Revision Memo in Response to Reviews of the Manuscript “The Nexus of Oil, Conflict, and Climate Change Vulnerability of Pastoral Communities in Northwest Kenya” (esd-2015-28)

Authors:

We thank both Reviewers for their positive and constructive comments and suggestions.

Anonymous Reviewer #1 (17 August 2015)

Reviewer:

The paper does fit the aims and scope of the journal by “conceptualizing, modelling, quantifying and predicting system behaviors and global change.” It specifically examines whether oil exploration in the Turkana District will make pastoral communities more vulnerable to climate change. It draws on two bodies of literature, one showing the detrimental impact of the oil industry on the environment and communities in other parts of the continent; and the second, the impact of climate change on pastoral conflict.

Response:

We thank the Reviewer for acknowledging the suitability of the paper for the journal’s aim and scope.

Reviewer:

The paper is unique in coupling these two effects; however it ultimately fails to link oil exploration to increased ethnic conflict, the second part of their second research question (p. 1167).

Response:

To clarify, it is not the aim of the paper to link oil exploration to increased ethnic conflict but rather to explore “the risk of the oil exploration to create new conflicts or aggravate existing ones” (p. 1167). So the paper does not try to establish a link between oil exploration and inter-community conflict. The aim is rather to point to potential impacts of the oil exploration on inter-community conflict.
Reviewer:

Based on interviews with town dwellers, the paper documents the discontent and tension with the oil exploration company, Tullow Oil.

Response:

To clarify, the paper documents the discontent and tension of local pastoral communities with Tullow Oil but no town dwellers have been interviewed.

Reviewer:

Newspapers have reported thefts and vandalism at oil exploration sites. The authors discuss the degradation of the environment occurring with oil exploration and extraction, rendering it less suitable for watering and feeding livestock; and the fencing off land by oil companies making it inaccessible to pastoralists. The authors also show the increase in violent conflict in the Turkana-Pokot border region within a four-year period that coincides with the period of oil exploration. However, they fail to provide any evidence directly linking pastoral conflict with oil exploration. For now the paper gives only a warning of the possibility of violent conflict, which is nonetheless an important point to make known. Oil exploration could force more Turkana pastoralists into the border zone where they would be more vulnerable to Pokot attack. However without further evidence, the actual rise in conflict in conjunction with oil exploration could be just coincidence. Pastoral conflict does occur in cycles with annual fluctuations in rainfall.

Response:

To clarify, the raids shown in Fig. 1 (p. 1197) cover the period 2006 to 2009. Oil was first found in Turkana in 2012. Hence the two do not coincide. The purpose of Fig. 1 is rather to show that the region where oil has been found recently is one that has seen strong raiding activity in the past.

We agree with the Reviewer that the paper “gives only a warning of the possibility [of aggravation] of violent conflict” between communities. The research has shown that there are only indications which point to an aggravation of inter-community conflict, for example through the mechanisms the Reviewer has mentioned. But nowhere in the paper do we claim that there already is a strong link between oil exploration and inter-community conflict. Instead, we phrase this very carefully. Examples from the respective section (3.2.2) include “there is a concern that” (p. 1183, l. 16), “To what extent oil exploration will affect land rights and prices is however too early to say” (p. 1183, l. 19/20), “Employment with Tullow could also become a source of conflict between communities” (p. 1183, l. 26/27, emphasis added). In the Synthesis section we stress again “There were indications that oil exploration affects the Turkana–Pokot conflict through an alteration of security presence and potential greed driven motivations over territory
and oil compensations but this finding is less reliable than the others” (p. 1184, l. 26-28, emphasis added).

In summary, the “failure” to “provide any evidence directly linking pastoral conflict with oil exploration” as stated by the Reviewer is due to the fact that the research simply did not find a strong link (yet) but rather gave reasons for concerns and indications for a potential risk of oil exploration to aggravate existing inter-communal conflict.

**Reviewer:**

Linking oil exploration with increased ethnic conflict is problematic in this paper because the authors overlook two important aspects of Turkana social organization in the ethnography. One is the Turkana are organized into territorial "sections" that circumscribe migratory routes in good rainfall years. While border conflict and oil exploration may occur in the same southern region of the Turkana District they are in different Turkana sections and may not involve the same Turkana groups (see Adem et al. 2012).

**Response:**

We agree with the Reviewer that the Turkana move with their livestock in smaller groups, called “sections” (Reviewer) or “kraals” (Schilling et al. 2012b, p. 6). We thank the Reviewer to pointing us to the Adem et al. paper which we find very relevant. We have now made reference to the Adem et al. paper in sections 1, 2 and 3 of our paper. Adem et al. (2012, p. 1) show that “most of the raiding against the Turkana occurs while the herds are on transitional moves, splitting from, and coalescing at, the margins of expansive plains, en route to patches of dry season ranges”. This is mostly the case along the border areas between the Turkana and the Pokot. So in theory the Turkana kraals engaging in violent raids with the Pokot could be different ones than those Turkana communities (Lokwamosing, Lopii, Nakukulas) we interviewed. However, in practice Fig. 1 shows that these communities (and particularly Lokwamosing) are heavily exposed to raids. The interviews with the community members show that they see the Pokot as their greatest enemy (see p. 1176, l. 21, p. 1180, l. 1/2, p. 1181, l. 1, p. 1183, l. 14). Hence the Turkana people who are now exposed to the oil exploration are the same people exposed to the violent conflict with the Pokot.

**Reviewer:**

The other aspect of Turkana social organization is the divide between pastoralists and town-dwellers, the latter are individuals and families who are no longer able to survive as pastoralists and have moved to towns where they can find wage labor (see Broch-Due and Sanders 1999).
Pastoralists and town-dwellers might have different expectations, be differentially impacted by oil exploration and climate change, and therefore require different policy responses.

Response:

We agree with the Reviewer that town-dwellers are likely to be impacted differently by oil exploration and their engagement with the oil company is also likely to be different when compared with pastoralists. However, the paper is not concerned with town-dwellers. Since no down-dwellers were interviewed, we cannot say anything about this group. We purely focused on the type of community members specified in the method section (see 2.2). The issue of the town-dwellers is nonetheless an interesting one. In the last paragraph of the paper (p. 21) we now suggest to study the effects of oil exploration on town-dwellers in future research.

Reviewer:

Also it is not clear whether Turkana pastoralists would violently engage oil companies the same way they do the Pokot, or the same way that town-dwellers do.

Response:

The Turkana violently engage with the Pokot mostly in the form of livestock raids and other forms of attacks. We have described this in a previews study (Schilling et al. 2012b) which we reference several times in the present paper (for instance on p. 1165, 1168, 1170). In the section on community–company conflict (3.2.1) we describe how the concerned Turkana communities engage with the oil company. This engagement includes road blocks (p. 1176) as witnessed by the research team and community demonstrations and storming of an oil site, including lootings and destruction of property (as reported by newspapers, p. 1177).
Reviewer #2, Patricia Vasquez (10 September 2015)

Reviewer:

1) The article is good in bringing out most of the issues that could be conflictive in relation to the development of oil in Turkana. It perhaps stresses the negatives and does not explore potential positives that much.

