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The causal cascade: dwindling resources, violence and escapes

2.1 Aim of this chapter

As stated in the Introduction, the nexus of natural resources that play a role in violent conflict causation or as conflict object (when abundance-in-scarcity is at stake) is the subject of this thesis. For the purpose of the research, three different areas which seem to foster some grievances, but which have not developed full-scale violent conflicts (yet) have been studied. The aim was to make a comparison between the three full causal stories of conflicts. This chapter intends to come up with a framework to systematise the research field of ‘environmental security’1 (ES) and thereby clarify the discussion between academics (and politicians) who see or do not see a link between environmental scarcity and violence.

Within the ‘environmental security’ field as well, different scholars of the same and different disciplines have seriously conflicting opinions and not only use different concepts and definitions, different assumptions and different theories, but also study different scale levels. These different approaches must be integrated in order to reach a more fruitful debate and open up the possibility of reaching a more productive outcome. This integration takes place in the framework.

After a short discussion of the usefulness of the ES field, despite all the critics, I will explain the necessity of the proposed framework. Only then will I start to build up that framework.

1 For an explanation of this research field see the Introduction.
2.2 Objections to ES science

2.2.1 To the whole science field
Since the start of the research projects into a causal relation between environmental scarcity and violence, several scholars have reacted with scepticism. Some of them have even totally rejected Environmental Security as a science field. In general the critics have recognised three categories of flaws in ES that basically all come down to an excessively restricted view of the science field.

To the astonishment of many scholars, the ES field uses specific and fairly narrow definitions of the terms ‘Environment’ and ‘Security’. In fact, it is this limitation that spurs most of the criticisms. Why is ‘environment’ only seen as the natural resources that support the (economic) subsistence of people (or states)? What about nature in its own (intrinsic) right? And why are other resources, such as air, not incorporated? Violating the health of humans and nature by environmental pollution in favour of economic gains, especially threatens the security of the poor.

On the other hand, limiting the concept of security to ‘physical attacks against humans or material property’ unsettled social scientists. After the broadening of the term ‘security’ in the Eighties and Nineties - from the denotation of ‘safeguarding national values against external threats by military or allied means’ (Levy 1995) to ‘safeguarding also local and global values, among which economic and ecological ones and human rights against threats in general by not only military means’ - one would expect the subject of a new science field, which emerged in the same period and using this term in its name, to have the same scope.

Critics expect ES to study the connection between ‘human’ or ‘social’ (in)security and environmental degradation. Thus, ES should focus on securing a sane and supporting environment so as to safeguard the human lives and livelihoods that depend on it. However, doing so would mean that ES does the same as has already been done by Environmentalists or Sustainability researchers and politicians.

The irritation felt concerning the contradiction between the ‘all-involving’ name and the narrowness of the factual research subject as defined in its terms made opponents criticise 1) the origin of the science field, 2) the starting-point and end of the chosen ‘causal story’ and 3) the blindness for several important connections within that ‘causal story’. Together, critics say, these three weaknesses will lead to neo-Malthusian pessimism. This “fear for the poor” (Peluso and Watts 2001a: 11) will in turn cause the development of repressive policies to ‘save the world from violent reactions to scarcities’, thereby “not leaving any room for local negotiations, adaptations and innovations”, and “den[y]ing any role for agency in the non-violent resolution of local conflicts of interest” (Hussein et al 1999: 414).

However, the critics’ worries concerning “violence by states against their own people”

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1 See for example Rajan (2001).
2 The excessively narrow definition of ‘violence’ therefore excludes this ‘violence of pollution’ Peluso and Watts (2001a: 23): “… it implies a narrow interpretation of violence (for example it excludes the violence of cancer alley in Louisiana …) (a lane with an exceptionally high percentage of cancer: most probably due to pollution, RN).”
4 This is a term used by Noorduyn and De Groot (1999:36) see below for an explanation.
(Peluso and Watts 2001a: 30) and their apprehension of the narrowness of the notion of security, have engendered (or are perhaps based on) groundless accusations of instigation and the adoption of the subject by the military to safeguard their position after the end of the Cold War. In addition, this fear of the critics themselves caused them to regard ES as being founded on "the emergence of "new" forms of violence [...] such as Islamic terrorism or ethnic cleansing" (Peluso and Watts 2001a:11). By doing so they overlook the fact that, as they themselves (id: 10) rightfully state, ES had already started to play a role in the 1970s, when both geopolitical conditions did not seem so apparent or did not even exist. In addition, the second accusation contradicts the first: do the military need the environment as a funding issue, when "the war on terrorism" already furnishes them with endless funds? On the contrary, it was a politically inspired recognition of the lack of awareness of one of the causes of violence and the fear of too many military actions as a possible result that inspired pre-ES scientists to draw attention to the subject.

As the diverse projects mentioned in the introduction have shown, a connection between violence and environmental scarcity does exist. Thus, focussing on this connection and leaving out broader ones, is a legitimate choice of scholars. As Noorduy and De Groot (1999: 36) have explained, both "scientific and daily-life stories display relatively arbitrary cut-off points in spite of the fact that in the real world causal chains neither have a true beginning nor an end". A good scientist cannot cover the whole of reality. The demand of the critics to start not at the point that environmental scarcity exists, but to include the (political economic) causes of environmental scarcity as well, is equally arbitrary. Because many scientific disciplines focus on that subject. I consider the choice of the starting point of ES as a logical limitation. The same applies to the choice not to extend the ES research beyond the point of violence. Of course mediation and peace-building are important factors and phenomena, both for scholars and for politicians, but they need not per se to be included in ES, as an after-violence device.

Yet, not giving specific attention to phenomena that are present before the beginning or after the end of the chosen causal chain, that exist alongside the causal chain or that are the reverse of the causal chain, does not mean that ES denies their existence. Naming 'structural scarcity' or 'environmental discrimination' as key sources for environmental scarcity is an explicit reference to the political economic causes of this scarcity and, thus, fore-lying causal chains. In my opinion, it is also an implicit way to call for the halting of this kind of discrimination. Nevertheless, other academic (sub)fields have to cover (or already cover) this and the rest of the wide range of connections in detail. The results of all these different endeavours may be integrated later on, if necessary. Indeed, to show the positioning of ES in a wider context, several ES publications\(^{8}\) start to describe which sorts of linkages between environment and violence they will not take into further consideration.

An obvious link in addition to that of 'scarcity leads to violence' is the reverse one: violence and war can cause scarcity and degradation of natural resources. Violence or wars destroy

water wells, agricultural lands, or forests, whether deliberately or as collateral damage. In situations of violent threats, refugees tend to flight to marginal or as yet uninhabited areas, such as nature parks. The pressure thus augmented can degrade the already fragile lands or disturb the natural equilibrium. An example of the over-use of certain areas as a result of the flight from dangerous areas, prone to violence, is the southward movement of cattle nomads in Chad due to the civil violence (De Bruijn and Van Dijk 2003). But, being part of the sustainable development paradigm, the relationship between incoming refugees and the subsequent degradation of the environment has already been addressed outside the ES boundaries by environmental and (some) economic scientists. However, ES focuses on the effects of the resulting scarcity of natural resources (such as water or land) on the peace process or a new eruption of violence.

Yet, it is not only scarcity of resources that plays a role in violent conflicts. The opposite is also true. Since the end of the 1990s, scholars have claimed that the abundance of minerals, oil and even valuable crops such as (e.g.) coca-plants, is a far more important objective to fight for. Statistical analyses have demonstrated a far greater risk for civil war of resource abundance than of resource scarcity. In general, distinguishing between mineral resources and renewable resources is important. "The honey pot of abundant mineral resources is a major determinant of civil conflict" (de Soysa 2002: 28), but for renewables "conflict is likelier when countries have a moderate level [...] per capita but [it] diminishes with abundance" (De Soysa 2002: 17). However, some of these authors used primary commodity exports as a measure of resource availability, although this might as well be considered as a measure for resource dependence and scarcity. It does not say anything about potential resource availability and whether or not these exports are on the brink of disappearing because of resource supply depletion. Even those researchers who considered the real stock of natural resources based their calculations on data at country level and did not look at regional (or lower level) differences in natural resource endowments, let alone boundary-surpassing inequalities. The civil wars in both Sierra Leone and the Democratic Republic of Congo are not restricted to within these countries' boundaries.

As has already been mentioned in the introduction, absolute scarcity is no reason to fight. It is a reason to go away. It explains the link between moderate levels of renewable resource availability and violence. This can be seen, for example, in the study of Witsenburg and Adano (2003 and, Adano and Witsenburg 2004) in the Marsabit district of Kenya where, in drought years, water wells are not the object of conflicts because the majority of cattle-keepers move to the south in search of pastures. In addition, the remaining people are too poor and do not want to take excessive risks to safeguard their water access. Violence, "like any other form of organized social activity, requires financial and other resources ..." (Ballentine and Sherman 2003a: 1). When the possible gain is too low, a cost-benefit calculation of the use of violence

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* An often mentioned example is the use of Agent Orange in the Vietnam War, but the biblical acts of polluting the enemies drinking water sources also serve as examples.
* For example, bombing Serbia in 1999 destroyed the sewage system of Belgrade and caused the spill-over of waste water into the Danube.
* See for example Dudley, et al. (2002).
* See for example Cater (2003).
that includes the risks will turn out negative. Thus, the resource that will be fought for has to have (monetary) value. The abundant (but ‘free’) resource ‘air’, for example, has never been fought for. The value derives from the fact that the resource is precious on the (global) market and thus generally scarce and, secondly, that it can be looted. This means that it is locally abundant and provides an “easily [to be] captured stream of revenue” (De Soysa 2002: 8). These three conditions can be met more easily by non-renewable resources. The last two factors explain the positive relationship between civil war and the primary commodity export-factor.

Although ES does not deny the strong relationship between resource abundance and violent conflicts, it does question the specific role of the abundance. After all, statistical analysis does not reflect the direction of the cause-effect chain. Nor does it distinguish between abundance as a start-up factor or as a continuation factor1. “The larger the conflict, the more likely it is that it has evolved through many stages and the more likely it is that the factors that sustain it are different from those that provide the initial trigger” (Ballentine and Sherman 2003a: 8). In reality the underlying cause of an ongoing conflict may well be a (relative) scarcity of resources started at a very local level. Indeed, Cater (2003: 19) warns that several wars in Africa have a high “complexity and intractability” and that related (UN) “policy making [is] influenced by potentially misleading assumptions [...] particularly excessive reliance on a paradigm of economic predation.” A “modified ‘political economy’ approach may more accurately reflect the realities of contemporary armed conflicts”. Cater says (2003: 19-20) This is exactly what ‘improved ES’ (see below) will do.

Another link, described by Peluso and Watts (2001a) as an important but forgotten one in the nexus between environment and conflict, is the amelioration or restoration of the environment. However, contrary to what these critics state, this phenomenon falls directly in the ES body of research. It is nothing else than the struggle between two user groups over a certain scarce resource (mostly land) based on differences in interest and form of use. The establishment of a nature park or reserve to conserve an endangered species or to safeguard the potential environmental support systems pits the State against local herders or farmers who suffer from scarcity of land and have no alternative regions in which to perform their subsistence activities2. Although some ES scholars look too narrowly at the State’s role3, the phenomenon of the State as one of the contending parties in a conflict is incorporated in the body to be studied by ES.

Because ES confines itself to direct violence, all sorts of structural violence that indirectly engenders overwhelming poverty and bodily harm are not clearly incorporated. Structural violence against human beings because of the extraction of natural resources by rich end users without any account being taken of the well-being of the local inhabitants4, for example, or

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1 See Sandole (1999) about differences between start-up and continuation causes. See also Guaqueta’s (2003) description of how armed groups in the Colombian conflict transformed into “formidable money-making machines” (id: 93), tapping resource wealth during the conflict which was started on the basis of grievances concerning the low economic performance and unequal distribution of benefits.

2 Secondary actors in State policies to install nature parks are often international NGOs (e.g. IUCN)


4 The notion of the State as one of the parties in an environmental conflict escaped, for example, Homer-Dixon (e.g. 1999) who describes the State only at the end of his overall schema as a victim of escalating social effects of environmental scarcity.

5 For example the worldwide unequal distribution that engenders poverty and subsequent high morbidity and mortality rates.
structural violence caused by budget division in favour of the violence and defence industry, are connections between the two concepts that are not directly covered. However, by studying the causal pattern from environmental scarcity to violence and by examining all the factors that influence actors' steps and possibilities, ES cannot avoid involving these political economic subjects. That this should be done more systematically, while "preventing too simplistic conclusions", as Hartman (2001) now observes, is something I will come to in the next section.

