesticides and their negative effects the International Code of Conduct on the Distribution and Use of Pesticides accepted by the FAO member governments in 1985 is an international soft law document (FAO 1990). It is the primary document on the issue of pesticide in the South. In its general article on pesticide management, governments are given the overall responsibility for the distribution and use of pesticides in their countries. Major responsibility is also put on the pesticide industry who should "adhere to the provisions of this Code as a standard for the manufacture, distribution and advertising of pesticides, particularly in countries lacking appropriate legislation"(FAO 1990). Also exporting governments are given a role in the field of technical assistance and provision of data on the pesticides sold to other countries. Intergovernmental organisations are primarily assigned a role in the provision of scientific and technical information, they should "provide information on specific pesticides and give guidance on methods of analysis through the provision of criteria documents, fact sheets, training sessions etc."(FAO 1990). And all groups involved, national and international organisations, governments and pesticide industries, are asked to co-ordinate their efforts to disseminate education materials of all types to the affected parties, including pesticide users and farmers. The farmers and users on their part "should seek and understand educational materials before using pesticides and should follow proper procedures"(FAO 1990). This international document, a voluntary code of conduct, gives each stakeholder his or her ascribed roles to secure the proper management of pesticides, from intergovernmental organisations down to the farmer.

The various stakeholder groups and institutions at each level that relate themselves to pesticides in developing countries express several diverging views on strategies to reduce risks and who is primarily *responsible* for its safe use; the manufacturer, the government or the farmer. The central term around which risk reduction policies has circled, and still does, the International Code of Conduct and many project documents of IGOs including the FAO, in Industry and many governments is 'safe use'. The FAO strategy is to help each country ensure the adoption of the provisions in the Code of Conduct which implies safe handling of the substance from the manufacturing company down to the farmer. The key link between the ideal world of appropriate use and the actual use, is crystallised in the "pesticide label", the label that should be found at each sold pesticide container and which should outline the mode of use, the necessary

precautions that needs to be taken etc. If the farmers follow the instructions on that label, the problems of misuse and unsafe use would be radically reduced. Yet how can MNCs and IGOs assure themselves that the individual, often illiterate, farmer actually follows what is written on a label or in FAO's Code of Conduct? How can the global take into account the socio-economic situation, reasoning, sentiments and priorities of a small holder farmer spraying his crop?

The Rio 1992 process has on the environmental side lead to a range of initiatives. Among the most prominent ones is the World Bank rooted initiative to set up a mechanism for strategic National Environment Action Plans, NEAPs. The initiative has been accepted, and the proposal implemented, in many countries. A recent inventory of NEAP initiatives in Eastern and Southern Africa has been made by OSSREA, the Organisation for Social Science Research in Eastern and Southern Africa .(OSSREA 1998)A critical reading of the result with special attention to the local dimension (as suggested in what in effect seems to be another policy formation system, i.e. the one concerning Local Agenda 21), the following gloomy picture comes forth:

Table 1. Evaluation of NEAP initiatives in Eastern and Southern Africa

Country	Conclusion re. Local dimension
Ethiopia	There is no popular participation
Kenya	Lack of focused community participation
Lesotho	Primarily technical foci
Malawi	Population boom generates a top-down approach
Tanzania	Exclusion of stake holders in planning process
Sudan	Modern agriculture focus with little attention to traditional methods
Uganda	Sector approach in policy leads to gaps
Zambia	Lack of commitment and conceptualisation of sustainable development
Zimbabwe	District environmental action plans (CAMPFIRE)

The glaring message from this compilation is a top/down thinking in environmental management tradition. Even Kenya, with its long standing District Focus, Uganda with a similar emphasis of district levels and Zimbabwe with its much written-about CAMPFIRE initiative follow that pattern, in spite of their being the most prominent examples of moves towards decentralised approaches of decision-making.