Response:

We thank the Reviewer for acknowledging the paper’s contribution to identifying the conflictive issues associated with the oil development. The (potentially) positive aspects of oil, including employment opportunities, improved water situation for the communities (at least in the short term), new and improved infrastructure, investments into education and cash payments to the communities are mention and discussed (see sections 1, 3.1.1, 3.1.3 and 4). In the conclusion section “new economic opportunities and infrastructure improvements” (p.1185, l.20) are particularly stressed including the potential “to reduce the vulnerability of communities to climate change” (p.1185, l.21). A statement by the Member of Parliament for Turkana South has been added in section 3.1.3, stressing the potential of oil to act as a “boost” for the economy. We hence believe that the (potentially) positive aspects and opportunities of the oil development are now sufficiently covered in the paper.

Reviewer:

On the latter, the article could benefit from addressing two issues: 1) the recent discovery of water in Turkana; 2) the ongoing process of Devolution in Kenya and how that is affecting/will affect Turkana.

Response:

These are indeed relevant issues. To 1): During interaction with the communities the discovery of the aquifers did not come up. However, they were mentioned at the county government level. We have now included a paragraph on the aquifer based on our interview with the Governor of Turkana County and consulted secondary sources to describe the potential of the aquifer and the latest status of its exploration (see end of section 3.1.1 and Conclusions).

To 2): A paragraph on devolution has been added to the section on adaptive capacity (3.1.3) and the issue has again been addressed in the Conclusions.
Reviewer:

On the discovery of water reservoirs in Turkana, the Sensitivity section of the article talks about the potentially negative effects of oil discoveries on water. Maybe there should be a line or two about the new reservoirs, this is a positive development. Linking the new oil and the water discoveries, would open up questions that the article could explore, or at least mention, such as: In the process of developing the infrastructure to produce the water: would there be room for thinking of adopting contingency measures for preventing oil spills from contaminating the water? Is anyone thinking about this?

Response:

A paragraph on the aquifer has been added to the section on sensitivity (see also response above). The issue of oil pollution has now been addressed in a paragraph on the national environmental policy in Kenya (see 3.1.2). The paragraph shows that the government is recognizing this issue but that it has not taken specific measures (such as developing a national policy on toxic and hazardous substances).

Reviewer:

On Devolution: Kenya is now trying to address many of the institutional failures which the article mentions. Turkana has been long forgotten by the government as the article rightly says. But Kenya is trying to address this issue through Devolution. In 2013-2014, the first year of the implementation of Devolution, Turkana received the third largest transfer of devolved funds from the central government. During the second year of Devolution, Turkana is expected to also be among the most benefited counties. This is because Devolution is aimed at making the system more equitable by benefitting counties which, like Turkana, have been historically forgotten. So the main issue now in Turkana is not so much if they have resources, but why aren’t these being distributed more equitably among the population?. There is a problem with resource allocation, which is also trying to be addressed through Devolution and it is hoped will be improved throughout the years as Devolution is further perfected.

Response:

A paragraph on devolution has been added to at the end of section 3.1.3 (Adaptive capacity). The paragraph mentions the financial benefits Turkana has been and will be receiving from the county devolution fund. Implications of those benefits are briefly discussed.
Reviewer:

2) Perhaps the report could talk a bit about communication and transparency issues. It addresses the problem of high expectations among the Turkana population. They expect to get jobs from the oil industry. But the oil industry is not labor intensive. Has anyone told them this? Tullow says they have. Is the oil company the right stakeholder to inform the population about issues of such importance? What about the government? Tullow says they are very open and transparent: does this show from talking to Turkanas?

Response:

Indeed communication and transparency issues are central to the conflict dynamics between the communities and Tullow. We have discussed both issues, mainly in section 3.2.1. For example we discuss the role of the community liaison officers and the limited transparency Tullow shows when communicating official employment figures. We have added a sentence stating that neither Tullow nor representatives of the Kenyan government have clearly told the communities about the limited demand for unskilled labor (see 3.2.1, end of second paragraph after Table 1).

Reviewer:

3) The article could benefit from including a discussion on two other sources of conflict related to oil: weapon proliferation and geopolitical differences. In the first case, the Small Arms Survey has done some research on the proliferation of weapons Northern Turkana. On the geopolitical issue, Somalia shares its sea platform with Kenya and there are differences between the two countries on the location of deep water resources.

Response:

Weapon proliferation makes the existing communal conflicts more violent but we do not see this as a cause of conflict itself. We have now mentioned the issue of gun proliferation in section 2.1 (first paragraph), giving reference to the latest Small Arms Survey. We believe that the geopolitical dimension between Kenya and Somalia is beyond the scope of this paper and would hence suggest to not include it explicitly. We however point to the geopolitical dimension as part of the new paragraph on the LAPSSET project (section 2.1).

Reviewer:

4) I have attached an article I wrote in 2013 that brings out some of these issues: Patricia I. VASQUEZ, ‘n Kenya at a Crossroads: Hopes and Fears Concerning the Development of Oil and Gas Reserves Â´z, International Development Policy | Revue internationale de politique de
Response:

We thank the reviewer for pointing us to this very interesting and relevant article. It has been incorporated into the discussion of the results and cited several times in the manuscript (see for instance sections 1, 3.1 and 3.2).

Reviewer:

5) On page 1175, there is a reference to black smoke caused by oil extraction”. But oil extraction has not yet started in Turkana. You may need to double check what this refers to.

Response:

This has been corrected to “oil exploration site”.

Reviewer:

The article links oil developments with "direct" employment in several parts (see page1173). Again, I’d be cautious in making this linkage because the oil industry is not labor intensive. There are many indirect sources of labor.

Response:

The manuscript clearly states that “the direct employment of Turkana in the oil sector has been minimal” (page 1179). The statement on page 1173 has been revised.
The Nexus of Oil, Conflict, and Climate Change
Vulnerability of Pastoral Communities in Northwest Kenya

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Abstract

Turkana, in northwest Kenya, is the country’s poorest and least developed county. Pastoralism in Turkana is well adapted to the harsh climatic conditions but an increase in drought frequency associated with global climate change and intensifying violent conflicts between pastoral groups, poses significant challenges for local communities. The conflicts are especially violent in the border region between the Turkana and the Pokot communities. In this very region significant oil reserves have been found recently. The first aim of this paper is to analyse how the oil exploration affects the communities’ vulnerability to climate change. Secondly, the paper explores the risk of the oil explorations to create new conflicts or aggravate existing ones. The primary method of the study is qualitative field research supplemented with a geo-spatial analysis of conflict data. The field research was conducted in October 2013 and April 2014 in three villages with different levels of engagement with the oil exploration. At the time of the research, oil exploration was expected close to Lokwamosing while it had recently started in the vicinity of Lopii and had been ongoing for a longer time close to Nakukulas. The findings suggest that the oil exploration increases the community’s vulnerability to climate change. Further, unmet community expectations for water, employment and development pose a significant risk for violent conflict between local communities and the operating oil company. Intercommunal conflict over water and land could increase as well.
Introduction