In short, the critics who repudiate the whole ES science field do so because they think that the boundaries thereof are set too narrow. They do not disclaim the existence of a link between environmental scarcity and violent conflict. Yet, they judge the exercises of ES as being too limited to generate unambiguous results. Their last category of criticisms contains all the aspects which lie within the causal story studied by ES but which have not been studied. As Dietz (1996: 23) already said: "interpersonal strive and competition can be turned to productive co-operation, and collective solutions to difficulties can be found, even in desperate resource situations." Claiming an unambiguous relationship between scarcity and violence via the ruin of management institutions, without any eye for the constant re-definition of such institutions and for other routes that may be chosen by actors, indeed risks leading to 'dangerous' top-down policies.

Like the critics, I think it is necessary, both for a general scientific understanding and as an aid for policy measures, to improve the knowledge about the discussed link. The connections between environmental scarcity and violence deserve special attention to help explain when and why violent outcomes have to be feared. Therefore, partly in order to overcome "simplistic linkages between 'increased environmental scarcity', 'decreased economic activity' and 'migration' that purportedly 'weaken states' and 'cause conflicts and violence' (Peluso and Watts 2001a: 5), my study tries to improve the concepts, methods and therefore results of research in the ES field.

2.2.2 Countering flaws within the science field

Although most of the weaknesses of ES mentioned so far are going to be described and responded to in following sections, I will briefly enumerate some of them here.

Up to now too much emphasis has been given to the supra-local, even national or supra-national level in the search for causal links between environmental scarcity and violence. Systems, not actors and agents, have been the focus of attention. To clarify people's strategies, the local and (small) regional levels as well as empirical studies in these local and regional settings should be focused on.

In addition, a greater insight into the relationship between scarcity of natural resources and violence will be gained if circumstances of environmental scarcity without violence are studied. As yet, attention has almost exclusively been paid to cases that show, at first sight, both violent conflicts and environmental scarcity. However, in most cases of environmental prob-

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20 As has already been stated with regard to Bächler's "environmental discrimination" (Bächler 1999), and Homer-Dixon's (1999) "structural scarcity."

21 The level of the State is also used to measure the importance of resource scarcity versus resource abundance in civil war causation. Regional differences between regions within States, that is the abundance-in-scarcity paradigm, are ignored.

22 This point is also made by some critics of the whole ES science, for example Levy (1995).
lems people do not react with violence. Equally interesting to study for clarifying causal patterns between scarcity and violence are the situations in which clear-cut violence does not (at first glimpse) coincide with environmental problems. Violence as such is the result of “very complex interactions, and seldom mono-causal” (Van de Goor et al. 1996:1).

However, the absence of violence may also be part of a complex situation in which both violence and non-violence are chosen as a strategy to overcome the insecurity raised from the environment. What Homer-Dixon (1999) traverses with two steps (from environmental scarcity to social effects to violence) in local realities appears to comprise a myriad of different strategies and tactics which are different for different actors at different moments in time and which are influenced by insecurities in other domains than the environmental one.

Such highly complex situations have to be studied with the help of the insights into and theories of all different science fields that already cover (parts of) the phenomena involved.

2.3 Complexity and models

2.3.1 Multy-disciplinarity

*Human-Environment Interaction*

To study such situations that can be classified as (potential) resource scarcity conflict situations, different theories and concepts from disciplines and sub-disciplines are used that study the interaction between individual human beings as well as their groups and societies with their surrounding environment (being local, regional or even global) and the problematic aspects thereof. In accordance with the New Ecology ideas that characteristics of ecosystems are no self-preserving properties but only by-products of individual plant and animal strategies (Cahezn 1988), ecological branches of several social sciences, regard human beings as agents in an environment built by the natural surroundings, the socio-cultural and the legal-political fabric, as well as the economic reality. “The variability of natural resources over time and people’s varying and often flexible responses to

20 Such as Human Ecology (e.g. Levine 1975), Cultural Ecology (e.g. MacC Netting 1977), Ecological Anthropology (e.g. McCay and Vayda 1993 or Milton 1996) and Political Environmental Geography (e.g. Dietzn 1996).

24 Dutch Environmental Science developed in the Netherlands in the early 1970s as a discipline that combined the insights of both social and natural sciences and formed an interdisciplinary body of knowledge to study the interrelationships between humans and their environment, with emphasis on potential and actual problems within this relation, with the aim to find ways to solve these problems (e.g. Udo de Haes (1991), Bouwer and Copius Peereboom (1993)).

27 At the beginning of the 19th century ecological principles, such as Darwin’s theory of ‘survival of the fittest’, that triggered the idea of competition as the driving force behind all actions of living organisms, inspired several scientific (and non-scientific) domains. From then on, ecological branches of several social science disciplines sprouted (and evolved) from this stem, wherein human beings are finally thought of as not being independent from their (natural) environment. As man was seen as a biological species, interrelations of human beings were studied analogue with plant and animal interrelations. To this end the social sciences used methods and theories from the biological sciences, with the inevitable result of (from time to time) “unsophisticated adoption of biological concepts” and “bad analogies” (Young 1983: 96). Very soon the social and the moral order of human society were seen to be missing in the analysis. Headland (1986: 61) wondered “how [...] culture articulates human populations with their environment” and Steward (1955 in Young 1983: 63) wanted to “understand [...] the effect of environment upon culture” (continued on next page)
it” (Dietz 1996: 34) make this environment a highly dynamic one.

To this should be added the influence of people’s images of the surrounding reality on their actions. “Man’s behaviour is structured by a set of habits, norms and values which reflects the perceptions or rationalisations of the surrounding world in the particular society or social group to which he belongs.” (Plateau 1996: 55). “While there is an objective reality, our perceptions of that reality are mediated by social processes. Biophysical reality shapes social perceptions about itself through individuals reflexively changing or accepting their perceptions contingent to their direct or indirect experiences with reality” (Burke 2001: 467). Dialectically, the behaviour, that is the actions, of people which result from worldviews and direct perceptions, influences the shaping of that physical reality.

Yet, the perceptions (although influenced by former generations’ stories) cannot be but short-time based. They do not account for the fact that “the causal relationships within environmental systems are sometimes best represented by sharply non-linear mathematical functions” (Homer-Dixon 1999: 37): that “indeed, some environmental systems are chaotic” (id.: 38). For everyday human life, the knowledge of ecologists that “to describe complex, interdependent systems of organisms [...] metaphors of anarchy, flux, and constant turmoil are [...] apt” (Homer-Dixon 1999: 39) are not workable.

Thus, in order to tackle this mixture of influences that shape people’s roles and positions in and with their environment, several theories about mutual human-environment determination, more specifically those that regard the use of land and the expansion of the use thereof, are (sometimes implicitly) integrated into the framework and will therefore be discussed shortly. Meanwhile, the (perhaps simplifying) perceptions of actors (between other things, the interpretation of the state of their natural resources) are considered to be decisive in the shaping of their strategies and actions.

**Human-Human Interactions**

In a study that tries to explain the reasons of the outbreak of violence between people or the absence thereof, theories and concepts from the fields of social sciences and humanities have to be incorporated that describe or explain human interactions as such. Not only the problematic relationships of people with their environment, but also the problems that arise there from in the strictly social domain (or vice versa) is the subject of the study. Within Sociology (as

Although the ‘ecological social scientists’ themselves have formulated critiques on their over-reaction to see all human beings and action as wholly ‘natural’ and (thus) their unrestricted adoption of ecological notions, such critiques can be extended still, especially since ecologists have developed totally new insights into ecosystems and aggregate communities therein instead of (only) competition as a driving force. Although the use of concepts, like ‘niche’ or ‘predation’, may sometimes be very useful, it has to be stressed that the focus of the different ecological social sciences on “individual as well as population responses to environmental forces and stresses” (Orlove 1980: 251) is too narrowly restricted to a one way relationship between people and their environment. In addition, phrases like “the mechanisms by which the system is sustained and maintains its equilibrium” (Van Driel 2001: 26) indicates a systems approach – with its box-like concepts – that is too confined in situations where there are no boundaries, and certainly not those drawn on a very limited scale, whether in time or in space. Last but not least contemporary ecological insights deny the existence of total balanced ecosystems. Especially, the Sahel and Sahel-Sudan zone are currently seen as non-equilibrium environments. These three issues are already stressed by Leach. Meanies and Scoones (1999: 232): “We need to ask, for instance, which social actors see what components of variable and dynamic ecologies as resources at different times?” [...] How does natural resource use by different social actors transform different components of the environment?”
‘Conflict studies’), Anthropology, and Political Science (‘Peace studies’), to name but a few. sub-disciplines focus specifically on discords between people. There are many theories about the development of revolutions\(^2\) that offer ideas and concepts, of a socio-cultural and structural-political kind, which are helpful for an analysis of growing discontent and rising tendencies to violence. In addition, although revolution against authorities as such is not the focus of this study, during the course of the study the overthrow of governments or (particularly) other authorities may, nonetheless, appear to be a factor.

More important are the theories and case studies dealing with conflict and conflict resolution on an inter-personal or inter-group level\(^3\). Of these, the theories on individual behaviour and goal seeking (e.g. rational choice theory), which are based on social identity (whether or not ethnicity driven), relative deprivation and frustration, psychologically formed stereotypes and world views (whether or not based on cultural patterns), and group conflict patterns and resource mobilisation methods occupy a prominent place in the description of conflict theories.

2.3.2 Why a model
Basing a study on such an overwhelming number of different theories and disciplines could lead to the main issues becoming lost in a plethora of complexities. We need to “find a language that makes interdisciplinary discourse possible” (Brox 1990: 227). Therefore, as has been stated, I will develop an integrating framework based on the perception that a concise theory, that incorporates all these different notions, is necessary in order to acquire a view of reality. However, it has to be emphasised that it can only be “a kind of ‘window’ on reality” (Brox 1990: 229), “that provides us with a particular view of the phenomena we are trying to understand” (Kenneth Pike in Headland 1986: 65). Broadly speaking, there are two types of theories. First, ‘simple’, ‘straightforward’ models to explain certain phenomena (such as Rational Choice Theory or the Geographical Location Theory of Von Thünen (see below)), and, second, ‘encompassing’ models to order the world.

The first are used to discern the “A” from the “non-A” in a certain situation, i.e. not to prove the ‘realness’ or truth of A, but to test the relevance of the “A - non-A” divide. For example, the Rational Choice Theory says that people act according to rational cost-benefit considerations. Of course the non-A, that is behaviour that is not based in rational calculations, does exist. However, it can be useful to initiate a search for an explanation of people’s actions in the rational domain. This is especially so when the limitations, such as the existence of non-A, are recognised. Here the warning of Ostrom (1990: 183-184) springs to mind that several criticised models are not so much wrong, but only applicable under special circumstances, namely “[w]hen conditions in the world approximated the conditions assumed in the models…” She also states that “these are special models that utilise extreme assumptions rather than general theories.”

The second type of model tries to describe a whole complex of phenomena, all mutually related as well as related to other complexes. In short, it describes a non-limited system of the real world. At the same time, though, such a “description is necessarily a selection out of the real world” (Segers 1977: 57). It is always possible to use another cut-out of the world, anoth-


\(^3\) For example those of Burton (1993), Rubin et al (1994) or Sandole and Van der Merwe (1993).

er angle from which to view reality. For each such window or 'frame', one should keep in mind the things that are neglected by this view. According to Headland (1986), Pike has already argued that the same phenomena can be viewed through two or more different windows (or theories), showing different aspects of a pattern. It is in this tradition of description of an entire, complex part of reality that I will build my model to enable a better understanding of the relationship between resource scarcity and violence or non-violence at local level: the model as “a paradigmatic structure that helps to order the material” (Rapaport 1985). The proposed model will be descriptive in the sense that it seeks to give “all” possible reactions and influences that drive an actor’s conduct in the pathway to violence (or, for that matter, the avoidance of violence). And because, “[a] theory must be simpler than reality if it is to be helpful.

[1] It attempts to strip away from attention those items which are not important to the observer at the moment. In this way it helps obtain answers to particular questions on a narrow front by simplifying the task of investigation ... A scientific theory is good only if it leaves out wisely those materials which are relevant to other questions but not to those immediately being answered” (Pike 1982: 5-6 in Headland 1986: 65).

Thus, for my model, the word “all” must be interpreted with some reservation: only the important “all” will be included and these will be categorised in order to reach the aimed simplicity. The other restriction is that the model describes only a selection of the world by limiting its scope to the local or regional level and by not surpassing the moment of violence outbreak.