The next example is the United Nation Convention to Combat Desertification (UNCCD), where the dryland situations are specially highlighted. Those situations can be used to understand several of the principal issues raised in the ambition to connect environment and development, inherent not least in Agenda 21. There is a strong emphasis on bottom/up approaches in the UNCCD negotiations (Corell 1999). In terms of perspective, it allows comparing with the Local Agenda 21 (LA21) from Rio and the National Environmental Action Plans (NEAPs) of the World Bank. Both perspective (bottom-up) and structure (district focus) are similar. The National Action Plans prescribed by the CCD also emphasise local participation. We can regard LA 21 as a

process towards building improved competence to combat desertification (seen in a global perspective), but we can also note that the initiative comes from the outside. The capacity of traditional institutions to deal with environmental problems stands in focus, along with the role of environmental awareness and know-how at community levels. From the application of an LA 21 on the combat against desertification follow some key conclusions (Farah, Hjort-af-Ornäs et al. in press):

> • Decision-making over combined rural resource aggregates has to occur at community level;
> • National policy should focus on bottlenecks to existing conservation or production systems, not on changing systems in ranching or other directions;
> • Informal cultural institutions and community environmental competence are key assets for sustainability;
> • Long-term thinking (decades) at aggregated structural levels on risk management is required for the success of any development project in the field.

What we challenge in the current discussion is an over-emphasis of decision-making at community level as basic for management of common pool resources. Decision-making is in actual fact circumscribed by other than uniquely local conditions. For situations of activated complexity, the strive must be for co-ordinated management of a common resource across levels. There are two specific contexts where the wide scope and added complexity manifests itself. The first is the need for the local to include the global and the second how the global needs to accommodate for the local if co-ordinated policies for multilevel resources are to be achieved. We will discuss these two requirements in the following.

6. Local globality

In order to address many environmental issues the individual at local level, the multitude of grassroots in countless localities, needs to change his/her behaviour, for example to implement Multilateral Environmental Agreements (MEAs). Yet the effects of her action may be distanced from herself which as, Saurin makes it difficult to realise the impact of ones actions:

> "The effect of time-space distanciation is to render opaque-through the mediation of action-the relationship between intention, action and outcome, thereby confusing our comprehension of causality" (Saurin 1994, p.48)

Old studies such as (Hardin 1968) suggest that to switch to co-ordinated action for CPR management actors need to view response strategies to be in their interest. This has mostly been interpreted as meaning a short-term egocentric self-interest. Over the past 30 years many have disputed that this should be implicit in each situation of open access to a CPR and lead to the classical 'tragedy'. Although not accepting basic assumption of self-interest as the only motivating force in an individual's actions as completely valid we agree that people need to have a reason, an incentive, to forego old patterns of action.

If actors at local level do not see co-ordinated action for resources of common interest for a larger part of humanity to be in their interest, what could enhance their insight? Broadly speaking two ways can be distinguished in which the latter might be realised:

(I) Local actors are faced with a deteriorating situation which is connected to degradation of the environment.
(II) Local actors perception of what is in their interest is expanded to include new interests.

The first alternative is driven primarily by outer circumstances, by crises. The effects would have to be linked in a very obvious way to ones own actions, the self-interest for many actors would become the primary incentive and only option left. We leave this option at that.

Enlightened self-interest

In the second alternative there are two possible approaches in which a wider perception could be gained. One is when people's perception of what could be considered as threats to their own security is deepened beyond the most obvious cause-effect chains. This is again based on self-interest, but this time more enlightened and not as easy to discern. It depends on the awareness of causative links of the interconnectedness in situations of increasing complexity, and may necessitate a cautioned attitude in situations of uncertainty and enlarging the time perspective of effects considered. Physical bonds necessitates action as Shrader-Frechette argues:

> "Just as planetary interdependence at the political and economic level establishes a moral foundation for our duty to help those in underdeveloped nations, so also our ecological interdependence establishes a prudential basis for our obligation to help ourselves by helping them " (Shrader-Frechette 1991, p.164)

In an integrated world the enemy is both ourselves and all the 'others' or as Giddens puts it there are no 'others' (Giddens 1990). Once we know the causative links we should know more how our own actions may eventually affect ourselves.

The Rio example to highlight local commitment through a Local Agenda 21 as a general process towards upgrading competence suggests bottom-up. A combined traditional and new outside knowledge can be applied locally when circumstances permit (Hjort af Ornäs 1997). Thus only a combined attention to local and global factors can enhance sustainable development by stressing empowerment at community level and good governance at national and global levels.