Agriculture and pastoralism are the dominant sources for food production and income generation in Africa (World Bank, 2014). Especially in arid and semi-arid regions such as Turkana in northwest Kenya, pastoralism is a well-suited livelihood and production system that makes efficient use of the highly limited water and pasture resources (Levine, 2010; Koocheki and Gliessman, 2005). But pastoralism across the African continent is often viewed by national governments as being “backward” and partly even “primitive” (see Pavanello, 2009; Devereux, 2010). Views like these have resulted in political, economic and social marginalization and discrimination of pastoral communities (GoK, 2007). Turkana is no exception. Here, the limitation of pastoral mobility by the government of Kenya and the neighbouring governments (mainly Uganda, Ethiopia and partly South Sudan) has decreased the adaptive capability of pastoralists (Schilling et al., 2014). This is particularly critical as an increase in rainfall variability and higher drought frequency, associated with global climate change, pose significant challenges for pastoral communities (Schilling et al., 2014; Opiyo et al., 2014). However, most detrimental to the resilience of Turkana pastoralists and their livelihood in general, are the violent conflicts between pastoral groups. Each year hundreds, some sources suggest thousands of people loose their lives in violent attacks, called raids, executed to acquire livestock or gain control over water points and pasture resources (Schilling et al., 2012b; CEWARN, 2010; Adem et al., 2012). Within Turkana the conflicts are particularly violent in southern Turkana where the Pokot of Kenya and Uganda raid the Turkana and vice versa (Mkutu, 2006, 2010; Schilling et al., 2012b). In this conflict-affected, underdeveloped (in the formal sense) and water scarce area, significant oil reserves have been discovered recently (Vasquez, 2013; see also Anderson and Browne, 2011). The dimensions are immense. The main basin in Turkana alone contains more than 600 million barrels of oil according to the UK-based operating company Tullow Oil (Tullow, 2014c). The commercial viability has been confirmed and Tullow’s exploration director concludes that “northern Kenya has the potential to become a significant new hydrocarbon province” (Tullow, 2014c). For the government of Kenya the discovery of oil is “very good news” (GoK, 2012) as former President Kibaki stated after first oil explorations in 2012.

For the pastoral communities the effects of the oil exploration are likely to be more ambivalent. But how ambivalent? A review of existing studies on pastoralism and oil provides little ground to answer this question, simply because there are very few studies on oil
exploration, pastoralism, conflict and climate change. On Kenya there is so far only one study but Johannes et al. (2014) do not specifically focus on vulnerability to climate change. The authors conclude that oil is part of “a tinderbox of risk and opportunism for violent conflict, lawlessness, and potential armed rebellion” (Johannes et al., 2014).

Most other studies on the topic have focused on (South) Sudan. For pastoralists in Sudan already confronted with militarization of inter-ethnic conflicts and displacement, oil is an additional worry (Chavunduka and Bromley, 2011). Chavunduka and Bromley (2011) conclude that “oil has not engendered peace and prosperity but the exact opposite”. Similarly, Pantuliano (2010) finds that oil exploitation in Sudan has contributed to environmental degradation, for example through tree-cutting for oil extraction sites, which in turn has exacerbated conflict over land (see also Switzer, 2002). Further, disappointed expectations of pastoralists for employment in the oil sector have led to attacks on oil sites and contributed to insecurity. But Pantuliano (2010) also points to positive aspects of the oil exploitation. The road infrastructure and hence the mobility has improved as a result of the presence of the oil industry. Along the oil roads new settlements and markets have emerged, opening new opportunities for trade and development.

Beyond (South) Sudan, there are several studies exploring the effects of oil exploitation on communities, although not on pastoralists. Particularly in Nigeria the detrimental effects of oil exploitation on the environment and the communities is well studied (for example Aghalino, 2009; Anifowose et al., 2012; Ikelegbe, 2001; Obioha, 2009; Osuji et al., 2004). Given the significant revenues earned with oil and the persistent high levels of insecurity and urban poverty, oil has mostly become a “resource curse” for communities in rural Nigeria (Sala-i-Martin and Subramanian, 2013; Obi, 2012; Idemudia, 2012). For example, unfair distribution of oil revenues has been reported as a major cause of attacks on oil pipelines and raids of oil sites (Anifowose et al., 2012). In Angola the exploitation is similarly viewed as mostly negative for rural development (Amundsen, 2014; Wenar, 2013; Hammond, 2011). For Uganda, International Alert identifies conflict risks associated with oil but the peacebuilding organisation also stresses the opportunities of “harnessing oil for peace and development” (International Alert, 2009; see also Vokes, 2012).

The overall aim of this paper is to explore the interactions between oil exploration, conflict and vulnerability of pastoral communities to climate change. This aim is divided into two specific research questions. First, how does the oil exploration affect the communities’
vulnerability to climate change? Second, what is the risk of the oil exploration to create new conflicts or aggravate existing ones? To address these questions, field research was conducted in October 2013 and April 2014 in Turkana South. Specifically, the three villages Lokwamosing, Lopii and Nakukulas were chosen to be able to compare communities with different levels of engagement with the oil exploration. The qualitative research was supplemented with a geo-spatial analysis of conflict data in Turkana. More details on the methods are described in the following section before the results are presented and conclusions are drawn.

2 Methods

2.1 Research area

The study was carried out in the county Turkana, located in north-west Kenya (Fig. 1). Nomadic pastoralism is the main livelihood in Turkana. Water, pasture, land and livestock (mainly cattle, goats, sheep and camels) are the key resources for the population. The lack of formal education, poor health and road infrastructure, and the limited existence of businesses (mostly concentrated in Lodwar) offer the Turkana population very few opportunities in the formal job market (UNDP, 2010, 2006). Turkana has a poverty rate of 94%. About 76% of the population never attended a school (Kenya Open Data, 2011a, b). In their “National policy for the sustainable development of arid and semi-arid lands”, the government of Kenya (2007) acknowledges the marginalization of Turkana and the government’s failure to integrate Turkana into the national economy. Insecurity related to pastoral conflicts, violent livestock raids and proliferation of small arms is widespread in Turkana (see Adem et al., 2012; Wepundi et al., 2012; Schilling et al., 2012b, Fig. 1 and 3.2).

The climate in Turkana is semi-arid to arid and characterized by a bi-modal rainfall pattern with “long rains” between October and December and “short rains” between March and May” (McSweeney et al., 2012). Reliable climate date is mostly available for Lodwar, the county capital of Turkana. In Lodwar the annual rainfall ranges from 500 mm in particularly wet years to less than 50 mm in drought years (Schilling et al., 2014).

Figure 1. Research location, oil exploration and distribution of raids in Turkana (based on TUPADO, 2011; Tullow, 2014b).
The average annual temperature in Lodwar is usually above 30 °C. Global climate change is likely to lead to temperature increases and a more variable and less predictable rainfall pattern in Turkana (Schilling et al., 2014; McSweeney et al., 2012). Both trends are likely to increase the drought risk. Droughts, a historically common phenomenon in Turkana have already been occurring more often in the past decades (Mude et al., 2009; Opiyo et al., 2015 (forthcoming)). In general, water is a scarce resource in Turkana. Lake Turkana is the only permanent source of water, although with a high salt concentration. Apart from several smaller ephemeral rivers (called laghas), the semi-permanent rivers Turkwel and Kerio are the only source of freshwater (see also Kenya Open Data, 2014a).

Within Turkana, the study was conducted in the Sub-Counties Turkana South and Turkana East (Fig. 1). The counties cover an area of about 18,670 km² and have a population of about 226,000 people (Kenya Open Data, 2014b). The villages of Lopii, Nakukulas and Lokwamosing were chosen for the field research to be able to compare different levels of engagement with the oil exploration.