In such an ‘encompassing’ model the simpler “A – non-A” models, the actor level and actor-in-interaction-models, can be used to analyse the different ordering steps. Assuming that violent encounters can occur between two individuals or between clusters of individuals or even very big groups, the framework proposed here starts at the individual level and works with the individual actor models as they exist in the social sciences (e.g. De Groot 1992). Personal livelihood strategies formed by ‘rational’ use, overuse and shifts of and between the diver actors, as described by Bebbington (1999), will be the focus of my attention. Within the flow-diagram I try to discern the different steps that actors can make based on their livelihood decisions, the influences that lead to a specific step and the consequences of different steps, following especially the chain that may lead to violence. Other scholars have to focus in more detail on the peaceful pathways of co-existence that, together with the competitive ones, always form a complex mixture of livelihood strategies in the real world. In compliance with Bebbington, who emphasises the importance of access to different “capital assets”, I wish to point out the fact that ‘whole’ frameworks “must capture both the dynamics of conflict [...], and those of cooperation ...” (Bebbington 1999: 2023). However, it has to be stressed that every researcher always chooses ‘his own part of the total story of reality’ (Noorduyn and De Groot 1999: 36). Of course a cascade that describes only the path up to violence does not imply total ruin without recovery, as some critics suggest Homer-Dixon (1999) said by ending his

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[7] Thus, here the frame focuses on scarcity of natural resources in the story-line towards violence. Another possible frame may be the role of ethnicity or religion in the story-line towards violence. Nevertheless, as will be explained further in the sections about the influencing factors, the chosen frame does not mean that these other phenomena do not play a role in my model.

[8] Produced (being separated by Henkemans (2001), and DFID (Appendix 2001 26) into physical and financial, social, natural, human and cultural capital (see the next sections about escapes and influencing factors).
model after the breakdown of states and governments". ‘No condition is permanent’ (Berry 1993) as has been noticed already by the pioneers of sociology (Simmel 1955, Coser 1967) and their followers (Parsons 1994, Boulding 1993). Moreover, sometimes conflict and even violence seems to be necessary to alter a status quo that hinders development. Then the breakdown forms the dawn of a better situation.

Like the ‘encompassing’ model of Homer-Dixon (1991, 1994, 1999)" by which it is inspired, my window on reality only deals with the Cascade from scarcity to violence, albeit with all its in and outgoing influences and possibilities, and the flows (called ‘escapes’) to non-cascade-following actions. Structurally including (co)-causes and ‘escapes’ helps to counter the missing views from the Homer-Dixon model.

Next to that, there is one aspect of the Homer-Dixon model that, according to me, makes the analysis somewhat rough. Yet, it cannot be enhanced by simply adding to that model. As “a good analytical model makes you see one aspect of a complex problem in great clarity, [and] you always risk that it makes other important details of the same phenomenon disappear from your view” (Brox 1990: 232), I have chosen to change the perspective of my model a bit from the systems-level to the perspective of the individual actor. Mostly, in my research, this is a human person, but it can be a group. Yet, because local communities are diverse and divided entities, perspectives of individuals within the group are always of importance. Von Benda Beckman et al (1992: 3) already stated that “there is no such thing as the community as a whole”. People have different positions dependent on different situations. For example, men and women as well as adults and children have different roles, capacities and stakes. “There are differences in access to resources, in power, in technical skills between ethnic groups, between age groups and between individuals” (Van Est and Noorduyn 2000: 54-55). Within the hearthhold family, the extended family, the village or towards the outside world (e.g. as a member of a political party or an employee of a certain enterprise) persons have different bearings in different groups. A group only serves as such under specific circumstances. Under other circumstances or from another perspective the group boundaries have to be demarcated differently."

The value of a ‘window’ or ‘frame’ is that it can help to look at certain situations. My model will help, while following one causal chain backwards, to explain an already existing violent conflict or, by going forward, to predict probabilities of certain strategies, one of them violence.

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20 Laurent and Mathieu 1994. Van der Merwe 1993 (263) “Such social upheaval also contains the seeds of re-generation and growth” Gluckman (1982) even describes the positive social ordering principles of conflicts within and between family ties.
21 Homer-Dixon 1999. 134, figure 1. Starting from three types of rising scarcity he unfolds a flow chart of causal steps leading to three types of violence. One of his main points is that only ingenuity (page 109: “by ingenuity I mean ideas applied to solve practical, technical and social problems”) can give an escape, but although “necessity will often be the mother of invention”, “[i]n some societies […] resource scarcity simultaneously increases the requirement for ingenuity and impedes its supply, producing an ingenuity gap” (id. 108), see also Homer-Dixon (2002).
2.4 Building the model of this thesis

2.4.1 General remarks

The framework may be seen as a conspectus of possible reactions that people can show when confronted with the series of events, that are formed by the positive and negative influences and circumstances from outside or from within their own ‘life’, or by the ‘flow’ itself. As mentioned above: “organisms and environment are dialectically related” (Barry 1999: 188). To this I add that this applies to the dynamic part of their relationship as well: series of actions both influence and are influenced by themselves, their users and the surroundings. This interdependent mixture of (changing) facts, events and reactions of actors to these three parameters is schematised in Figure 2.1: forming the Cascade from environmental scarcity to Violence connected with the flows to Escape the seemingly inevitable cascade.

*Figure 2.1 Violence or Escape diagram*

The following applies to the legend of the figure:

The grey boxes on the left-hand side of the framework represent (changing) facts, which are real or at least perceived by the actor. The three white boxes on the right are ‘events’ caused by reactions of actors. The white boxes in the second row are ‘non-cascade’ events. Straight arrows are ‘steps’, reactions of the actor. Double-lined arrows depict the influence of two types of factors on the reaction of the actor, on events and facts or on both. Dotted lines and arrows reflect results of actions not necessarily directly brought about by the actor; sometimes leading to (new) facts and events, sometimes to other people’s actions, mostly in a feedback loop.
2.4.2 The model at large

**Start: left-hand side**

Despite criticism claiming that Homer-Dixon is a pessimist neo-Malthusian because he warns against something they do not see, I do not reject Malthusian theory all together. As is emphasised within the (Dutch) Environmental Science Theory, attention should be focussed on the intersection of Boserup ("the growth of population is a major determinant of technological change in agriculture." (Boserup 1965: 56)), and Malthus ("the power of population is indefinitely greater than the power in the earth to produce subsistence for man."); "Population, when unchecked, increases in a geometrical ratio. Subsistence increases only in an arithmetical change in agriculture." (Malthus 1965: 56)) and the circumstances that influence the evolution of either of these paths.

Thus, following on from the ideas of Malthus (1798)\(^7\) and Hardin (1968)\(^8\) that our world is finite, and of neo-Malthusians that human beings are perfectly able to minimise the resource base by unsustainable use\(^9\). I start the causal flow on the left-hand side of the diagram

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\(^7\) See Introduction.

\(^8\) See De Groot (1999: 2-6), and Homer-Dixon (1999: 43).

\(^9\) Malthus (1798) has argued that the exponential growth rate of human population could not and would not be followed by the same rise in food production. According to Boserup, Malthus states that "... food production [is] a limiting factor for population growth" (Boserup 1965: 12). In the end, humankind will be faced by "miser and vice" (Malthus 1798: 5), by famine, "starvation and death" (Malthus 1803, in Mazzucato and Niemeijer 2000: 307), if not by war over these scarcities as well. For Malthus the core idea was that scarcity and poverty are the consequence of the combination of a stable resource availability coupled with a rising resource demand. More labour does not increase extraction from the resource base such that an increased demand will be met.

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\(^7\) The common property theory has a biology and economics foundation. It stated that in a situation of "unlimited harvesting of common and freely accessible resources", while these resources as such are limited (Hardin 1968: 1244), in the end "[harvesting] becomes, and stays, unprofitable for all participants" (Brox 1990: 227).

\(^8\) This basically Malthusian view has already been voiced by Gordon in 1954 (p.131): "There appears, then, to be some truth in the conservative dictum that everybody's property is nobody's property. Wealth that is free for all is valued by no one, because whoever is foolish enough to wait for its proper time of use will only find that it has been taken by another ...". Hardin has called this the 'tragedy of the commons', meaning that (Bryant and Bailey 1997: 161) "individual action leads inexorably to social and environmental ruin in the absence of a state to protect collective interests." The only other possible option, adherents of Hardin's theory claim, is to change the commonness of the resource to something private to produce a situation wherein "both costs and benefits of resource use accrue to individuals who rightfully control the access of others" (Burke 2001: 453). In 1990, Ostrom first challenged the wisdom of Hardin's 'tragedy of the commons' and explained that the described phenomenon only pertains to "open access". Since then, Common Property Theory has evolved from having a focus on state-dictated or private property management systems of resources, via the Evolutionary Theory of Land Tenure, in which communal land tenure rights are claimed to change automatically over time into effective and efficient yield enhancing systems (see e.g. Plateau 1996), to more nuanced and place and circumstances-dependent ideas of 'ideal' management forms of natural resources (see e.g. Berkes 1996)).

\(^9\) With some minor changes, present-day followers of the Malthusian way of thinking still 'emphasise physical causes of scarcity and poverty, population size and growth, the resource-consumption rate per capita and the quantities of natural resources available to a society' (Homer-Dixon 1999: 43). Recently researchers have added a yet stronger reason why production would not keep pace with rising consumption, by suggesting that a larger population might decrease the resource base through environmental degradation because of their greater demand. In that case the scarcity is self-perpetuating.

\(^{10}\) This does not mean that I see this and the poverty that arises from it as an inevitable path ("a law of nature"), with which humanity has to live. Similarly to Ross (1998) I assume that the Malthus path is avoidable when a sufficient and the right effort is made.
(see Figure 2.1), assuming a negative impact of humans on their environment\textsuperscript{41}. Of course such an impact can also be brought about by ‘natural’ factors, like climatic extremes\textsuperscript{42}. The reaction to these natural set-backs can be the same as to human-induced degradation. As Homer-Dixon pointed out, it is not only environmental degradation that leads to diminishing possibilities for people to use natural resources. Environmental scarcities are also brought about by excessive demand for these resources (by Homer-Dixon (1999: 48) called ‘demand induced scarcity’). In addition, some people experience scarcities because they cannot use what they need because others have taken too much (in Homer-Dixon’s terminology: ‘structural scarcity’).

The problem with Homer-Dixon’s three causes of environmental scarcity is that they do not represent the same conceptual level. I will go even further in the distinction than the fundamental critics, who only separate structural scarcity from the other two. It is not true that demand and supply are of the same order and “refer to the changing size of the pie driven by population size and consumption”, as Peluso and Watts (2001a: 18) remark. In principle, a higher demand does not cause a generally smaller pie. It only results in smaller pieces per consumer. Simple economic laws then predict an increase in production. In the case of natural resource output, this may be reached by an increase in technology. However, natural resources do not strictly (and always) follow normally applicable economic laws. Excessively high demand (and thus a scarcity experienced by the consumer), that otherwise would have been answered by an increase of the supply, may, in the case of natural resources, totally ruin the supply because of the resulting degradation and exhaustion.

Paradoxically, the disastrous effects on the resources of excessive demand by all may be countered by an increase in unequal distribution. Then, scarcity for some will increase. This brings us to the third of Homer-Dixon’s scarcity-inducing factors. Indeed, structural scarcity is not a real scarcity, but a distribution problem that may also exist when the pie is ‘big enough’ (and as such requires different actor strategies). Indeed, Fairhead (2001) warns that Homer-Dixon’s ‘structural scarcity’ is nothing other than the well-known inequalities tackled in political economic approaches. Re-naming it as environmental scarcity, he says, exposes the risk that it will be de-politicised. “[isolated] from international political economy” (id: 215), and with this “[obscuring] more than it reveals in analyzing causes of war” (id: 214).

Bearing in mind the conceptual differences between the three ‘sources of scarcity’ (Homer-Dixon 1999: 47) and thus the necessity of careful disentangling of underlying causes. I agree with Homer-Dixon that it is the dearth of natural resources (or of a specific natural resource) for certain actors that may cause conflict\textsuperscript{43} and that the causes of environmental scarcity are not only degradation. Besides, very often the causes of environmental degradation as such lie in the political economic realm. Structural scarcity itself can cause real scarcity in the sense that it can lead to environmental degradation of marginal areas. The research field of Political Ecology has recognised this link\textsuperscript{44}. Thus, focussing on the environment in conflict studies does not mean de-politicising it. It purely means drawing attention to a field of causes that would be otherwise overlooked (see introduction). For all these reasons the left-hand side of my

\textsuperscript{41} Like Bachler (1999), although he considers degradation as a given fact.

\textsuperscript{42} Whether or not detected climate changes are human induced remains a topic of discussion which I will not go into here.

\textsuperscript{43} A phenomenon that demands more knowledge and insight.