Expanding loyalties

The second approach to reach an insight needed to switch to co-operative action is that individuals' perception of their area of concern is widened. This brings the discussion further than based only on enlightened self-interest. A common understanding at local level, in countless localities, that there is a need to incorporate wider spheres of concern in ones decision-making and actions would then be required in a higher degree.

The issue is that of good environmental governance and leadership that accounts for secondary interest groups. These may be future generations as in the Brundtland Commission thinking, downstream water consumers or other categories that have an interest in natural resources without being directly involved in reaping the benefits of such resources. This addresses solidarity as a lifestyle, thus introducing a decisive cultural dimension to management of common resources. We may for example speak about solidarity with future generations, hydro-solidarity or solidarity with citizens of other countries. The need to include larger groups of stakeholders has been given increased emphasis of late. It relates for instance to the discussion on global citizenship connected to the World Summit on Social Development in 1995 (UNRISD 1995). In those discussions the view on national borders as the only possible demarcations for the sphere of both rights and responsibilities was challenged something which Shrader-Frechette expressed earlier in the following way:

> "Admittedly, fellow countrymen have prior claim to our loyalties, in large part because of an explicit social contract we share with them, But just because they have prior claims, they do not necessarily have exclusive claims to our loyalties. " (Shrader-Frechette 1991, p.160)

7. Global locality

> "Modern organisations are able to connect the local and the global in ways which would have been unthinkable in more traditional societies and in so doing routinely affect the lives of many millions of people"(Giddens 1990, p.20)

With more policy measures being discussed in global intergovernmental forums that affect people in their towns, villages and hamlets, and increased level of consensus and co-ordination are reached, challenges arise concerning strategies of balancing the aim for unified action and adjustment to the diversifying local environmental, socio-economic and cultural conditions. It brings the need for the global to be aware and incorporate local and community diversity to the forefront as phrased by Svedin:

> "We thus have a kind of international consensus about the issues to be addressed but below the surface there is much specificity connected to the various national and cultural realms within which they are dealt with" (Svedin 1992)

To illustrate this we discuss the community based natural resource management (CBNRM) on the one hand, and the Integrated Pest Management (IPM) approach to reducing risks from pesticide use in the South on the other.

The quest for a community resource control principle

The attention to CBNRM groups has an early NGO origin. It highlights empirical experience and case specificity. Three models for community development under CPR circumstances are mentioned here in order to illustrate differences in community empowerment and natural resource control; top/down and bottom/up perspectives are interwoven in various ways. The first concerns conservation of nature in areas of communal tenure?? not least in drylands. The second is more complex through

addressing a combined resource perspective on the various natural resources. The third is one example from a sector and production oriented community mobilisation.

(1).A Conservancy would be typically formed by an existing Development Committee. The Conservancy would ideally consist of members who contribute resources towards conserving and using wildlife in a sustainable fashion. The activity, community based, might be backed up with a Wildlife Council (with national mandate to co-ordinate tourism development plans). The encouragement at policy level is for the Conservancy, through its Committee, to derive an income from trophy hunting, sale of live game and tourist concessions. Other natural resource use fall outside a Conservancy mandate.

(2) Widening the scope beyond wildlife and tourism deliberations for environmental management, but remaining with conservation, can be achieved through applying current thoughts on CBNRM into forming a Community Management Body, authorised by Government with tenure rights over all aspects of communal lands, also pasture, farming and settlement along with roads and possible other infrastructure. A supporting structure from central government would then be required for help with regards to land administration and land use planning.

(3) A development model based on Pastoral Associations, PA, would be next level of community empowerment. It has a different focus from the others in that it is entirely concerned with extensive livestock production. Conservation aspects are not active parts in the model. They are lifted to the context. The approach has resurfaced over the past decade, after the sad development that essentially all projects targeted for dryland development had failed by early or mid-1980s. at least in a World Bank perspective.