Lokwamosing is furthest away from any oil exploration site. At the time of the research, members of the community in Lokwamosing had only heard about oil exploration but they had no contact with any oil company. Oil exploration had recently started in the vicinity of Lopii. Community members in Nakukulas had the most engagement with Tullow. Ngamia is the first and most developed onshore exploration site in Kenya. When the exploration at Ngamia started in January 2012 over 200 m of net oil pay were found (Tullow, 2013b). Net oil pay refers to the thickness of rock that can deliver oil to the well at a profitable rate (Tiab and Donaldson, 2012). Ngamia is located in the Lokichar Basin containing more than 600 million barrels of oil (Tullow, 2014c). All three villages fall in the oil exploration block 10BB which is held by Tullow (50%), Africa Oil (10%) and Lion (10%). Tullow is the only operator while the others hold a “non-operated interest” (Tullow, 2014c). Ngamia and Amosing are already in the phase of appraisal drillings (for the different phases see Cairn, 2015; for recent updates see Africa Oil, 2015). The recent period of low oil prices has forced Tullow to cut its global exploration and appraisal budget from $300 million to $200 million (Financial Times, 2014). Estimates of when production of oil could start in Kenya range from as early as 2015 to later than 2020 (Daily Nation, 2015; Standard, 2015; Financial Times, 2015; LAPSSET, 2015). The commercial production of oil in Kenya could reach 100,000 barrels per day.
How fast Kenya will become an oil exporter will also depend on the oil pipeline, proposed to run over a distance of 850 km cutting through the country from Turkana to a maritime terminal in Lamu, located at the coast of south-east Kenya (Tullow, 2014a). The pipeline will be part of a huge infrastructure project called LAPSSSET (Lamu Port-South Sudan-Ethiopia-Transport). The aim of LAPSSSET is to connect South Sudan and Ethiopia with Kenya’s coast through railways, roads and oil pipelines (Kenya, 2015). Lokichar in Turkana will become a hub of the project. The governments of Kenya and Uganda recently settled on a pipeline to transport oil from Albertine, Uganda to Lokichar. The pipeline is estimated to cost 400 billion Kenyan Shilling (KSH) ($4.8 billion) and to be completed in 2020 (LAPSSSET, 2015) an the northern route for the Sh crude oil pipeline that will transport oil from Albertine to in Turkana County.

2.2 Data collection

Data collection for this study was carried out in October 2013 and April 2014. The main research method applied was a qualitative approach based on individual interviews, small group interviews, focus group discussion and observations. In total 124 persons participated in the study. Most of them were community members including women, pastoralists, elder, youth and village chiefs. To pick up on potential gender differences, men and women were interviewed in separate as well as in mixed groups. Each interview or focus group discussion was conducted by at least two researchers to increase objectivity. Interviews and focus group discussions were audio recorded, unless people did not agree to be recorded. In each village about the same composition and number of people were sampled. Individual interviews were conducted with each village chief or assistant chief, other government representatives and a few members of non-governmental organizations (NGO) working in the research area. For example a discussion was held with a group consisting of local NGO representatives and local businessmen working on natural resources in Turkana South.

All efforts were made to get interviews with or statements from Tullow oil representatives but the requests were denied. The research team spoke to a few Tullow Community Liaison Officers (CLO) but these were not formal interviews from which direct quotes could be used. The atmosphere was partly tense, especially in Nakukulas where the purpose of the research had to be explained extensively prior to the survey.
The individual and small group interviews were based on an interview guideline structured along the themes of “general changes”, “worries” and “expectations/hopes”. To avoid biasing responses, terms such as “oil”, “conflict” and “climate” were only used by the researchers after respondents used them first. Further, participating and non-participating observations were conducted. These were particularly useful to assess sensitive issues such as interactions between Tullow representatives and communities as well as the operations of the oil exploration itself.

The secondary research method of this study is quantitative. Data on livestock raids in Turkana, collected by the local NGO Turkana Pastoralist Development Organization (TUPADO) was analysed using Excel (for a more detailed description of the conflict data see Schilling et al., 2012b). The data was then geo-referenced using ArcGIS, to show the distribution of raids and the location of oil exploration sites within Turkana (see Fig. 1 and section 3.2.2). The analysis is limited to 2006 to 2009 as the reporting was only consistent in this period.

In addition, an in-depth review of the literature on pastoralism, conflict, oil and climate change was conducted and newspaper articles and press releases by oil companies operating in Turkana were studied. The research team also drew on experience gained over five months in 2011 during field research on conflict and climate change in Turkana (see Schilling et al., 2012b; Schilling et al., 2014).

Like every study, the present one has its limitations. The sample size is limited to three villages and the perspective of Tullow could not be captured directly. The latter could in parts be compensated by informal conversations with Tullow representatives and a review of Tullow press releases. And while three villages are not representative for Turkana as a whole, this is to the authors’ knowledge one of the first studies that explores the oil-conflict-pastoralism-climate-nexus in Kenya.

2.3 Conceptual framework

The study applies a conceptual framework based on agents who each have a certain capability and motivation to pursue certain goals. This approach has been developed by Scheffran et al. (2012) and previously applied to the Turkana-Pokot conflict (see Schilling et al., 2012b). Motivation is commonly understood as the process that initiates, guides, and maintains goal-oriented behaviours. Capability is the ability to execute a certain course of action (Scheffran
et al., 2012). This relates to skills, knowledge, experience and networks on the one hand and financial resources and physical means such as men, weapons and ammunition on the other. Each actor has the choice between investing resources into a cooperative path which implies to try to work with other actors or into a conflicting path which implies pursuing aims in a forceful manner (Fig. 2).

Figure 2. Framework on conflict and cooperation (adapted from Schilling et al., 2012b)

Fig. 2 shows that if one actor chooses the conflict path the other actor almost has to take this path as well to avoid disadvantages. In theory, mutual cooperation has the potential to generate the highest overall benefit for all actors as no resources are wasted for destructive purposes.

To be able to apply the described framework, key terms need to be defined. Violent conflict is defined as the forceful settlement of opposing views. In contrast, cooperation is the peaceful sharing of resources and a state in which differences are reconciled peacefully. Climate change relates to long term changes in temperature and rainfall (IPCC, 2013). These interact with environmental changes, for instance land degradation which in turn are driven by human action (e.g. overexploitation of land). Vulnerability, specifically the vulnerability of the communities in Lokwamosing, Lopii and Nakukulas, is commonly divided into the three elements of sensitivity, exposure and adaptive capacity (IPCC, 2014). Sensitivity is determined by the effect of climate change on a particular resource (for instance water), its availability and how important the resource is for a certain actor (Schilling et al., 2012a). Climate exposure is the rate and extent of temperature and precipitation changes that a region is exposed to. The exposure to climate change interacts with exposure to environmental changes, for instance water pollution. It is hence important to consider the climate exposure in conjunction with the environmental exposure (see for example Schilling et al., 2013). Adaptive capacity relates to the actor’s knowledge, skills, options and assets to adapt to climatic changes (IPCC, 2014). Since risk is a central term of this study, it is important to define it as well. Risk is understood as a product of the likelihood of an event to happen and its (potential) impact (Scheffran et al., 2012).
3 Results and discussion

The result section is structured along the two research questions. In the first section the effects of the oil exploration on the communities’ vulnerability to climate change are presented. The second section addresses the risk of the oil explorations to create new conflicts or aggravate existing ones.