\textsuperscript{44} For an extensive overview of Political Ecology: see Bryant and Bailey (1997).
model is a little bit different from that of Homer-Dixon, although I too focus on environmental scarcity in a broader sense than only degradation.

The quality and quantity of the effect on the environment is determined by several factors, all incorporated within the flow-scheme on the far left-hand side. I will deal with them when discussing the different parts of the schedule. Here I only wish to mention that these factors, contrary to the assumption voiced in Homer-Dixon’s model, do not only cause or aggravate a negative impact. There are also positive factors, such as the positive influence of humans and their institutions, as described in the Boserupian and Ostromian theories about human capacities, which prevent and counteract the negative impacts on the environment and the diminishing of the resources. In consequence, both Malthus’ and Boserup’ pathways are possible and are thus incorporated in the VoE diagram.

One of the agencies that influence the direction of the pathway is the State (or the lower level State-representing bodies). In contrast to what Homer-Dixon suggests in his schema (Homer-Dixon 1999: 134), States and other institutions are not only vulnerable entities that suffer from negative impacts of scarcities and the ways people react to that, and then give way in reaction to violence. Positively or negatively they co-shape the factors that cause the impact on the environment, or they determine the impact directly, for example by fixing the actual use of someone’s ‘environmental use space (EUS)’ via rules and the implementation (or not) thereof (De Groot and Persoon 1999: 158). Moreover, State institutions also shape and influence the ways conflicts are handled. Perhaps even, they may cause the outbreak of conflict, out of neglect – as Boulding (1993: 197) put it: “… wisdom and skill complex [of identity groups] may undergo distortion and even degeneration in interaction with an indifferent or hostile state” – or out of faulty and wrongly judged interference. For example, land registration by States with the aim to diminish disputes have, as Platteau (1996) demonstrates, only “opened up new possibilities of conflict and insecurity” (id: 48) “for less influential rights-holders” (id: 40). Next to that, States can lose their legitimacy by strange and not-trustworthy actions, thereby causing (escalation of) conflict”. However, conversely, they may help to overcome discord about resources between actors by a dependable legal system and courts (Mc Kean 1996: 240).

In short, in my model institutions figure more on all the influencing sides than only as victims on the far right-hand side of the diagram. It should be noted that violence at local level does not always have anything to do with State breakdown, or rarely does so. It may, however, be related to the breakdown or the general loss of legitimacy of local governing bodies.

Continuation: Middle part

The diagram begins on the left-hand side with the elements that build up the Impact on the environment and the factors that influence these elements. Moving to the right, each box depicts an event. Following the Cascade to Violence each ‘event box’ leads to a new event, ending in the event ‘violence’. On the way, each box is (or can be) influenced by certain co-causing aspects. Next to that, the unwinding of the cascade can be stopped (that is: given

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4 Ostrom (1990) describes the conditions that make sustainable use of common resources possible.

6 A term, first introduced by Opschoor and Van der Ploeg (1990) as being that part of the natural environment that human beings can occupy without causing damage to the essential elements thereof. and thus leaving the same ‘amount’ of natural environment for future generations to use.

7 See Warfield (1993 182-183).

8 Also further on the right-hand side of the VoE diagram which I will refer to later.
another direction) by ‘escapes’ at each step, which form equally important routes within the model. Each escape has its consequences and can be enhanced or frustrated by certain facts. Of course certain types of escapes can have the form of a negative feedback on earlier effects and events.

End: the right-hand side box
As explained earlier, the narrative of this research starts with environmental scarcity and ends with the outbreak of violence. However, this is not an absolute end, because violence itself is no one-dimensional, one-time event. It has the same complex position (and build-up) as all other factors of the diagram. Thus, when the violence influences the Violence-or-Escape diagram (= VoE diagram) again, in a kind of feedback loop, ‘that which comes after’ is incorporated into the study (see Figure 2.1).

Hereafter. I first discuss the central steps in the framework from left to right: the Cascade to Violence. I then focus on escapes and influencing factors for each step. By categorising these factors and escapes I will try to generalise on peoples’ strategies, although, of course, these are always totally context-dependent.

2.4.3 The details of the three parts of the VoE diagram

The Cascade to Violence

Box 1
As already stated, a negative impact on the environment is the basis for starting to construct a stream-diagram of actors’ steps in the direction of violence (see Figure 2.2).

Figure 2.2 Violence or Escape diagram, left-hand side (Box 1).
In the Environmental Sciences for this Impact the symbol \( I \) has been used, meaning the impact of human beings on the environment in terms of some basic normative values. This impact is the same as the product of three interconnected factors \( I = PAT \) and depends on the physical basis of the environment. For actors in direct need of natural resources, the impact on the environment combines with the actual possibility of individuals to use, control and access the environment (and which environment) to determine the amount of scarcity they encounter.

In the Environmental Science equation \( I = PAT \), the different factors stand for:

- **P** = Population (number of persons)
- **A** = Affluence (turnover of goods per person, i.e. type and extent of ‘implemented’ demands per person)
- **T** = type and extent of Technology with a (negative) impact, i.e. impact per unit of goods (e.g. technology that diminishes pollution is ‘positive’ technology, if it does not cause roll-offs and externalities)

The fact that \( I \) is the same as the product of these three factors means that whenever one or more of the factors rise, the Impact rises. \( I \) can stay the same or even diminish when one or more of the factors diminish or the combination of increase and decrease of the different factors generates a lower product. For example, the number of persons increases, with each of them using the same number of goods, but the technological way of production has improved and the negative impact per good has diminished in such a way that the total impact declines. In Malthusian reasoning, even when affluence stays the same, rising population numbers are far greater than any technological improvement of agricultural production. On the other hand, the Boserup line of thinking states that, even in the case of rising affluence, the increase in the number of persons causes such a technological improvement that all negative impacts are countered. Access possibilities are implicitly incorporated in the \( P \). If people are prohibited from using a certain piece of land (for example) in a densely populated and increasingly populated area, and if said piece of land is indeed not used, the \( P \) for that specific piece of land returns to zero.

**Physical basis**
An important determining factor for \( I \) is the ‘physical basis’ of the environment. The effect of \( PAT \) is different under different physical circumstances. It refers to the ultimate resilience of a certain environment. This is related to long term vulnerability to changes, as well as to desired use, which as such refers to difficult concepts such as carrying capacity. In the Netherlands, with its large-scale bio-industrial way of livestock keeping and the related fodder imports and fertiliser use, the physical basis of the soils with regard to mineral content is...

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* Boserup (1965)
* Bartels et al. (1993) provided an excellent overview of the history, different meanings, confusion and (non) usefulness of the concept ‘carrying capacity’. “A general definition”, they said, “should encompass the elements of animal production goal, acceptable resource condition, and time.” (id 94). Applicability, however, “is of questionable validity in livestock production systems in Africa” (id 100). See also Seidl and Tisdell (1999).
almost reached. This means that the soil has reached its mineral-absorbing limit: many plants are no longer able to survive in this 'poisoned' environment and any surplus minerals will be rinsed out to the groundwater and thereby pollute this drinking-water resource.

The physical basis of the Sahel and Sahel-Soudan zone is a totally different one. Whether it is vulnerable is the subject of ongoing debates. "[P]astoral areas [here are] characterised by a so-called non-equilibrium environment..." with a "resource availability in these areas [...] characterised by spatial heterogeneity and temporal variety" (Juul 2002: 189). Hiernaux (1996: 14) notes that "Sahelian vegetation appears very resilient to natural and pastoral stresses because of the strong dynamism of its seed production, dispersion and germination cycle". The system is used to 'natural' (climatic) extremes within and over the years. However, "grazing during the growing season can significantly affect production in the same season and may affect long-term productivity" (id: 13). Moreover, the resilience of the environment to year-long agriculture may be low. Declining soil fertility, erosion and changes in watershed structure lead to increased vulnerability to drought.

Thus, an actual physical basis is formed partly by basic natural processes and structures and partly by human influences that have altered the basic natural status quo and processes. These human influences on the natural basis as such are shaped by institutions and policies, for example those regarding property rights, being distribution, access and use-forms of these natural resources". In addition, human institutions and policies also influence the right side factors of the I = PAT equation. Sometimes these influencing institutions or policies are not directly aimed at the natural resources or the population size, the affluence or the technology, but have other goals, while the influence discussed is only a side effect. Of course all institutions are embedded in wider 'environments', from regional through national up to even global, being structurally shaped situations or event-like.

Increasing scarcity
To use the dynamic aspects of the Environmental Science equation. ES should not focus on scarcity as such, but on the increase thereof. Because this study wants to focus on the local level, the deteriorating situation of local actors is of importance: the diminishing of 'Environmental Use Space' (see note 46) at the personal level. In other words, the cascade of the VoE diagram begins with an increase of the F for a natural resource that is important for an actor (person), and/or with a worsening distribution of that resource.

The I is raised, diminishing the environmental space of users (meaning 'rising scarcity'). because of rising population pressure (either based on population growth, or on population distribution, or on both), affluence or technology or two or three of those together, under physical-biological circumstances that cannot counter-play this. For the individual actor, this 'negative' impact can also originate in, or be aggravated by, limiting access regimes. The influence of access to natural resources therefore plays a role at different levels.

As has been stated above, in the Sahelian context the phenomenon of a rising human impact on the environment can be questioned". Scarcity of natural resources has been, and always will be, an inherent characteristic of the semi-arid and arid regions of the world. Inhabitants of

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" See for example Ostrom and Schlager (1996).
\* From the I = PAT equation.
these types of eco-regions are well adapted to these circumstances. With the insecurity of the climate and the wave-like pattern of abundance and want, they have developed a kind of fluidity in their institutions as well (Berry 1993), both in time and in space. Yet, the growing populations seem to reduce the fluidity of the systems, at least in space. Now distribution of the resources has become important. In addition, the fluidity does not exceed a certain level. This level may prove to be too low when environmental change passes the threshold that ecologists warn of. When the system suddenly changes, personal scarcity may rise abruptly. Such a ‘flip-over’ can be due to extreme climate changes or to (direct) human impacts. For example caused by day to day unintelligent use of the resources or by events such as war. In such instances, a real change in livelihood strategies, and not only flexibility, is required. “It is often hard for human societies to adjust their institutions and technologies rapidly enough to prevent sudden changes in environmental systems’ behaviour from producing a grave impact on human well-being” (Homer-Dixon 1999: 191, note 46).

On the other hand, institutions sometimes change too quickly or in an unfavourable direction, at least for some local users. Already in non-scarcity situations, not all actors have the same position when it comes to negotiating the rules. The fluidity of the institutions serves the powerful, especially when resources become scarcer. As stated earlier, it may be the case that a rising I is only perceived. Indeed, this perception can also be constructed by powerful persons for strategic goals. For example, perceived environmental change can be used by authorities as a pretext to overrule existing management institutions, instead of giving them time to adapt.

Thus, by way of institutions and policy the three basic factors, as well as the access factor, can be influenced directly (the box furthest to the left) or via feedback after the ‘scarcity’ has first increased or is perceived as having increased. To make it even more complex: limiting access practices can be installed by institutions to counteract the longer term $P \times A \times T$ effect. In that case they form both a negative and a positive feedback on the I (at least for the area under the regime: it can cause negative effects in other places, because of increased pressure there). Long-term and short-term as well as individual and society effects have to be detected. As regards the VoE diagram, societal effects are only interesting as long as they influence personal strategies.

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Holling and Sanderson (1996: 67) warn that the renewal phase (the fourth phase in their ecological model of adaptive renewal) “contains the potential to jump to unexpected different [...] systems.”

“Historical events [...] may trigger savannas into a new ecological state” (Stott 2003: 2).

See, for example, the situation in Chad (De Bruijn and Van Dijk 2003).

Peters (2002)

See Bachelier (1999) over the instrumentalisation of the environment, one of his “key situations” in relation to natural resources engendering violence.

Examples thereof can be found everywhere, both in developing countries and in the West. With regard to the latter, we can mention areas where only agriculture under strict conditions is allowed. Another example is ‘indigenous people’s reserves’ that consist of land given back by the State to traditional ethnic groups to be used solely by them (e.g. see Aquino 2004).
When people perceive their Environmental Use Space to be limited compared to what they need, want or are used to\textsuperscript{60}, they start intruding into other peoples ‘niche’ or assert the rights to their own niche right away (e.g. in the event that the I is increased by way of rising population numbers because of immigration). Officially, according to ecological science, a niche is ‘the way in which a certain complex of natural resources, related to a certain place, is used’. Most of the time people in a scarcity situation search for niches that are more, or preferably even richly, endowed with the wanted resource\textsuperscript{61}. The act of entering a niche may force the present user into a position of competition. An example of the same use of a resource in the same way in the same geographical area is that of two fishermen using casting nets in one specific fishpond\textsuperscript{62}. As we have seen in the case of Padmangay versus Davagang in the introduction, this can lead to profound conflicts over the resource.