Pesticide risk reduction

The approaches of global institutions to reduce risks with pesticide use in the South can if simplified be divided into two broad approaches. The one with a longer history, which is promoted by Industry and those who wish to see a highly intensified agriculture in developing countries after the pattern in the Northern parts of the world, is to ensure that every southern farmer knows how to apply the pesticides in a 'safe' way. The tools to achieve this is by a proper legislation covering registration, import, transport, labels, retailers etc., and training of farmers *en masse* in how to read the labels, what protective clothing to wear etc. The other approach is based on an emerging understanding in global policy circles of the limitations with the safe use approach, that the use of pesticides *per se* by poorly educated small-holder farmers in the South constitutes a risk to their own health. By supporting the approach of Integrated Pest Management one aims to reduce the volumes of pesticides used in agriculture. One common definition of IPM is found in the FAO's Code of Conduct:

> "a pest management system that, in the context of the associated environment and the population dynamics of the pest species, utilises all suitable techniques and methods in as compatible a manner as possible and maintains the pest population at levels below those causing economically unacceptable damage or loss"(FAO 1990)

Yet it is a very elastic concept spanning from the Industry interpretation where chemical pesticides form an essential part of IPM to the other extreme in which pesticides should only be used as a very last resort. But in a similar way to sustainable development IPM is used as a common denominator with a goal that few can object.

The switch in donor policy from encouraging the use of pesticides to favouring IPM has been most apparent in the 1990s. This has brought consequences for the role of IGOs and bilateral donors in their aid process, specially how they are handling scientific and local knowledge. Global institutions, such as the Global IPM Facility (a joint initiative by e.g. the World Bank, FAO and WHO) has a mandate to encourage IPM initiatives around the world. Industry deliver standardised IPM packages while the Facility favours an approach developed in the 70s and 80s in the South which involves farmers in the research process and give them a central role in the generation of locally specific knowledge. The scientific knowledge produced by researchers, which are always striving to be as widely applicable as possible, has by policymakers long been seen as superior to the more locally specific, and historically based knowledge produced by each farmer. This is still the case in most settings, special at national level but it is slowly changing in IGOs. Integrated Pest Management is if understood in the more recent form, is messy, it can not be written down in a book, and extensionists can not deliver a package, neither can an IGO give out standardised guidelines on its application. Risk reduction strategies promoting Integrated Pest Management (IPM) require more, in terms of commitment, knowledge, human and financial resources than the approach to advocate safe use. All this means their are more obstacles to climb for both IGOs and national governments to encourage IPM than normal pesticide and safe use packages.

When interpreted and implemented in policy the specificity of scientific knowledge can be lost for the sake of making issues more 'manageable' for the institutions to handle (Saurin 1994, p.55). The average farmer gets an average pest management package. With more policy measures being discussed in global intergovernmental forums and increased level of consensus and co-ordination are reached, more attention should be paid to the spatial distribution of knowledge, its generation and accessibility and how it is used in global policy making processes.

8. Knowledge systems and value frameworks

The knowledge of the interrelatedness of things needs to be in common for actors across levels, the awareness of at least the potential consequences of your actions to yourself or those whose fate concern you. Otherwise it is not even theoretically possible to take action for these resources based either on self-interest or beyond it. With increasing complexity this factor is hard to fulfil. The disparate accessibility to knowledge among stakeholders strongly influences the possibility for collective action. Causative links may be unknown, or too complex to capture as explored above. Science may in some cases have the potential of uniting decision-makers for action as Brenton notes:

> "Indeed the power of a united scientific view to push even unwilling governments into action is now one of the key mechanisms of international environmental cooperation.."(Brenton 1994, p.255)

But over-reliance on a science that is limited in scope, depth and detail when compared to the vastness and complexity of the Earth's ecological and social system leads to inaction. Waiting on scientific, indisputable evidence that may never come on the effects of human actions, at least not in time is then not rational by itself. Complementing the scientific approach by accepting basic ecological principles on the interconnectedness of the living world often inherently part of the knowledge systems of indigenous peoples or applying the precautionary principle are strategies to reduce the strong reliance on detailed scientific knowledge. Implicitly this would include a more value based approach.