3.1 Oil exploration and community vulnerability

Fig. 3 summarizes the effects of oil exploration on the communities’ vulnerability to climate and environmental change. Each element of sensitivity, environmental exposure and adaptive capacity is worded to have the same sign as the respective category. For instance, the higher the water scarcity and dependence on pastoralism, the higher is the sensitivity. Major current and future effects are shown in bold. Land and especially water use are the issues contributing most to community vulnerability. In the future, the issues of water extraction, pollution and soil degradation are likely to become more prominent. Elements of the adaptive capacity of the communities are likely to have improved due to Tullow’s payments to the communities and investments into education. In the future, there is a risk that the pipeline between the extraction site and the refinery will disrupt migration routes of the Turkana and other pastoral groups in the area. Overall, the oil exploration and particularly the oil exploitation are likely to make the communities more vulnerable to climate change. The following sections describe each element of vulnerability in more detail.

Figure 3. Effects of oil exploration on vulnerability of pastoral communities

3.1.1 Sensitivity

Water and land (including pasture) are already scarce resources in Turkana. Oil exploration and exploitation aggravates water scarcity as significant amounts of groundwater are needed in every step (including drilling, injection, completion, and fracturing) (Allen et al., 2011). Studies for Canada for instance show that about three barrels of water are needed to extract one barrel of oil (Ptacek et al., 2004). Tullow aims to produce 100,000 barrels of oil per day in Kenya and mainly in Turkana (Standard, 2015). This will likely be felt in the mid to long run while in the short run Tullow has improved the communal access to water through the
installation of water tanks along the main road and in Nakukulas and Lopii. Community members reported that these tanks are filled by Tullow with water trucks.

Further, the extraction of oil in Turkana has the potential to offer some direct and indirect employment opportunities with Tullow and stimulation for the local economy, for example in the nearby town Lokichar. Both could to a certain extent decrease the communities’ dependence on pastoralism and hence make it less sensitive to climatic and environmental changes (Fig. 3). However, given that the effect of oil extraction on local employment is limited (see 3.2.1), the importance of water for pastoral communities and hence their climate sensitivity is likely to remain high.

A potential game changer could be the vast aquifers discovered in Turkana in September 2013. The replenishing rates of about 1.2 billion cubic metres per year would be more than enough to supply the entire county with water (Guardian, 2013). The aquifer did not come up in our interviews with community members. Only at the county level, Josphat Nanok, Governor of Turkana County, stressed the need to develop the aquifer. In 2013 the Kenyan government in cooperation with Unesco launched a countrywide groundwater mapping programme. As part of this mapping, the French company Radar Technologies International (RTI) announced to have found “66 trillion gallons of potable water” (Radar Technologies International, 2015) in Turkana. However, apart from a few boreholes drilled in northern Kenya, the process of the aquifer development has been slow and the impact limited (Guardian, 2015).

3.1.2 Exposure

Globally the burning of fossil fuels, including oil, is a major driver of climate change (Armaroli and Balzani, 2011). But the oil exploration in Turkana, at least so far, increases the climate exposure for the pastoral communities to a negligible extent. However, the oil exploration in Turkana exposes the communities to environmental changes which in turn interact with changes in temperature and rainfall. Exposure to pollution of water, land and air is a major concern (Fig. 3). It has been known for a long time that oil spills on land can “pose long term threats to groundwater quality” (Duffy et al., 1980). Studies conducted in Nigeria show that oil extraction can have detrimental effects on the environment and local populations, especially where environmental regulations are lacking or are not enforced, like in Kenya (for Nigeria see Linden and Palsson, 2013; Iwegbue, 2007; Orisakwe, 2009). Apart from the risk of contamination of drinking water (Owamah et al., 2013), for example by so
called non-aqueous phase liquids (NAPL), there is the possibility of inter-aquifer leakage. This term describes the process in which pumping causes (contaminated) ground water from another aquifer to enter the one being pumped (EPA, 1993). While the pollution of aquifers by oil is an environmental risk, it is beyond this study to assess this issue in detail. The respondents did not mention the pollution of water, possibly because they are not noticeable yet as the exploration in Turkana has only started in 2012. In addition to water, land could be polluted for instance by the dumping of oil wastes without proper sealing and treatment (Khaitan et al., 2006; da Silva et al., 2013). But again, the pollution of land did not feature strongly in the responses of the communities.

In its national environmental policy, the Government of Kenya (40) recognizes that “Kenya is vulnerable to illegal dumping of obsolete and banned toxic and hazardous substances”. In response, the government stated in 2013 that it will develop a national policy on toxic and hazardous substances (ibid). However, to the authors’ knowledge, this has not happened yet.

The community members reported several smaller changes in their environment related to the oil operation and preparation for it. Pastoralists from Lopii and Nakukulas mentioned that the noise and vibrations caused by the drilling disturb and scare the livestock. Community members claimed that some of their smaller livestock were injured by the wires that Tullow has set up. The research team observed that these wires run for several hundred meters about ten to twenty centimetres over the ground. As they are often hidden by bushes, it is plausible that pastoralists see the wires as a tripping hazard for them and their livestock. Another reported change in the environment is black smoke coming from the oil extraction exploration sites. Several community members in Nakukulas stated that they were afraid of the smoke since they were not used to it. And while the Turkana are used to cars, a few pastoralist reported that more livestock is injured or killed in road accidents. Indeed, the increased traffic with jeeps, trucks and movement of heavy machinery related to the oil exploration was noticeable. Several pastoralists from Nakukulas complained that Tullow had cut down several trees and therefore shade was lacking to protect livestock from the heat.

### 3.1.3 Adaptive capacity

The adaptive capacity is mainly determined by the knowledge, skills, resources and options the pastoralists have. A key adaptation strategy to lack of water and pasture is migration
Some pastoralists claimed that the oil exploration sites have altered their migration routes but the extent seems to be limited. This is likely to change when the extraction sites are connected to the refinery through a pipeline (see Tullow, 2014a for the route of the pipeline). The degree of disruption caused by the pipeline will depend on how much of the pipeline will run underground. According to Tullow (2014a) this will “mostly” be the case. Railways and roads built as part of the LAPSSET project (see 2.1) are likely to affect pastoral migration in the future.

The research team observed envelopes being handed out by Tullow representatives to several community members in Lopii who reported that Tullow has been distributing cash with the community. While this has other implications (see 3.2), the availability of financial resources generally increases the adaptive capacity of community members. Employment and stimulation of the local economy related to the oil extraction in Turkana offer further income opportunities. In an interview James Lomenen, Member of Parliament for Turkana South, described the discovery of oil as a promising “boost” for Kenya’s economy. However, the low level of formal education is a disadvantage of the local communities when competing with others for economic and employment opportunities—the low level of formal education is a disadvantage of the communities. Tullow has made efforts to contribute to education in Turkana. In Nakukulas, as part of its corporate social responsibility package, Tullow has built two classrooms and bought textbooks for the local primary school. In addition, the company has given scholarships to a few students to attend secondary school.

Improvements of infrastructure can also be related to Tullow’s presence and it has brought better transport links. Existing roads have been improved, new ones have been built, and the local airstrip has been rehabilitated. However, most roads only connect Tullow sites to the major road. And the airstrip is only used by the oil company and government officials. Despite this, the assistant chief of Nakukulas acknowledged that this provision of services was never less, more than the government was offering, and better than nothing: “If it was left to me, I couldn’t have brought this much development to my village”.

In the mid to long term the adaptive capacity of communities in Turkana will likely be affected by the process of devolution which Kenya has been undergoing since March 2013 (Vasquez, 2013). The World Bank (2015) has called it one of “the most rapid and ambitious devolution processes going on in the world”. In an interview with James Lomenen, he
described the idea of devolution to us as “bring[ing] services to the people”. A key aim of the devolution is to reduce development imbalances between different regions within Kenya (Vasquez, 2013). As Turkana is the most marginalized county in the country, the county has received one of the highest financial transfers from the county devolution pool. In the financial year 2014/15 Turkana has received KSH9.1 billion, equal to about $86.8 million and this amount increased for the current financial year (2015/2016) to KSH10.2 billion ($97.3 million) (Nairobi News, 2015). However, these sums have not (yet) made a difference on the ground.