However, there are possibilities of resource use other than that of exactly the same niche that cause different users to become competitors. If the resource is a ‘moving’ one, “transferred impact” may play a role. A moving resource can be used on different spots. But, once used at a first site, it is no longer possible to use it at a second site. The impact of use is transferred over time and space. This is the case, for example, when fishing with a net in a river influences the chances for a fisherman down-stream of catching the same fish. Then, although the users are situated at different spots, competition over the resource can still flare up\textsuperscript{63}.

When people use the same resource but in a different way, competition is only bound to occur if the uses are mutually excluding. An example of this is the use of a tree for fuel-wood or for building: these are different niches, but the user of one niche intrudes the other one and thereby decreases the possibilities of use by others. Another possibility of such resource use concerns the subsequent blockade of the use of a niche further away. Excluding types of use of one resource at a certain location will hamper the accessibility of another resource. Examples thereof are fish channels\textsuperscript{64} or agricultural fields that impede the track of cattle to their grazing grounds. Obviously this can give rise to conflicts.

\textsuperscript{60} See below the sections about influencing factors at the right side of the diagram and the phases of conflict.

\textsuperscript{61} Again, an example of the importance of ‘abundance in scarcity’ (see the discussion about the role of scarcity versus that of abundance of natural resources in the Introduction and earlier this chapter).


\textsuperscript{63} Ecologically speaking the niches are different because when defining a niche it is not only the use of the environment for food that is important, but also the use thereof for other purposes (for example housing and shelter).

A possibility that can lead to the exclusion of the use of a niche by another user without using the same resource is the use of a resource in such a way that it influences the existence of another one in the same region. An example of this is the use of water for irrigation, such that the use of the resource fish is hampered or the building of a dam to gather the water, thereby causing the fish to disappear downstream because the spawning grounds are no longer flooded. Although this can lead to conflicts between users, the condition for such to occur is that the connection between the two phenomena has to be clear to at least the "second" user.

In short, conflicts between users can flare up not only when using the same niche, but also when the impact of the use is transferred over time and/or over space to another niche. Thus, in the VoE diagram 'intrusion into other people's niche' also includes those cases in which the niche is not entered, but the possibilities of use by the other are diminished via transferred impact.

The first real step by an actor in the VoE diagram is the moment (s)he enters somebody else's niche. The choice for, and actual implementation of, this step is influenced by many factors. These factors are important in the analysis and therefore have a place throughout the diagram. I will discuss them in the next two sections. Sometimes the actor does not physically enter the new niche, but starts the assertion of rights straight away, that otherwise would be the next step.

Box 3

Figure 2.4 Right side of VoE diagram

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65 See, for example, the extensively documented Aral Sea history (e.g. De Villiers (1999), Smith (1995)).
66 Examples of such an impact of dam construction are the Karnali and Arun dams built in Nepal (Himalayan Power Consultants (1989), Ives and Messerli (1989), Nepal Electricity Authority (1992)). But it is an effect that results almost always from big dams (e.g. Goldsmith and Hillyard 1987; Bernacsek 1984).
Following the Cascade to Violence from the intrusion into other people’s niches, the next step is the assertion of rights to the resources, in casu the niche. This is only necessary if the other user(s) of the niche do not agree with the intrusion or the claim made without actual entry having (yet) occurred. After which these user(s) try to ascertain their rights. I call this ‘conflict’. Here the word ‘conflict’ means ‘collision of interests’, in the sense that the actors go one step further than only wanting exclusive use of a resource: they (or s/he) actually do (does) something - more than just ‘sitting there’ and telling everybody that it is theirs - to satisfy this want”.

On the other hand, conflict can have another origin as well, such as a more normative one. Although these other possibilities are not the focus of my research, they are of great importance in the analysis. In addition, the reason to ascertain one’s rights to resources can be influenced by world views and perceptions that (also) come into conflict. Without these other conflict causing reasons and triggering circumstances, actors would perhaps chose another route (in the diagram called ‘escape’). Thus, these “influencing factors” have a place in the VoE diagram. They are presented, at each step, at the top half of the framework (see next sections for a further explanation).

**Box 4 (See Fig 2.4)**

When people oppose each other and both claim the rights to a certain resource violence may be chosen as a way out. ‘Violence’ here means: a physical attack against other persons or their goods, ranging from a simple one blow on the nose to more heavy clashes between individuals or groups and/or with damage being deliberately caused to material belongings. The remarks given above in relation to Box 3 and the step taken to reach this box, the step towards conflict, also regard the choice for violence or not. This step can again be influenced and triggered by many other factors and many other strategies can be used to ascertain someone’s rights to the environment. The use of violence itself influences the conflict and therefore forms a (positive or negative) feedback loop in the VoE diagram.

In each step of the diagram, these factors and other strategies are indicated by ingoing and outgoing arrows. In a way, those in and out-going streams are the most interesting. Dividing the Cascade into four boxes connected by three causal arrows, the VoE diagram offers the opportunity to distinguish different influences at different times and then, in a real situation, identify the point or points at which the Cascade to Violence started (or starts) to be inevitable.

The framework describes three big basic steps and ‘events’ (in the ‘event boxes’). In practice the steps may appear to be sub-divided into (sometimes even several) smaller steps. For example, in his schema, Homer-Dixon (1999) uses the “social segmentation” lemma. It emerges, according to him, as one of the social and societal answers to scarcity and forms, as such, one of the co-causes of the direction of violence. In the framework proposed here this ‘step’ is not voiced but it is certainly one of the possible interim steps between the ‘assertion of rights’ and ‘violence’. On the other hand, though, segmentation in the sense of niche differentiation, with such being an ‘escape’ route in an earlier phase of the flow diagram, can be a conflict-preventing phenomenon. Moreover, one can question whether the development or increase of ‘we-they’ divides, as referred to by Homer-Dixon, did not already occur in a far

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*For a more extensive explanation of the concept of ‘conflict’ see the Introduction and the section ‘phases of conflict’
earlier phase and is, as such, a co-causing factor in the unwinding of the Cascade that should have its place in the in-coming arrows of the influencing factors. As Bächler (1999: xvi) stated: environmental scarcity (what I refer to as: the narrative of environmental scarcity) can be used as an instrument "to pursue specific group interests [... and] becomes an (ideological) issue of group identity". These groups, then, have to exist already, albeit rudimentary.\(^8\)

**Escape routes**

**Categorisation**

Now we have discussed the central part of the framework from increasing resource scarcity to violence, all possibilities of actors to escape this route need attention. Each step from an ‘event box’ in the VoE diagram to the next, the actor can choose to divert his pathways away from the Violence Cascade flow. To describe this process ‘A – non-A’ models (see page 17), such as the approach to livelihood strategies and rational decision-making, are useful.

In a way, one could say that with growing (natural) resource scarcity the ‘output’ of a certain unit of resource has to increase. The two basic responses are: “Involution (= […] doing more of the same“) and Transition ( = […] a qualitative system change)” (De Groot and Kamminga 1995: 76). The first is easy to do and does not require much of an investment but will eventually lead to a downward spiral because of a decline in labour productivity and the exhaustion of the resource and finally a collapse: this is the Malthusian path. The second is the one that Boserup highlights in her analysis: “Certain types of technological change\(^9\) will occur […] when a certain density of population has been reached”.

Apart from involution and transition of land-use, other responses to pressure are also possible. First, these may be agricultural, such as “the extension of cultivation into unsettled areas” (Moonen and Verolme 1991: 67)\(^1\) or, as is the main item of this thesis, the extension of agriculture into niches already being used. Although the farmers then try to do “more of the same” they do so in a different place\(^2\), where others are trying to continue doing the same as usual. Migration is a response that can be agricultural when farming is taken up in the new area, or non-agricultural when urban areas are sought. Other examples of non-agricultural responses are “... population control, manufacturing, or trade ...” (id). Even a kind of agriculture-influencing, non-agricultural response is possible, as we see in the study of Mazzucato and Niemeijer (2000: 301): “... agricultural performance is affected by the social organisations around production [...], in the study area people have intensified the uses of social networks for agricultural practices”. This is more or less the same as Ostrom (1990). Ostrom and

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\(^{8}\) See also the section on influencing factors on the right-hand side of the VoE diagram and ‘phases of conflict’.

\(^{9}\) I would add here ‘at the same spot’

\(^{1}\) Boserup herself spoke of yield increasing technologies. Nowadays soil conserving technologies are also included (see Mazzucato and Niemeijer 2000: 309): “Boserup’s thesis is extended to the land degradation debate by arguing that as land becomes scarce, the technological change stimulated by population growth will move in the direction of conservation technologies in order to conserve the scarce, and therefore highly valued resource, namely land.”

\(^{2}\) Strictly speaking this is not an answer that increases the output of a unit of resource. As long as there are still ‘unsettled’ and useable areas, the scarcity of the resource is not extremely high. Yet, in reality, most ‘unsettled areas’ prove to be the niche of one group or another, or are claimed by the State for public goals.

\(^{3}\) Sometimes the incoming farmers even consider the place as being the same because they only see it as continuing their fallow rotation schedule as they have done for ages. In such situations they do not at first perceive land scarcity. This notion only arises at the moment they encounter the other users.
Schlager (1996) and McKean (1992: 258-261) have pointed out: they focus not only on land use transition but also on the ways people organise common use so as to prevent a diminishing of the EUS per user, or even increase output. In the VoE diagram this forms the feedback from an increased I to the box "institutions and indiv. strat." or it is directly incorporated in this box, as a kind of 'prevention' strategy of the community.

Of course, in the long run the institutional answers to resource scarcity should cause (some) qualitative system change to increase the output per unit, or they should engender a broad transition that even surpasses the boundaries of agriculture (for example changing an agricultural society in an industrial one).

Institutional changes can also play their role further to the right in the VoE diagram, where they may influence decisions about (e.g.) the use of violence or not. Then they are 'co-causing factors' or 'escape encouraging factors'.

**Different forms of capitals**

To categorise this ad hoc list of possibilities and to try to come to a more exhaustive enumeration I will use Bebbington's (1999) five types of 'capitals' that "give [people] the capacity to be and to act" (id: 2022), and thus to build their livelihoods". In short, livelihood strategies consist of the use of one or more of these 'assets' to enlarge (or at least sustain) the total of the capital". The assumption is that an actor deliberately capitalises or enlarges his or her capitals. Sometimes a person eats into one of the five capitals to enlarge the whole, as a kind of investment. As a consequence, the rationality, spoken of here, does not only include economic deliberations. As we will see from the enumeration and discussion of Bebbington's capitals, social, cultural, political and moral elements (etc) are also considered. Thus, in the VoE diagram, the escapes are all composed of the use of one or more or even a mixture of Bebbington's capitals. These capitals are: Natural, Produced, Human, Social and Cultural capital7. Instead of intruding into other peoples' niches, nearby or far away, (or physically defending ones own niche) an actor can choose to invest in another type or aspect of 'natural' capital or to extend the investment in one of the other capitals. The other capitals can also be used to support the assertion of rights to one's niche.

Examples of the investment in each of the (other) capitals, together with an explanation of their content, are:

1. Investment in Natural Capital means enhancement of the productivity of the threatened niche or intrusion into a niche not (yet) being used". This may, if possible, be a further niche specialisation and thus lead to segmentation of society albeit – in contrast with Homer-
Dixon's assumption - most probably in a positive way. Examples pertaining to the first option are increasing the soil fertility through the application of fertiliser or animal dung, or using mechanic weeding equipment. Two theories that explain certain strategies for enhancing natural capital are that of Von Thünen and that of Boserup. I will elaborate on them when discussing the use of capitals in escape routes (see below).

2. Produced Capital consists of stock (food and animals), “housing. equipment, machinery, energy, infrastructure, drinking water. health care [system] and education [system]” (Henkemans 2001), as well as saved money, loans, subsidies, remittances and pensions (Bebbington 1999. Serageldin and Steer 1994). Examples of extending this capital are: building a water pump for drinking water: a small, local barrage to hold water for cattle in the dry season; or building a road to make the marketing of products more feasible.

3. Human Capital means personal capabilities, skills and competences. This is based on health and physical composure, but also on knowledge and personal characteristics such as charisma or intelligence, etc. This capital can be extended by investing in schooling and training, improved health care, etc.