Ethical principles can guide decision-makers who face high degrees of uncertainties in problem description and guide them in choosing strategies for co-ordinated action. Efforts to govern the resources that stretch out across from the global to the local where no one government or actor is empowered to enforce the policies, also implies depending more on ethically motivated behaviour from actors at each level. On the one hand one may argue that the transaction costs for eliciting co-ordinated action across levels and stakeholder groups in situations of activated complexity would increase dramatically. Not only because of the higher degree of complexity but also due the difficulties in monitoring, the lack of clear hierarchies and centralised government (Keohane and Ostrom 1995). The common understanding that transaction costs do not exceed benefits would be extremely difficult to reach. On the other hand such situations may open new dimensions of interaction as Giddens expresses it:

> "Disembedded institutions greatly extend the scope of time-space distanciation and, to have this effect, depend upon coordination across time and space. This phenomenon serves to open up manifold possibilities of change by breaking free from the restraints of local habits and practices"(Giddens 1990, p.20)

The rather far reaching requirements of reaching common understanding of the problem, alternatives for co-ordination, and decision-making costs, outlined may when comparing with the current state of the world give a rather gloomy picture,

> "Since politicians and policy-makers appear unable to agree about what is properly an environmental problem, it seems unrealistic to believe that they will come to find agreement over humanity's supposed common environmental interests" (Yearley 1996, p.84)

But there are still positive prospects for the future and the choice of paths to lead to either crash or sustainability remains. Svedin expresses a positive and yet not naive approach:

> "There must be a 'realistic' idea of what is governable and how. A too restrained idea of possibilities must, however, not be allowed to destroy the essential normative ethos of possible beneficial gains by action, so significantly apart of our present civilisation...How can we, in a situation of widely differing goals and aspirations worldwide, find paths for

> reconciliation and fairness?...There must be a path where both brain and heart has its proper share.".(Svedin 1992, p.309)

The starting point is perhaps to look at the role of a "common perception of mutual trust and reciprocity". This was the last of the four factors considered by Ostrom as requirements in an appropriator organisation for a CPR. In a local setting it is essential to develop a sense of mutual trust not only among the appropriators themselves.[7] In our situation of common resources across levels it would mean to develop such trust between e.g. individuals, local NGOs, the nested layers above e.g. the state and the global community. It is in these situations of complexity and uncertainty that trust plays an even bigger part:

> "For trust is only demanded where there is ignorance-either of the knowledge claims of technical experts or of the thoughts and intentions of intimates upon whom a person relies" (Giddens 1990, p.89)

In the current situation of globalisation caused complexity, not having much formal global-local governance structures, establishing such trust appears fraught with difficulties but then, as Hirst argues for situations of economic governance at global level, the need for trust among parties augment:"...the 'informality' of the system's decision-making processes actually fosters an emphasis on the trust between the parties involved" (Hirst and Thompson 1996, p.134).

Consensual awareness that there are few desirable options other than to work on developing some degree of trust between both institutions and individuals across the spatial scales would make it more worthwhile to see this approach as both realistic and inevitable i.e. the only alternative once more in Giddens' words "Trust is much less of a "leap to commitment" than a tacit acceptance of circumstances in which other alternatives are largely foreclosed" (Giddens 1990, p.90). The ability to express trust is one element of social capital, that capital which in later years have been shown to be of significant importance in the building of societies that prosper in the generation of more materially tangible capital (World Bank 1997). The degree to which such capital has been developed at local, national and global level varies greatly. Local communities have had to interact closely for centuries in co-operating for scarce resources. Close observance of each others behaviour and close reciprocal dependence that facilitates trust were developed over long periods. Local CPR regimes are based on co-operative rather than competitive attitudes (Jacobs 1989). The sense of communalism is more prevailing than in current western societies which poses the crucial question whether this has any chance of occurring across between North and South, between the local and the global level. The existence of a community feeling promotes co-operative efforts (Karlsson 1997).