3.2 Oil and conflict risk

This section discusses the conflict risk associated with the oil exploration. Both dimensions of community-company and intercommunal conflict are addressed.

3.2.1 Community-company conflict

The communal perceptions of oil extraction and Tullow range from cautiously hopeful to hostile. In Lokwamosing and Lopii community members have hopes and fears when it comes to and the impacts of oil. Some hope for jobs, water and education while others, like the chief of Lokwamosing, have heard “where there is oil, there are conflicts”. In Nakukulas, this is already the case. Tullow is increasingly viewed as a stressor or even an enemy. One woman describes the situation as being caught between two enemies: “on one side is the enemy [Pokot] and on the other is the oil company.” The conflict between the community in Nakukulas and Tullow has resulted in community road blocks that disrupt the traffic from and to Tullow sites. The road blocks are usually resolved in exchange for water to the community and under heavy presence of security personal. The security personal consists of Kenya’s administration police, KPRs and other Tullow security staff. While leaving Nakukulas, the research team of this study was also held up in a community road block which was resolved without violence after about half an hour. Community members in Nakukulas also reported that “some Turkana” had “chased away” workers who were trying to fence off an area. Several participants of a gender-mixed focus group discussion in Nakukulas mentioned that they have “seen people” destroying the wires that Tullow installed. The majority of participants in the focus group discussion supported this action. Especially in comparison to the other two research location, the atmosphere at the time of the research visits was tense. During the first research phase in October 2013 it took the local research assistants some
efforts to explain the purpose of the research and that the visitors are not associated with Tullow before the community would speak to the research team. Without being asked for it the community members in Nakukulas started talking about Tullow and oil which were the dominant topics. During the second research phase, the research team only interviewed the chief of Nakukulas because the aggravation of the community had reached a level which did not allow further interviews on this heated topic. Between the two research trips the level of violence between Nakukulas and Tullow had escalated. Newspapers reported of community demonstrations and storming of an oil site, including lootings and destruction of property (Nation, 2013). Tullow had to hold operations for several weeks because of the fragile security situation (Tullow, 2014c).

The causes of the community anger towards Tullow are less driven by the externalities of the oil exploitation but rather by the unmet expectations that the communities have for Tullow.

The expectations have to be understood against a wider background. There is a strong perception within the three communities and among pastoral groups in Turkana in general that they have been “forgotten” by the central government who does not care if they live or die (Schilling et al., 2012b; de Vries et al., 2006; Lesorogol, 2008; McCabe, 2004). This perception and the high development needs in Turkana create a hotbed for extremely high community expectations for the oil companies operating in the area. The communities see Tullow coming in with heavy and expensive machinery, building roads and drilling for water that the communities were unable to access. Table 1 shows the expectations of the communities in Lopii and Nakukulas (ranked by their importance) and how well they are met according to the communities.

By far, the most important issue was employment. “We want Tullow to give us jobs”, was a recurring expectation articulated by community members in both Lopii and Lokwamosing. In Nakukulas this expectation has already been disappointed.

Table 1: Community expectations and level of satisfaction

According to the county government act, 70% jobs from Tullow are meant for local Turkana and 30% for others. However this allocation is not being met. Community members themselves acknowledge that the locals are not qualified. They suggested that Tullow could
offer apprenticeships to train them. Several respondents felt they are stereotyped as a
community as being illiterate and ignorant pastoralists. The highest position a Turkana has at
Tullow is Community Liaison Officer, there are no Turkana in management positions, and the
best job a young Turkana man can get is a security guard (earning about KSH18,000 or $190
per month). According to villagers, Tullow even flies in drivers from Nairobi. This is a source
of major resentment: “Employment from Tullow goes to people from Kitale. Leadership is
not proactive to help us get work. They say we are not learned to get jobs, that we have not
been to school. We don’t know what kind of school these people in Kitale have! If we are not
learned, can we not be given causal jobs?” If things do not change, community members saw
that conflict was inevitable. “We can only see a tense future with Tullow unless the
government can do something good for us that will let us forget our precious treasure that
have been taken from us.”

Tullow has not released any recent numbers on employment and the company was not
available for any interviews. In October 2013, a press release by Tullow claimed that “Tullow
employs over 800 people from the Turkana region out of the 1,400 people currently employed
on Tullow’s Kenyan operations” (2013b). There are several newspaper reports and websites
citing a more recent Tullow statement that “as at the end of August 2014, 2,187 out of the
3,619 staff employed by Tullow and its contractors came from Turkana” (Oilnews, 2014;
Business Daily, 2014). The statement is however not available (anymore) on the Tullow
website and it needs to be questioned whether the numbers are realistic, at least for the
research area. According to the chiefs and community members in Nakukulas and Lopii, the
direct employment of Turkana in the oil sector has been minimal. Numbers between four and
fifteen were given. Community members stated that the highest position a Turkana has at
Tullow is Community Liaison Officer (CLO). The CLOs are the main communication
channel between Tullow and the communities. On the one hand the CLOs are supposed to
listen to the communities’ needs, concerns and complaints and to feed them back to Tullow.
On the other hand CLOs should inform the communities about the company’s actions and
plans. Another position mentioned was security guard. In the capital rather than labour
intensive oil industry the demand for unskilled labour is low. This is a fact that neither Tullow
nor representatives of the Kenyan government have clearly told the communities.

Water is the next critical conflict issue. The three communities expect Tullow to give them
water. To a limited extent, Tullow is doing this; drilling boreholes, setting up water tanks and
filling them, according to an informal interview with a CLO, “on a regular basis”. In addition, water points with pumps are set up in communities. However, the members of the Nakukulas community reported that Tullow only started to share the pumped water after on-going and vocal complaints from the community. Further, Tullow is unlikely to meet the communities’ expectations for water. One elder in Nakukulas stated that “we have only very small positive changes from Tullow since 2011. The water pump they gave us is not enough as it serves both livestock and community – one water source can’t support everyone.” Asked about the reasons for the community road blocks and attacks on Tullow, most interviewees responded “jobs” and “water”. The latter is likely to become more prominent in the future when almost inevitable high usage and pollution of groundwater will become noticeable.

Land is the third critical conflict driver. Traditionally Turkana is communal land which means there is no individual ownership of the land. However, the government of Kenya has given Tullow and Oil Africa licence to explore oil reserves in Turkana. The communities in Lopii and especially in Nakukulas perceive Tullow has an actor who comes and takes their land without proper community consultation or compensation of taken land. One woman from Nakukulas states “of our two enemies [Pokot and Tullow], we fear the Pokot the most. Tullow will only take our land, but the Pokot will take everything and kill us.” Several community members mentioned that Nakukulas has received some compensation from Tullow. One elder named an amount of KSH2.2 million ($24,000). In Lopii the research team observed Tullow distributing one-off cash payments to households. The immediate response in the community was very positive. “Today is like a festival” stated one woman. But the payments are likely to further increase community expectations for more payments, especially because the compensations for the lost resources are seen as insufficient. The following statement from Nakukulas summarizes the view on compensations. “[These] are good but too small to address the negative impacts of the companies. They are not enough for us. We cannot consider the small gestures as compensation for the amount of land and animals they have taken from us.” Another elder added, “our main concern is the land they [Tullow] have taken from us.” The communities have not received any compensation from the Kenyan government. Once the actual exploitation of the oil reserves starts (see 2.1), the Kenyan constitution demands that the profits are shared between the national government receiving 70%, the county government receiving 20% and 10% are meant to directly go to the local communities (Republic of Kenya, 2010). The issue of revenue sharing is already causing disagreements between the different levels of government (Star, 2012).
The demand for education was less of a conflict driver in Lopii and Nakukulas, although still present. Tullow has made efforts to improve the level of education in Turkana. According to Tullow 100 (out of 11,000) applicants were selected for the 2013/2014 scholarship program which supports postgraduate degrees, technical trainings and vocational studies (Tullow, 2013a, b). In Nakukulas the company has built two new classrooms, bought textbooks and gave a few students scholarship.