4. Although a lively discussion is going on about the exact content of the concept Social Capital, it can be defined with a certain communal agreement as: “The stock of active connections among people: the trust, mutual understanding, and shared values and behaviours that bind the members of human networks and communities and make co-operative action possible” (Cohen and Prusak 2001: 4). These active connections can be realised at an individual or a higher congregation level, via group and community up to the nation and, in general, the macro level. Whether or not the definition has to be limited to one of these levels is subject to discussion, but the fact that individual level social capital (or even group level social capital) is not the same or can even hinder higher aggregate level social capital is acknowledged (see below: when ‘Bonding’ becomes exclusive). The World Bank (1999) distinguishes personal and collective social capital. the latter is: “norms and social relations embedded in the social structures of societies that enable people to co-ordinate action to achieve desired goals.” (in Tadepally 1999: 45).

A society is organised along horizontal and vertical (= hierarchical) linkages. With an eye on these two dimensions. Social Capital can be divided into properties such as 1) Bonding: referring to “local institutions that are necessary to bind individuals together to pursue collective needs” (Warren. Thompson and Saegert 1999) and to “exclusive and homogeneous networks” (Paxton 1999) of “people-such-as-us” (Portes and Landhold 1996). The latter is the societal segregation Homer-Dixon mentioned as a cause of violence. 2) Bridging: referring to “building ties to other communities” (Warren. Thompson and Saegert 1999), “overcoming social divides” (Portes and Landhold 1996) and 3) the vertical connections = Linking: referring to “the capacity to gain access to resources, ideas and information from formal institutions beyond the community” (Portes and Landhold 1996), also embedded in the term ‘Political Capital’, that is “the informal relationships and norms that links civil

The term ‘used’ reflects the different notions about rights to resources, that is “rights to own resources, rights to use [(have access etc., RN] resources, and the right to intervene in resource situations” (Dietz 1996: 41).

To prevent confusion with human capital aspects, I have added the words ‘system’ (in italics)

Even some founding fathers of the concept such as Bourdieu (1986). Coleman (1988) and Putnam (2000), differ in their definition of the concept and their opinion of for whom the capital is a resource.
society and the state ..." (Bebbington and Perreault 1999).

Broadly speaking, to arrive at the possession of Social Capital two general domains have to be represented: Structural Social Capital, being organisations, roles, rules and networks, and Cognitive Social Capital, being attitudes, norms, values, trust and reciprocity.80

Enhancement of Social Capital can be obtained by, among other things, bride-wealth investments, gifts to neighbours, strengthening family ties, praying together, organising women groups and mutual cash facilities, as well as working parties and building (new) institutions.

5. The term Cultural Capital is even more disputed. Although Bebbington himself distinguished it clearly from Social Capital, some other scholars do not acknowledge the separate existence of one of the two. Some, such as Berkes and Folke (1994) and Gadgil et al (1993), do not use the concept of Social Capital, but incorporate the notion, together with Institutional capital and Political capital, within the Cultural Capital domain (Berkes 1996: 91). Others want to divide the concept's contents (as described by Bourdieu81) between Human Capital (the aspects that have to do with knowledge and learning and the insights into the value of knowledge as well as the possession of diplomas). Social Capital (when connected with religion, for example81) and even Produced Capital (the economically obtainable objectified objects of Bourdieu's Cultural Capital (see note 80)). Furthermore, several aspects of culture are not comparable to the 'capital' with which or in which persons can invest, but are fixed to a person's (or society's) personality and his/her identity. It is this line of thinking that is followed in this thesis.

There are many examples of interaction between capitals, as we can see for example in the above-mentioned case of Mazzucato and Niemeyer (2000) concerning the influence on agriculture of social institutions. “On the one hand there are interactions within each type of asset [...] at the same time each asset clearly interacts with the others [...] synergistic [or [...] destructive" (Bebbington 1999: 2032). Being an active member in the collective social capital domain (and thus enhancing it) increases personal social capital as well. Enhanced produced capital in the form of more drinking water pumps also has a positive effect on human capital, by providing safe water and thus more healthy people. If the pumps have to be built by the community members themselves, a certain degree of social (bonding: bridging) capital is required. For the construction of more technically advanced wells, help from outside is required and 'linking' social capital forms become indispensable. Using savings to buy a plough (to increase both produced capital and natural capital), instead of organising the monthly beer party, decreases social capital. A status (= social position) in a neighbourhood can be quickly

80 See for example Francis (2002).

81 Bourdieu (1986) distinguishes three forms of cultural capital. The embodied state is directly linked to and incorporated within the individual and represents what they know and can do. Embodied capital can be increased by investing time in self improvement in the form of learning. As embodied capital becomes integrated into the individual it becomes a type of habitus and cannot therefore be transmitted instantaneously. The objectified state of cultural capital is represented by cultural goods, material objects such as books, paintings, instruments, or machines. They can be appropriated both materially with economic capital and symbolically via embodied capital. Finally, cultural capital in its institutionalised state provides academic credentials and qualifications which create a "certificate of cultural competence which confers on its holder a conventional, constant, legally guaranteed value with respect to power." (Hayes 2003: 248). “Bourdieu favours a nurture rather than a nature argument. ....” (id 2003).

81 For reasons in the social domain to change religion see, e.g., Van Santen (1993).
destroyed if social norms are ignored\(^8\). In most Third World communities ‘rich’ people have to share, otherwise they lose social capital. Van Est (2000, personal comment) tells the story of her interpreter in North Cameroon who, with the money earned, bought a ‘pouse-pouse’ (a kind of wheelbarrow) to earn money as a transporter for others. Because he did not spend his earnings on his co-villagers, they set up a trail of wheel-prints from a richer neighbour’s house to his, and accused him of theft of the other wheelbarrow. He indeed ended up in jail. Social capital is useful to enhance human capital, for example, in “collaborative learning” (Allen et al 2001: 1). Last but not least, if too much social capital and/or natural capital is lost at a certain place, people can decide to use their produced and human capital to move away and try their luck elsewhere\(^9\).

Use of capitals away from violence

Following the unwinding of the VoE diagram (see also Fig 2.5), the number of options for escaping diminishes. As has been stated, a decreasing ‘EUS’ can be counteracted by using all five capitals. Sometimes, some of these capitals are indispensable. For the transition of land-use, for example, pressure on the land is not enough. Even Boserup herself warned against “turning the argument upside down”:

“If it is true [... that certain types of technical change will occur only when a certain density of population has been reached, it of course does not follow, conversely, that this technical change will occur whenever the demographic prerequisite is present.” (Boserup 1965: 41)

Technological improvements require knowledge (human capital) and the availability of the techniques, materials and utensils. Boserup (1980: 413) also highlighted the importance of produced capital for making options implementable\(^\text{10}\): “local populations in savannah regions – and in other rural areas – are often prevented from carrying out such modernisations due to a lack of rural infrastructure in the area in which they live ...” To improve both the supply of the technology and the off-take of products, social capital in the linking sphere is necessary. Most of the time local individuals cannot invest in infrastructure because it does not give them enough personal returns\(^\text{11}\). There is no motivation to implement this option, even when actors have enough (financial) capital. Outside institutions have to be involved, that is external authorities, aid organisations or external (private) enterprises with interests in marketable rural products\(^\text{12}\). The latter corresponds to the location theory of Von Thünen (1826), an explanatory theory of land-use transition based on economic principles, such as “... simple micro-economic assumptions and profit maximisation” (Cleuren 2001: 28). The motivation for intensification, it says, will only be high enough when the distance to a market centre is small enough. “The economic profitability of crops and land decreases with increasing distance from markets.” (id). Less intensive land-use patterns will be found in concentrical circles further away from the market centre, with the farthest circle, where pioneers start to clear until then empty bush, being called the ‘frontier zone’.

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\(^8\) This shows that knowledge about cultural patterns is part of social or human capital

\(^9\) Migration is one of the reactions repeatedly described in the literature e.g. Quin (2001)).

\(^\text{10}\) See next section: ‘influencing factors’

\(^\text{11}\) Investment in infrastructure suffers from a kind of prisoner’s (or free rider) dilemma

\(^\text{12}\) For example, in North Cameroon, several roads have been built and are maintained by the SODECOTON, the parastatal institute that manages the cotton production-chain.
In contrast to the VoE diagram, migration in the theories of both Boserup and Von Thünen, only figures as an escape route from pressure areas into ‘empty’ space. Indeed, the choice for migration is influenced by the total set-up of actors’ capitals. In Von Thünen’s theory, migration takes place by people who lack capital to invest in the intensification. They move up to the outer circles, where the pressure on the land is less because of its lower economic value. In Boserup’s theory, migration is seen as a last escape from starvation in cases in which the population does not dispose of enough human capital in the form of “knowledge of any types of fertilisation techniques.” (Boserup 1965: 41).

None of the two theories mentions the negative impacts and effects of migration that made me place the phenomenon at the core of the VoE diagram (box 2). When encounters with other groups are mentioned, only the “positive learning effects” (Boserup 1965: 43) are voiced. However, the extreme violence by new immigrants in the Thünian frontier zone of the Brazil forest fringe⁸, for example, cannot be seen as the result of an escape route away from the Violence Cascade.

Yet, not all invasions of new areas lead inescapably to violence. If another niche has already been entered, apart from retreating to the former or yet another niche, thereby starting again as it were at the beginning of the framework, in theory the option of investment in the current natural capital is available and will certainly be used (denuding of the bush, for example). However, this can be read by others as an assertion of rights and then forms the transfer to the next ‘event box’ of the VoE diagram. Moreover, trying to be accepted as a newcomer (sometimes by acting as an almost invisible vulnerable person who only needs a very small part of the new niche and on other occasions by acting as the big giver that helps the new community) is the most significant option in such a new niche status, besides launching into conflict. The new situation, then, demands investment in capitals, such as social capital. Strengthening friendship bonds and founding new relationships is an indispensable aspect. If the new niche has been physically positioned in a new area⁹, ‘old’ cultural aspects of social capital are very difficult to use (although overlapping belief systems and values may help) and produced capital is most probably spent on movement to the new area. If some savings or stock are still left, they can be used to increase the social capital. Knowledge of the social fabric and cultural set-up and rules of the new society is important and forms a human capital type of asset that can be enlarged and used.

If the actor is opposed by others and has started to claim his rights to the niche, investment in the natural capital is mostly only done to underline the assertion and is therefore no longer an escape route. In Africa, the planting of trees as an investment in natural capital is a good example of an assertion to the land itself⁹, although there are several places where tree planting does not enlarge peoples’ position vis-à-vis the land that is planted out. An alternative way to ‘escape’ can only be found via the other capitals. Social position, alliance forming, knowledge about recent laws, powerful villagers and the positioning of the resources, are all assets, as in the former step, via which the use of violence can be kept at bay. Demands, negotiation, mediation, arbitration and litigation, as well as successful threats, all feature in the human and social capital domain. The knowledge and intuition of which forum c.q. institution is the best

⁹ This means a real migration has taken place.
²⁰ For that reason several landowners do not want the users of their land to plant trees.
for resolving the problem also lies in the human capital domain, whether or not supported by social capital, which helps to augment this kind of knowledge.

It has to be noticed, however, that a conscious unwinding of the Cascade to Violence will make actors invest in those capitals that will help them to be successful in a later stage. I am going to study these investments under the heading ‘influencing factors’, since the prior build-up of certain ‘capitals’ co-determines the route to be followed.

**Influencing factors**

**Categorisation**
The last important part of the VoE diagram comprises all the factors that influence actors’ ‘steps’. Both at the top and the bottom of the diagram, such factors are indicated as, respectively, ‘co-causing’ and ‘escape encouraging’ factors. The top factors all depict factors that make actors choose for the direction of unwinding of the main flow-route, the Cascade towards Violence. Each new step again opens the possibility of escape. Therefore, at the bottom of the diagram the factors are grouped which help actors choose other options, away from the ‘Violence Cascade’.

**Figure 2.5 Escapes and influencing factors in VoE diagram**

There are many factors that influence actor’s decision-making and the implementation of these decisions. The position of capitals (as defined by Bebbington 1999) as something people have and use or want to have and choose as an escape route, has already been described in the section on escapes. However, in decision-making, more fluid and abstract dimensions are also important. Indeed, Bebbington’s capitals are again involved at different moments, now as influencing factors, in the schema of De Groot and Kamminga (1995) that I used to categorise all influencing factors. Based on the more limited ‘options and motivations’ divide of the ‘Actor-in-context’ model of the social sciences, De Groot and Kamminga define four concepts:

1) **Potential and implementable options** (potential options are defined as all actions the actor could conceivably implement, if he availed of all necessary knowledge, power funds and so on
And, as has been said before, the different interpretations and interpretative frames of actors generate different perceptions by people of their surroundings and of the influence of their behaviour on that environment (Burke 2001), as well as of their interpretation of the 'arrived' information. It goes without saying that culture is an important factor in the shaping of world-views and interpretative frames. As such it influences the "autonomy" of actors. Nevertheless, "culture does not 'cause' behaviour ..." (Avruch and Black 1993: 135). Situation, "circumstances and historical time periods" (Druckman 1993: 33), as well as (collective) memories decide which "cultural imperatives, [...which] broad constraints within which a wide range of [...] behaviours can occur" (Druckman 1993: 33) are chosen as a guide for action. However, "culture is a perception-shaping lens or [...] a grammar for the production and structuring of meaningful action." (Avruch and Black 1993: 132). In addition, 'human capital' in the sense of education also shapes the interpretative frames of actors.

