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# Economic and Environmental Early Warning for Confidence Building and Conflict Prevention

## DISCUSSION PAPER

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### Scope of this paper

In the past decades, environmental factors and natural resources have attracted considerable attention as a source of conflict. Depending on the respective theoretical premises, some scholars have argued that scarcity of natural resources inevitably leads to increased competition for economic assets and thus gives rise to conflict escalation and violence. Others have tried to show that it is not scarcity but on the contrary abundance of natural resources which creates problems.[1] Both approaches have in common that the authors suggest a direct link between environmental factors and conflict. The flip-side to this hypothesis is that if there is such a direct link, environmental and economic policies can also be used to ease societal tensions and enhance stability and peace. Confidence building via appropriate environmental and / or economic action becomes possible.

In this article I try (a) to describe the nexus between environmental factors and conflict, and (b) to outline the basic needs for a viable early warning or monitoring system that could be used as a tool to build confidence between conflict actors. While the emphasis is on the environmental aspect of the problem, the arguments can easily be applied to the economic dimension as well.

1 For an overview regarding the competing concepts see Hans Günter Brauch, in: Hans Günter Brauch, Ursula Oswald Spring, Czeslaw Mesjasz, John Grin, Pal Dunay, Navnita Chadha Behera, Béchir Chourou, Patricia Kameri-Mbote, P.H. Liotta (Eds.): *Globalization and Environmental Challenges: Reconceptualizing Security in the 21 st Century.* Hexagon Series on Human and Environmental Security and Peace, vol. 3 ( Berlin – Heidelberg – New York: Springer-Verlag, 2008).

## Theoretical premises

In general, an early warning system can be defined as a process which entails the following three distinct steps:

1. The systematic and continuous collection of information that is relevant for early warning purposes,
2. The analysis of this information, and
3. The formulation of policy options at the address of decision makers which consequently lead to concrete early action[2]

When one looks at existing so called early warning systems, one instantly becomes aware of the fact that many of them actually do not fulfil these criteria. The Crisis Group (ICG), to name just one example among many, regularly produces “early warning” reports in which political, social, and economic developments in the target countries are assessed with regard to their impact on peace and conflict. They also contain recommendations at the address of relevant national and international actors which, if implemented, would help to transform conflict peacefully. What is lacking, however, is the systematic and continuous focus on a set of theory based pre-defined indicators. At one time ICG authors are looking at economic, social or other factors believed to potentially trigger violence, at other times they might be aiming at important national or international policies by major regional or global powers or the threat posed by radical Islam that embraces terrorism as its main strategy to achieve political goals. While these reports are generally very informative with regard to the situation in the country, these qualitative expert based risk assessments lack the systematic and continuous character which is essential for early warning systems.

It goes without saying that the continued observation of core indicators can be done qualitatively by knowledgeable experts who, based on theoretical assumptions, systematically monitor a certain country or region. Far more promising than such qualitative approaches, however, are quantitative methods. In the latter case it is

[2] As Adelman put it, "Early warning is not simply the sharing of information about an impending crisis, let alone the wail of a siren announcing the immanence of such a crisis. Early warning goes beyond collecting and sharing of information to include both analysis of the information and the formulation of appropriate strategic choices given the analysis (Adelman, 1997, 7).

easier to claim objectivity, since quantitative methods largely eliminate the expert bias problem.

The presently most promising quantitative early warning systems in place are those which rely on event data analysis (CEWARN, ECOWARN, and previously FAST). In the following paragraph I will briefly outline the FAST early warning approach, which has been developed at swisspeace for a number of development agencies between 1998 and 2008. While it represents a combined qualitative and quantitative method for monitoring conflict relevant political, economic, social, environmental, etc. trends, I will limit my description to the quantitative part as this aspect seems to be the most relevant in the context of today's workshop.

**The FAST Approach**

Event data based early warning departs from the assumption that political developments do not unfold in a random manner but are the outcome of specific conflictive and cooperative events within a given society. Thus, each event perceived to be relevant in the local peace and conflict context is being coded. In the case of FAST, the Local Information Network reported the events, which subsequently were coded according to the standards of the Kansas Event Data System (KEDS) that assigns each event to one of the event categories defined in the Integrated Data for Event Analysis (IDEA) framework (Bond *et al.*, 2003).[3] Over the years, the FAST database which contained information on 24 countries at risk of political violence became the largest contemporary collection of hand coded political event data with more than 160'000 reported events and 19 attributes associated with each of them.[4]

Table 1 shows a template of the information collected and stored in the FAST data base. Among the variables are not only the "initiator" and "recipient" and the "event type" but also the "event issue" which allows us for example to run analyses of events which are related to environmental or economic issues.