Some community members in Nakukulas expressed hopes that Tullow could improve the security situation in the region. But an elder noted “Tullow is not concentrating on conflict between Turkana and Pokot. Pokot always come and raid us. Tullow does not even want to mitigate or to respond” (see also 3.2.2)

The conceptual framework, developed under 2.3, is useful in understanding the interactions between the communities and Tullow. The communities in Lopii and especially Lokwamosing had not interacted with Tullow much. But in Nakukulas a motivation to choose a conflicting path with Tullow could be observed. In the first research phase the assistant chief of Nakukulas explained that if community members have a complaint, for example over the cutting of trees, an animal hit by a Tullow vehicle, or about a water issue, the elders come together to talk to the village chief, who then takes the issue to the district commissioner and finally to Tullow. The majority of respondents expressed dissatisfaction with this very indirect way and the response to some of the complaints. CLOs offer a more direct way of communication but Tullow had stopped sending CLOs to Nakukulas, likely because of the tense security situation associated with a series of community road blocks and an attack on an oil site. This shows that after the Nakukulas community had chosen a conflicting path, Tullow refrained from investing into a cooperative path (Fig. 2). This in turn is negatively perceived by the community. The assistant chief states; “the CLOs used to come to talk to and even stay with community to try to understand their views before extraction started but [they] stopped coming last year [2013]”. “Tullow is like a rock. It does not listen”, stated one elder. The broken communication with Tullow is likely to increase the risk of community members resorting to force to achieve their aims. Table 2 lists the main actors and their motivation and capability.

Table 2 Motivation and capability of key actors
A long history of violent conflicts with other groups has provided the Turkana communities in the research area with the skills, knowledge and arms to execute violent attacks. Tullow is motivated to ensure smooth operations. The company has the financial means to set up their own security forces but these imply costs, especially when conflicts are escalating.

Despite likely contradictions with Kenya’s climate goals (Sawa, 2015), the national government supports Tullow because of the expected revenues. There is a risk that the oil profits do not trickle down through the different levels of government to the local communities, especially because corruption (rank 145 of 175 countries) and patronage along political and ethnic lines is already a widespread problem in Kenya (Transparency International, 2014; Carrier and Kochore, 2014). The member of Parliament, James Lomenen notes: “Oil is not the problem – it is how it is done that is the issue.” The local government, mainly represented by the village chiefs, is in a difficult position. On the one hand, the chiefs have to follow the national direction and support the oil exploration. On the other hand, they understand their communities’ frustration with the effects caused by oil exploration.

The assistant chief of Nakukulas warns that “if Tullow will not work hand in hand with the community and administration, the direction will be very, very hard for them.” An elder concluded “we do not see a positive future relationship with Tullow”. Against this background, the risk of an escalation of conflict between the community of Nakukulas and Tullow is significant. Lopii and Lokwamosing could follow that path. In addition, the exploration of oil has implications for intercommunal conflicts in the region.

3.2.2 Intercommunal conflict and oil

The research area is heavily affected by intercommunal conflicts and raids (see Fig. 1 in 2.1). Between 2006 and 2009 the average number of 71 raids per year (six raids per month) reflects the high level of insecurity expressed by the interviewees. On average two people died per raid over the four years considered (TUPADO, 2011). The highest intensity of raiding is found in the border region between the Turkana and Pokot (Fig. 1). Lokwamosing is part of this raiding hotspot while Nakukulas and Lopii fall within the second highest raid category. The distribution of raids across Turkana shows a similar pattern to the one identified by Ember et al. (2012), with two differences. First, according to the TUPADO conflict records no raids occurred in the northeast part of Turkana while Ember et al. (2012) report between 11 and 14 raids here, although over a longer period of time (1998 to 2009). Second, Ember et al.
(2012) find a significantly smaller total number of raids. For instance, the dark red area in Fig. 1 indicates more than 40 raids while Ember et al. (2012) find none to a maximum of ten raids in the same areas.

Tullow has dealt with this high level of insecurity by recruiting Kenya Police Reserve (KPR), from the wider region to protect their oil sites and transportation routes. KPRs are community members who are given a gun, some ammunition, a uniform and some allowance by the government of Kenya to protect their community (Schilling et al., 2012b). A member of parliament stated in an interview that 1,000 KPR officers have been assigned to guard oil operations. Tullow informally gave a much smaller figure of 200. Regardless of the exact number, members of all three research locations have indicated that on the one hand, the increased presence of KPRs has improved the security situation where the oil exploitation is taking place. Several community members, for example in Lokwamosing reported that the raiding of the Pokot has decreased. “The home guards are patrolling” notes one community member. On the other hand, security in other areas such as the raiding hotspots along the Turkana-Pokot border was reported to have increased due to a lack of KPRs.

In addition, to affecting the distribution of security forces in the region, there is a concern that oil is increasing the value of land and hence the Pokot’s interest in it (Table 2). Disputed territory is already a driver of the Turkana-Pokot conflict (Schilling et al., 2012b; Adem et al., 2012; Vasquez, 2013). To what extent oil exploration will affect land rights and prizes is however too early to say. But the oil exploration could further weaken the already weak social contract between the pastoral communities and the central government. A few community members in Nakukulas blamed the government in Nairobi for the situation with Tullow. One woman summarised “we don’t know fully of the oil company’s benefits to us. Maybe it will be of benefit to our children. But now we have no power to change anything. This is something that the government has brought to us.”

Employment with Tullow could also become a source of conflict between communities. The members of a group consisting of local NGO representatives and local businessmen working on natural resources in Turkana South stated that people from Turkana East do not want people from Turkana South to take “their” jobs and vice versa. However, the community interviews in Nakukulas, Lopii and Lokwamosing gave little evidence for strong grievances over employment among communities in Turkana.
3.3 Synthesis of oil, conflict, vulnerability, and climate change

Fig. 4 combines the results of 3.1 and 3.2 to place them into context of the big picture. The oil exploration creates high expectations among the communities for employment, water provision and general development (education, infrastructure, financial benefits). In the communities’ perception the expectations are not met which in turn can be seen as the major driver for the conflicts between the communities and Tullow. It is possible that the longer the community expectations are not met, the stronger this conflict driver will become.

Oil exploration (and later exploitation) needs significant amounts of groundwater which the communities depend on. Other externalities (loss of land, disturbance of livestock, and disruption of migration routes) and pollution of water and soil will likely become a source of conflict but at the time of the research these externalities were less noticeable (hence a thinner line between externalities and conflict). The pollution and externalities associated with oil contribute to the communities’ vulnerability through an increase of their exposure to environmental changes (reduction and degradation of water and land resources, loss of trees) and a potential reduction of their adaptive capacity through limitation of mobility (especially once the pipeline is built).