**Relationship of categorising concepts**

Indeed, Bebbington's capitals influence the third and fourth categories of De Groot and Kamminga. However, they play their greatest role in the first two categories. In the same way, the entitlements and endowments of Leach *et al* (1999) can be assumed to have been incorpo-
rated into the categories of De Groot and Kamminga.

The term ‘autonomy’ can be seen as consisting of Leach’s terms ‘endowments’ ( – rights and resources actors have) and ‘entitlements’ ( – legitimate - in the sense of both formal and customary law as well as other social norms - effective command over alternative commodity bundles), and the mapping (c. q. gaining access) thereof. Although not mentioned explicitly by Leach et al., these are all co-shaped by the ‘restrictions’ within the ‘autonomy’ category of De Groot and Kamminga.

In the same way four of the five capitals of Bebbington can be seen as endowments-entitlements that can be used in different bundles as well as in mutual substitutions. As such, these lead to ‘capabilities’ (= “what people can do or be with their entitlements”, as defined by Leach et al. (1999: 233)) to actors”. The capitals therefore define the autonomy of actors. Only cultural capital is of another order, as is mentioned already. Culture (not cultural capital) does connect more with the 4th category of De Groot and Kamminga. Additionally to co-shaping the interpretative frames, it may have to do with the restrictions connected with ‘autonomy’. It sets (and changes) the structures and institutional regimes within which the actor has to act. The autonomy defining macro structure of the global market, for example, is shaped by the western based capitalistic culture.

Leach’s and Bebbington’s frameworks show the dynamics of the autonomy concept. As can be seen specifically in the second set of the autonomy description (but also in the first one, if examined more closely) power relations and positions (that are part of social capital) are very important in the construction of endowments and entitlements or ‘capitals’. Leach et al (1999: 234) regard institutions, ranging from micro to macro and sometimes changing, as shaping these processes. This relates to the outward contextualisation of the “actor-in-context” method of De Groot (1992). Influences on actor’s decisions and strategies can be traced in an ever widening field of secondary, tertiary, etc. actors, who are themselves influenced by a same web of connected categories.

Similarly to the ‘autonomy’ category, the other three categories of De Groot and Kamminga should not be approached as being static. For example, options and motivations are constantly changing with the shifts in personal capitals that, in turn, are caused by strategies based on the options and motivations. Neither is culture an everlasting stock of ‘things’. It also has changing aspects that are in constant interaction with the more enduring factors. Moreover, the birth and development or death of institutions, or changes in structures beyond the scope of individual actors changes options and motivations as well as interpretations. In addition, interpretations and their frames alter whenever knowledge grows or power exercising demands shifts. Even objectified motivations change with market change and price differences.

An important illustration of this constant and mutually dependent change is the fact that the moment of choice to follow one or another route of the VoE diagram is determined by the pertaining factors and also influences the outcome. “People may be too poor and the environment too degraded to enable a cross-over to the [transition] response” (De Groot and Kamminga 1995: 74). We can call this the ‘poverty trap’ with regard to natural resources. In addition, according to Bebbington (1999: 2032) his capitals are assets or compose of assets of rural people. What is important are “the ways in which people are able to access, defend and sustain these assets and the abilities of people to transform those assets into” better living conditions and better asset and asset-transformation conditions.
Homer-Dixon (1991, 1994, and 1999) warns of the effect of a certain level of resource scarcity under certain conditions on the possibilities for escaping this same scarcity. While highlighting the difference between neo-Malthusians and neo-Boserupians and while discussing the possibility of the absence of innovation”, he stresses the importance of the ‘in-between’ position and the analysis of the whole complex set of different influencing factors.

A-rationality

The effect of the moment of choice highlights the fact that any rationality has to have a long time horizon. In addition, it has to deal with a large number of uncertainties with respect to what the future will bring. “Uncertainty is endemic to natural systems” say Hanna and Jentoft (1996: 43), to which I would add: and to social systems. Nevertheless, within the limited possibilities they have, people are certainly guided by conscious calculations. For example, the choice for agricultural transition in times of population pressure is a choice for less labour efficiency”. The rising land scarcity and the rational calculation of labour input versus output may result in the choice for a one-time investment in violence via new niche-invasion rather than the ever-continuing higher labour costs of intensification, especially when markets are too far away”.

Calculations can also be connected to values other than economic ones. Rational Choice Theory “views humans as intentional actors with rational correspondence among their perceptions, preferences, decision-making, and behavior [...]. It also recognizes that individuals hold non-economic preferences, such as love and respect” (Burke 2001: 455-456). Thus, these rational considerations have to be taken into account when studying actors’ decision-making and the implementation thereof.

However, Rational Choices no matter how broadly defined and no matter how well the ‘colouring’ of the information is taken into account”, are not the whole story. Sometimes humans do not calculate at all. Even if actors have access to the right and comprehensive information. “[t]hey often do not make efficient use of it” (Burke 2001: 467). Most of the time they just do what their fore-fathers did, that is act according to tradition and according to what they have ‘seen’ being done. To that has to be added that, although perhaps intentionally ‘rational’, actual behaviour can be far from that because, as Ostrom (1990: 21) puts it: “The differences between those who have and those who have not extricated themselves from commons dilemmas may also have to do with factors outside the domain of those affected. Some participants

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" In contrast with the first, who give primacy to natural factors, “[e]conomic optimists and distributionists emphasise social factors, that may hamper technological innovation, but they differ on which social factors are important: economic optimists stress market failures and bad economic policies and institutions, whereas distributionists emphasise social structures and political behavior, especially skewed distribution of wealth and power among classes and groups.” (Homer-Dixon 1999: 43)

" According to Boserup (1965: 32) the “output per man-hour” declines in intensification. She said that, because the fall in efficiency is a price to be paid, “the shift from efficient extensive systems to less efficient intensive ones [are only made] when driven by the necessity of feeding more individuals” I would add: ‘and when no other systems have a more positive cost-benefit calculation’.

" See Von Thunen’s location theory; e.g. in Cleuren (2001) or De Groot (1999)

" See also note 91 about HEC domains.

" As mentioned earlier, most of the time information is not neutral and objective but coloured by previous perceptions and manipulations of both the information itself and the perceptions. This may suggest non-rational reactions, but taking account of actor information, deliberations can still be very rational
do not have the autonomy* to change their own institutional structures and are prevented from making constructive changes by external authorities who are indifferent to the perversities of the commons' dilemma, or may even stand to gain from it. In addition, there is the possibility that external changes may sweep rapidly over a group, giving them insufficient time to adjust their internal structures to avoid the sub-optimal outcomes.*

Last but not least there is the non-rational, even non-reasonable, behaviour of humans 'not having control over themselves': a state of mind which everybody encounters one day or another but which in general depends on personal characteristics (see Sandole's list in the next sub-section). As such, it is therefore related to the second category of De Groot and Kamminga: Autonomy. Some scholars even see emotion as one of the basic features of human behaviour. Uperti (2001: 27) notes that "when people perceive injustice or conflict in their society, they assess it with emotions and act or react accordingly". Scimecca (1993: 213) also considers that "deep-seated conflicts are often irrational". Although perhaps less frequently applicable to land-use practices earlier in the diagram, where highly rational notions can prevail in setting the strategies, all these different aspects of human choice are very relevant specifically to conflicts and their genesis and development.

Influencing factors on the right-hand side of the VoE diagram
In the early (left-side) phases of the flow-chain, strategies other than the assertion of rights are possible. There is still a broad range of actor options and motivations. This is indeed what can be seen in the field. The success thereof decides how vulnerable actors feel, how they perceive their insecurities and thus how much emphasis they will place on the assertion of rights to the environment later on. Sometimes the feeling that this environment is indispensable either for themselves or for their offspring is an important factor in their decision to resort to violence. Sometimes natural resource insecurities are at best a trigger in an otherwise unsatisfying situation. In other circumstances, actors choose a non-violent way to overcome the conflict concerning resources.

During the history of social sciences the development of conflicts into violence has been a major field of inquiry. Different schools have proposed different theories of explanation, although the concept of "basic needs" always played a big role. For example Burton (1993: 58) stresses that "... human needs deprivation forced the individual to act in ways that would otherwise not be chosen." With the basement of (violent) conflict in basic needs, most theories also include contextual and structural factors. Sometimes only as variables that determine the availability of the needs itself: "Any system [...] that fails to satisfy [...] people's basic human needs and long-term interests will generate instability, political repression and violence." (Rubenstein 1993: 153). Others, like Van der Merwe (1993: 266), stress that those needs are only one factor between others: "If human needs are seen as one aspect (present to a greater or lesser degree) of many real-world conflicts, rather than the defining characteristic ..."
To achieve a greater insight into the reasons and possibilities of choice during the last (right-hand side) phase of the VoE diagram a combination of several of these theories will help the best. “The recognition of the multidimensionality [of conflict] should sensitise us to the limitations of specific approaches that offer only partial solutions…” (Van der Merwe 1993: 273). Thus, because it is put together from theories and paradigms from “all levels to the development of conflict” (Sandole 1993: 20) I refer to Sandole’s list for a “basis of a generic theory on the initiation and escalation of violent conflict” (Sandole 1993: 20-21). As can be seen, this generic theory will be firmly based on the needs paradigm.

Sandole’s list starts from biological and physiological mechanisms that generate a certain propensity to violence of human beings. This requires “some kind of stimulation to be activated […] which can be influenced by learning” (id). He then articulates the existence of human beings’ biological “basic needs for security, identity [such as ethnicity] and the like”. In this biological-psychological domain, others add the need for a “social life” (Clark 1993: 47), even “associational or organizational life” (Brown 1993: 165) and “needs that arise out of self-awareness”, such as “the need for sacred meaning”, “creativity” (Clark 1993: 47), “recognition, solidarity, and personal development” (Rubenstein 1993: 150) as well as “autonomy” (Burton 1993: 58). Buruma and Margalit (2004) consider humiliation as a driving force towards the use of violence. Apart from the general term ‘security’, Sandole does not mention the ‘normal’ basic needs but, for the sake of completeness, I add food, shelter and clothing. However, when discussing the role of physiology, he does refer to what I called non-rational and non-reasonable reactions. When the needs are threatened, or “frustrated”, he says that the “physiological mechanisms may come to dominate the actor’s […] rationality”. That means that the actor then resorts to violence.

Although the suggestion that violence is a non-rational choice in which limbic systems dominate the more highly-developed brain may be true for certain situations, as a general concept of the origin of violence it contradicts Sandole’s remark about the effect of learning. Indeed, the use of violence can be perfectly based on conscious cost-benefit and risk calculations, in which the brain masters the emotions. Then not only the direct goal plays a role, but also longer term societal positions. In so-called ‘cultures of violence’, such as some of the Latin American or the Sicilian ones\(^{10}\), social status may, for example, depend on the early, fearless (and preferably effective) use of violence.

The threats and frustrations that play an important role in driving people to violence can be caused by many things. For example, the memory of past violence can cause fear of physical attacks and loss of life that makes people strike pre-emptively\(^{11}\). This is one of the reasons why causes of the start-up of violence are often different from those that continue it (see Sandole 1999)\(^{12}\). Many times perceived or indirect threats play a role. “Frustration can be fed by perceived structural violence” (Sandole 1993: 11)\(^{13}\).

The well-known concept of ‘relative deprivation’, as voiced by Gurr (1970), is a variation of this theme, in which actors perceive a discrepancy between “resources to which one feels entitled and […] resources which one feels capable of acquiring and keeping” (Sandole 1993: 12).

\(^{10}\) See for example Krujt (1997) or Cottino (1999)
\(^{11}\) See Oketch and Polzer (2002) about Burundi: “… the importance of fear as a motivating factor for killing”
\(^{12}\) See also the last of Bachler’s (1999) five key factors in conflict causation: spill-over from an historical conflict.
Relative deprivation is explained mostly as a situation of initially increasing welfare, followed by a decline and thus a gap between expected and real satisfaction of needs that triggers people’s aggression against the State and its elite (Davis 1962; Gurr 1993). This is even more so, when this elite has both a better societal and economic position than its subjects and when they (or the State institutions) are rigidly trying to maintain the status quo (Huntington 1968). This is a reaction by the elite to the threat of diminishing well-being, a fear of the loss of wealth. Indeed, Gurr refers to physical needs and not so much to the meta-physical ones listed above.