[3] Bond D, Bond J, Oh C, Jenkins JC, Taylor CL (2003), Integrated data for events analysis (IDEA): An event typology for automated events data development. Journal of Peace Research 40, 733 - 745.
[4] For further information on the FAST Early Warning System see the FAST Coding Handbook, version 4, 2006, swisspeace.

Table 1: Content of the FAST data base

**FAST Database**

| **Event attributes** | **Description** *(in parentheses the number of possible parameter values)* |
|---|---|
| Reporter | Name of the person who reports an event |
| Event date | Date when the event took place |
| Reporting date | Date when the event was reported |
| Event location | State, province and district level; *(ca 11'000)* |
| Event type | Type of event that took place. The coding is based on the IDEA event form typology *(208)* |
| Initiator | The agent who did something.<br>1) Location: Describes where an agent comes from; *(ca 11'000)*<br>2) Sector: Defines from which sector of society an agent comes from; *(46)*<br>3) Level: Refers to the organizational or geographic structure of an agent; *(14)*<br>4) Literal Name: Exact name of an agent |
| Recipient | The agent to whom something was done<br>1) Location: Describes where an agent comes from; *(ca 11'000)*<br>2) Sector: Defines from which sector of society an agent comes from; *(46)*<br>3) Level: Refers to the organizational or geographic structure of an agent; *(14)*<br>4) Literal Name: Exact name of an agent |
| Information Source | Source of information; *(4)* |
| Information Credibility | Refers to the credibility of an information; *(3)* |
| Geographic Scope | Geographic area in which an event took place; *(3)* |
| Event Salience | Political significance of an event; *(3)* |
| Injuries | Number of injured people |
| Death | Number of dead people |
| Damage | Material damage |
| Issues | Issue or topic of an event; *(30)* |
| Description | Literal description of an event |

Each event is then given a numeric value according to the Goldstein scale[5] that weighs event types from -10 for the most conflictual to 8.3 for the most cooperative interaction. Thus, by aggregating the data we are not only able to graphically display patterns of conflict and cooperation for given time intervals or specific territorial entities but also make predictions about the future course of action.

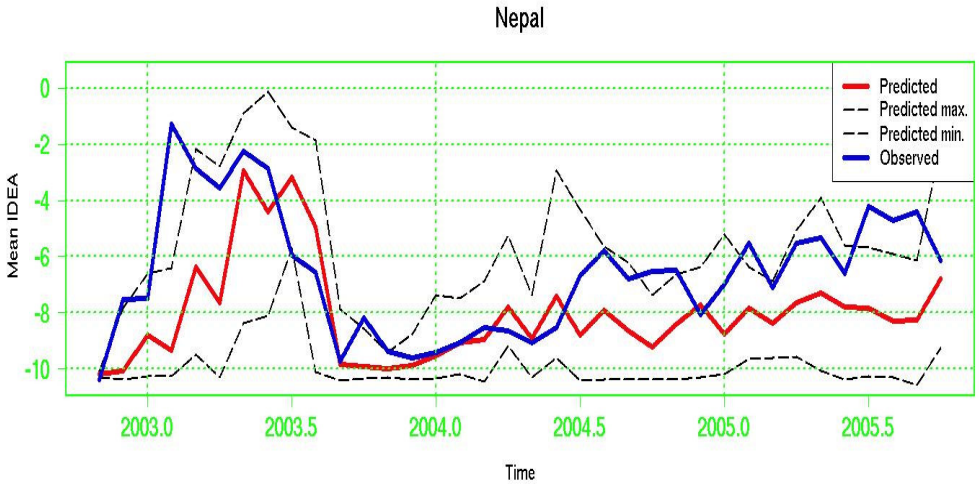
The following two graphs are examples of how such "Tension Barometers" look like. Graph 1 depicts co-operative and conflictive events in Uzbekistan (April, 2006) by domestic, governmental and non-governmental actors. Graph 2 illustrates how event

[5] See Goldstein, Josuah S. (1992) A Conflict-Cooperation Scale for WEIS Events Data, in: *Journal of Conflict Resolution*, 36, 2.

data can be used to forecast future developments. The case here is Nepal in between 2003 and 2005 where one can observe that our prediction (red line) was slightly more optimistic than the actually observed development (blue line).[6]

Graph 1: Cooperative and Conflictive Domestic, Government and Non-government Conflictive Events in Uzbekistan, April, 2006