But the oil exploration can also improve the communities’ adaptive capacity and hence reduce vulnerability through offering of development opportunities (Fig. 4). Direct employment with Tullow and indirect income opportunities related to the growth of local hubs such as Lokichar (Fig. 1) can strengthen the adaptive capacity of communities while reducing their dependence on pastoralism and therefore their sensitivity to climatic changes.

There were indications that oil exploration affects the Turkana-Pokot conflict through an alteration of security presence and potential greed driven motivations over territory and oil compensations but this finding is less reliable than the others.

The oil exploration and especially the exploitation later on will produce greenhouse gases which in turn drive climate change (left side of Fig. 4). But in the context of global emissions this has a marginal effect for the local situation (hence a dashed line). However, previous studies have shown that climate change aggravates the existing conflicts between the Turkana...
and Pokot (Scheffran et al., 2014; Omolo, 2010; Schilling et al., 2014; Ide et al., 2014). The conflicts in turn contribute strongly to community vulnerability because they lead to loss of human lives and livestock, spread insecurity and result in inefficient use of pasture (Schilling et al., 2012b). Positive mutual feedback between community-company conflict and vulnerability indicates that a vicious cycle or a “spiral of violence” (Scheffran et al., 2014) could start or escalate. Vulnerability increases the risk that communities resort to violence and conflicts while these in turn contribute to vulnerability.

Overall, the identified conflict risk is in line with a previous study. However Johannes et al. (2014) place a stronger emphasis on land as a key conflict driver while the present study suggest that the conflicts between the communities and Tullow are mostly driven by disappointed community expectation for water and employment.

4—Conclusions

The communities in Turkana South face significant challenges of violent intercommunal conflict, climate change and political and economic marginalization. Devolution is moving forward. Now oil enters the scene. The current extraction and later exploitation of oil brings new economic opportunities and infrastructure improvements to Turkana. Both are likely to reduce the vulnerability of communities to climate change. However, significant water usage and pollution of soil and water related to the oil extraction are likely to exceed these effects. So far the externalities of the oil exploration are much less of a driver of the conflicts between the community in Nakukulas and Tullow as compared to the disappointed community expectations. The Kenyan government has failed to provide Turkana with basic services, including education, infrastructure and foremost security. Now the communities see a new potent actor entering the region who has the capability to drill for water, build roads and accumulate security personal. This has let the communities to transfer their expectations for development and security away from the government of Kenya onto Tullow. It is however not the company’s responsibility to compensate government failure. However, Tullow is facing these expectations whether they are justified or not. Tullow has responded with some provision of water, financial compensations and education resources but there is still a strong feeling among the communities that they only experience the externalities of the “oil rush” while others, outside of Turkana get the jobs, revenues and prosperity. Unmet community expectations, especially for employment and provision of water
have resulted in community road blocks, destruction of company property and attacks on oil sites. To prevent a further escalation of violence which will be detrimental to all parties involved, significant changes are needed driven by different actors.

In conjunction with the ongoing process of devolution, the national government of Kenya needs to ensure a fair and transparent sharing of oil revenues between the different levels of government and the local communities who have to be included more strongly. The county government has to use the financial assets received through devolution and the oil has to use the revenues generated through the selling of oil exploration licences and taxes from exploitation to finally compensate its failure in Turkana. This implies significant investments into education, health services and water transport and transport infrastructure. Particularly, the development of the significant aquifers found in Turkana needs to be prioritised and accelerated to improve the water availability and access for the communities. The oil pipelines, roads and railways associated with the LAPSSET project need to be planned and built with sensitivity to existing pastoral migration routes and grazing land.

The issue of land rights has to be addressed to prevent the communities from losing their land without proper compensation. Strong environmental regulations and especially their enforcement are needed to prevent oil pollution of water and soil. The county and local government need to offer communication channels for local communities to enable them to express their concerns and requests in a more effective and direct way. Finally, but most importantly, the issue of insecurity and violent conflict needs to be addressed through intercommunal peace meetings, especially between the Turkana and Pokot. Further, the governments need to ensure that the expected oil revenues are shared as stated in the constitution. Particularly, the local communities need to benefit based on a transparent process. The issue of land has to be addressed to prevent the communities from losing their land without proper compensation. Strong environmental regulations and especially their enforcement are needed to prevent oil pollution of water and soil. The county and local government need to offer communication channels for local communities to enable them to express their concerns and requests in a more effective and direct way.

Tullow and any oil company operating in Turkana are well advised to closely communicate with the local communities to inform them about the operations, get their feedback and particularly manage their expectations. Community liaison officers (CLOs) are a promising approach. While it has to be acknowledged that the demand for unskilled labour in the oil industry is limited, integration of Turkana into the company’s workforce will be a positive sign for the communities. To be able to increase the share of Turkana employees, it is important to offer trainings in which
community members can acquire skills needed in the oil industry. Tullow should ensure that risks of environmental pollution are minimized. Water needs to be shared with the community in a way that is reliable and transparent but also sustainable.

The communities need to reduce their expectations for employment at Tullow and redirect their legitimate demands for development and security back to the government of Kenya. Frustration with Tullow should be expressed in a non-violent manner, for example through the chiefs or CLOs. If every actor, particularly the government of Kenya and Tullow, takes these recommendations seriously, than there is a real chance that Turkana and Kenya overall can benefit from the oil. Unfortunately, the more likely scenario is that oil will exacerbate the existing marginalization and discrimination of pastoral communities which in return is likely to fuel more conflict.

For further studies it is promising to continue to explore the nexus of oil, conflict and climate change, also in urban centres of Turkana, and particularly with respect to the evolving issues of environmental pollution, the building of the oil pipeline (including LAPSET) and potential impacts on inter and intra communal conflict.

Acknowledgements

The authors dedicate this publication to their dear friend Beth Njeri Njiru who has passed away so early and unexpectedly. The authors thank the communities of Lokwamosing, Lopii and Nakukulas, and every person who volunteered information for this study. The authors appreciate the helpful comments of the reviewers. The field research was made possible by International Alert. The overall work is supported through the Cluster of Excellence ‘Integrated Climate System Analysis and Prediction - CliSAP’, Universität Hamburg, funded by the German Science Foundation (DFG).

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Table 1: Community expectations and level of satisfaction

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<td>1. Employment</td>
<td>very low</td>
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<td>2. Water</td>
<td>medium</td>
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<td>3. Land compensations</td>
<td>very low</td>
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<td>Improved water infrastructure</td>
<td>Decrease of violent conflicts</td>
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<td>Improvements in schools and education</td>
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<td>Avoiding of externalities of oil exploration</td>
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<td>Increase of local economy</td>
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<td>Decrease of violent conflicts</td>
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<tr>
<td>Capability</td>
<td>Local knowledge of communities and area</td>
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<tr>
<td>Weapons/ammunition</td>
<td>Relations to and support of National government</td>
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<td>Manpower</td>
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Figure 1. Research location, oil exploration and distribution of raids in Turkana (based on TUPADO, 2011; Tullow, 2014b).

Figure 2. Framework on conflict and cooperation (adapted from Schilling et al., 2012b)
Figure 3. Effects of oil exploration on vulnerability of pastoral communities

Figure 4. Key interactions between oil, conflict, vulnerability, and climate change