These physical needs (or wants) also play a role in the type of relative deprivation that plays a role in the greed variant of environmental conflicts. As depicted by Collier and Hoeffler (2002: 21) a combination of greed and grievance models makes more sense in explaining violent rebellion than one of them alone. Here, it is the possession of fewer resources by a person or group compared with what others, like the elite referred to, have that sets the frustration in motion.

Mostly, though, greed for resources is mixed with greed for power (the one stemming from the other and vice versa). Moreover, conflict and possible subsequent violence only arise when another party puts forward a counter claim to the wanted resource, whether out of their own greed or out of grievance. In their articles on the incredible violence in the Great Lakes region of Africa, Oketch and Polzer (2002) and Bigagaza et al (2002) stress that the greed of the elite for the power to extract wealth from the scarce resource land, and its subsequent manipulation of the masses, only led to the massacres because poor farmers indeed reacted on the basis of a threat to, or the actual lack of, subsistence possibilities. However, it has to be born in mind that defining the motivation for resources as based on greed or grievance is a moral (and etic) choice. The observer decides whether the party that strives for a resource has, in general, enough to meet its basic needs and is thus greedy, or acts from grievance because it does not have enough. Yet, as can be seen in the ever-expanding list of different (possible) basic needs given above, it is difficult to decide whether or not people’s basic needs are threatened. Apparent greed can in fact be a grievance in another domain.

Another variation in the frustration realm is “Galtung’s rank disequilibrium [that] refers to discordant locations of actors along various indicators of socio-economic (and other) measurement” (Sandole 1993: 20). This frustration-aggression mechanism can be recognised in Richards’ (1996) observation that the Sierra Leone militia specifically consists of more highly educated young men from poverty struck families and with no access to better (power) positions within society. It has to be stressed, however, that Galtung adds to his theory that “these extreme forms of aggression are unlikely to occur unless 1) other means of equilibration towards a complete top-dog configuration have been tried, and 2) the culture has some prac-

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104 Defined by Galtung as “a structurally based discrepancy between actual and potential states of somatic and mental well-being, it need not be perceived by its ‘victims’ or involve physical violence” (in Sandole 1993: 11).
105 See also Schoofl (1974: 237-238).
106 See also the remarks about land in the Introduction.
107 See Ballentme and Sherman (2003a: 5): “there is little consensus as to how [economic factors] matter, how much they matter, or in what ways. In part, this disagreement has stemmed from the loaded normative connotations of the terms ‘greed’ and ‘grievance’.”
108 The extremely violent struggle for diamonds in Sierra Leone (Richards 2001) or the Congo basin (Ross 2003) have a different start-up cause, but the continuation of the fights is due to the local abundance of this natural resource that is scarce and in worldwide demand and, thus, has a high economic value that can provide the warring parties with funds. These civil wars clearly illustrate Sandole’s (1999) point of a difference between causes of start-up and of continuation of conflicts.
tice in violent aggression.” (Galtung 1964: 116).

The frustration-aggression spiral seems to fuel itself by the mechanism that involved parties “tend to overperceive and overreact to threatened and actual assaults to needs” (Sandole 1993: 20). This underlines the role of emotions in violence genesis and development. Moreover, natural and social “environmental ‘shocks’ and uncertainties associated with developments at the international and global level” can exacerbate the “conflict-as-process” (id: 21).

As mentioned above, although most authors describe economic principles as driving forces, frustration can also develop with regard to basic needs in other life domains. Unfortunately, Sandole’s list does not answer the question of which basic needs from all those listed by different scholars are the most basic, that is which needs are more important than others (Mitchel 1990) and demand means. That sacrifice everything else. The theories about the relative shortage of (basic) needs as a cause of violence indicate that, perhaps, the more meta-physical needs are indeed the most important and that Sandole was right to mention only them. Also other scholars from the conflict field discuss that people can bargain over (basic) needs, but that ideological or deep-rooted values can give rise to unsolvable disparities (Druckman 1993).

Ronen (1995: 41) distinguishes two different types of needs: in the psychic and in the physical sphere, sustaining respectively mental (e.g. pride, trust, love, sense of freedom) and physical (e.g. food, water, shelter) well-being. Compared to, e.g., Boserupian theory, one has to note that this adds not only several aspects in the physical domain besides the strictly food-centred one, but also a whole new domain. “The satisfaction of both sets of needs is necessary for human physical and psychic survival” (Ronen 1995: 41). What is interesting is the type of reaction in the case of frustration. Stone (1966) specifically mentions the strategies other than aggressive ones as ways of reaching a solution of the perceived backwardness. He stresses that sometimes a sequence (or even a mixture) of different ways of reacting exist.

Phases of conflict
According to Rubin et al (1994) reactions to a conflict can be ordered along a line of diminishing attention to other party’s interests. The management of a conflict is more difficult when parties are more focussed on achieving their aspirations, when their aspirations are higher than usually and when they think another person’s aspirations are less legitimate than their own. These circumstances can come about when “after a period of expanding achievements, there is a slowdown or reversal in this achievement” and when a person “develops the awareness that [the] other is of no greater merit than [himself], yet [the] other is afforded greater privilege” (id: 18-19). This is the same as the above-mentioned ‘relative deprivation’ feelings, but now also relative to others.10 When there is a “status inconsistency” (when some people are higher on one criterion of merit-assessment than on another, but are assessed as being less high in status than a person with the reverse constitution), when parties both evaluate the existing power structures in their favour and when norms “that dovetail the aspirations of potential opponents” become weakened (id: 19), a conflict will easily spill over into the next phase.

Rubin et al (1994) distinguish four possible strategies or phases with increasing negation of other party’s interest: avoiding, yielding, problem-solving (compromise can be one of these), and contention. Yielding can be explained as first stating one’s claims in the dispute, but with-

10 See also Ukeje (2001) on the role of educated youths in rebellion in Nigeria
11 Jealousy plays a big role!
drawing as soon as the other party also makes a claim. Contention means that a party tries to “resolve a conflict on [its own] terms without regard to the interests [of the other]” (Rubin et al. 1994: 28). The authors explain that each strategy can be “more or less vigorous” (id.: 44) and played out in a more or less rational manner. In the case of contention, more vigorous means more intense and frequent violence, e.g. “shots instead of shouts” (id.: 45).

Rational considerations of parties that fuel the process development of the conflict are based on thoughts about a person’s own interests and aspirations and the perceptions of the adversary’s interests and aspirations. In addition, the perceived feasibility of a chosen strategy, that is “the assessment of the effectiveness and the costs” (Rubin et al. 1994: 21) is just as important. Indeed, as has been pointed out, perceptions of the world in general and the actors’ position in it, both absolutely and relatively when compared to others, as well as perceptions on possible livelihood strategies and the position of conflict and violence in society111, play an important role. These perceptions are shaped by (as mentioned above in the ecological-sociological theories) the mutual interaction between the natural-physical environment and the social domain. Herein, but also in the strictly social field, personal characteristics and culture play an important role. Within the framework of post-colonial theory it is stressed that perceptions are also formed by internalised prejudices based on notions from ‘foreign’ power-holders about their subjects as well as about themselves via their subjects, and thus by power relations themselves112. The researcher should be aware of this. Besides this, acceptable explanations (or explanations given by acceptable persons) about the relative deprivation can lessen the frustration.

In addition, the idea of ‘having excessively less than your neighbour’ is connected to feelings of powerlessness. “The distribution of power constitutes a continuing problem for society” (Scimecca 1993: 215). Social insecurity may be countered by a better power position. A perceived low power position vis-à-vis the adverse party may influence the choice for yielding or even avoiding, but it may also trigger a strategic move towards violent contending in a latter stage. Sometimes such a powerless position with regard to the competing party may even engender conscious or frustration-fuelled actions against a third party (scapegoat). Thus, in this study power, disparities and the question of the legitimacy of power both with regard to the allocation of resources and the management of discords are regarded as influences on conflict development.

Trying to gain the more powerful position by force is a way of showing off one’s own power. Safeguarding ‘your’ fish on your neighbour’s territory, as the inhabitants of Padmangay did, is also a sign of power. “The ability to achieve one’s own will in a situation of scarcity is what makes one powerful.” (Sandole 1993: 12). Sometimes management power over a certain resource is sought via control of another natural resource. Then the conflict seems to be triggered by the scarcity of the first resource, but it is power over the whole complex that is at stake. In North Senegal, for example, conflicts between herders seem to be focused on the scarcity of water wells. However, it is the surrounding grasslands that make herders want to have exclusion-power over the wells (Juu 2002). At the same time, the control of the wells is politicised via “struggles over difference and belonging” (Juu 2002: 186), that mean that social identities related to ‘autochthonous’ or ‘foreigner’ have to be played out. “[R]ights to

111 See for example De Groot (1992), Laurent and Mathieu (1994), Krujt (1994) and Jaddallah (n.d.).
resources often depend on social identity" (Juul and Lund 2002b: 249).

The mix of wanting to be a member of a managing committee\textsuperscript{11} for the sake of power over the resource or for the sake of becoming a powerful member of society in general, can be seen in more cases of conflicts in which resources are involved. Thus, whether or not natural resources are a direct cause for conflict or only a pretext to enhance power-positions remains to be seen. However, it is certain that they do play a role in the struggle for and with power that is abound in society as a whole.

An actor’s position in his community is also important in the distinction that has to be made when looking at causes of the outbreak of violence, between “group aims” or “personal goals” (Ronen 1995: 31). The sum of several of the same individual goals or strong loyalty feelings within an otherwise formed group can lead to escalation of a conflict, whether or not over resources. The Social Identity Theory of Tajfel and Turner (1979) states that sometimes people identify themselves as members of a social group (i.e. the social identity\textsuperscript{14}) and at other times as unique individuals (i.e. the personal identity), depending on the situation. “...We are, in some sense, the same, or identical to the other people. [...] When we say that we are the same, we mean that for some purposes we treat members of our group as being similar to ourselves in some relevant way. Social categorisation accentuates similarities within and differences between groups. To take the most extreme example, in some violent conflicts such as war, the members of the opposite group are treated as identical and completely different to the in-group” (Australian National University 2003: 1). This social level of identity\textsuperscript{15} “is the level at which individuals tend to regard themselves as relatively interchangeable (in terms of perceptions and beliefs) with other people” (Turner 1982: 23). To achieve a positive social identity, it is necessary to view one’s own group as somehow better than other groups. This is social competition.

Thus, strong group feelings can trigger the defence of group members’ interests out of loyalty. Then, the strength of feelings of injustice and deprivation with regard to natural resources, but certainly also with regard to other social issues, or the perception of those feelings, define the choice of the strategy in the conflict. In the case of individual powerlessness, group strength can cause highly vigorous contending actions.

\subsection{2.5 In summary}

The central route of the whole cascade (within the VoE diagram) is an investment in natural capital, but with only one goal and (finally) executed with one means. As regards other options, at each step the actor can choose to invest in (or with) one of the other capitals of Bebbington or even in natural capital, but in another sense. Escape routes are thus found in investment in and capitalisation of produced, human, social or even natural capital, or in combinations thereof. Why, how and when actors choose for a certain investment is determined by ‘influencing factors’. These can be categorised according to the four domains of De Groot and

\begin{itemize}
  \item \textsuperscript{11} See in relation to a well-committee Juul (2002).
  \item \textsuperscript{14} “Social identity = that part of an individual's self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership” (Tajfel 1978: 35).
  \item \textsuperscript{15} According to the Self-categorization Theory, next to individual and social it is possible that more levels of identity exist. See Turner (1982), Turner et al (1987), Australian National University (2001).
\end{itemize}
Kamminga, being (implementable) options: autonomy: objectified motivations and interpretations(-frames). The different domains are all influenced by
- existing capitals, and the possibilities to use them
- micro and macro structures and institutions (part of which are culturally defined with power relations being especially important) and the possibilities to change them, which in itself depend on, among other things, the possession of relevant capitals.

In general, explanations of strategies are sought in rational calculations. However, the fact that humans are also emotional beings, gives rise to the possibility of causalities outside the ratio. The human necessity to fulfil ‘basic needs’ both in the physical and meta-physical sphere connects the rational calculation of strategies with the a-rationality of ‘biological predispositions’. Both before and during the conflict, influences on choices for certain actions differ per stage and have different effects per stage. In addition, underlying ‘structural’ patterns, both in the biological and in the social environment, can account for the reactions shown.