Graph 2: Forecasting Conflict level in Nepal in between 2003 and 2005

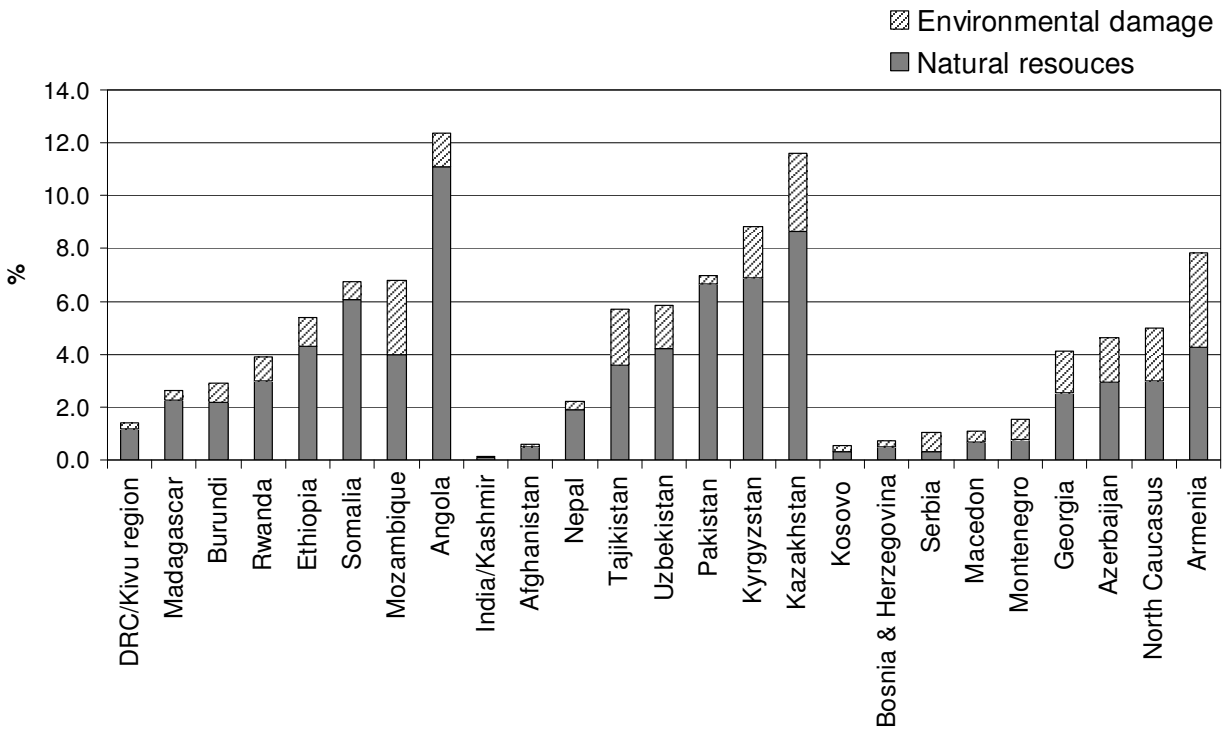



[6] For more details see: Hämmerli, August and Dominic Senn (2009), Detecting conflict patterns with sequence alignment from computational genomics, swisspeace.

**The nexus between Environment and Conflict**

If we look at the percentage of events in the FAST data base which are related to environmental issues (environmental damage and / or natural resources as "event issue"), we see at first glance a huge difference between the different countries. For example, in oil-rich countries such as Angola or Kazakhstan more than eleven percent of all events, which from a conflict / cooperation viewpoint are considered to be relevant, are linked in one way or the other to environment. On the contrary, in countries such as Afghanistan, India / Kashmir, or Kosovo this percentage tends to be much less, indeed it is almost non-existent (see table 2).. Overall, the percentage of events with an environmental background is 4.5, with around 3.5 per cent falling in the category of "natural resources" and only around one percent of all events tied to environmental damage.