The global community is very young and has had little time to knit social bonds across the globe. A history of war and power struggles between states is not quickly erased

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[7] The local regimes do not depend completely on altruistic behaviour of people in the community however. There is a recognised need for some level of mutual coercion such as monitoring and graduated sanctions (Ostrom 1990; Gibbs and Bromley 1992)

from the memories of governments and peoples. Mutual trust and reciprocity is but slowly built by e.g. continuous interaction. Interaction between individuals and governments across the globe is growing on an unprecedented scale. So is the possibility for observing each others behaviour. Both processes are facilitated by new information and communication technology. Positive social forces towards a more just society are growing stronger (Huddleston 1989), e.g. democracy and respect for human rights, which support the development of trust and reciprocity.

When looking at experience based knowledge as constraining habits we search for new institutional capacity through building mutual trust and reciprocity. More independence from the "constraining habits" opens for greater integration, and again to more inter-dependency. The global village metaphor is valid also in this dependency respect; new forms for, and levels of, interaction that take long to secure.

> "the ideal is for social institutions to be self-generating and organically evolving from basic sets of common values, rather than to be built to a rigid preconceived framework" (Dahl 1996, p.139)

The conclusion from this line of argument is that without building a community feeling and a sense of trust, there is little chance of success in managing a resource as Common among a group of farmers or a group of states and specially a group of diverse stakeholders that include both farmers *and* states, individuals *and* institutions across levels. This may necessitate a new ethical concept at the basis of governance, and one discourse that has implied such is on 'security'.

9 From common resource to common security: institutional diversity, environmental awareness and social capital

The recently coined concept of 'people security' is gaining much attention (Commission on Global Governance 1995; Kothari 1995). Here the focus is individual humans' perceived security, based on human dignity. It is naturally connected to both planet and environmental security and conventional notions of security, since the main target will in all cases be individual humans with a reduced quality of life. Favouring a shift from states to individuals as focus for studies in International Relations, Smith considers it a prerequisite to address environmental issues: "To take the environment seriously requires shifting the level of analysis away from the state to the society or the individual" (Smith 1994, p.43). Dyer sees environmental security in stark opposition to national security, as incompatible world-views, again confirming the emphasis we have put on perspectives and awareness in this paper:

> "Environmental security and national security are alternative values, arising in the context of alternative world-views. If the case is made out for adopting a global perspective, environmental security could stand as a universal values on which more localised environmental policy could be properly founded. If traditional inter-state perspectives hold sway, there is little chance of environmental security becoming any more than an addendum to the traditional politico-military security agenda" (Dyer 1996, p.37)

And finally we can with the help of Shrader-Frechette connect this discussion to the Human Rights discourse, recognising that the globalisation created interdependence brings obligations to recognise and secure equal individual rights:

> "There are also a number of nonutilitarian grounds for believing that all persons have equal basic rights to security and, therefore, that no countervailing benefits can justify failure to recognize these rights. One of the strongest arguments for recognizing equal, transnational rights to security is that human interdependence, across national boundaries, creates transnational moral obligations to recognize basic human rights" (Shrader-Frechette 1991, p.150)

Lifting the CPR concept beyond the community specific means adding complexity (cf. (Hjort af Ornäs 1997; Granfelt 1999). This follows from the act of the abstaining to confine the notion of Common to a specific level. We apply in the current essay the metaphor "activated complexity" to characterise the situation of high interrelatedness among factors influencing the management of resources that can be regarded as common for actors at different levels. The applied issue becomes whether the concomitant whole range of policy decisions can be synchronised. This seems necessary to manage conflict and upgrade peoples' security awareness. The choice of perspective, for the local actor towards the global implications of his actions and for the global policy-maker to secure the basic rights of local actors in their context are central aspects of our discussion. We have illustrated this through examples from pest management and risk reduction, implementation of LA 21:s and community based dryland resource management. The situation of activated complexity for resources raises the need to develop a range of competence profiles. These consist of social capital, environmental awareness and institutional capacity. Variations in all three must be managed. The span for all three is wide if it is to meet the demands for modern organisational capacity from the emerging concept of global locality. The process takes time and can hardly be speeded up.

The role of knowledge for global common resources thus becomes different from the community CPRs in this approach. Instead of being science oriented, its prime concern is with interrelatedness. The gain is building mutual trust and reciprocity. Perceptions of security can improve and be precautionary against fragmentation and conflict.

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