Table 2: Percentage of environmentally induced events to all events

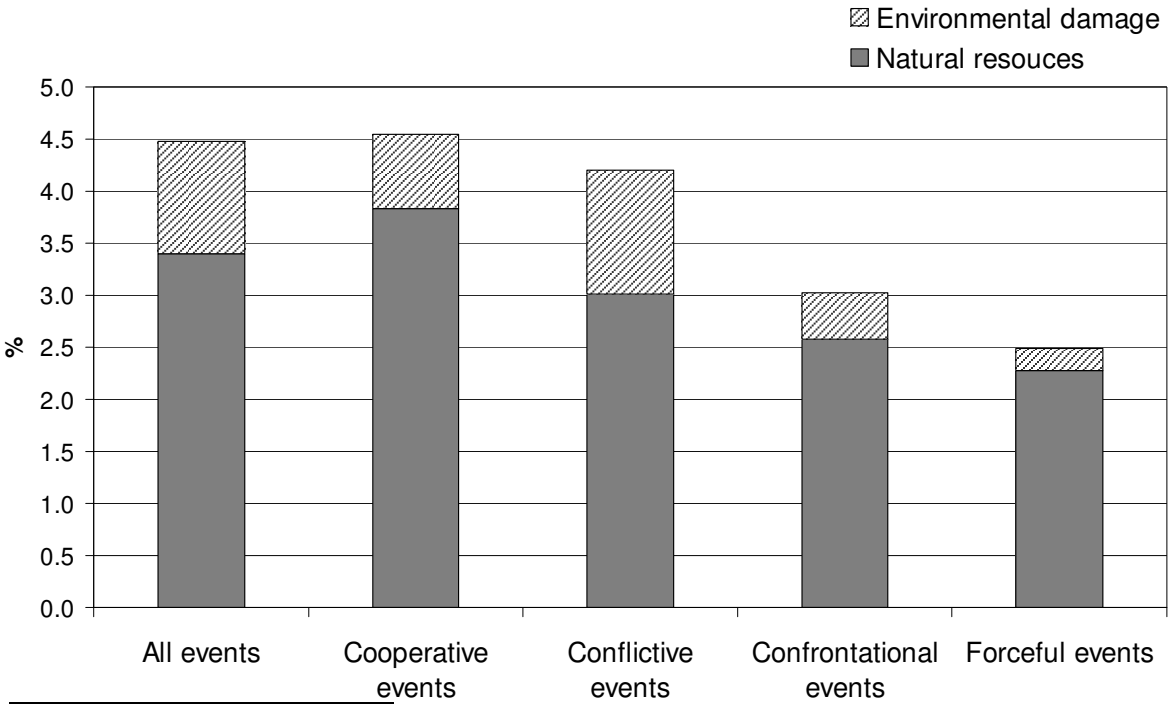


These results coincide with an earlier study we did within the ENVSEC[7] program on the Ferghana valley. There we found that out of the approximately 2000 events eight percent were related to "Natural Resources" and three percent to "Environmental Damage". Thus, the Ferghana valley shows a slightly higher incidence of environmentally caused conflictive / cooperative events than the average of the 24 countries, which were monitored within the FAST program.

**Frequency of Environment-Related Events per Event Type**

Assessing these results, it is important to keep in mind that the FAST data base contains not only events which comprise the use of force or violence but also events that contribute to an easing of tension. Thus both conflictive as well as cooperative events can have an environmental dimension. Table 3 shows that half of the events that have an environmental / resource aspect are of cooperative nature (cooperative vs. Conflictive). Violence as such (i.e. events that entail force) amounts to only 2.5 percent of all events, while cooperative events account for 4.5. percent of all events.

Table 3: Event type and environment




[7] The ENVSEC-initiative is a joint program by UNEP, UNDP, OSCE, UNECE, REC, and Nato that has three key objectives: (1) assessment of environment and security risks, (2) capacity building and institutional development to strengthen environmental cooperation, and (3) the integration of environmental and security concerns and priorities in international and national policy-making (For further information see: www.envsec.org).

The Ferghana valley example reveals some other interesting facts. While in the Tajik and Uzbek parts of the Ferghana Valley we observe a pattern that resembles the global trend, i.e. salient environmental events are mostly linked to conflict, this does not hold true for the Kyrgyz part. Here the reported environmental events are slightly stronger linked to cooperation. Hence, Kyrgyzstan would be interesting testing ground to examine under which conditions environmental factors promote peace.

**Conclusions and Recommendations to the OSCE**

What are the main results of our very cursory descriptive analysis of the FAST conflict and cooperation data from an environmental perspective? And what are the conclusions to be drawn? First, given that only 4.5. of all relevant events are linked to environmental issues ("natural resources" or "environmental damage"), empirical evidence suggests that there is actually no direct link between environmental parameters and political violence. Environmental factors undoubtedly play a crucial role in explaining political escalation and de-escalation processes. The causal relationship, however, is not linear. Neither the scarcity of land or water nor the abundance of oil or gas drives a society straight down the road to violent conflict. Resources like minerals, water and land or environmental degradation can be important ingredients in a complex blend of political, cultural and economic factors that eventually breed violence.

Second, just as the historical, institutional, cultural and political context play an important role in explaining violent conflict, the same variables also determine to which extent environmental activities – and I would argue economic as well - can be used as confidence building measures. This ultimately calls for the creation of a reliable monitoring or early warning system that allows decision makers to analyse the situation in the countries under scrutiny very carefully. The main questions to be asked in each particular conflict setting are: (1) Are environmental factors linked to conflict escalation or de-escalation, and in which way? (2) Who are the main potential or actual actors who drive or mitigate a conflict and under which circumstances are they susceptible to environmental or economic incentives to opt for peaceful solutions? These questions, however, can only be answered if there is a reliable monitoring system in place – I would argue that such a system cogently needs to be quantitative in nature.